



MODEL S MODEL X

2015–2020

2012–2020

2021 +

OWNER'S MANUAL







NORTH AMERICA

MODEL S MODEL X

2015–2020

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OWNER'S MANUAL





NORTH AMERICA

USING THIS OWNER'S MANUAL

YOUR OWNER'S MANUAL

For the latest and greatest information that is customized to your vehicle, view the Owner's Manual on your vehicle's touchscreen by touching the app launcher and then selecting the Manual app. The information is specific to your vehicle depending on the features you purchased, vehicle configuration, market region, and software version. In contrast, owner information that is provided by Tesla elsewhere is updated as necessary and may not contain information unique to your vehicle.

RELEASE NOTES

Information about new features is displayed on the touchscreen after a software update, and can be viewed at any time by choosing the **Release Notes** tab in the Manual app, or by touching **Controls > Software > Release Notes**. If the content in the Owner's Manual on how to use your vehicle conflicts with information in the Release Notes, the Release Notes take precedence.

ILLUSTRATIONS AND PRODUCT SPECIFICATIONS

The illustrations provided in this document are for demonstration purposes only. Depending on vehicle options, software version and market region, the information displayed on the touchscreen in your vehicle may appear slightly different.

All specifications and descriptions contained in this document are verified to be accurate at the time of printing. However, because continuous improvement is a goal at Tesla, we reserve the right to make product modifications at any time. To communicate any inaccuracies or omissions in this document, please send an email to: ownersmanualfeedback@tesla.com.

SAFETY INFORMATION

You can find safety information in your Model S/Model X Owner's Manual on the touchscreen.

For detailed information about your Model S/Model X, go to the Tesla website for your region, log on to your Tesla account, or sign up to get an account.

If you have any questions or concerns about your Model S/Model X, call 1-877-79TESLA (1-877-798-3752).

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MODEL 3 MODEL S TESLA TESLA ROADSTER
MODEL Y MODEL X TESLA MOTORS T E S L A



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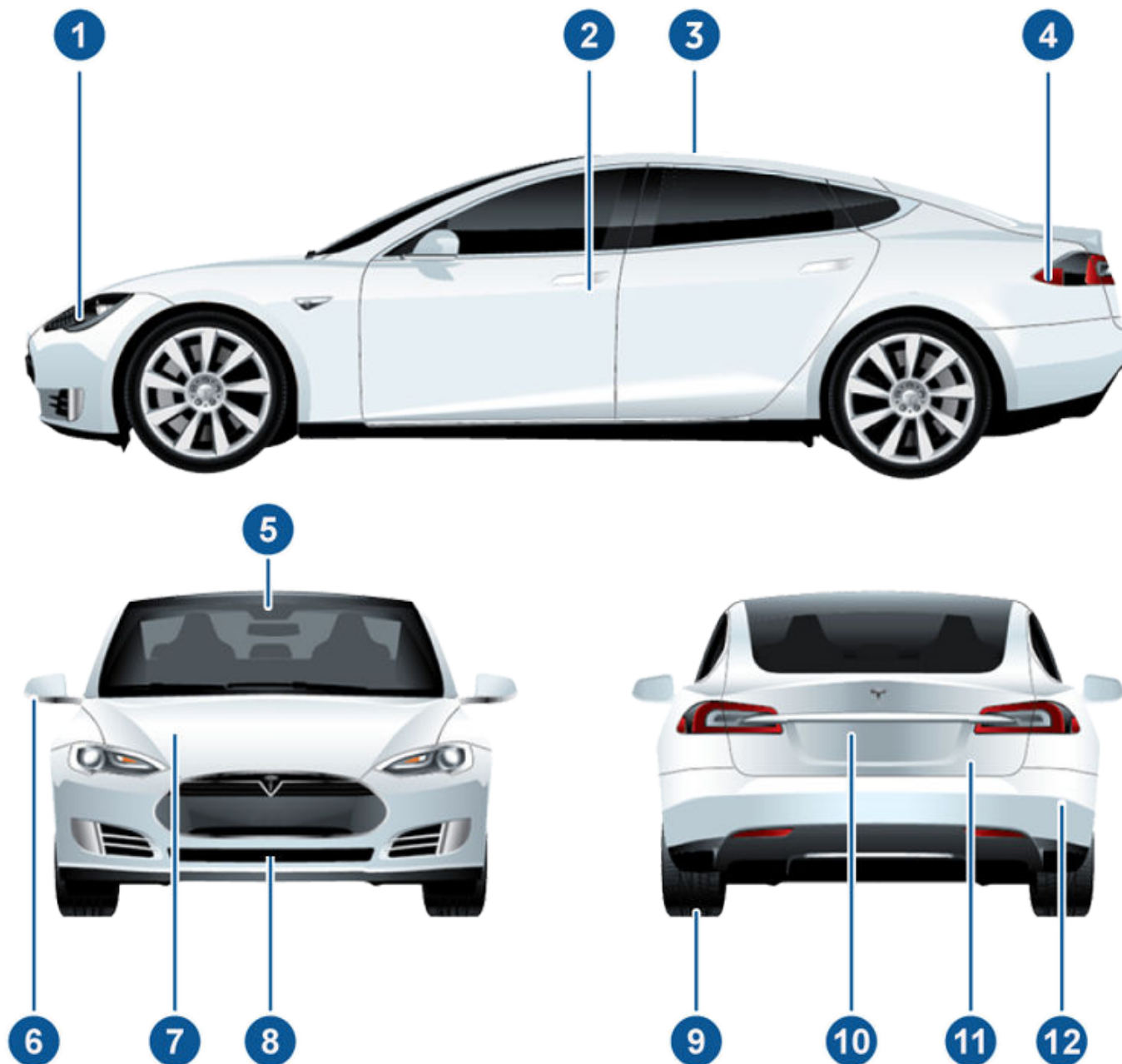
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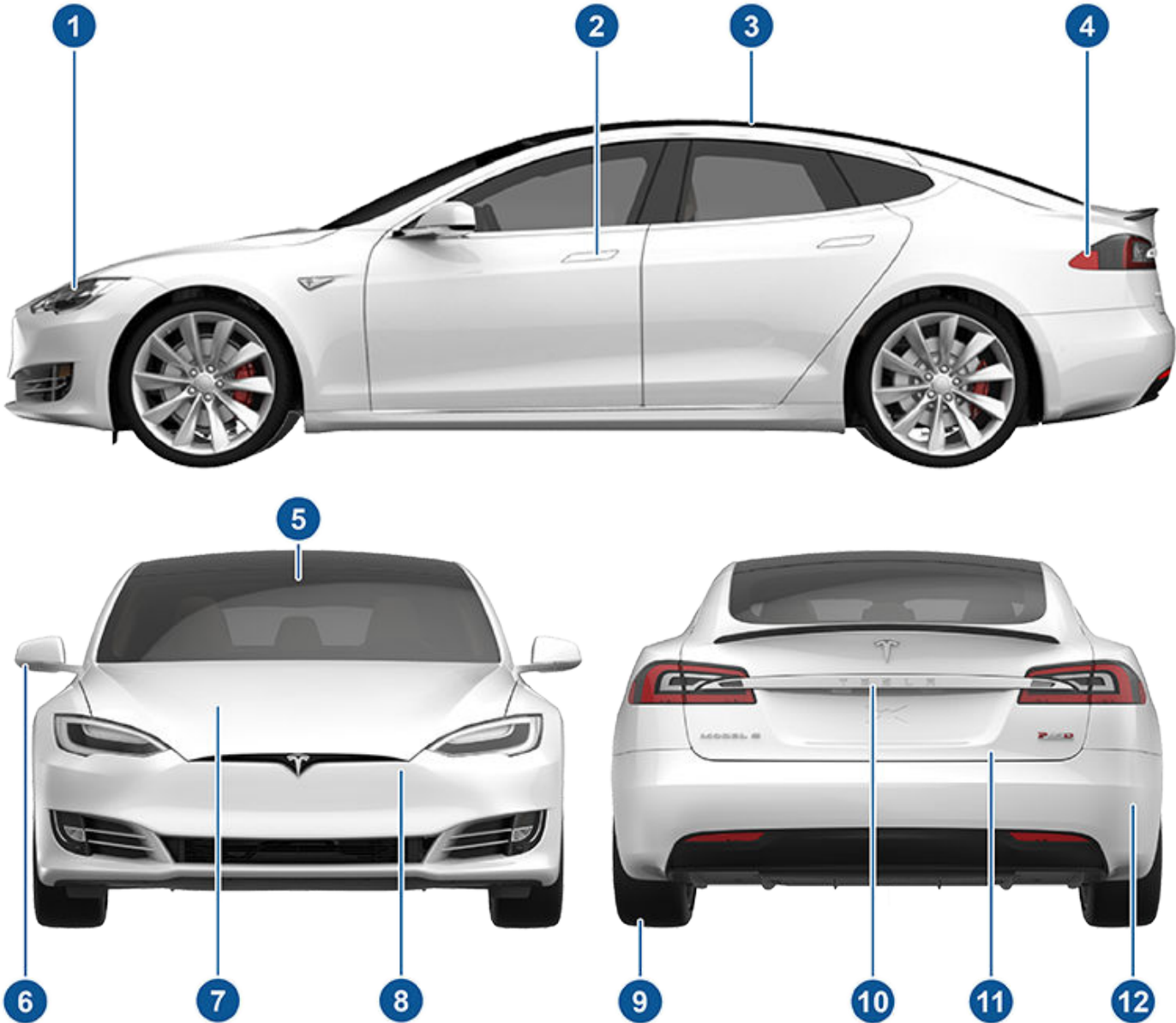
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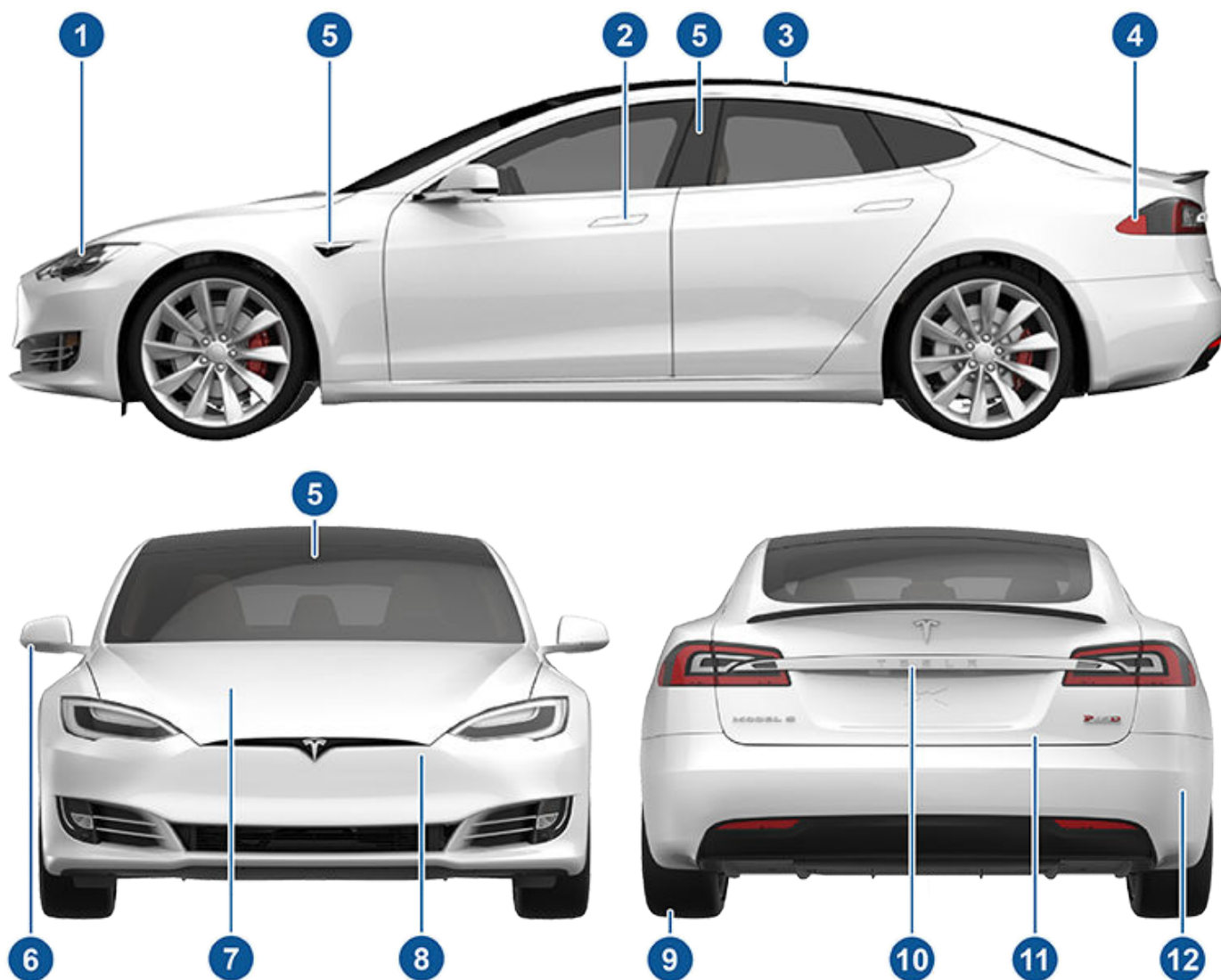


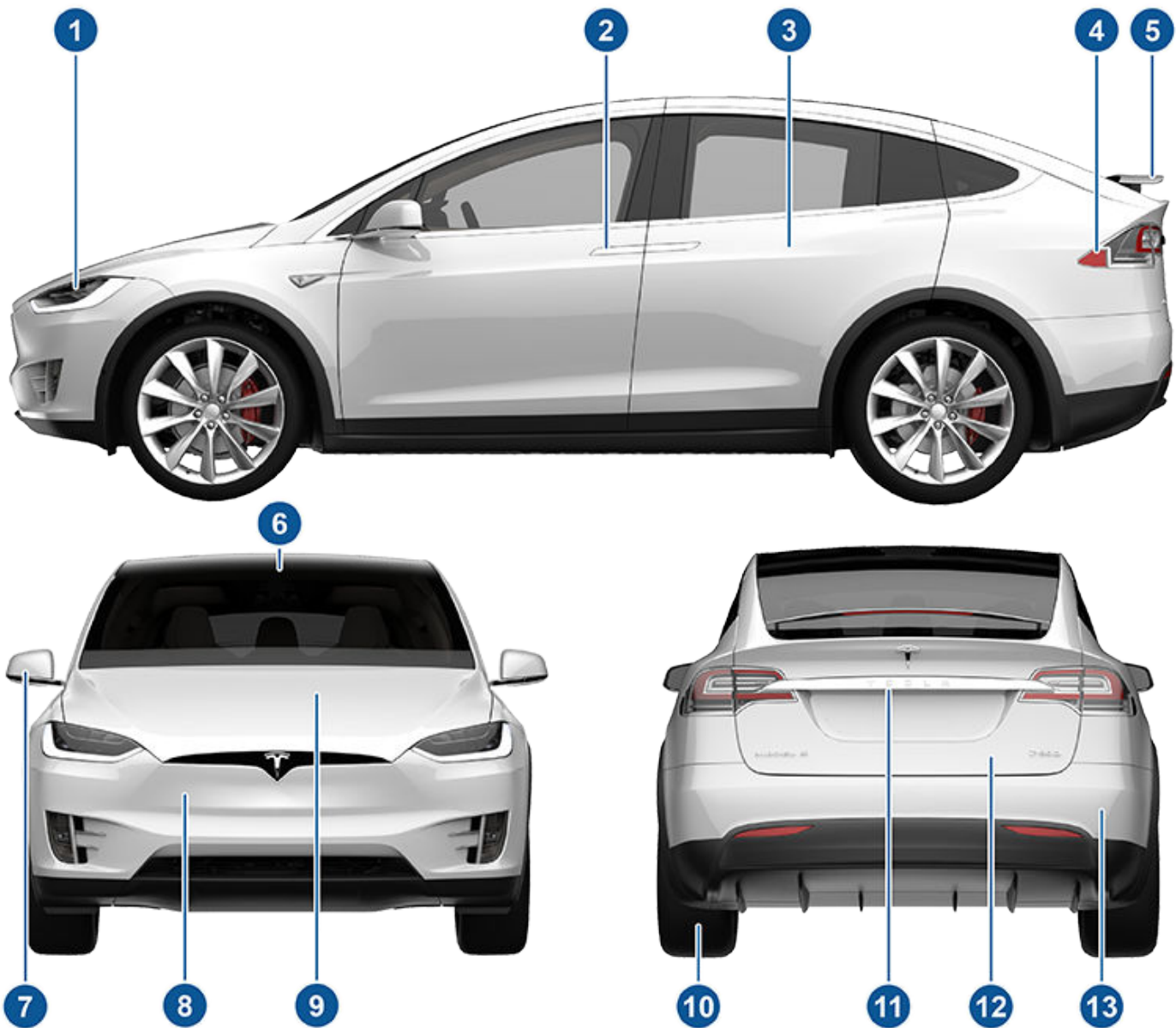
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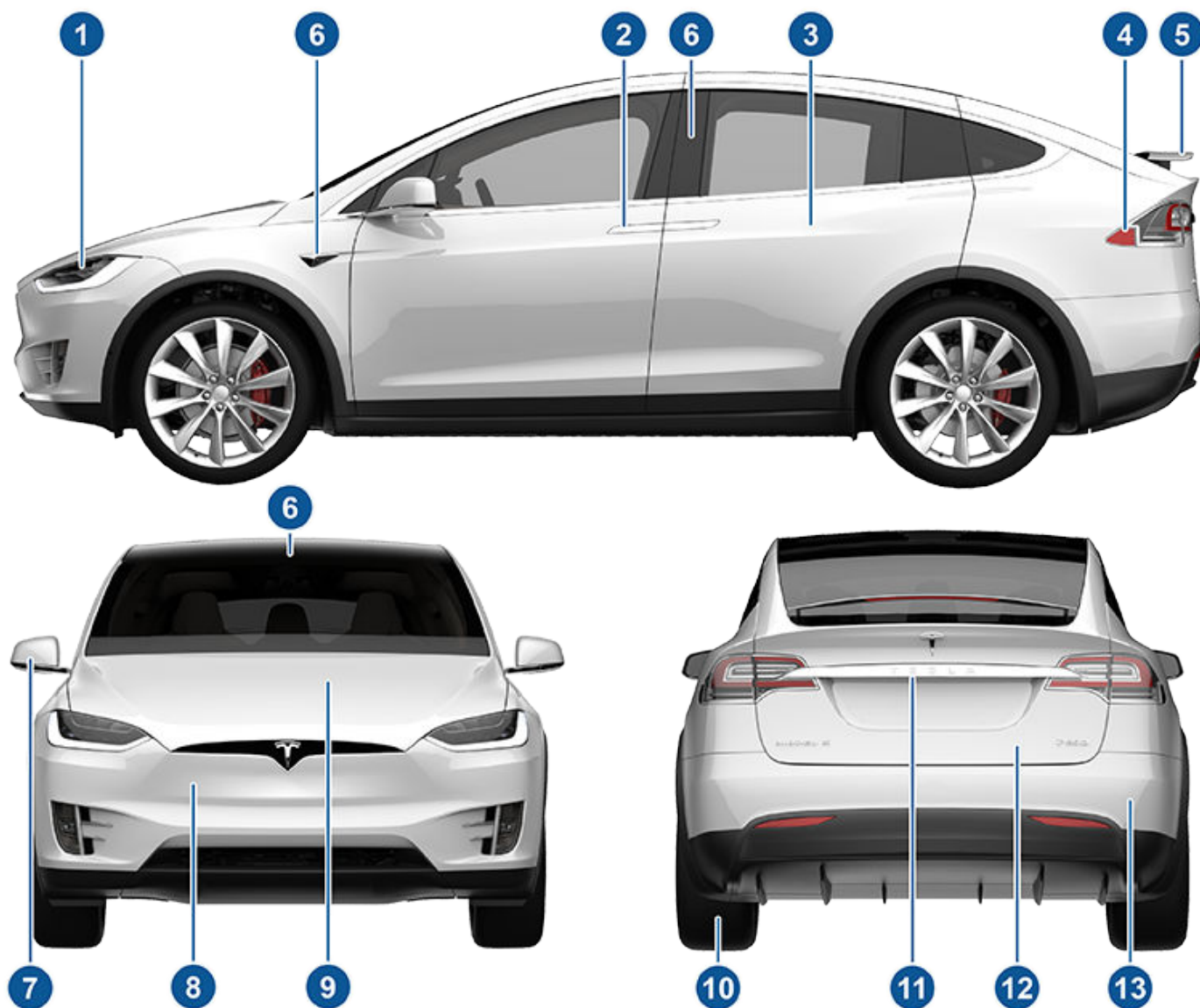
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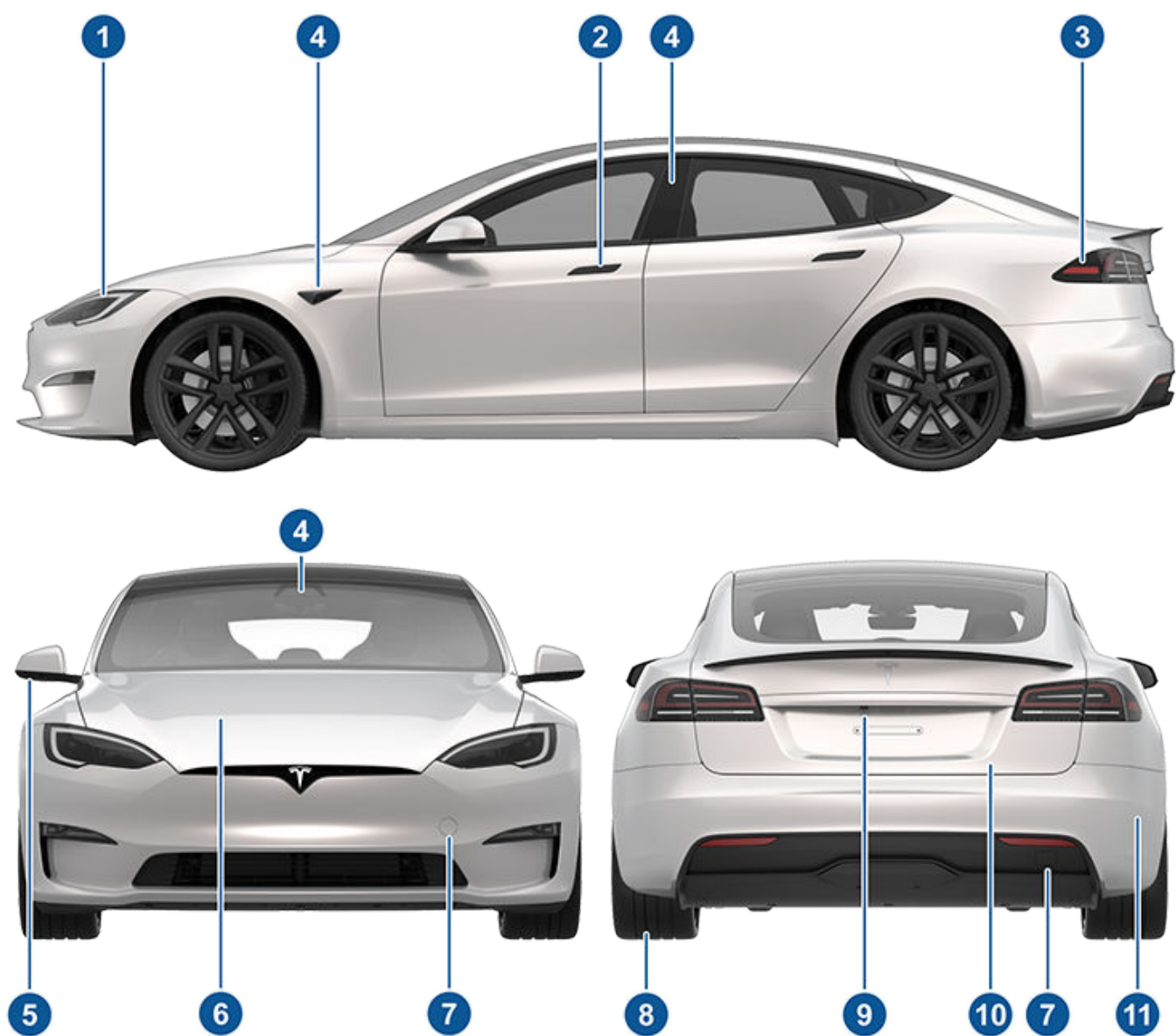


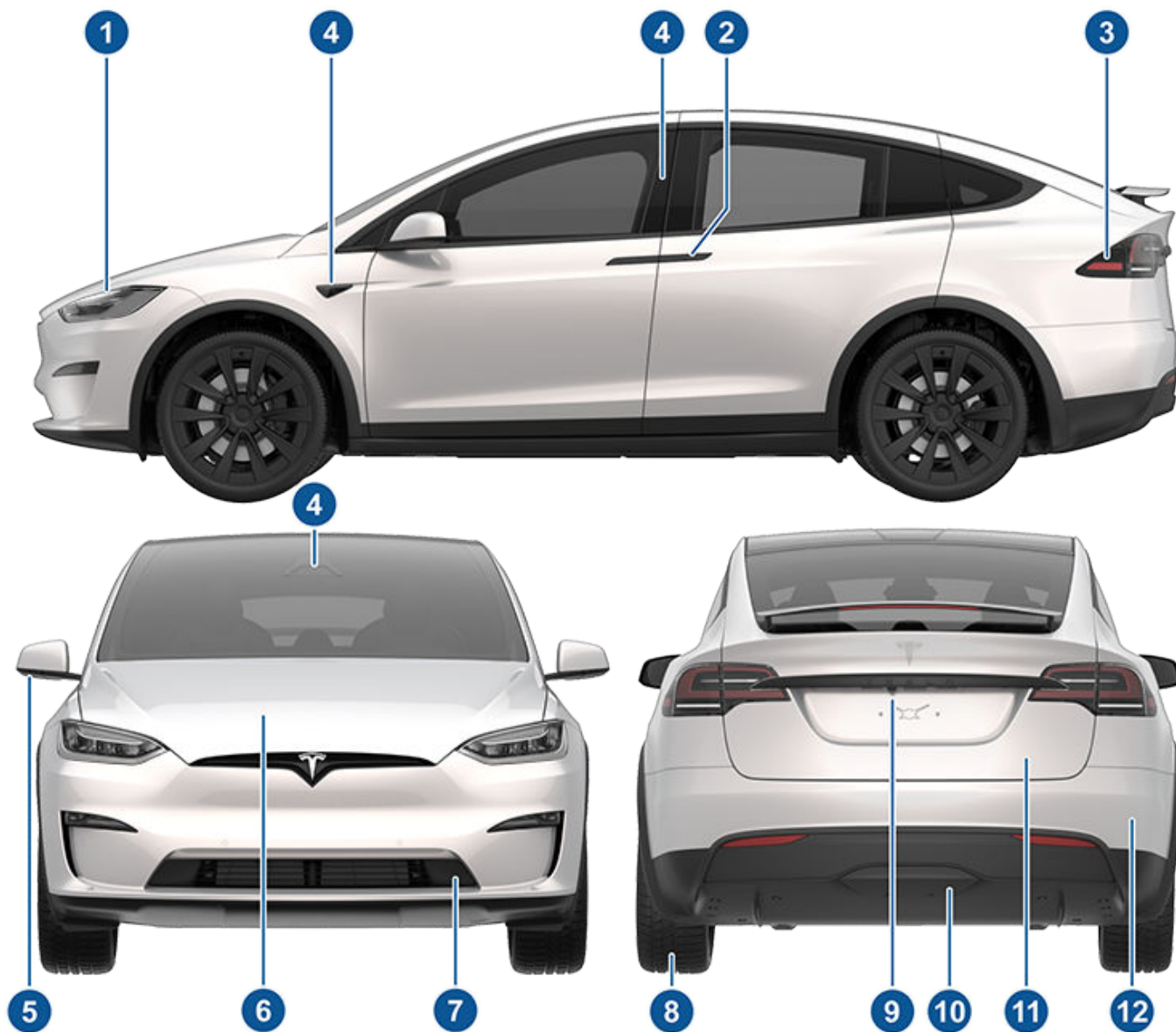


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NOTE: Depending on market region, vehicle configuration, and options purchased, your vehicle may look slightly different than described.

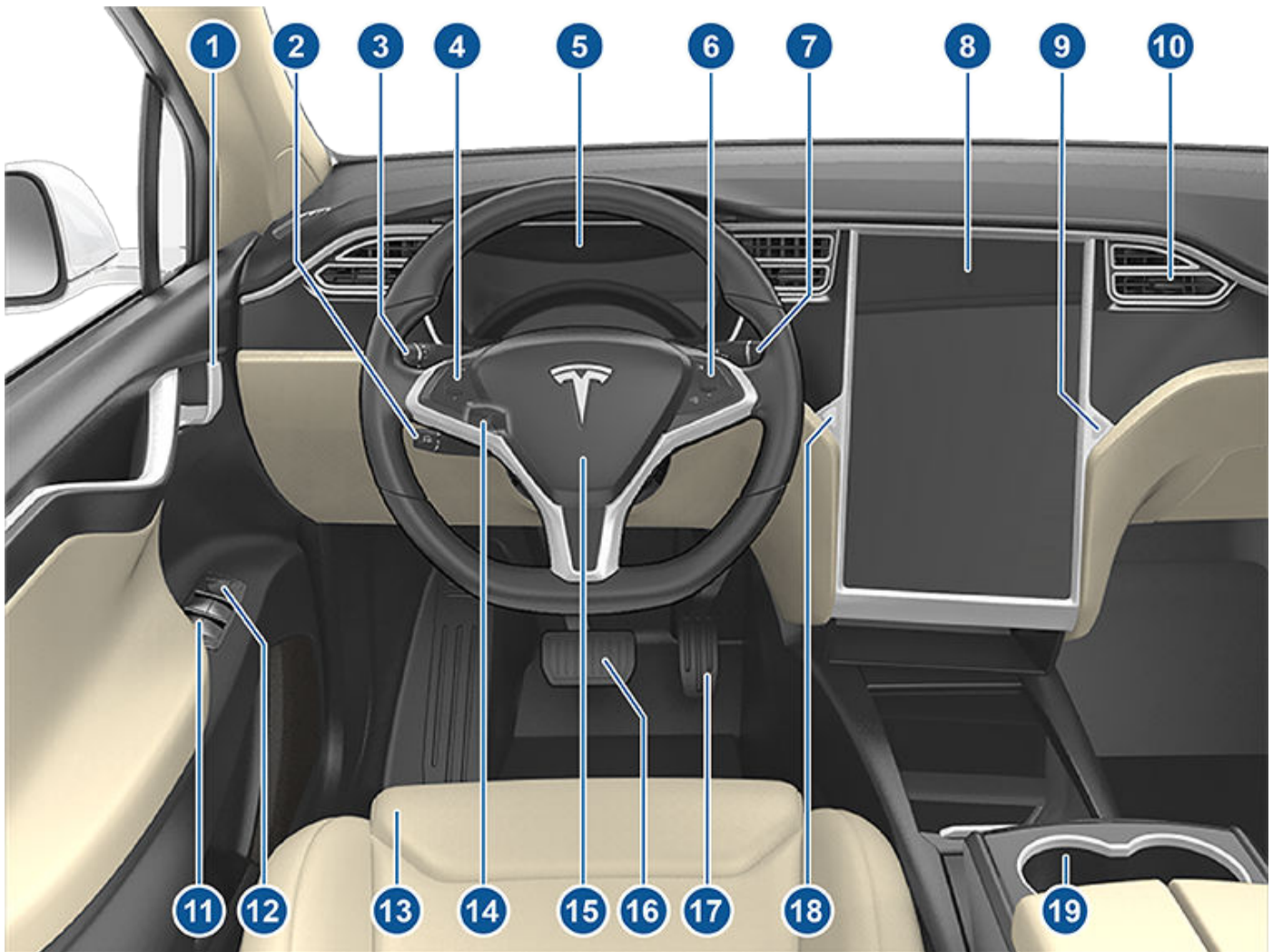




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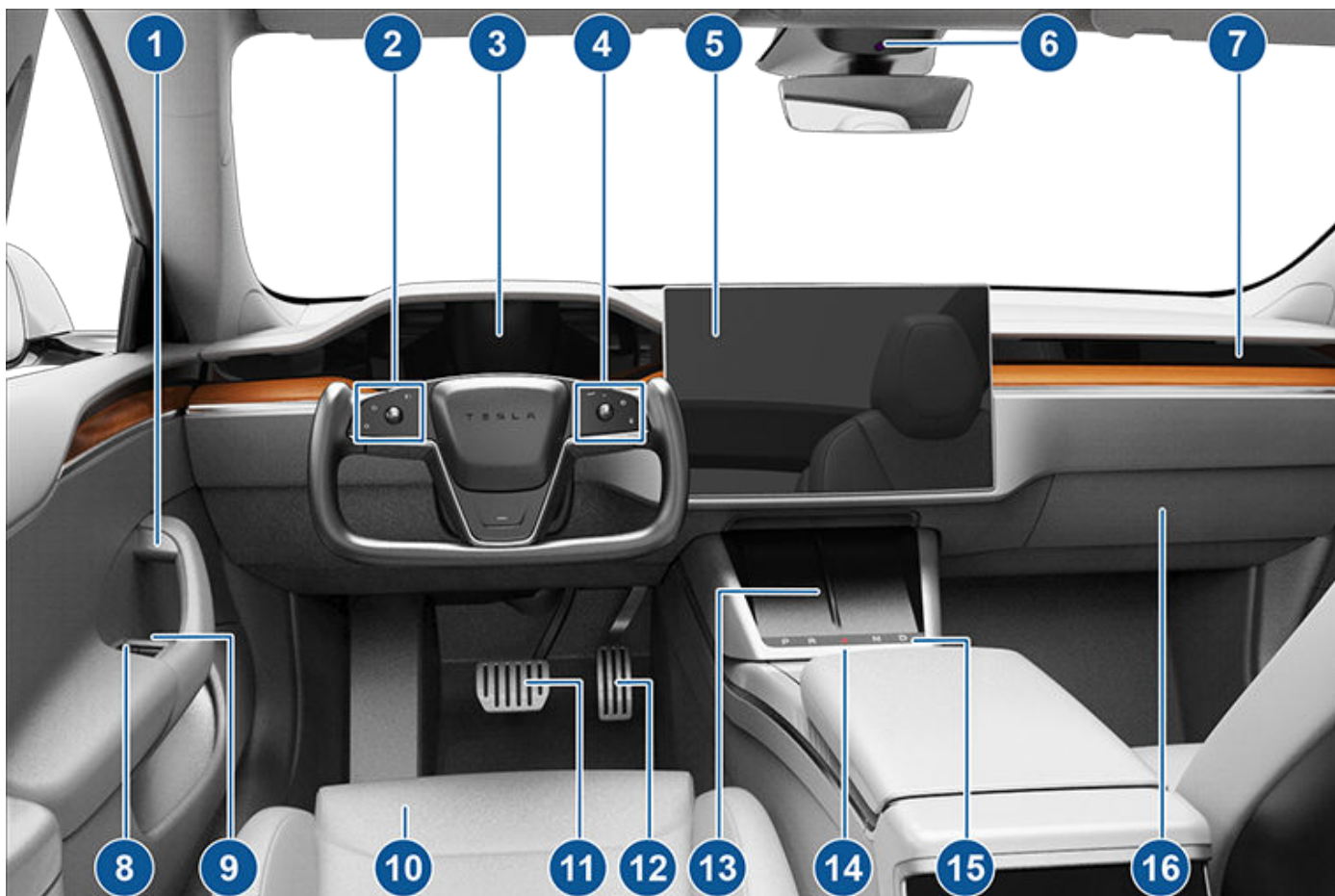
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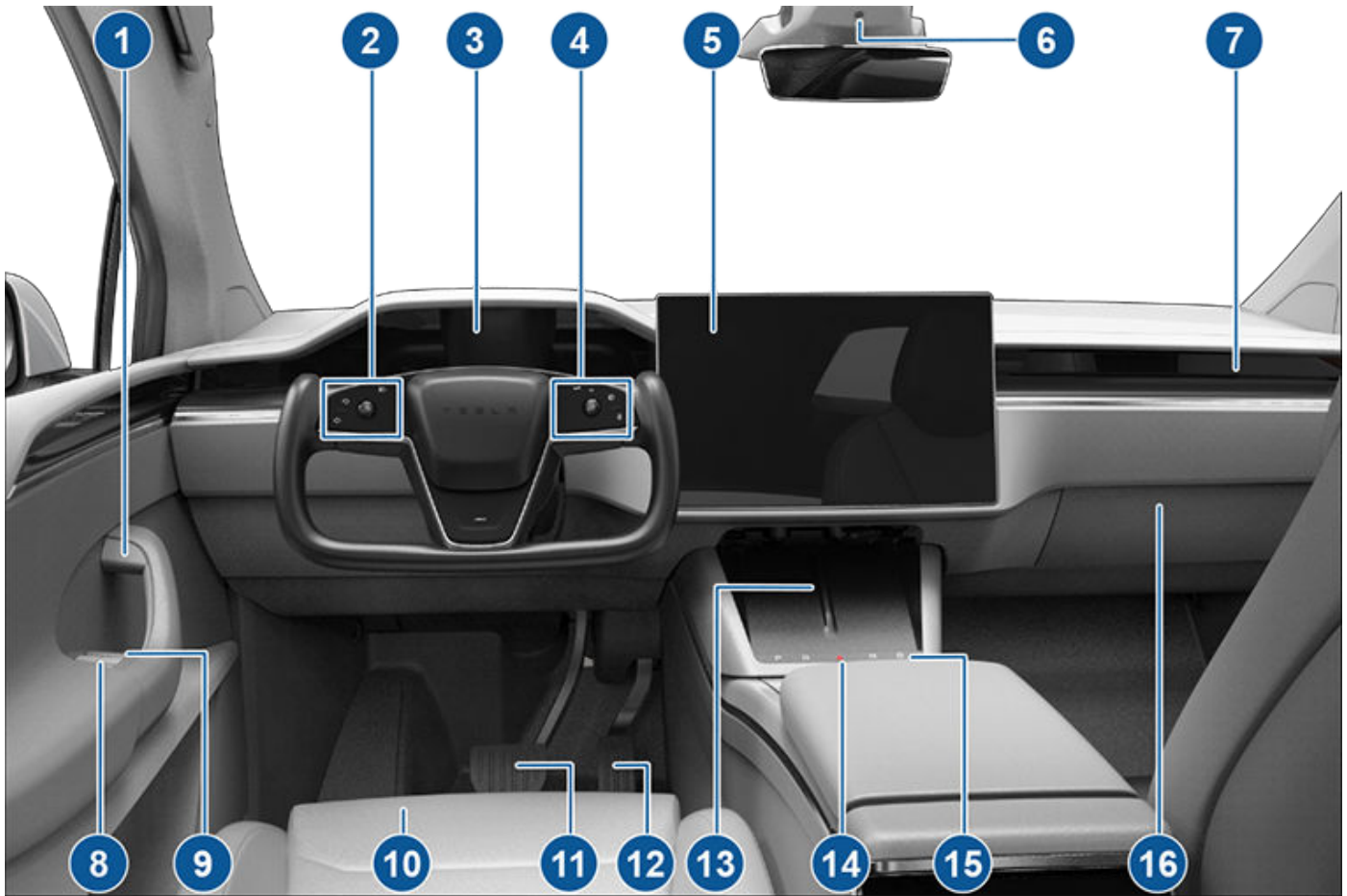


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- 17. Accelerator pedal ([Acceleration Modes on page 254](#)) Accelerator pedal ([Regenerative Braking on page 233](#))
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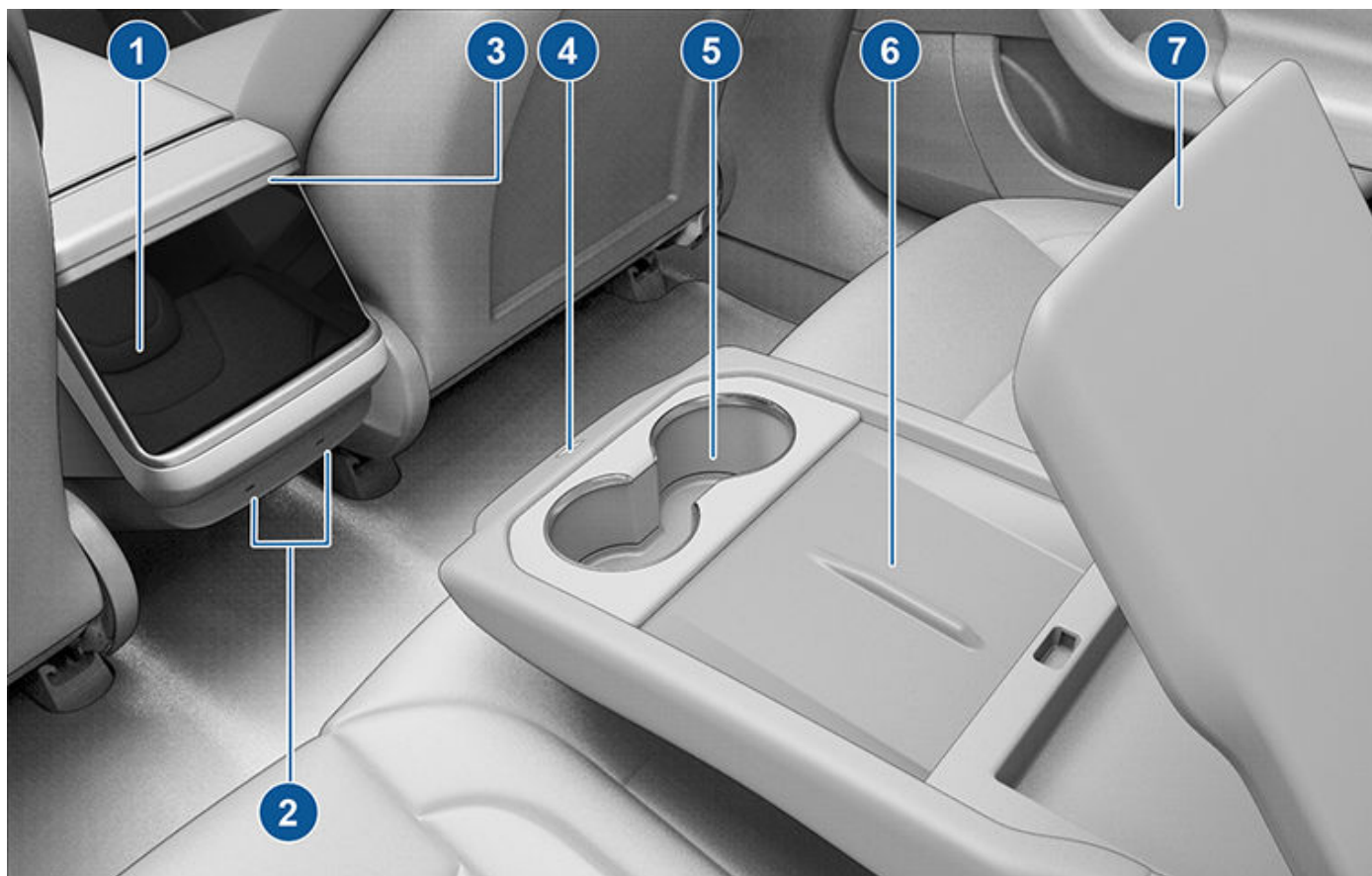


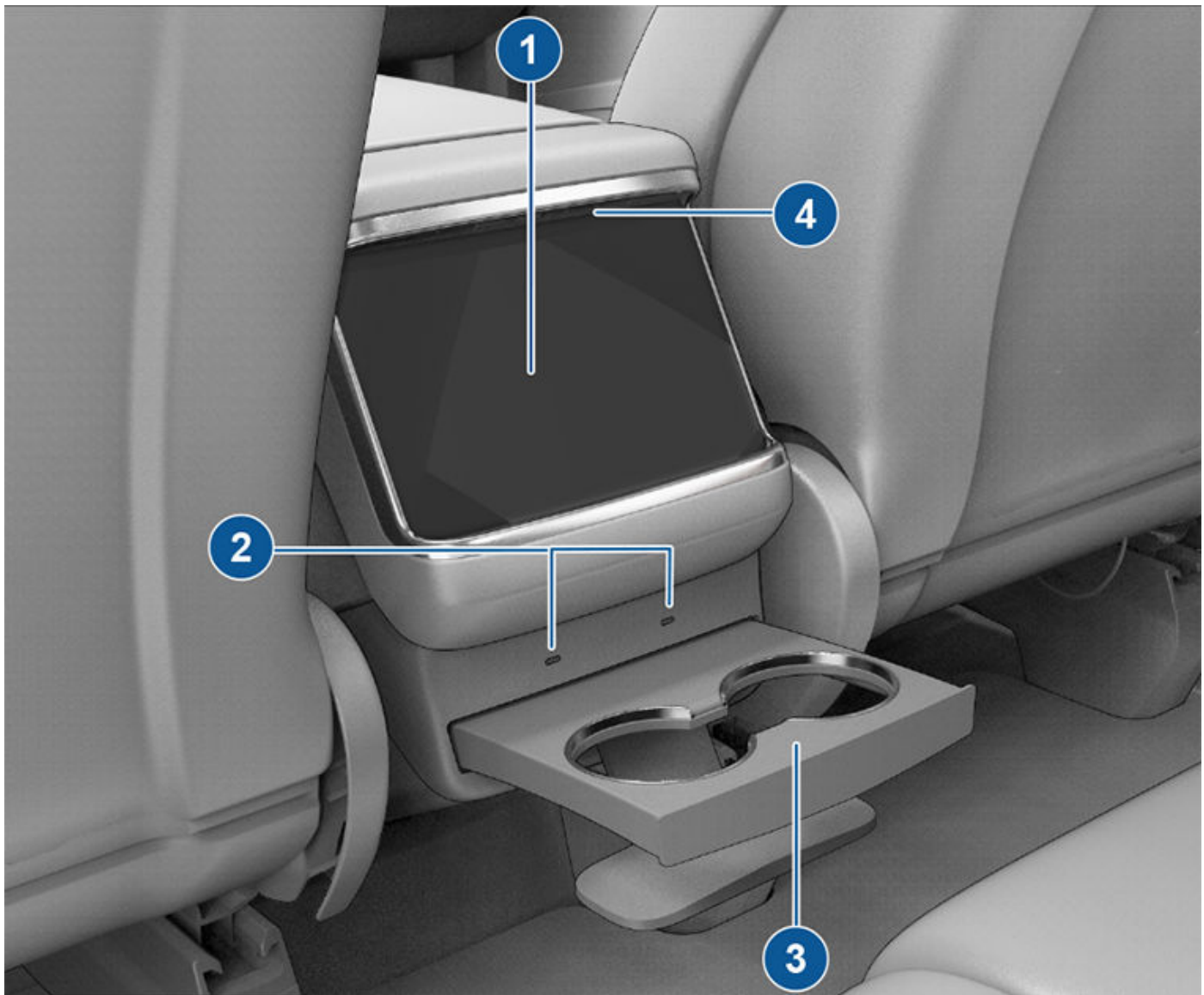
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8. Rear armrest ([Second Row Console on page 84](#))

Touchscreen Overview

In addition to the instrument panel, Model S Model X is equipped with a front and rear touchscreen.

NOTE: Throughout this Owner's Manual, the front touchscreen is referred to as the "touchscreen" whereas the rear touchscreen is referred to as the "rear touchscreen".

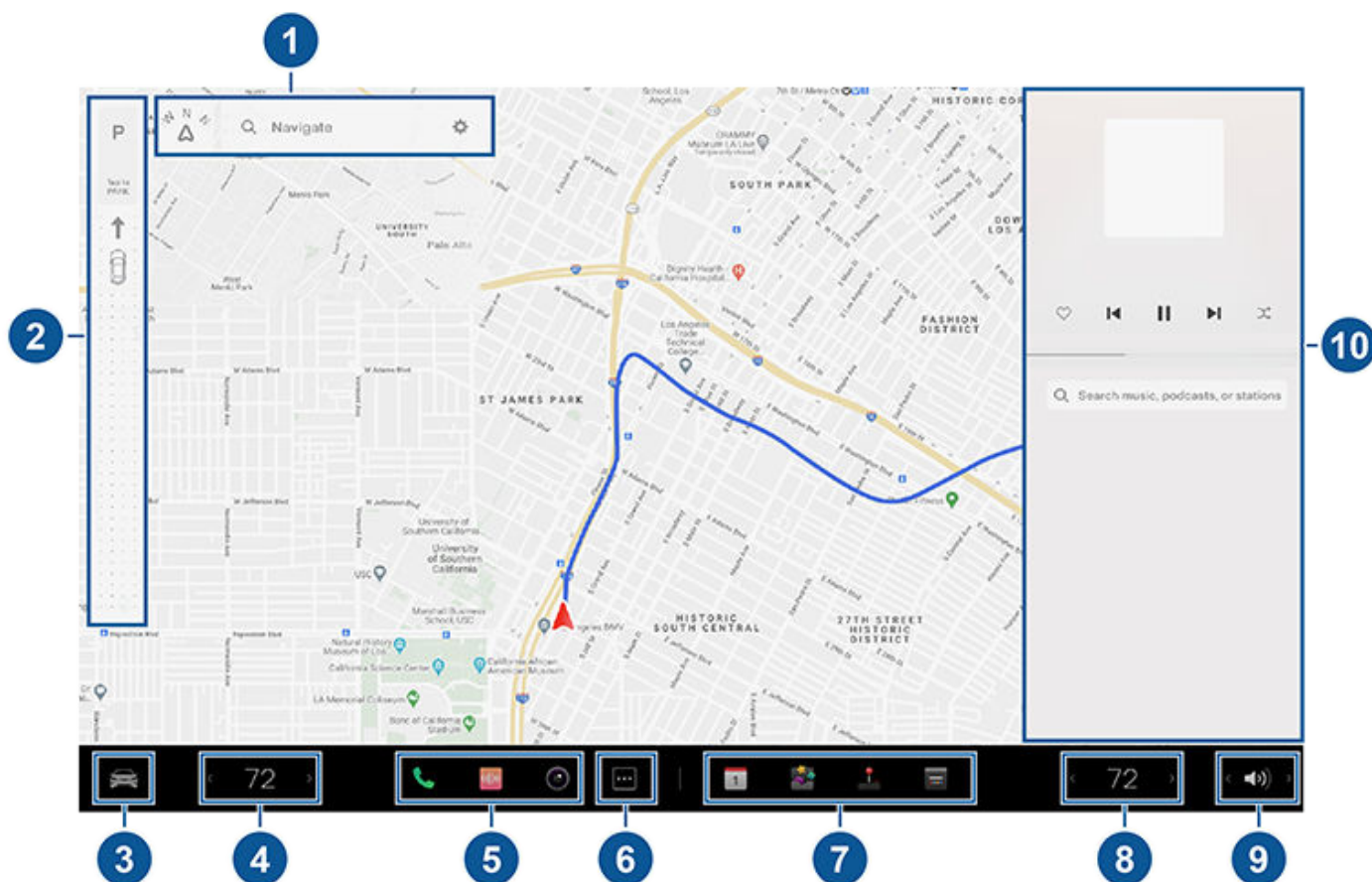


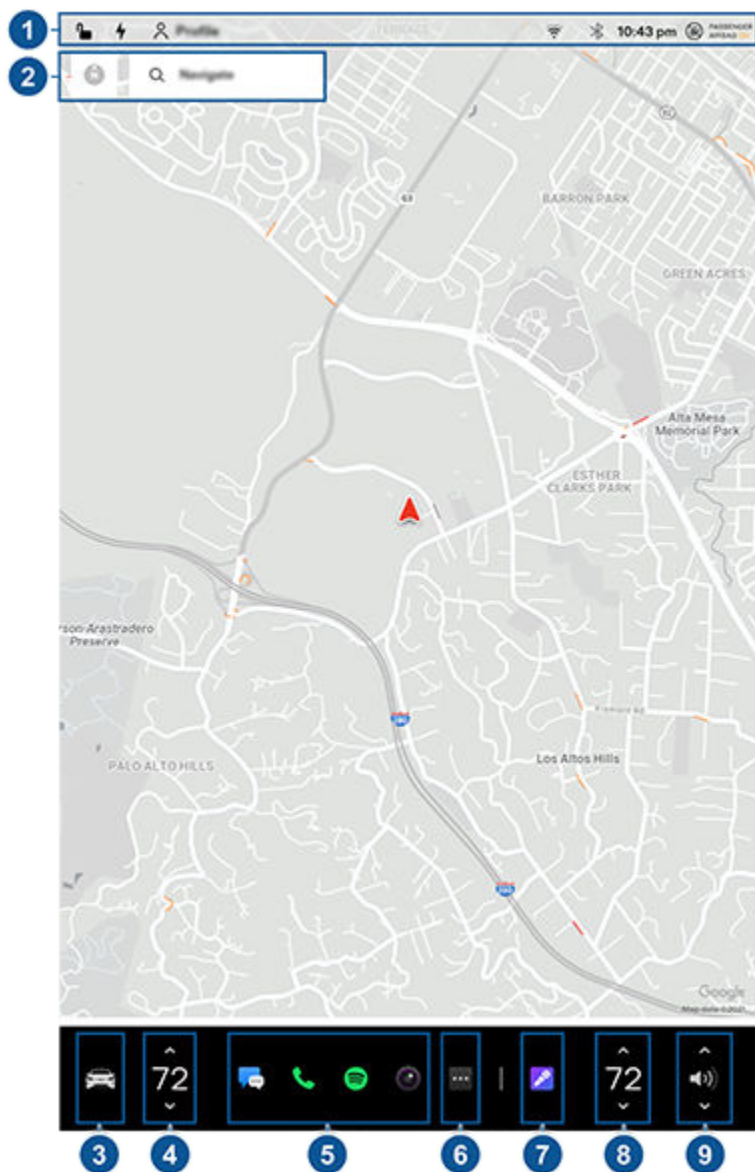
Owners Manual

WARNING: Always pay attention to road and traffic conditions when driving. To minimize driver distraction and ensure the safety of vehicle occupants as well as other road users, avoid using the touchscreen to adjust settings while the vehicle is in motion.

Use the touchscreen to control many features that, in traditional cars, are controlled using physical buttons (for example, adjusting the cabin heating and air conditioning, headlights, etc.). You also use the touchscreen to control media, navigate, use entertainment features, and customize Model S/Model X to suit your preferences. The main component of the touchscreen is the map area. Other main components are shown here:

NOTE: Illustrations are provided to improve conceptual understanding only. Depending on vehicle options, software version, market region and regional and language settings, the details displayed on the screen will differ.





1. **Status bar:** This area on the top of the touchscreen displays the time of day, the outside temperature, and the following icons:



Touch to lock/unlock all doors and trunks.



Status of the front passenger airbag (see [Airbags on page 172](#)[Airbags on page 161](#)).



Displays when a software update is available (see [Software Updates on page 404](#)).



Add, configure, or quickly switch driver profiles (including Valet Mode and Easy Entry). See [Driver Profiles on page 182](#).



Control or program HomeLink devices (if equipped) (see [HomeLink Universal Transceiver on page 400](#)).



Displays when a notification is in effect. Touch to display information about the notification. To display a list of the most recent notifications, with the most recent listed first, you can also touch **Service > Notifications**.



Connected to a Wi-Fi network.



Connected to cellular network. Touch to connect to Wi-Fi (see [Connecting to Wi-Fi on page 403](#)).



Connect to a Bluetooth device (see [Pairing a Bluetooth Phone on page 381](#)).

2. **Navigation:** Change the orientation of the map, find or navigate to a destination, and change navigation settings (see [Maps and Navigation on page 368](#)).
3. **Drive mode strip:** Use to shift into Park, Reverse, Neutral, or Drive. The drive mode strip always displays on the touchscreen when you touch **Controls** (see [Shifting on page 200](#)).
4. **Controls:** Control various features and adjust settings to customize your Model S Model X (see [Controls on page 348](#)).
5. **Climate controls (driver):** Use the left and right arrows to decrease/increase cabin temperature. Touch **Split** on the popup to display separate controls for the driver and passenger. Touch the temperature icon to customize climate control settings (see [Climate Controls on page 360](#)).
6. **My Apps:** For one-touch access to frequently used apps, you can choose what displays here. See [Customizing My Apps on page 19](#).
7. **App Launcher:** Touch the app launcher to open the app tray. Then touch any app to open it. The app you choose displays on top of the map. To close an app, drag it downward.
NOTE: You cannot completely close Media Player. When you drag Media Player down, it displays Mini-Player which allows you see what's playing, pause/play, and skip reverse/forward.
8. **Recent App(s):** Displays the most recently used app(s). The number of recent apps displayed here depends on how many apps have been added to **My Apps**. If you add the maximum number of apps to **My Apps**, only the most recent app displays.
9. **Climate controls (passenger):** Displays when temperature controls have been **Split** to provide separate controls for the driver and passenger.
10. **Volume Control:** Controls the volume of media player and phone calls (see [Volume Controls on page 376](#)). The volume of navigation instructions is controlled separately (see [Maps and Navigation on page 368](#)).
11. **Media Player:** See [Media on page 375](#).



Popup messages appear at the bottom of the touchscreen. For example, a seat belt reminder appears if a seat belt is unfastened in an occupied seat, an alert appears to notify you of an incoming phone call, a text message appears (when applicable), and voice commands appear when in use. If applicable, touch options from these popup messages (for example, accept/decline a phone call, choose an option from the headlight menu, etc.). To dismiss a popup message, swipe it downward.

The bottom of the touchscreen may also display the following:



Displays the status of the front passenger airbag (see [Airbags on page 172](#)[Airbags on page 161](#)).

Customizing My Apps

For one-touch access to commonly used apps, you can customize what displays in the **My Apps** area on the touchscreen's bottom bar:

1. Enter customization mode by touching and holding any app in the **My Apps** area. If this area is empty, touch the App Launcher.
2. Simply drag any app from the app tray onto the **My Apps** area in the bottom bar.

NOTE: When you've added the maximum number of apps to **My Apps**, adding an additional app removes the rightmost app.

NOTE: Remove an app from the **My Apps** area by touching and holding, then touching its associated "X".

Rear Touchscreen

The rear touchscreen provides rear passengers with access to:



1. **Temperature:** Touch the arrows to decrease/increase cabin temperature.
2. **Media:** Play, pause, skip or rewind through the currently playing song (see [Media on page 375](#)).
3. **Rear fan:** Touch to turn the rear fan on or off, to adjust fan speed and control the direction of air flow from the rear vents (see [Adjusting the Front and Rear Vents on page 364](#)).
4. **Seat heaters:** Control rear seat heaters.
5. **Video:** Access video streaming services.
6. **Volume:** Touch to adjust the volume.

NOTE: Adjusting the temperature, media and volume controls adjusts the front cabin settings also.

You can lock the rear touchscreen by touching **Controls > Display > Lock Rear Display**. Locking the rear display stops any media and video apps from playing, and all touches are ignored until you use this setting to unlock it.



NOTE: You can also use the front touchscreen to adjust climate settings in the rear cabin (see [Adjusting Climate Control Settings on page 360](#)).

Opening and Closing

Keys

Three Types of Keys

Model SModel X supports three types of keys:

- **Phone key** - You can set up your personal phone as a "phone key" that communicates with Model SModel X using Bluetooth. A phone key supports automatic locking and unlocking.
- **Key card** - Tesla provides a key card that communicates with Model SModel X using short range radio-frequency identification (RFID) signals. The key card is used to "authenticate" phone keys to work with Model SModel X and to add or remove other key cards, phone keys, or key fobs. Unlike the phone key and key fob, the key card does not support automatic locking and unlocking. In situations where your phone key has a dead battery, or is lost or stolen, use your key card to unlock, drive, and lock Model SModel X.
- **Key fob** - The key fob allows you to press buttons to open the front and rear trunks, and unlock, lock, and drive Model SModel X. The key fob also supports automatic locking and unlocking, if available in your region (see [Passive Locking and Unlocking on page 26](#)) and can be used as a backup to your phone key.

Model SModel X supports a total of 19 keys, which can include phone keys, key cards, and up to four key fobs.



CAUTION: Remember to bring a key with you when you drive. Although you can drive Model SModel X away from its key, you will be unable to power it back on after it powers off.

Phone Key

Using your phone as a key is a convenient way to access your Model SModel X. As you approach, your phone's Bluetooth signal is detected and doors unlock when you press a door handle. Likewise, when you exit and walk away with the phone key, doors automatically lock (provided the **Walk-Away Door Lock** feature is turned on; see [Walk-Away Door Lock on page 41](#)).

Before you can use a phone to access Model SModel X, follow these steps to authenticate it:

1. Download the Tesla mobile app to your phone.
2. Log into the Tesla mobile app using your Tesla account user name and password.

NOTE: You must remain logged in to your Tesla account to use your phone to access Model SModel X.

3. Ensure that your phone's Bluetooth settings are turned on. Also ensure that Bluetooth is turned on within your phone's global settings for the Tesla mobile app. For example, on your phone, navigate to Settings, choose the Tesla mobile app, and ensure the Bluetooth setting is enabled.

NOTE: Model SModel X communicates with your phone using Bluetooth. Keep in mind that your phone must have enough battery power to run Bluetooth and that many phones disable Bluetooth when the battery is low.

4. Ensure access to your location is enabled by viewing the Tesla mobile app in your phone's settings and selecting **Location > Always**. For the best experience, keep the mobile app running in the background.
5. On the touchscreen, ensure that Allow Mobile Access is enabled (**Controls > Safety > Allow Mobile Access**).
6. While inside Model SModel X with a key card handy, open the Tesla mobile app and follow the prompts to set up a phone key.

To view a list of keys that can currently access Model SModel X, or to remove a phone key, touch **Controls > Locks** (see [Managing Keys on page 29](#)).

Model SModel X can connect to three phone keys simultaneously. Therefore, if more than three phone keys are detected and you want to authenticate or pair a different phone, move the other connected phone key(s) out of range or turn off its Bluetooth setting.



NOTE: If multiple vehicles are linked to your Tesla account, you must ensure that the vehicle you want the mobile app to access is currently selected on the mobile app.

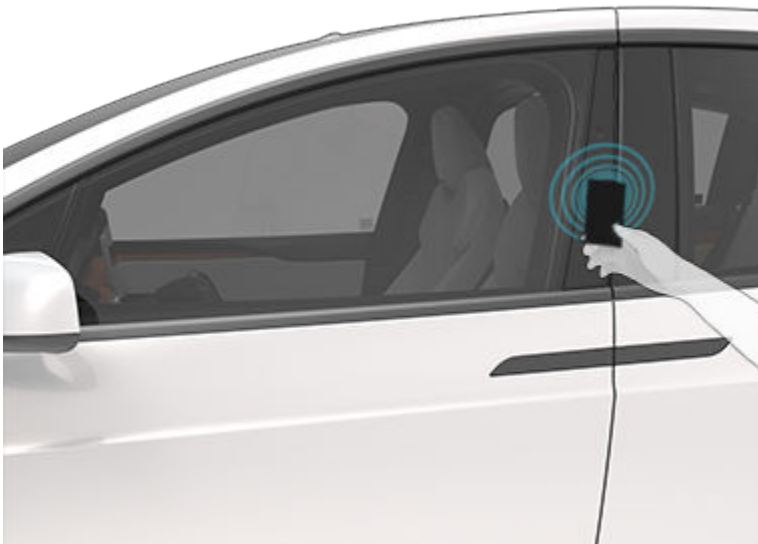
Once a phone has been authenticated, it no longer requires an internet connection to be used as a phone key for Model S/Model X. However, to use the phone hands-free, access your phone's contacts, play media from it, etc., you must also pair it and connect it as a Bluetooth device (see [Pairing a Bluetooth Phone on page 381](#)).

Key Card

Tesla provides you with two Model S/Model X key cards, designed to fit in your wallet.

To use a key card to unlock or lock Model S/Model X, position the card as shown and tap it against the card reader located approximately one third the way up of the driver's side door pillar. When Model S/Model X detects the key card, the exterior lights flash, the mirrors unfold or fold (if Fold Mirrors is on), the horn sounds (if Lock Confirmation Sound is on), and the doors unlock or lock.

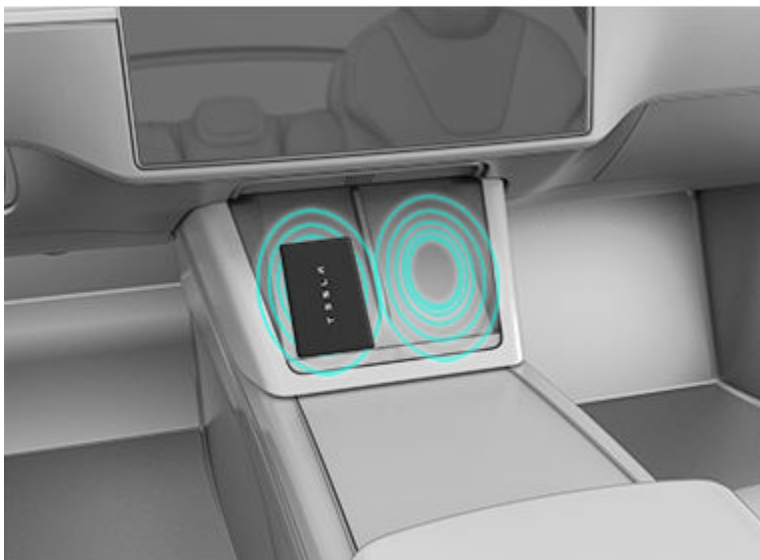
NOTE: You may need to physically touch the wireless phone charger or driver's side door pillar with the key card, and you may need to hold it against the transmitter for one or two seconds.





Owners Manual

Once inside, power up Model SModel X by pressing the brake pedal within two minutes of scanning the key card (see [Starting and Powering Off on page 195](#)). If you wait longer than two minutes, you must re-authenticate by placing the key card near the card reader located in the wireless phone charger on the center console. When your key card is detected, your two minute authentication period restarts.

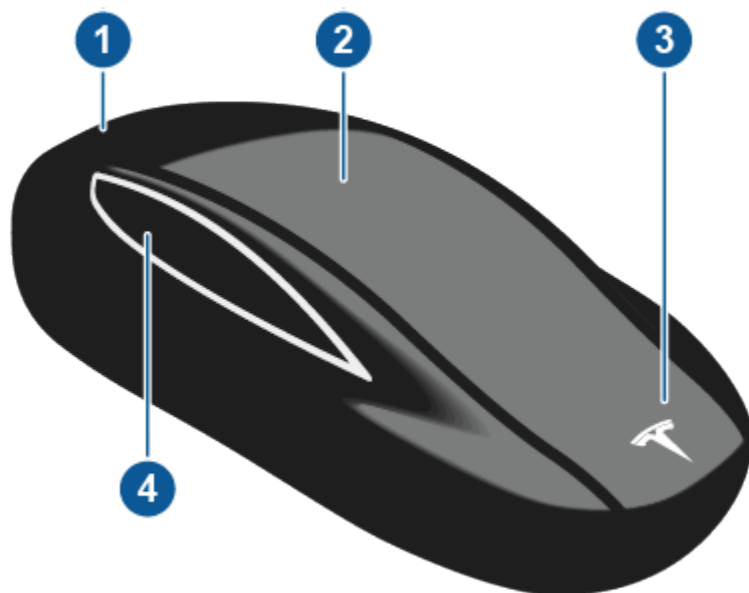


NOTE: If enabled, Walk-Away Door Lock (see [Walk-Away Door Lock on page 41](#)) operates only when you walk away using a phone key or passive key fob. When you walk away carrying your key card, Model SModel X does not automatically unlock/lock.

Key Fob

You can quickly familiarize yourself with the key fob by thinking of it as a miniature version of Model SModel X, with the Tesla badge representing the front. The key has buttons that feel like softer areas on the surface.





1. Rear trunk - Double-click to open or close the rear trunk. Hold down for one to two seconds to open the charge port door.
2. Lock/Unlock All - Single-click to lock doors and trunks (all doors and trunks must be closed). Double-click to unlock doors and trunks.
3. Front trunk - Double-click to unlatch the front trunk.

1. Trunk

- Double-click to open or close the rear trunk.
- If equipped with a powered liftgate, double-click to unlatch the rear trunk. You can also single-click to stop the liftgate when it is moving.
- Hold the button down for one to two seconds to open the charge port door.

2. Lock/Unlock All

- Single-click to lock all doors and rear trunk. Hazard warning lights flash once.

NOTE: If a door or the rear trunk is open, hazard warning lights flash three times and doors do not lock. But you can enable a single-click to both close all doors (and rear trunk) and lock them, by turning on the **Close All with Key Fob** setting (touch **Controls** > **Locks** > **Close All with Key Fob**). By default, this setting is turned off and you must triple-click the button to close and lock all doors.

- Double-click to unlock. Hazard warning lights flash twice.

NOTE: If Automatic Doors is enabled (touch **Controls** > **Locks** > **Automatic Doors**), doors unlock and the driver's door opens as you approach Model X. A subsequent double-click opens the passenger front door.

3. Front trunk

- Double-click to unlatch the front trunk.

4. Falcon wing doors

- Double-click to open/close the associated falcon wing door.
- Single-click to stop movement of the associated falcon wing door. Subsequently double-clicking reverses movement of the falcon wing door. For example if the door was opening, it closes, and vice versa.

NOTE: Falcon wing doors are designed to proactively detect obstacles that prevent the doors from moving when an obstacle is detected.



WARNING: Model X falcon wing doors have several sensors to detect the presence of an object in the door's path. In most cases, when an object is detected, the door stops moving. However, the sensors are unable to detect all areas under all circumstances, particularly when closing. Therefore, you must monitor the movement of falcon wing doors to ensure the door's path of movement is free of obstacles, staying prepared at all times to proactively intervene to stop the door from contacting an object (including a person). Failure to do so can cause serious damage or bodily injury.

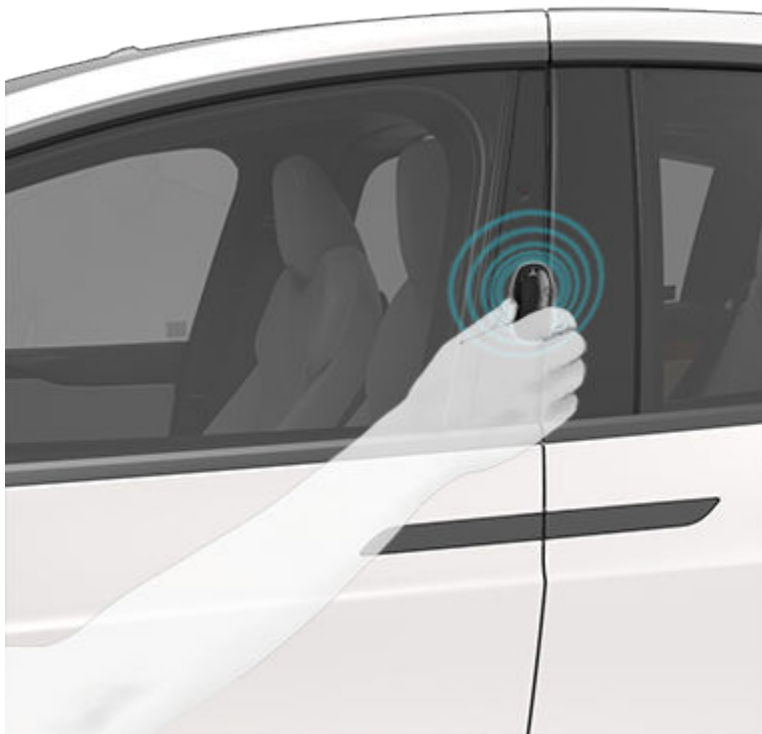
Once inside, power up Model S/Model X by pressing the brake pedal within two minutes of pressing the unlock button on the key fob (see [Starting and Powering Off on page 195](#)). If you wait longer than two minutes, you must press the unlock button again, or place the key fob near the card reader located in the lower half of the left wireless phone charger, facing downward, on the center console. When your key fob is detected, the two minute authentication period restarts.

When approaching or leaving Model S/Model X carrying the key fob, you do not need to point the key fob at Model S/Model X as you press a button, but you must be within operating range.

Radio equipment on a similar frequency can affect the key. If this happens, move the key at least one foot (30 cm) away from other electronic devices (phones, laptops, etc.).

In the event that the key fob's battery is dead, you can still use it. To unlock the vehicle, scan the key fob on the card reader located on the driver's side door pillar (like the key card).





To drive the vehicle, scan the key fob on the phone charger.

1. Place it at the top of the left phone charger, **against the center divider**.
2. Point the front of the key fob down.
3. Swipe downwards.



1. Place it at the top of the left phone charger, **against the center divider**.
2. Point the front of the key fob to the left.
3. Swipe downwards.



Instructions for changing the battery are provided in [Replacing the Key Fob Battery on page 26](#).

NOTE: You can use the same key fob with multiple Model S/Model X vehicles provided you authenticate it (see [Managing Keys on page 29](#)). However, key fob works with only one Model S/Model X at a time. Therefore, to use a key fob for a different Model S/Model X, touch its flat side against the card reader on the driver's side door pillar.

NOTE: Model S/Model X supports up to four different key fobs.

CAUTION: Protect the key from impact, high temperatures, and damage from liquids. Avoid contact with solvents, waxes, and abrasive cleaners.

Passive Locking and Unlocking

Locking and unlocking Model S/Model X with your key fob is conveniently hands-free. Although you must be carrying a paired key fob, there is no need to use it. Model S/Model X has sensors around the vehicle that can recognize the presence of a key fob within a range of approximately six feet (two meters). Therefore, you can keep your key fob in your pocket or purse and press the door handle to unlock and extend the handle. When carrying your key fob with you, you can also open the trunk without having to use the key by pressing the liftgate's exterior switch. If **Walk-Away Door Lock** is enabled, Model S/Model X automatically locks when you exit and the key fob is no longer in range (see [Walk-Away Door Lock on page 41](#)). Passive locking and unlocking is automatically enabled when you pair your key fob to Model S/Model X.

Although you can use the same key fob with multiple vehicles, it can only be paired to one vehicle at a time. To activate a paired key fob to a different vehicle, touch the flat side onto the driver's side door pillar and click any button on the key fob to confirm.

NOTE: For increased security, passive locking and unlocking disables after being stationary for five minutes while within vehicle range when the vehicle is not in use (for example, you are standing outside your vehicle). In this situation, you must shake or press a button on the key fob to re-enable passive locking and unlocking.

Replacing the Key Fob Battery

Under normal use, the key fob has a battery that lasts for up to one year, depending on key fob version and selected vehicle settings. When the battery is low, a message displays on the touchscreen.

To replace the key fob battery:

1. With the key fob placed button side down on a soft surface, release the bottom cover, using a small flat-bladed tool.



NOTE: If a lanyard is attached to the key, you can release the bottom cover by placing your thumb against the "X" on the bottom cover, then firmly pulling the lanyard toward you (hence pushing the key off of its cover). You can also pry the cover off by placing a small flat-bladed tool, a fingernail, or the Tesla-provided tool against the lanyard cord.

2. Remove the battery by lifting it away from the retaining clips.



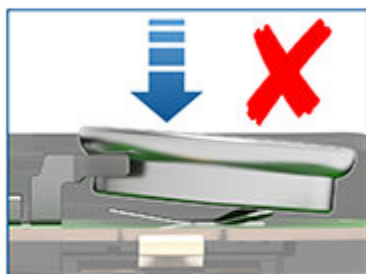
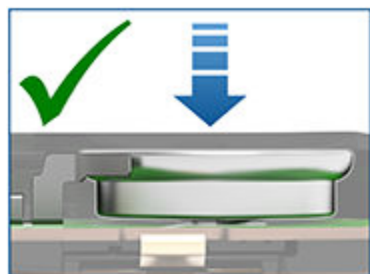


3. While avoiding touching the battery's flat surfaces, insert the new battery (type CR2330CR2354) with the '+' side facing up.

NOTE: Wipe the battery clean before fitting and avoid touching the battery's flat surfaces. Finger marks on the flat surfaces of the battery can reduce battery life.



CAUTION: The battery should press against the spring on the positive contact. Do not place the battery on top of the contact and force it down vertically. Doing so may damage the contact.



NOTE: CR2330CR2354 batteries can be purchased from any retailer that sells batteries.

4. Holding the bottom cover at an angle, align the tabs on the cover with the corresponding slots on the key fob, then press the cover firmly onto the key fob until it snaps into place.
5. Test that the key fob works by unlocking and locking Model SModel X.



WARNING: Key fob batteries contain a chemical burn hazard and should not be ingested. The key fob contains a coin cell battery. If the coin cell battery is swallowed, it can cause severe internal burns within two hours and can lead to death. Keep new and used batteries away from children. If the battery compartment does not close securely, stop using the product and keep it away from children. If you think batteries might have been swallowed or placed inside any part of the body, seek immediate medical attention.

Attaching a Lanyard

To attach a lanyard, release the bottom cover as described above. Place the lanyard over the pin located between the slots on the widest side of the key fob. Re-align the cover and snap into place.

Managing Keys

To display a list of all keys (phone keys, key cards, and key fobs) that can access your Model SModel X, touch **Controls > Locks**. An icon displays next to each key to indicate whether the key is a phone key, key card, or key fob. Use this list to manage keys that have access to your Model SModel X. To add or delete keys, see [Adding and Removing Keys on page 29](#).

Model SModel X supports up to 19 keys. When you reach this limit, you must delete a key before adding a new one.

NOTE: You can use the same key for more than one Model SModel X. This prevents you from having to deal with multiple keys when you switch vehicles. If you customize the name of an authenticated key card or key fob on one Model SModel X (by touching the pencil icon), any other Model SModel X to which the key card or key fob is authenticated also displays the changed name.

Adding and Removing Keys

To add a new key card or key fob:

NOTE: When adding a key fob, ensure it is at room temperature. Pairing a key fob that is very cold can be unsuccessful.

1. On the touchscreen, touch **Controls > Locks** then touch **+** in the Keys section.
2. Scan your new key card or key fob on the card reader located on the wireless phone charger. To scan the key fob:
 - Place it at the top of the left phone charger, **against the center divider**.
 - Point the front of the key fob down.
 - Swipe downwards (as shown in the image).

When you hear a chime and the new key is recognized, remove it from the card reader.



3. Scan your new key card or key fob on the card reader located on the wireless phone charger. To scan the key fob:
 - Place it at the top of the left phone charger, **against the center divider**.
 - Point the front of the key fob to the left.
 - Swipe downwards (as shown in the image).



When you hear a chime and the new key is recognized, remove it from the card reader.



4. Scan a key card or key fob that has already been paired to the vehicle to confirm new key pairing.
5. When complete, the key list includes the new key. Touch the associated pencil icon to customize the name of the key.

To add a new phone key:

NOTE: You must enable Bluetooth on the phone and have the Tesla mobile app installed and connected to your Tesla account.

1. While sitting in Model S or Model X, open the Tesla mobile app (if you have multiple Tesla vehicles, select the appropriate vehicle), then touch **Phone Key > Start**.
2. Scan an authenticated key card or key fob on the card reader located on the center console wireless phone charger (see [Key Card on page 21](#)).
3. When the mobile app notifies you that pairing was successful, touch **Done**. The key list on the touchscreen (touch **Controls > Locks**) includes the newly authenticated phone key. The name of the phone key is determined by the name used in the phone's settings.

Removing a key:

When you no longer want a key to access Model S or Model X (for example, you lost your phone or key card, etc.), follow these steps to remove it.

1. On the touchscreen, touch **Controls > Locks**.
2. In the key list, find the key that you would like to delete and touch its associated trash icon.
3. When prompted, scan an authenticated key card or key fob on the card reader to confirm the deletion. When complete, the key list no longer includes the deleted key.

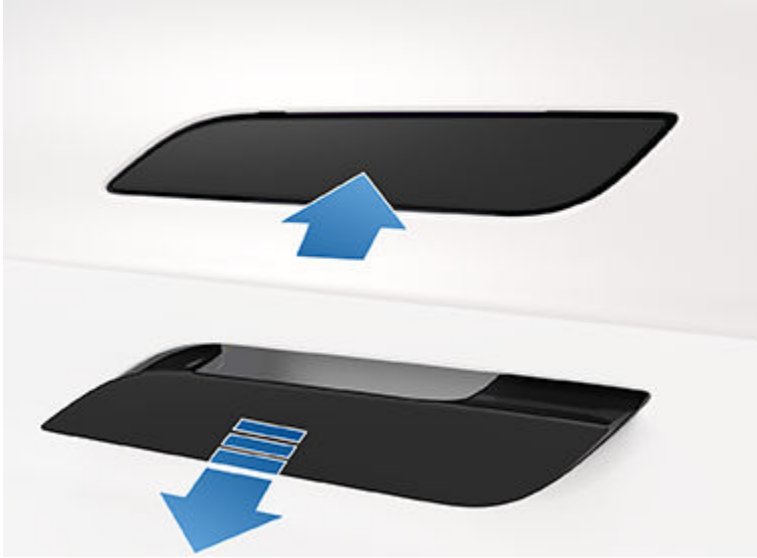
NOTE: Model S or Model X requires at least one authenticated key card or key fob at all times. If only one key card remains on the key list, you cannot delete it.



Doors

Using Exterior Door Handles

A light press on a door handle extends it provided Model S/Model X is unlocked and detects a phone key or key fob nearby. You can set door handles to extend automatically when you approach the driver's side carrying a phone key or key fob. Touch **Controls > Locks > Auto-Present Handles**.



Insert your hand into the handle and pull to open the door.

Door handles retract if you do not use them within one minute after they extend. Just press a handle to extend it again. Door handles also retract a minute after the last door closes, when Model S/Model X begins moving, and when you lock Model S/Model X.

NOTE: To preserve battery life, Model S/Model X is designed to temporarily disable the **Auto-Present Handles** feature if the vehicle is unable to detect a phone key nearby.

In these cases, extend a door handle by pressing it, or by pressing the unlock button on the key fob. There is no need to reset the setting. The next time you approach Model S/Model X, provided the above conditions do not apply, handles automatically extend.



When a door is open, the Door Open indicator displays on the instrument panel.

Opening and Closing Front Doors from Outside

Model X doors are electrically powered. When you approach Model X carrying a key, the doors automatically unlock. The front doors open when you press the door handle.

You can also set the driver's door to open automatically upon your approach (if equipped). The door partially opens (between 20° and 45° depending on obstacles detected by sensors). Touch **Controls > Vehicle > Locks > Automatic Doors**. If this setting is on, you can also open the driver's door by double-clicking the key fob's lock/unlock button. A subsequent double-click opens the front passenger door.

You can also specify that you want to unlock only the driver's door when you shift into Park by touching **Controls > Vehicle > Locks > Driver Door Unlock Mode**.

NOTE: See [Cold Weather Best Practices on page 284](#) for information on opening the doors in cold weather.



CAUTION: The front doors may not fully open or close automatically when parked on a very steep hill. Never rely on Model X to fully open or close the doors for you when parked on a steep hill.

NOTE: Depending on date of manufacture and options chosen at time of purchase, your Model X may not be equipped with automatic doors.



Whenever a door is open, the Door Open indicator displays on the instrument panel. Also, the image of the Model S Model X on the touchscreen's **Controls** window also provides a visual representation of an open door or trunk.

To close doors from the outside, you can:

- Manually push them shut.
- Single-click or triple-click the key fob's lock/unlock button (if the **Close All with Key Fob** setting is on, only a single click is needed to close all doors and trunks—a triple-click is needed if the setting is off).

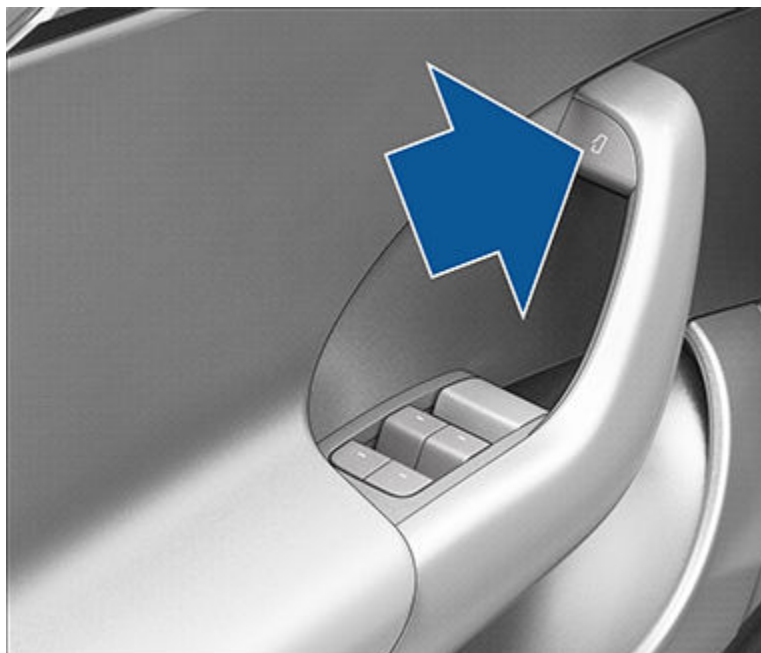
Once inside you can close the doors by touching **Controls** > **Close**.

NOTE: Powered doors stop moving if an obstacle is detected.

WARNING: Before allowing an automated feature to open or close a front door (rather than doing so manually), it is important to check that the area around the door is free of obstacles (such as people and objects). You must proactively monitor the door's movement to ensure that it does not contact a person or object. Failure to do so can result in damage or serious injury.

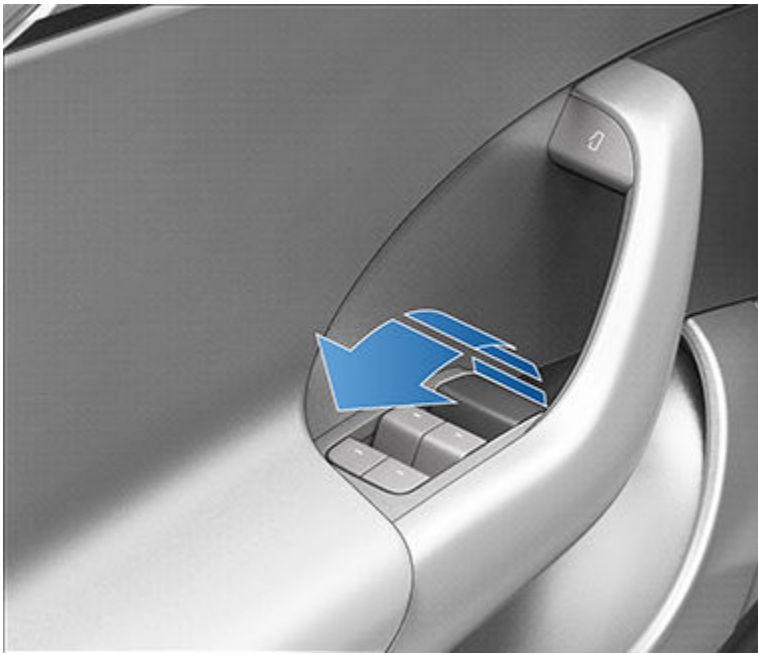
Opening Doors from the Interior

Model S Model X doors are electrically powered. To open a door while sitting inside, press the button located at the top of the interior door handle and push the door open.

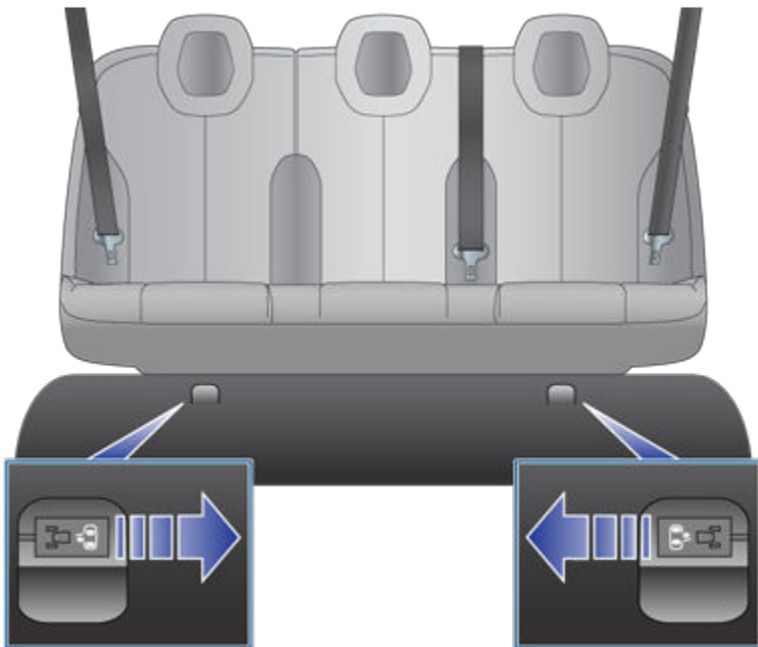


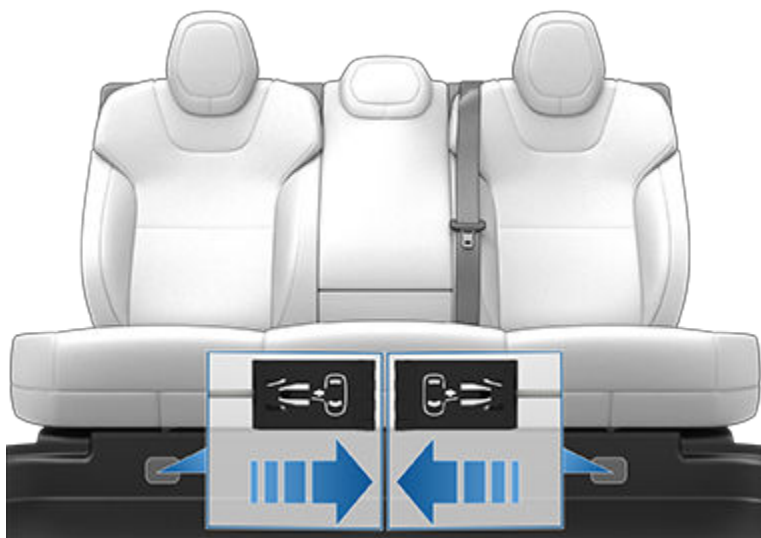
NOTE: To prevent children from opening the rear doors, turn on child-protection locks (see [Child-Protection Lock on page 42](#)).

To open a front door in the unlikely situation when Model S Model X has no power, pull up the manual door release located in front of the window switches.



To open a rear door in the unlikely situation when Model S/Model X has no power, fold back the edge of the carpet below the rear seats to expose the mechanical release cable. Pull the mechanical release cable toward the center of the vehicle.





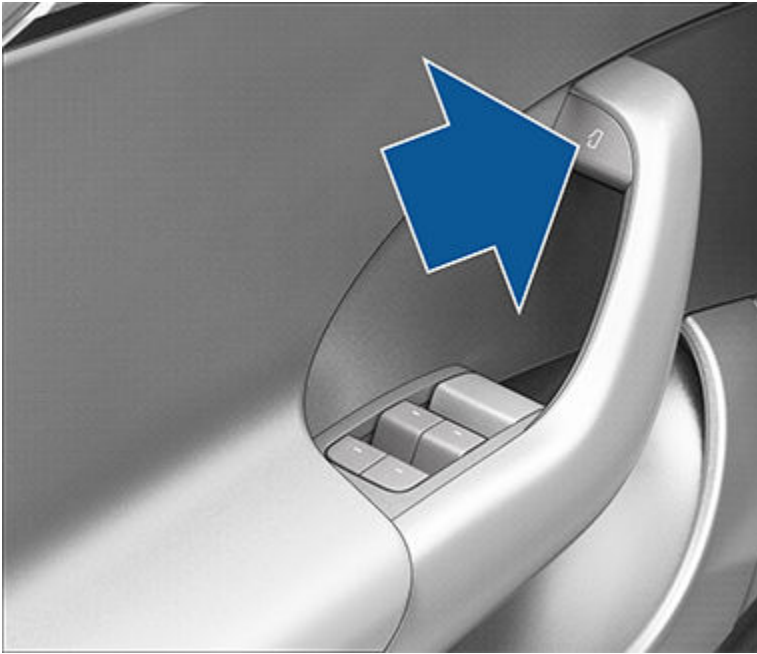
⚠ CAUTION: Manual door releases are designed to be used only in situations when Model S/Model X has no power. When Model S/Model X has power, use the button located at the top of the interior door handle.

Opening Front Doors from Interior

To open a front door, pull the interior door handle toward you.

To open a front door while sitting inside, press the button located at the top of the interior door handle and push the door open.





You can also use the touchscreen to open and close doors when inside Model X. Touch **(Controls)(Controls > Locks)**, then choose the door you want to open or close. In addition, if Model X is equipped with the premium upgrades package, when you press the brake pedal, the driver's door automatically closes.

Opening and Closing Falcon Wing Doors

Model X has falcon wing doors that easily open and close by pressing a button, using a key fob, using the mobile app, or touching the associated icon on the touchscreen. The falcon wing doors are equipped with several sensors that detect the presence of people and objects and, if an object is detected, the door stops moving. Based on detected objects, the doors may adjust their outward and upward movement in an attempt to avoid contacting the object. For example, if an object is detected above Model X, the door's movement may extend further outward but lower, whereas if an object is detected beside the door, the door may extend outward much less.

-  **WARNING:** It is important to keep your hands clear of the falcon wing door frames at all times. Proactively check the door frame area prior to closing, and monitor the movement of the door during closing to ensure that it does not come into contact with a person or object. Failure to do so can result in damage or serious injury.
-  **WARNING:** Before opening or closing a falcon wing door, it is important to check that the area around the door is free of obstacles (people and objects). Although the doors have many sensors, it can not detect all objects at all times, particularly when moving. At any given moment, there may be areas near the door that are not in the detection zone. Therefore, when opening or closing a falcon wing door, you and your passengers must stand away from the door as it is moving, while proactively monitoring the door's movement and being prepared to take corrective action at any time. To stop a door from moving, single-click the falcon wing door button on the key fob, press the switch on the door or door pillar, or touch the button on the touchscreen.

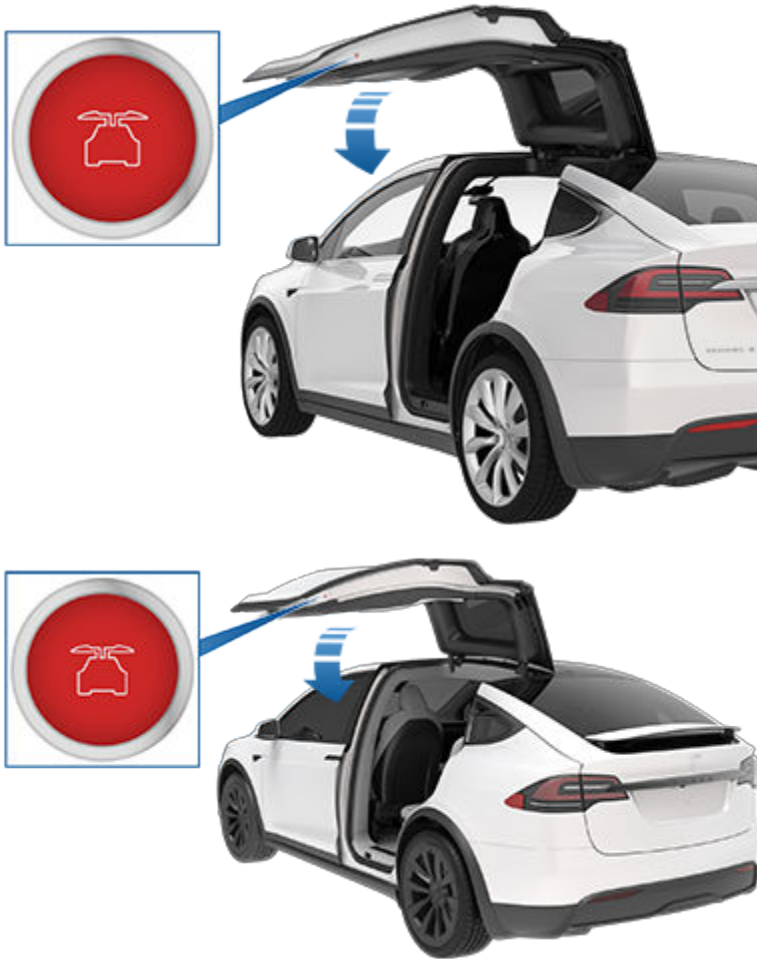
To open a falcon wing door from outside Model X, press the door handle or press the falcon wing door button on the key fob (see [Keys on page 20](#)[Using the Key Fob on page 43](#)).

To open a falcon wing door from inside Model X, press the switch located on the door pillar, or touch the associated door icon on the touchscreen **(Controls)(Controls > Locks)**:



NOTE: If Model X is locked, using the switch (illustrated above) the first time unlocks the associated door. Pulling it a second time opens it.

To close a falcon wing door, press the button located on the inside of the door. You can also use the key fob (see [Using the Key Fob on page 43](#)), use the switch on the door pillar (illustrated above), or touch the associated door icon on the touchscreen (**Controls**) (**Controls** > **Close**).



If a falcon wing door or the front trunk is left open when you attempt to shift out of Park, a notification requiring you to confirm your intent to drive appears on the touchscreen. The falcon wing doors may automatically close once you begin to accelerate. In addition, your vehicle speed is limited if you choose to keep the front trunk open while driving. It is your responsibility to ensure doors and trunks are properly closed before driving.

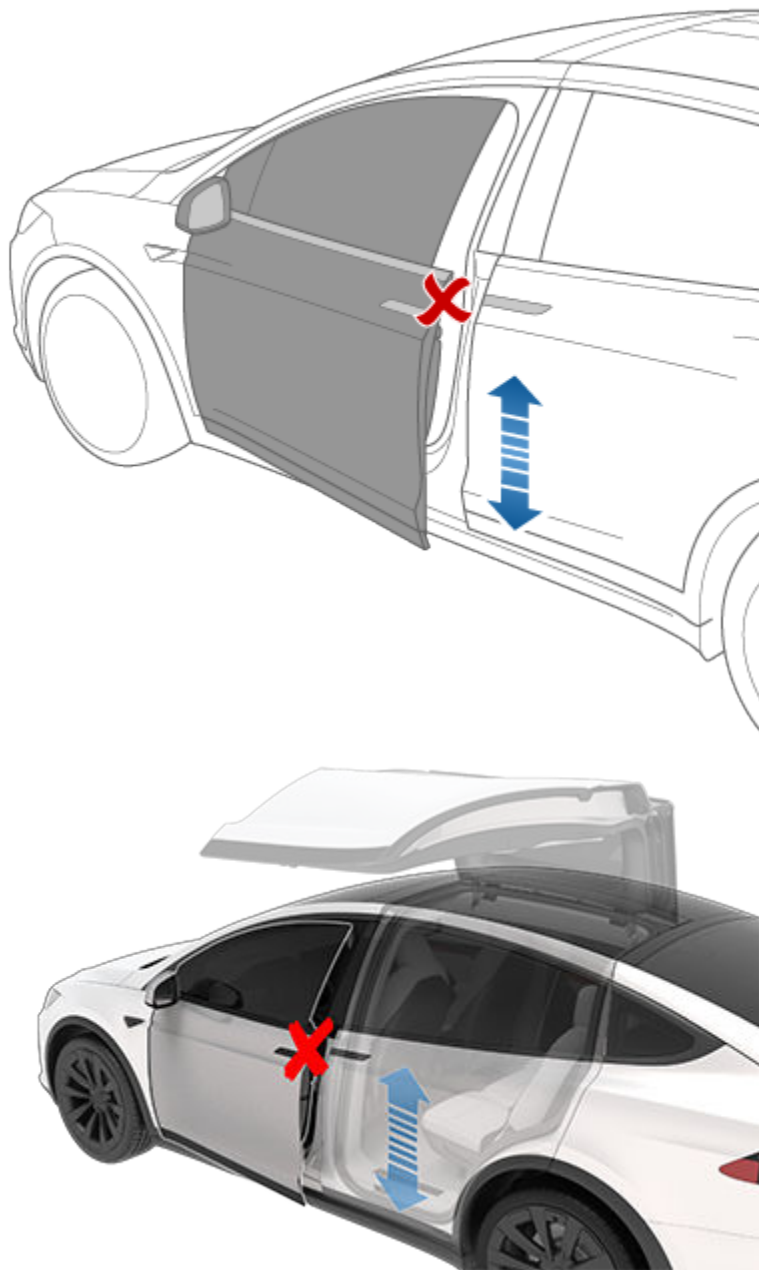
NOTE: To prevent children from opening falcon wing doors using the interior switch, turn on child-protection locks using the touchscreen (**Controls > Vehicle > Child- Protection Lock**)(**Controls > Locks > Child Lock**). See [Child-Protection Lock on page 42](#)[Child-Protection Lock on page 55](#).

NOTE: You can configure Model X to open the falcon wing doors to a lower height setting by using the touchscreen (**Controls > Vehicle > Locks > Falcon Door Height**).

NOTE: If a falcon wing door detects an obstacle while closing, it reverses a few inches before it stops moving.



WARNING: Whenever a front door is partially open (approximately 20°) as you are opening or closing the associated falcon wing door, you **MUST** keep your hands (or any object) away from the opening edge of the front door. When a falcon wing door passes by a partially opened front door, the distance between the two doors is very narrow. Objects, such as hands or fingers, placed in this area, are not detected by sensors and can therefore become pinched between the doors. To avoid bodily injury, it is a good practice to keep your hands away from the front door whenever you are opening or closing a falcon wing door.



CAUTION: Remove accumulation of snow or ice before opening a falcon wing door. Snow can get inside Model X and ice can prevent the door from opening.

CAUTION: In rainy weather, leaving a falcon wing open while opening the liftgate can result in rain water falling from the liftgate into the rear seating area.

NOTE: Falcon wing doors open only when Model X is stationary.

WARNING: When opening or closing a falcon wing door, it is important to proactively monitor the movement of the door to ensure that it does not come into contact with a person or object. Failure to do so can cause serious damage or injury.

Obstacle Detection

A falcon wing door stops moving when one of its many sensors detects an obstacle, or when the door senses resistance because it has made contact with an object. The touchscreen displays a warning. In these cases, provided it is appropriate to continue opening or closing the falcon wing door, you can override obstacle detection by pressing and holding the switch located on the door pillar, or touching and holding the associated door icon on the touchscreen.



When Model X detects a low ceiling (for example, in a garage), it opens the falcon wing doors (and trunk) to a lower height, even if no obstacle is detected. You can override this height and open the doors higher by touching the associated door icon on the touchscreen (**Controls**). The touchscreen displays a message asking you if you always want to open the doors to the higher height at this location, and saves your choice. The next time you open the falcon wing doors at this location, Model X opens them to the height you saved.



WARNING: Before overriding a falcon wing door's default opening height, visually inspect the area to ensure adequate clearance between the door and the detected object.



WARNING: Applying adhesive products such as wraps, stickers, rubber coating, etc. on the outside of the falcon wing doors can affect the sensors' ability to detect obstacles properly.

Calibration

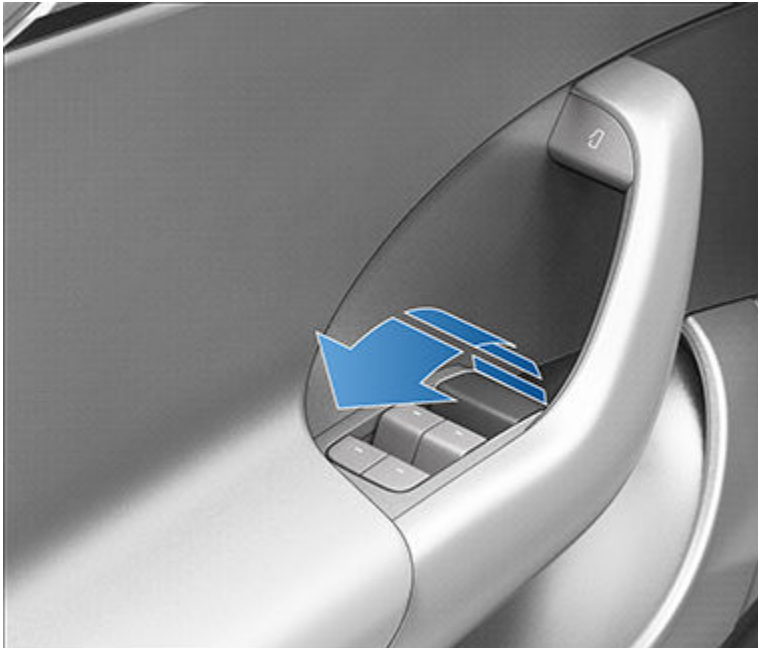
If the falcon wing doors lose calibration, a message displays on the touchscreen. To calibrate the doors, first ensure that both doors have plenty of space to open and close and are clear of passengers, objects, etc. Then press and hold the **Calibrate** button until calibration is complete. During calibration, the lower door opens all the way out (requiring extra space on the side of Model X), the upper door moves all the way down, and then the lower door closes.

Calibration

If the falcon wing doors lose calibration, the main Controls window on the touchscreen displays a **Calibration Required** message. To calibrate the doors, first ensure that both doors have plenty of space to open and close and are clear of passengers, objects, etc. Touch **Controls > Service > Calibrate Doors**, then press and hold the **Calibrate** button until calibration is complete. During calibration, the lower door opens all the way out (requiring extra space on the side of Model X), the upper door moves all the way down, and then the lower door closes.

Opening Interior Doors with No Power

To open a front door in the unlikely situation when Model SModel X has no power, pull up the manual door release located in front of the window switches.



CAUTION: Manual door releases are designed to be used only in situations when Model SModel X has no power. When the vehicle has power, use the button located at the top of the interior door handle.

To open the falcon wing doors, carefully remove the speaker grille from the door and pull the mechanical release cable down and towards the front of the vehicle. After the latch is released, manually lift up the door.



Front Door Reset

Since your Model S Model X does not have traditional door handles that you can pull from the outside, it is equipped with pop actuators (sometimes referred to as "ice breakers") that are used to assist in opening the front doors in cases where resistance is detected, such as ice buildup in cold weather. The pop actuator is located just above the front door latch and extends as necessary to open the front door. Once the front door opens slightly, the pop actuator gently retracts back into the door.



If the pop actuator is unable to retract because it is stuck to or caught on something, the pop actuator can be extended manually to extract the object by performing the following:

1. Carefully close the door latch using a pen, screwdriver, or comparable tool (never use a finger or body part and avoid damaging the paint); Model S Model X will detect this as though the door is closed.



2. Make sure Model SModel X is unlocked, then press the exterior door handle or pull the interior door handle to reset the latch and extend the pop actuator.
3. As the pop actuator extends out from the door, quickly extract the object.



WARNING: The pop actuator will attempt to retract back into the door almost immediately after the door handle is pressed or pulled. The pop actuator retracts gently, but will not release automatically if something gets caught.



WARNING: As with all mechanical and moving parts on the vehicle, never put body parts in, or near, moving components. Make sure children are monitored when opening and closing doors. Interacting with moving components, including the pop actuator, can cause serious damage or bodily injury.

Interior Locking and Unlocking

While sitting inside Model SModel X, you can lock and unlock all doors and trunks by touching the lock icon in **Controls**.



The icon changes to indicate whether doors are locked or unlocked.

Driver Door Unlock Mode

Enabling **Controls > Locks > Driver Door Unlock Mode** only unlocks the driver door when you first unlock Model SModel X.

Walk-Away Door Lock

Doors and trunks can automatically lock when you walk away carrying your phone key or paired key fob. To turn this feature on or off, touch **Controls > Locks > Walk-Away Door Lock**.

When the doors lock, the exterior lights flash once and the mirrors fold (if **Fold Mirrors** is on). To also hear a confirmation sound when Model SModel X locks, touch **Controls > Locks > Lock Confirmation Sound**.

Model SModel X does not automatically lock if:

- You check the **Exclude Home** checkbox and Model SModel X is parked at the location you have designated as Home. For details on how to designate a location as Home, see [Home, Work, and Favorite Destinations on page 371](#).
- A phone key or paired key fob is detected inside Model SModel X.
- A door or trunk is not fully closed.
- The phone key's Bluetooth setting is turned off.
- Key fob or phone key remains within range for five minutes after all doors have been closed.

Drive Away Locking

Model SModel X automatically locks all doors (including the trunks) when your driving speed exceeds 5 mph (8 km/h).



Child-Protection Lock

Model SModel X has child-protection locks on the rear doors to prevent them from being opened using the interior release buttons. On the touchscreen, touch **Controls > Locks > Child Lock**.

 **WARNING:** It is recommended that you turn on child-protection locks when children are seated in the rear seats.

Unlock on Park

When you stop Model SModel X and engage Park, you can choose to unlock all doors. To turn this feature on or off, touch **Controls > Locks > Unlock on Park**.



Keys and Doors

Keyless Locking and Unlocking



CAUTION: Do not leave your paired phone in your vehicle (for example, if you are hiking or at the beach). If you must leave your phone in the vehicle, disable Bluetooth and/or turn the phone off.

Locking and unlocking Model SModel X is convenient. Although you must be carrying a valid key fob, there is no need to use it. Model SModel X has sensors around the driver's door that can recognize the presence of a key fob within a range of approximately three feet (one meter). So, you can keep your key fob in your pocket or purse and Model SModel X detects it as you approach.

When you walk up to Model SModel X carrying your key fob, the doors automatically unlock if Passive Entry is on (**Controls > Safety > Passive Entry**). If a door handle is retracted, press it and it extends. If the **Auto-Present Handles** setting is turned on (see [Using Exterior Door Handles on page 47](#)), you do not need to touch the door handle. Instead, door handles extend automatically as you approach Model SModel X. Select **Exclude Home** to disable door handle presentation at home (set your home address by touching **Navigate > Set Home**). To open the rear trunk, press the switch located under the powered liftgate's exterior handle.

NOTE: Model SModel X must detect your key fob near the driver's door before the doors or powered liftgate unlock.

NOTE: If Passive Entry is off, you must use the key fob to unlock Model SModel X. See [Using the Key Fob on page 43](#).

If equipped with the premium upgrade package, and the **Automatic Doors** setting is turned on, when you walk up to Model X carrying your key fob, doors automatically unlock and the driver's door partially opens. If not equipped, or if this setting is turned off, doors automatically unlock and a door opens when you press its handle. Selecting **Exclude Automatic Doors Opening at Home** still allows for automatic closing doors at home but disables automatic door opening (set your home address by touching **Navigate > Set Home**).

NOTE: You can choose whether you want all doors, or just the driver's door, to unlock when you approach Model SModel X carrying your key fob (see [Driver Door Unlock Mode on page 55](#)).

When carrying your key fob with you, you can also open the rear trunk without having to use the key fob. Simply press the switch located under the powered liftgate's exterior handle. Driver Door Unlock Mode (see [Driver Door Unlock Mode on page 55](#)) must be off and the vehicle must detect the key fob near the driver's door before opening the rear trunk.

Model SModel X also locks automatically. If you enable **Walk Away Door Lock**, Model SModel X locks when you walk away carrying your key fob with you (see [Walk-Away Door Lock on page 55](#)).

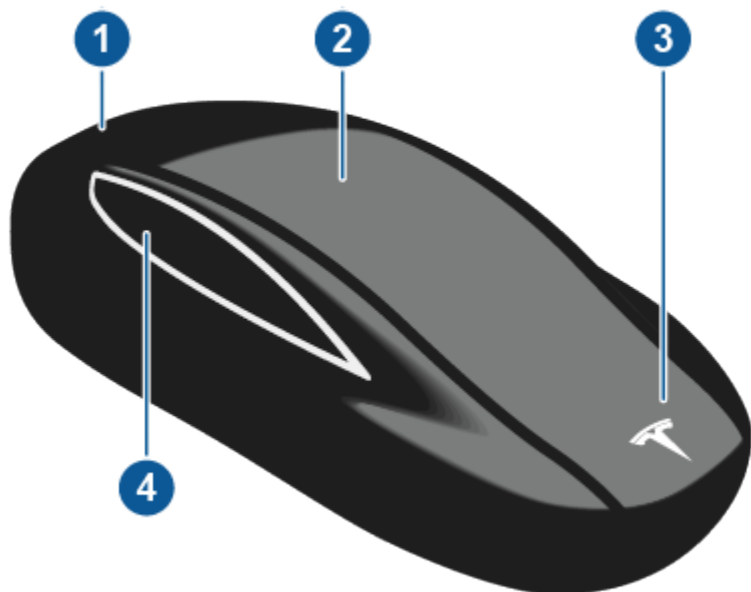
In addition, you can set Model SModel X to sound a soft horn whenever you car locks or unlocks (if equipped). To set up, touch **Controls > Vehicle > Lock Confirmation Sound**.

While sitting inside Model SModel X, you can also lock and unlock the vehicle by touching the icon on the touchscreen's status bar.

NOTE: Depending on date of manufacture and options selected at time of purchase, some Model S vehicles are not equipped with the automatic locking and unlocking feature.

Using the Key Fob

To quickly familiarize yourself with the key fob, think of the key fob as a miniature version of Model SModel X, with the Tesla badge representing the front. The key fob has three buttons that feel like softer areas on the surface. The key fob has three buttons on the top that feel like softer areas on the surface, and a metal button on each side representing the falcon wing doors.



1. Trunk

- Double-click to open the rear trunk.
- If equipped with a powered liftgate, double-click to close the rear trunk. You can also single-click to stop the liftgate when it is moving.
- Hold the button down for one to two seconds to open the charge port door.

2. Lock/Unlock All

- Single-click to lock doors and trunks (all doors and trunks must be closed). Hazard warning lights flash once and door handles retract. If a door or the powered liftgate is open, hazard warning lights flash three times and doors do not lock.
- Double-click to unlock. Hazard warning lights flash twice and door handles extend. If a door or the rear trunk is open, hazard warning lights flash three times and doors do not lock.

3. Lock/Unlock All

- Single-click to lock all doors and rear trunk. Hazard warning lights flash once.



NOTE: If a door or the rear trunk is open, hazard warning lights flash three times and doors do not lock. But you can enable a single-click to both close all doors (and rear trunk) and lock them, by turning on the **Close All with Key Fob** setting (touch **Controls > Vehicle > Close All with Key Fob**). By default, this setting is turned off and you must triple-click the button to close and lock all doors.

- Double-click to unlock. Hazard warning lights flash twice.

NOTE: If Model X is equipped with the premium upgrades package and Automatic Doors is enabled (touch **Controls > Vehicle > Automatic Doors**), doors unlock and the driver's door opens as you approach Model X. A subsequent double-click opens the passenger front door.

4. Front trunk

- Double-click to open the front trunk.

5. Falcon wing doors

- Double-click to open/close the associated falcon wing door.
- Single-click to stop movement of the associated falcon wing door. Subsequently double-clicking reverses movement of the falcon wing door. For example if the door was opening, it closes, and vice versa.

NOTE: Falcon wing doors are designed to proactively detect obstacles that prevent the doors from moving when an obstacle is detected.



WARNING: Model X falcon wing doors have several sensors to detect the presence of an object in the door's path. In most cases, when an object is detected, the door stops moving. However, the sensors are unable to detect all areas under all circumstances, particularly when closing. Therefore, you must monitor the movement of falcon wing doors to ensure the door's path of movement is free of obstacles, staying prepared at all times to proactively intervene to stop the door from contacting an object (including a person). Failure to do so can cause serious damage or bodily injury.

You do not need to point the key fob at Model SModel X, but you must be within operating range (which varies depending on the strength of the key fob's battery).

If Model SModel X is unable to detect the key fob, the touchscreen displays a message indicating that a key fob is not inside. Place the key fob where Model SModel X can best detect it, which is below the low voltage power socket (see [Key Fob Not Inside on page 195](#)).

Radio equipment on a similar frequency can affect the key fob. If this happens, move the key fob at least one foot (30 cm) away from other electronic devices (phone, laptop, etc). If the key fob does not work, you may need to change its battery. If the key fob's battery is discharged, you can open Model SModel X by following the unlocking procedure (see [Unlocking When the Key Fob Doesn't Work on page 56](#)).

For increased security, your key fob may require periodical updates. To update your key fob, go to **Controls > Service > Update Key Fob** and follow the onscreen instructions. Your vehicle must be in Park to update the key fob.



CAUTION: Remember to bring the key fob with you when you drive. Although you can drive Model SModel X away from its key fob, you will be unable to power it back on after it powers off.

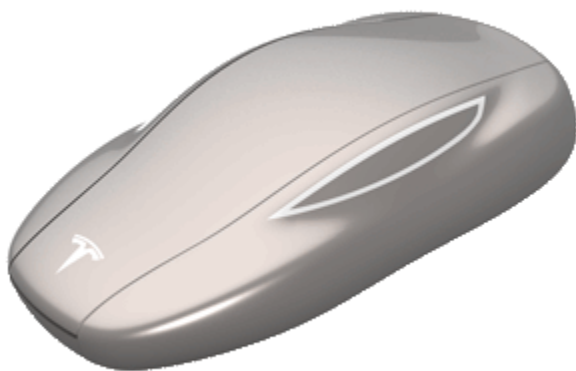


CAUTION: Protect the key fob from impact, high temperatures, and damage from liquids. Avoid contact with solvents, waxes and abrasive cleaners.

Replacing the Key Fob Battery

The key fob's battery lasts for approximately a year with normal use. When the battery is low, a message displays on the instrument panel. Follow these steps to replace it:

NOTE: Tesla recommends replacing the battery in all key fobs at the same time.



1. With the key fob placed button-side down on a soft surface, use a small flat-bladed tool or fingernail to release the bottom cover.

NOTE: If a lanyard is attached to the key fob, you can release the bottom cover by placing your thumb against the "X" on the bottom cover, then firmly pulling the lanyard toward you (hence pushing the key fob off of its cover). You can also pry the cover off by placing a small flat-bladed tool, a fingernail, or the Tesla-provided tool against the lanyard cord.

2. Remove the battery by carefully lifting it away from the front retaining clips. Remove the battery by carefully releasing it from the retaining clips at an angle.
3. Insert the new battery (type CR2032/CR2354) with the '+' side facing up. The battery fits snugly so you must slide it into position at an angle toward the Positive contact (the contact located near the center of the key fob), then press down firmly on the other side, ensuring it is held firmly in its intended position.

NOTE: Tesla recommends using Panasonic CR2032/CR2354 batteries. These can be purchased through online retailers, local supermarkets, and drug stores.



CAUTION: The battery should press against the spring on the positive contact. Do not place the battery on top of the contact and force it down vertically. Doing so may damage the contact.

NOTE: Wipe the battery clean before fitting and avoid touching the battery's flat surfaces. Finger marks on the flat surfaces of the battery can reduce battery life.

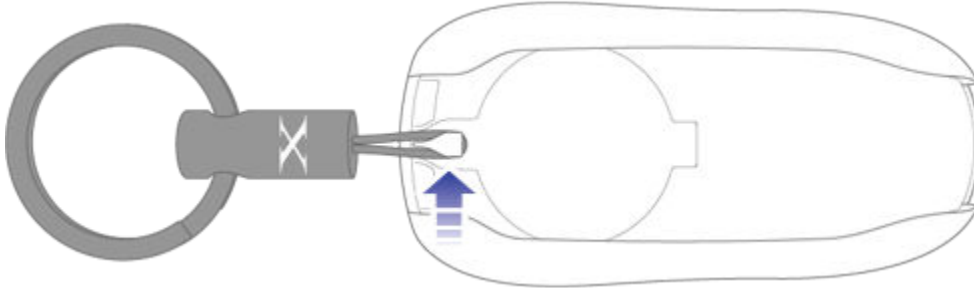
4. Holding the cover at an angle, align the tabs on the widest side of the cover with the corresponding slots on the key fob, then press the cover firmly onto the key fob until it snaps into place.



5. Test that the key fob works by unlocking and locking your vehicle.

Attaching a Lanyard

The Model X key fob supports the use of a small lanyard. To attach a lanyard, release the bottom cover as described above. Place the lanyard over the pin on the back side of the key fob. Re-align the cover and snap into place.



Getting More Key Fobs

If you lose a key fob or require an additional one, contact Tesla. Model S/Model X can recognize up to three key fobs.

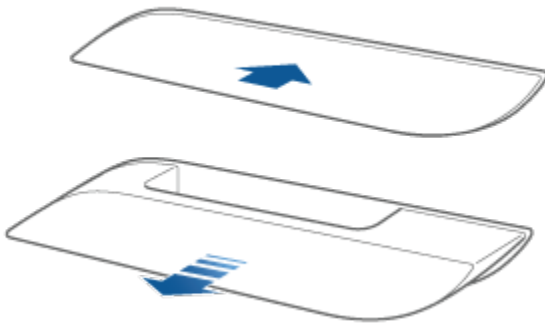
When ordering a new key fob for Model S/Model X, take all available key fobs with you for reprogramming.

Using Exterior Door Handles

A light press on a door handle extends it, provided Model S detects a valid key fob nearby and Passive Entry is on (**Controls > Safety > Passive Entry**).

You can set the door handles to extend automatically whenever you approach the driver's side carrying the key fob. On the touchscreen, touch **Controls > Vehicle > Auto-Present Handles**.

NOTE: Depending on date of manufacture and options selected at time of purchase, some Model S vehicles are not equipped with **Auto-Present Handles**.



Insert your hand into the handle and pull to open the door.

Door handles retract if you do not use them within one minute after they extend. Just press a handle to extend it again. Door handles also retract a minute after the last door closes, when Model S/Model X begins moving, and when you lock Model S/Model X.

NOTE: To preserve battery life, Model S/Model X is designed to temporarily disable the **Auto-Present Handles** feature when:

- The key fob has been out of range for more than 48 hours.
- The key fob remains within range for five minutes after all doors have been closed.



In these cases, extend door handles by touching one of them, or by pressing the unlock button on the key fob. There is no need to reset the setting. The next time you approach Model S/Model X, provided the above conditions do not apply, handles automatically extend.



Whenever a door is open, the Door Open indicator displays on the instrument panel. Also, the image of the Model S/Model X on the touchscreen's **Controls** window also provides a visual representation of an open door or trunk.

Opening Doors from the Interior

To open a door, pull the interior door handle toward you.

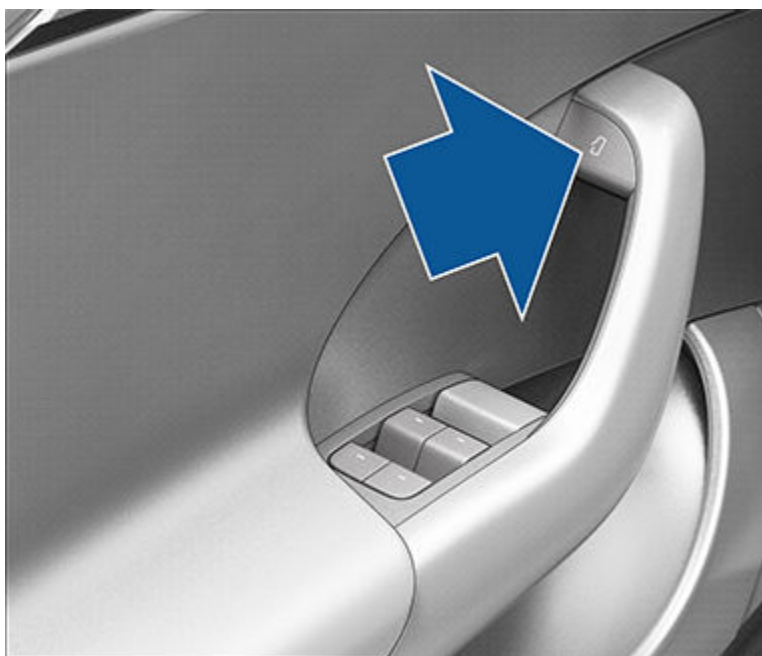


NOTE: To prevent children from opening rear doors using the interior handles, use the touchscreen, **Controls > Vehicle > Child-Protection Lock**, to turn on the child-protection locks (see [Child-Protection Lock on page 55](#)).

Opening Front Doors from Interior

To open a front door, pull the interior door handle toward you.

To open a front door while sitting inside, press the button located at the top of the interior door handle and push the door open.



You can also use the touchscreen to open and close doors when inside Model X. Touch **(Controls)(Controls > Locks)**, then choose the door you want to open or close. In addition, if Model X is equipped with the premium upgrades package, when you press the brake pedal, the driver's door automatically closes.

Opening and Closing Front Doors from Outside

Model X doors are electrically powered. When you approach Model X carrying a key, the doors automatically unlock. The front doors open when you press the door handle.

You can also set the driver's door to open automatically upon your approach (if equipped). The door partially opens (between 20° and 45° depending on obstacles detected by sensors). Touch **Controls > Vehicle > Locks > Automatic Doors**. If this setting is on, you can also open the driver's door by double-clicking the key fob's lock/unlock button. A subsequent double-click opens the front passenger door.

You can also specify that you want to unlock only the driver's door when you shift into Park by touching **Controls > Vehicle > Locks > Driver Door Unlock Mode**.

NOTE: See [Cold Weather Best Practices on page 284](#) for information on opening the doors in cold weather.



CAUTION: The front doors may not fully open or close automatically when parked on a very steep hill. Never rely on Model X to fully open or close the doors for you when parked on a steep hill.

NOTE: Depending on date of manufacture and options chosen at time of purchase, your Model X may not be equipped with automatic doors.



Whenever a door is open, the Door Open indicator displays on the instrument panel. Also, the image of the Model S Model X on the touchscreen's **Controls** window also provides a visual representation of an open door or trunk.

To close doors from the outside, you can:

- Manually push them shut.
- Single-click or triple-click the key fob's lock/unlock button (if the **Close All with Key Fob** setting is on, only a single click is needed to close all doors and trunks—a triple-click is needed if the setting is off).

Once inside you can close the doors by touching **Controls > Close**.

NOTE: Powered doors stop moving if an obstacle is detected.

WARNING: Before allowing an automated feature to open or close a front door (rather than doing so manually), it is important to check that the area around the door is free of obstacles (such as people and objects). You must proactively monitor the door's movement to ensure that it does not contact a person or object. Failure to do so can result in damage or serious injury.

Front Door Reset

Since your Model S Model X does not have traditional door handles that you can pull from the outside, it is equipped with pop actuators (sometimes referred to as "ice breakers") that are used to assist in opening the front doors in cases where resistance is detected, such as ice buildup in cold weather. The pop actuator is located just above the front door latch and extends as necessary to open the front door. Once the front door opens slightly, the pop actuator gently retracts back into the door.



If the pop actuator is unable to retract because it is stuck to or caught on something, the pop actuator can be extended manually to extract the object by performing the following:

1. Carefully close the door latch using a pen, screwdriver, or comparable tool (never use a finger or body part and avoid damaging the paint); Model S Model X will detect this as though the door is closed.



2. Make sure Model S Model X is unlocked, then press the exterior door handle or pull the interior door handle to reset the latch and extend the pop actuator.
3. As the pop actuator extends out from the door, quickly extract the object.



WARNING: The pop actuator will attempt to retract back into the door almost immediately after the door handle is pressed or pulled. The pop actuator retracts gently, but will not release automatically if something gets caught.



WARNING: As with all mechanical and moving parts on the vehicle, never put body parts in, or near, moving components. Make sure children are monitored when opening and closing doors. Interacting with moving components, including the pop actuator, can cause serious damage or bodily injury.

Opening and Closing Falcon Wing Doors

Model X has falcon wing doors that easily open and close by pressing a button, using a key fob, using the mobile app, or touching the associated icon on the touchscreen. The falcon wing doors are equipped with several sensors that detect the presence of people and objects and, if an object is detected, the door stops moving. Based on detected objects, the doors may adjust their outward and upward movement in an attempt to avoid contacting the object. For example, if an object is detected above Model X, the door's movement may extend further outward but lower, whereas if an object is detected beside the door, the door may extend outward much less.



WARNING: It is important to keep your hands clear of the falcon wing door frames at all times. Proactively check the door frame area prior to closing, and monitor the movement of the door during closing to ensure that it does not come into contact with a person or object. Failure to do so can result in damage or serious injury.



WARNING: Before opening or closing a falcon wing door, it is important to check that the area around the door is free of obstacles (people and objects). Although the doors have many sensors, it can not detect all objects at all times, particularly when moving. At any given moment, there may be areas near the door that are not in the detection zone. Therefore, when opening or closing a falcon wing door, you and your passengers must stand away from the door as it is moving, while proactively monitoring the door's movement and being prepared to take corrective action at any time. To stop a door from moving, single-click the falcon wing door button on the key fob, press the switch on the door or door pillar, or touch the button on the touchscreen.

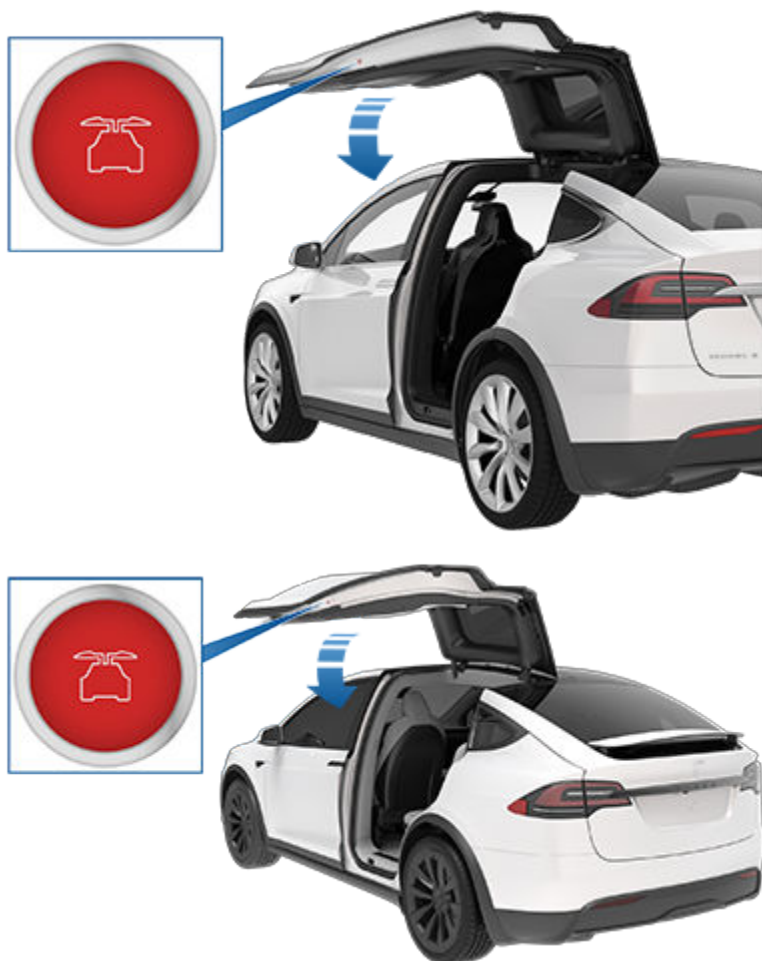
To open a falcon wing door from outside Model X, press the door handle or press the falcon wing door button on the key fob (see [Keys on page 20](#) [Using the Key Fob on page 43](#)).

To open a falcon wing door from inside Model X, press the switch located on the door pillar, or touch the associated door icon on the touchscreen (**Controls**) (**Controls > Locks**):



NOTE: If Model X is locked, using the switch (illustrated above) the first time unlocks the associated door. Pulling it a second time opens it.

To close a falcon wing door, press the button located on the inside of the door. You can also use the key fob (see [Using the Key Fob on page 43](#)), use the switch on the door pillar (illustrated above), or touch the associated door icon on the touchscreen (**Controls**) (**Controls** > **Close**).



If a falcon wing door or the front trunk is left open when you attempt to shift out of Park, a notification requiring you to confirm your intent to drive appears on the touchscreen. The falcon wing doors may automatically close once you begin to accelerate. In addition, your vehicle speed is limited if you choose to keep the front trunk open while driving. It is your responsibility to ensure doors and trunks are properly closed before driving.

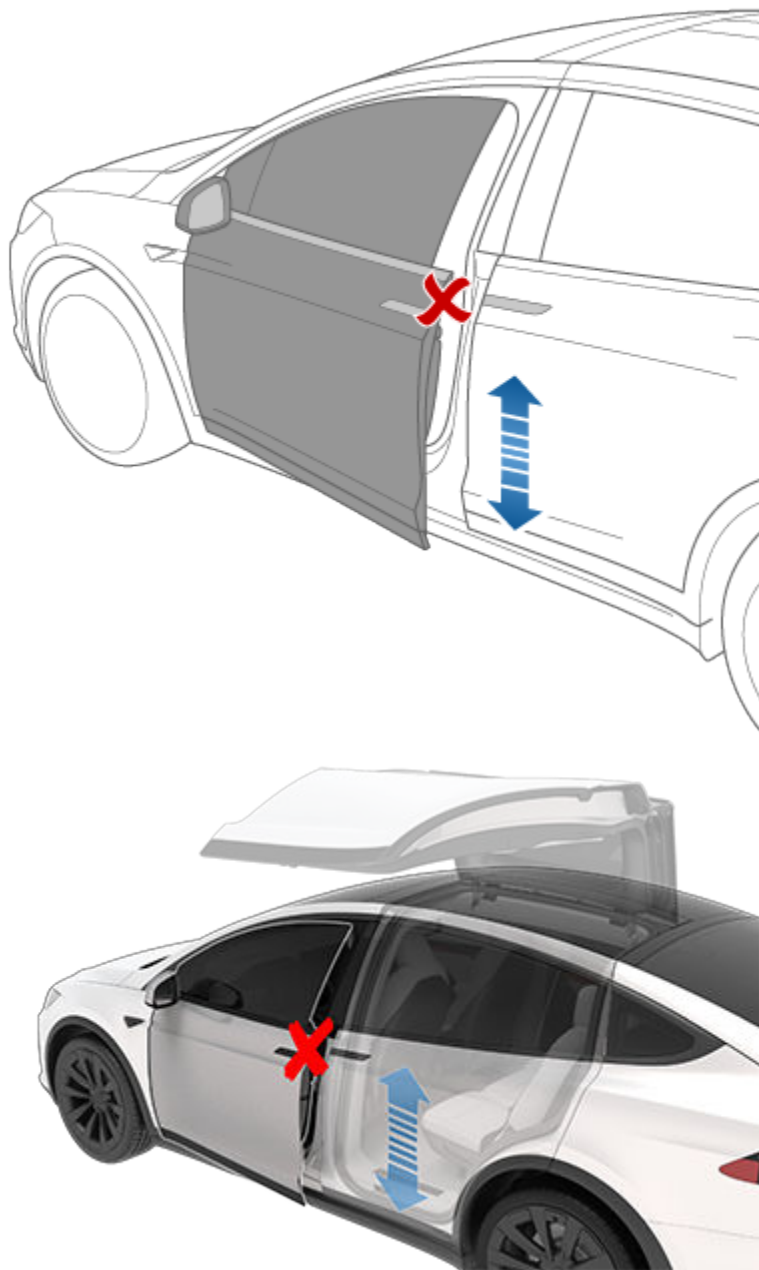
NOTE: To prevent children from opening falcon wing doors using the interior switch, turn on child-protection locks using the touchscreen (**Controls > Vehicle > Child- Protection Lock**)(**Controls > Locks > Child Lock**). See [Child-Protection Lock on page 42](#)[Child-Protection Lock on page 55](#).

NOTE: You can configure Model X to open the falcon wing doors to a lower height setting by using the touchscreen (**Controls > Vehicle > Locks > Falcon Door Height**).

NOTE: If a falcon wing door detects an obstacle while closing, it reverses a few inches before it stops moving.



WARNING: Whenever a front door is partially open (approximately 20°) as you are opening or closing the associated falcon wing door, you **MUST** keep your hands (or any object) away from the opening edge of the front door. When a falcon wing door passes by a partially opened front door, the distance between the two doors is very narrow. Objects, such as hands or fingers, placed in this area, are not detected by sensors and can therefore become pinched between the doors. To avoid bodily injury, it is a good practice to keep your hands away from the front door whenever you are opening or closing a falcon wing door.



CAUTION: Remove accumulation of snow or ice before opening a falcon wing door. Snow can get inside Model X and ice can prevent the door from opening.

CAUTION: In rainy weather, leaving a falcon wing open while opening the liftgate can result in rain water falling from the liftgate into the rear seating area.

NOTE: Falcon wing doors open only when Model X is stationary.

WARNING: When opening or closing a falcon wing door, it is important to proactively monitor the movement of the door to ensure that it does not come into contact with a person or object. Failure to do so can cause serious damage or injury.

Obstacle Detection

A falcon wing door stops moving when one of its many sensors detects an obstacle, or when the door senses resistance because it has made contact with an object. The touchscreen displays a warning. In these cases, provided it is appropriate to continue opening or closing the falcon wing door, you can override obstacle detection by pressing and holding the switch located on the door pillar, or touching and holding the associated door icon on the touchscreen.



When Model X detects a low ceiling (for example, in a garage), it opens the falcon wing doors (and trunk) to a lower height, even if no obstacle is detected. You can override this height and open the doors higher by touching the associated door icon on the touchscreen (**Controls**). The touchscreen displays a message asking you if you always want to open the doors to the higher height at this location, and saves your choice. The next time you open the falcon wing doors at this location, Model X opens them to the height you saved.



WARNING: Before overriding a falcon wing door's default opening height, visually inspect the area to ensure adequate clearance between the door and the detected object.



WARNING: Applying adhesive products such as wraps, stickers, rubber coating, etc. on the outside of the falcon wing doors can affect the sensors' ability to detect obstacles properly.

Calibration

If the falcon wing doors lose calibration, a message displays on the touchscreen. To calibrate the doors, first ensure that both doors have plenty of space to open and close and are clear of passengers, objects, etc. Then press and hold the **Calibrate** button until calibration is complete. During calibration, the lower door opens all the way out (requiring extra space on the side of Model X), the upper door moves all the way down, and then the lower door closes.

Calibration

If the falcon wing doors lose calibration, the main Controls window on the touchscreen displays a **Calibration Required** message. To calibrate the doors, first ensure that both doors have plenty of space to open and close and are clear of passengers, objects, etc. Touch **Controls > Service > Calibrate Doors**, then press and hold the **Calibrate** button until calibration is complete. During calibration, the lower door opens all the way out (requiring extra space on the side of Model X), the upper door moves all the way down, and then the lower door closes.

Interior Locking and Unlocking

From inside Model SModel X, you can use the touchscreen to lock or unlock doors and trunks, provided a valid key is inside the vehicle. Touch the lock icon on the touchscreen's status bar.

When you stop Model SModel X and engage Park, you can choose whether you want doors to unlock or remain locked. To do so, touch **Controls > Vehicle > Unlock on Park**. When enabled, doors automatically unlock when you engage Park.

You can also unlock doors and present handles by pressing the Park button on the end of the drive stalk a second time (for example, after pressing it one time to engage Park).

NOTE: If a door or trunk is still open when you lock Model SModel X, it locks when you close it.

Driver Door Unlock Mode

You can choose to unlock only the driver's door when you approach your vehicle carrying your key fob. To do so, touch **Controls > Vehicle > Driver Door Unlock Mode**. To unlock the remaining doors, use the touchscreen or press the key fob a second time.

Child-Protection Lock

Model SModel X has child-protection locks on the rear falcon wing doors and liftgate to prevent them from being opened using interior handles. Use the touchscreen to turn child-protection locks on or off. Touch **Controls > Vehicle > Child-Protection Lock**.

NOTE: It is recommended that you turn child-protection locks on whenever children are seated in the rear seats.

Drive Away Locking

Model SModel X automatically locks all doors (including the trunks) whenever your driving speed exceeds 5 mph (8 km/h).

Walk-Away Door Lock

Doors and trunks automatically lock whenever you walk away carrying the key fob or if the key fob is otherwise not detected by your vehicle (not present, dead battery, etc.).

To turn this feature on or off, touch **Controls > Vehicle > Walk-Away Door Lock**.



NOTE: Touch **Toybox > Boombox > Lock Sound** to customize the lock sound when the vehicle is locked from the outside (Pedestrian Warning System required).

Check the **Exclude Home** checkbox to prevent doors from locking when you walk away carrying the key fob when Model SModel X is parked at the location you have designated as Home. For details on how to designate a location as Home, see [Home, Work, and Favorite Destinations on page 371](#).

If you unlock Model SModel X using the mobile app, it automatically locks after a short period of time if all doors remain closed. If parked in an area without cellular service (such as an indoor parking garage), ensure that you have a functional key fob available to unlock Model SModel X.

If Model SModel X detects an authenticated key fob for five minutes after you exit the vehicle and close all doors, Walk-Away Door Lock disables and doors do not lock when you leave with the key fob. You will need to manually lock Model SModel X until after your next drive.

In addition, if all doors are closed and you use the key fob to unlock Model SModel X, walk away locking is temporarily suspended for one minute. If you open a door within this minute, it does not re-lock until after all the doors are closed and you have walked away with the key fob.

NOTE: Depending on date of manufacture and options selected at time of purchase, some Model S vehicles are not equipped with walk-away locking.

NOTE: It is ultimately your responsibility to ensure your vehicle is locked, even when Walk-Away Door Lock is enabled.

Unlocking When the Key Fob Doesn't Work

If Model SModel X does not unlock when you walk up to it, or when you double-click the unlock button on the top of your key fob, the key fob's battery may be dead. Even if this is the case, you can still use the key fob to unlock and drive Model SModel X.

NOTE: Although you can still use your key fob, you should consider using the mobile app to remotely unlock and start the vehicle. Then, replace your key fob's battery when convenient.

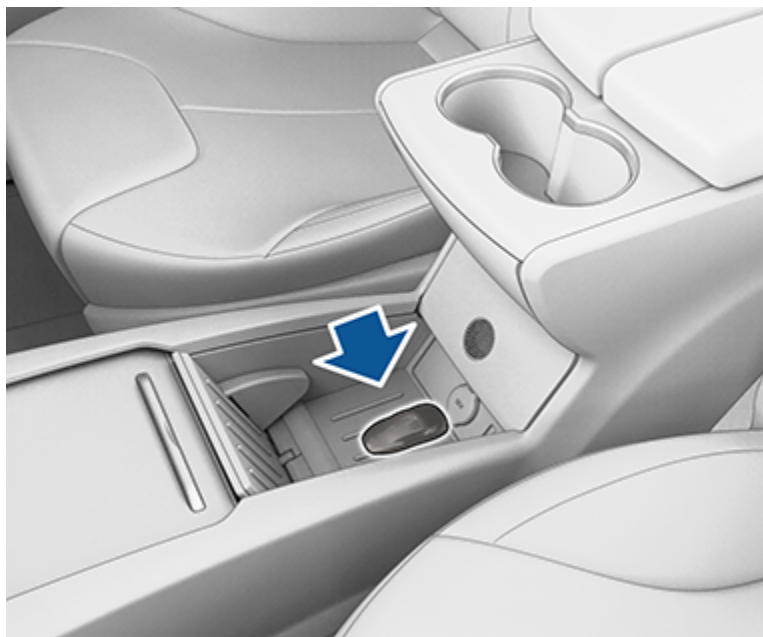
To unlock Model SModel X (and disable the security alarm) using the key fob, first position the key fob near the base of the passenger side windshield wiper at the base of the door pillar between the front door and the falcon wing door, on the driver's side of the vehicle. Then press the front door handle on the right side of the vehicle. Then press the driver's door handle. If Model SModel X doesn't unlock, try adjusting the position of the key fob and try again. The key fob must be in the correct position for the vehicle to unlock. If Model X still doesn't unlock, remove the key fob's battery and try again. See [Replacing the Key Fob Battery on page 45](#).

NOTE: The following illustration assumes a left hand drive (LHD) vehicle. On a right hand drive (RHD) vehicle, the locations are mirrored.





To drive Model S/Model X after gaining access to the cabin, place the bottom of the key fob against the center console, immediately below the low voltage power outlet, then press and hold the brake pedal to start Model S/Model X.



NOTE: Unlocking Model S/Model X using this method disables walk away locking. You must manually re-enable walk away locking after replacing the key fob's battery.

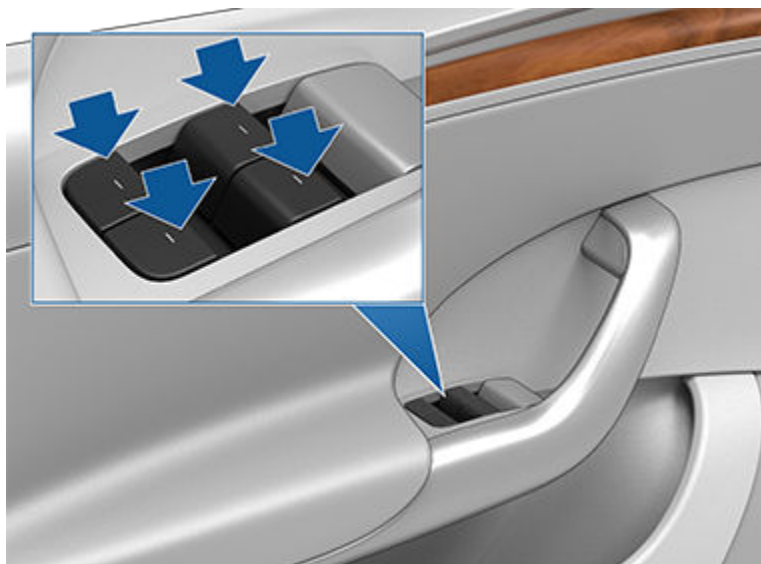
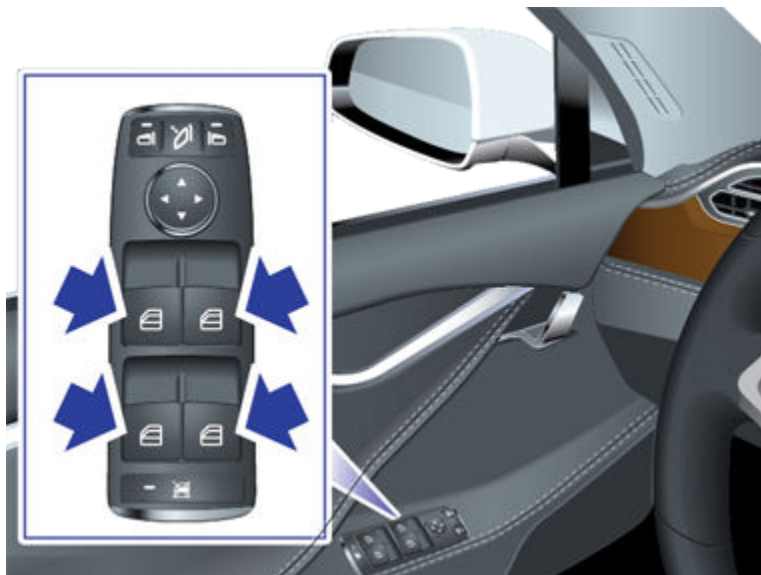


Windows

Opening and Closing

Press down on a switch to lower the associated window. Window switches operate at two levels:

- To lower a window fully, press the switch all the way down and immediately release.
- To lower a window partially, press the switch gently and release when the window is where you want it.



Similarly, pull a switch to raise the associated window:

- To raise a window fully, pull the switch all the way up and immediately release.
- To raise a window partially, pull the switch gently and release when the window is where you want it.

If a window is left open unintentionally, Model S Model X can send a notification to the mobile app (touch **Controls > Locks > Car Left Open Notification** **Controls > Vehicle > Car Left Open Notification**, then choose **Doors & Windows**).

You can also enable **Close Windows on Lock** by touching **Controls > Locks > Close Windows on Lock**. When enabled, your vehicle automatically closes the windows when Model S Model X locks.



NOTE: See [Cold Weather Best Practices](#) on page 284 for information on preparing windows for cold weather.

CAUTION: To avoid damage, windows automatically lower slightly when you open or close a door. If you manually raise a window when the door is open, ensure it is slightly lowered before closing the door.

WARNING: Before closing a window, it is the driver's responsibility to ensure that all occupants, especially children, do not have any body parts extended through the window's opening. Failure to do so can cause serious injury.

Locking Rear Windows

To prevent passengers from using the rear window switches, touch **Controls > Locks > Window Lock**. To unlock the rear windows, touch **Window Lock** again.

To prevent passengers from using the rear window switches, press the rear window lock switch. The switch light turns on. To unlock rear windows, press the switch again.



WARNING: To ensure safety, it is recommended that you lock the rear window switches whenever children are seated in the rear seats.

WARNING: Never leave children unattended in Model S/Model X.



Rear Trunk

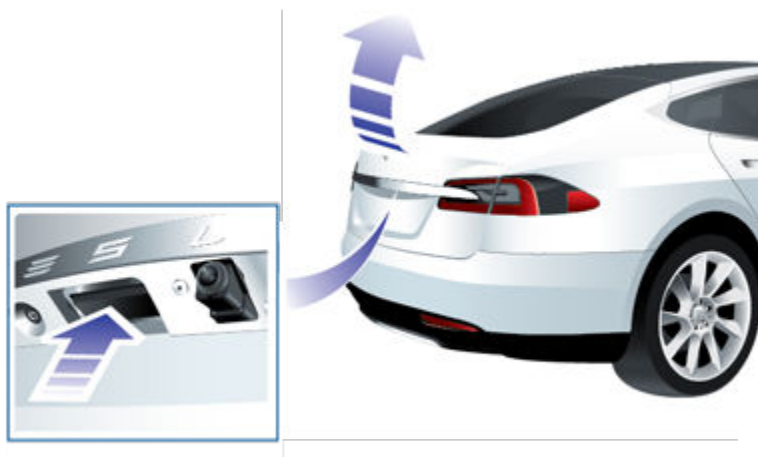
Opening

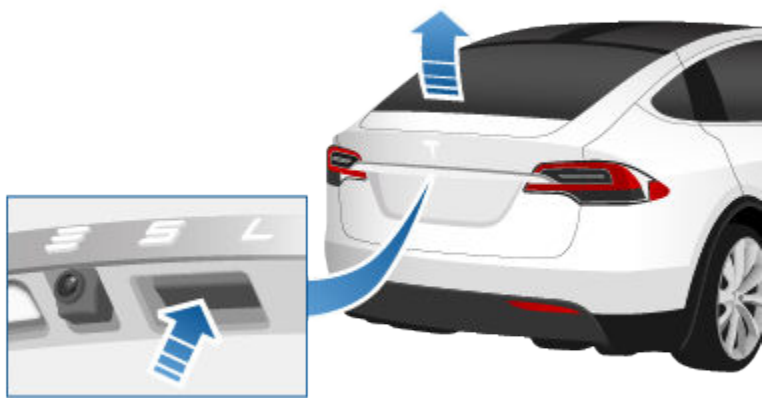
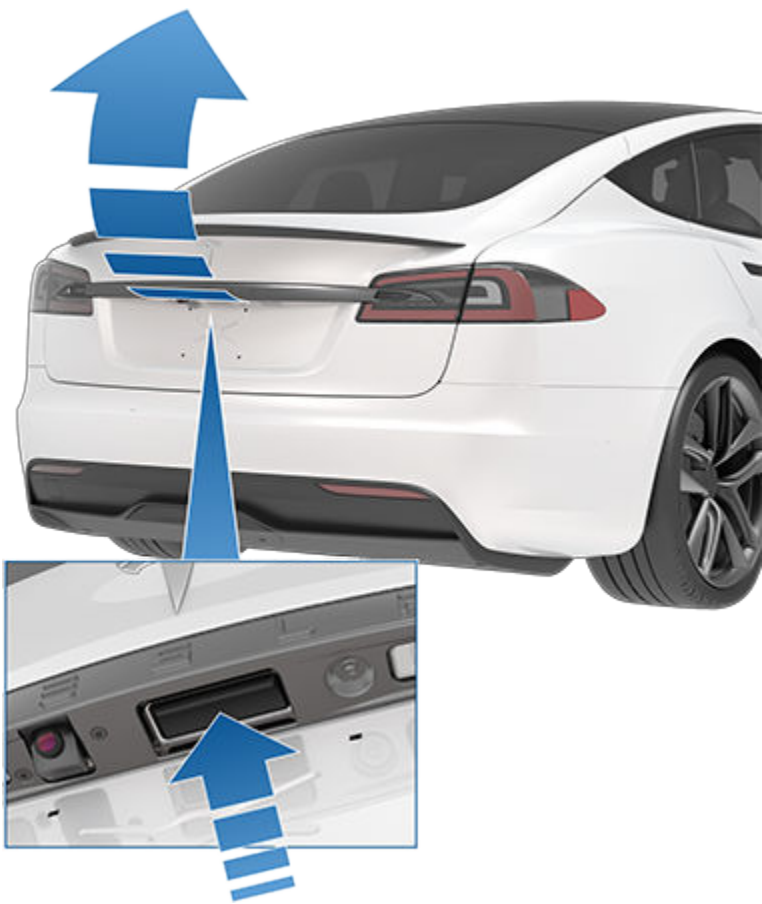
To open the rear trunk, ensure Model S/Model X is in Park, then do one of the following:

- Touch **Controls** > **Trunk** on the touchscreen.
- Double-click the rear trunk button on the key fob.
- Touch the rear trunk button on the mobile app.
- Press the switch located under the liftgate's exterior handle (a valid key must be detected).

NOTE: If **Passive Entry** is off, you must use a key fob to unlock Model S/Model X before you can use the switch to open the liftgate. See [Using the Key Fob on page 43](#).

Model S/Model X must be unlocked or detect a key before you can use the switch to open the liftgate.







The instrument panel informs you when a door or trunk is open.



When a door, trunk or liftgate is open, the instrument panel displays the Door Open indicator light. The image of your Model S/Model X on the touchscreen also displays the open trunk.

To stop a liftgate while it is moving, single-click the rear trunk button on the key fob. Then, when you double-click the rear trunk button, it moves again, but in the opposite direction (provided it was not almost entirely open or closed when you stopped it). For example, if you single-click to stop the liftgate while opening, when you double-click, it closes.

NOTE: In emergency situations, you can override an open or close command by grasping the liftgate to stop it in place.

To open the liftgate from inside the vehicle in the unlikely situation that Model S/Model X has no power, see [Interior Emergency Trunk Release](#) on page 67.

If Model X detects a low ceiling (for example, in a garage), it opens the liftgate (and falcon wing doors) to a lower height, even if no obstacle is detected. You can override this height by manually lifting it higher. When doing so, the touchscreen prompts you to choose if you always want the trunk to open to this higher position at this location, and saves your choice. If you choose to do so, the next time you open the liftgate at this location, Model X opens it to the saved height.



WARNING: Before opening or closing the liftgate, check the surrounding area (for people and objects). Although the liftgate can detect obstacles, it cannot detect all objects at all times. Do not rely on the liftgate to sense an obstruction when opening or closing. You must proactively monitor the liftgate to ensure that it does not come into contact with a person or object. Failure to do so may result in damage or injury.



Closing

If Model S is not equipped with a liftgate, close the rear trunk by pulling down on the liftgate and pushing firmly until it is fully closed.

To close the liftgate, do one of the following:

- Touch **Controls** > **Trunk**.
- Double-click the rear trunk button on the key fob.
- Press the switch located on the underside of the liftgate (see [Adjusting Liftgate Opening Height on page 63](#)).

If the liftgate senses an obstruction when closing, it stops moving and chimes two times. Remove the obstruction and try closing it again.

If the liftgate loses its calibration when opened, the liftgate chimes three times and does not move. To restore calibration, manually pull the liftgate down to close it.

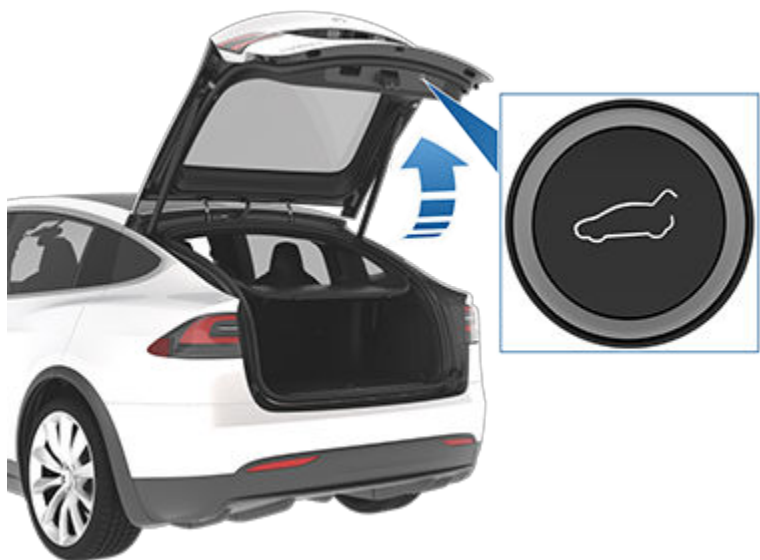
Adjusting Liftgate Opening Height

If Model S/Model X is equipped with a liftgate, you can adjust its opening height to make it easier to reach or to avoid low-hanging ceilings or objects (for example, a garage door or light):

You can adjust the opening height of the liftgate to make it easier to reach or to avoid low-hanging ceilings or objects (for example, a garage door or light):

1. Open the trunk, then manually lower or raise the liftgate to the desired opening height.
2. Press and hold the button on the underside of the liftgate for three seconds until you hear a confirmation chime.







3. Confirm that you have set it to the desired height by closing the liftgate, then reopening it.

Interior Release

To open the rear trunk from inside a Model S equipped with the Tesla Built-In Rear Facing Child Seats, press the interior release switch located inside the rear trunk and push the liftgate up. If Model S is locked and is equipped with a liftgate, the first press unlocks the rear trunk and the second press opens it.

NOTE: If Model S is not equipped with the Tesla Rear Facing Child Seats, the switch may appear to exist, but it is inactive and pressing it does not release the liftgate.



If Model S is equipped with the power liftgate, you do not need to push it up. When you press the release switch, it opens, and when you pull the switch, it closes.

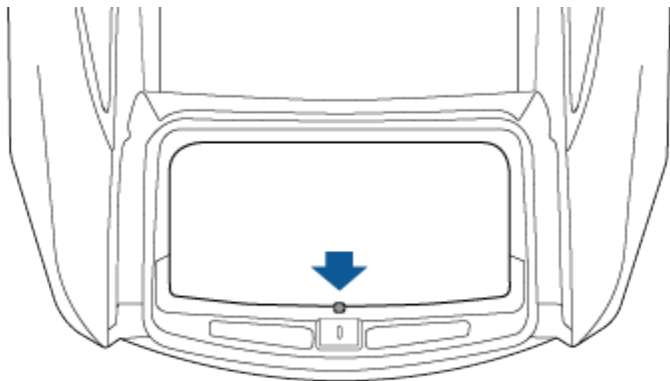
NOTE: The interior release switch is disabled if child-protection locks are turned on (see [Child-Protection Lock on page 55](#)), or if Model S/Model X is moving.



Accessing the Cargo Area

To access the cargo area inside the rear trunk, pull up the strap at the rear of the cargo cover. You can then fold the cargo cover forward or remove it from Model S/Model X.

Secure all cargo before moving Model S/Model X, and place heavy cargo in the lower/lower trunk compartment.



To access the cargo area inside the rear trunk, push down on the ridged portion of the handle of the cargo cover and then pull up. You can then adjust the position of the cargo cover or completely remove it.

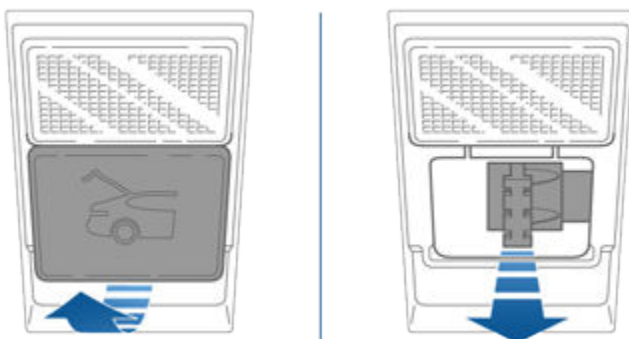


Distribute cargo weight between the front and rear trunks.

- CAUTION:** Never load more than 175 lbs (80 kg) in the upper compartment of the rear trunk or more than 175 lbs (80 kg) in the lower compartment. Doing so can cause damage.
- CAUTION:** Never load more than 220 lbs (100 kg) in the upper compartment of the rear trunk or more than 175 lbs (80 kg) in the lower compartment. Doing so can cause damage.
- CAUTION:** Never load more than 175 lbs (80 kg) in the upper compartment of the rear trunk or more than 285 lbs (130 kg) in the lower compartment. Doing so can cause damage.

Interior Emergency Trunk Release

An illuminated mechanical release located inside the rear trunk allows you to open the rear trunk from the inside if Model S Model X has no electrical power. This mechanical release also allows a person locked inside to get out.





1. Remove the cover by pulling its lower edge very firmly toward you.
2. Pull the cable to release the latch.
3. Push the rear trunk open.

NOTE: The button glows for several hours after a brief exposure to ambient light.

 **WARNING:** Do not allow children to play inside the trunk or become locked inside. An unrestrained child could suffer serious injury or death in a crash. A child could suffer heat exhaustion if trapped in the vehicle, especially without climate control on. If your Model S/Model X is equipped with Tesla built-in rear facing child seats, see [Tesla Built-In Rear Facing Child Seats on page 155](#) and ensure all restrictions, instructions, and warnings are followed.

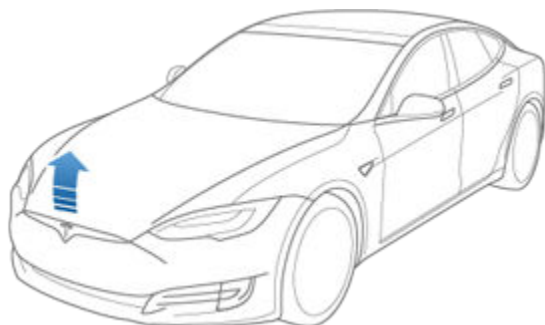


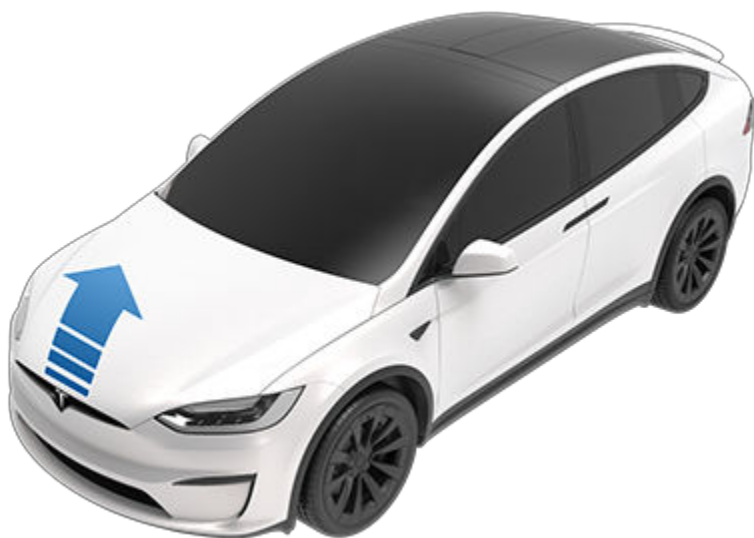
Front Trunk

Opening

To open the front trunk, ensure Model S/Model X is in Park, and then do one of the following before pulling the hood open:

- Touch **Controls** > **Front Trunk** on the touchscreen.
- Touch **Controls** > **Frunk** on the touchscreen.
- Double-click the front trunk button on the key fob.
- Touch the front trunk button in the mobile app.





The instrument panel displays when a door, trunk, or liftgate is open.



When a door or trunk/liftgate is open, the instrument panel displays the Door Open indicator light. The image of your Model S Model X on the touchscreen also displays the open front trunk.

WARNING: Before opening or closing the hood, it is important to check that the area around the hood is free of obstacles (people and objects). Failure to do so may result in damage or serious injury.

The cargo weight should be distributed between the front and rear trunks.

CAUTION: Never load more than 110 lbs (50 kg) in the front trunk. Doing so can cause damage.

CAUTION: Never load more than 300 lbs (136 kg) in the front trunk. Doing so can cause damage.

Closing

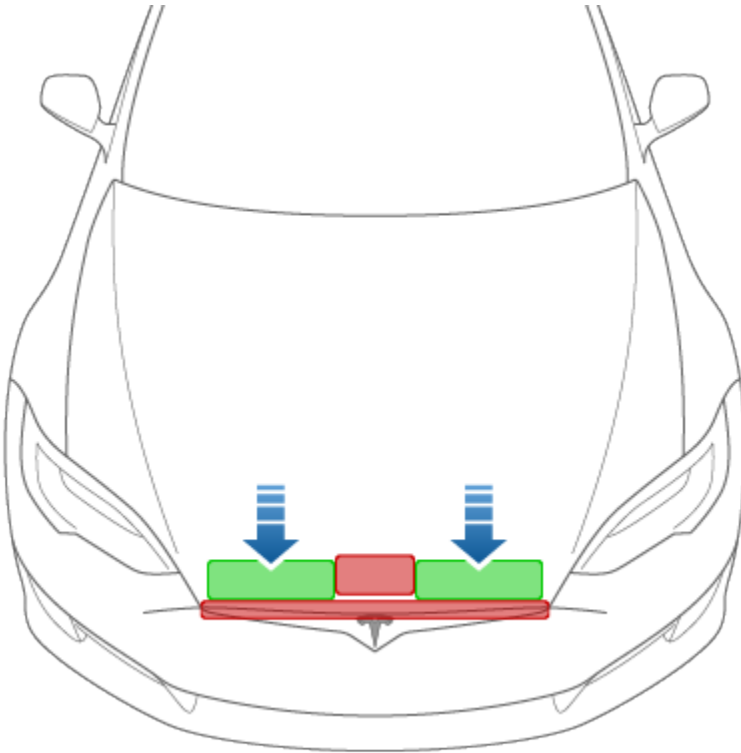
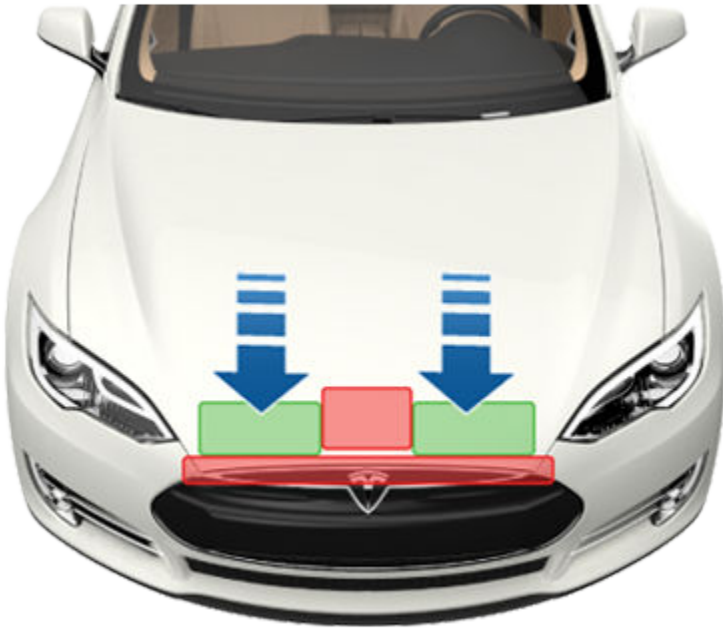
The Model S Model X hood is not heavy enough to latch under its own weight and applying pressure on the front edge or center of the hood can cause damage.

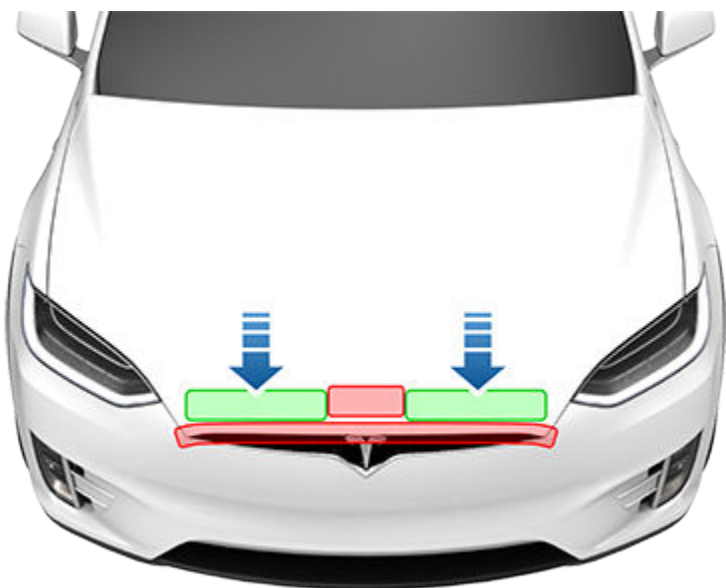
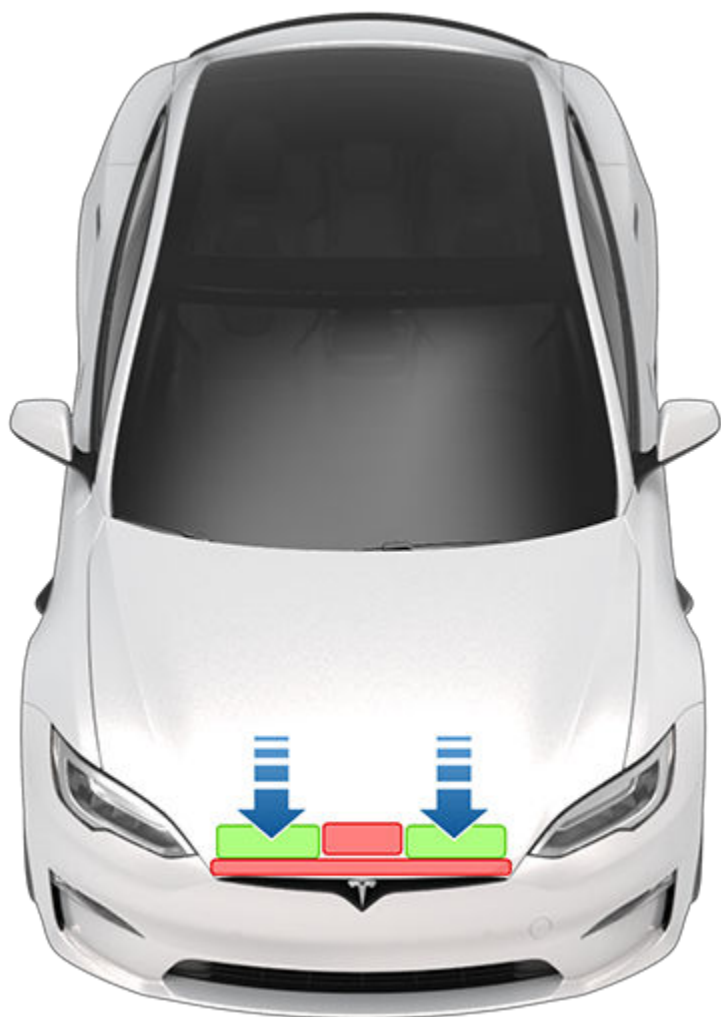
To properly close the hood:

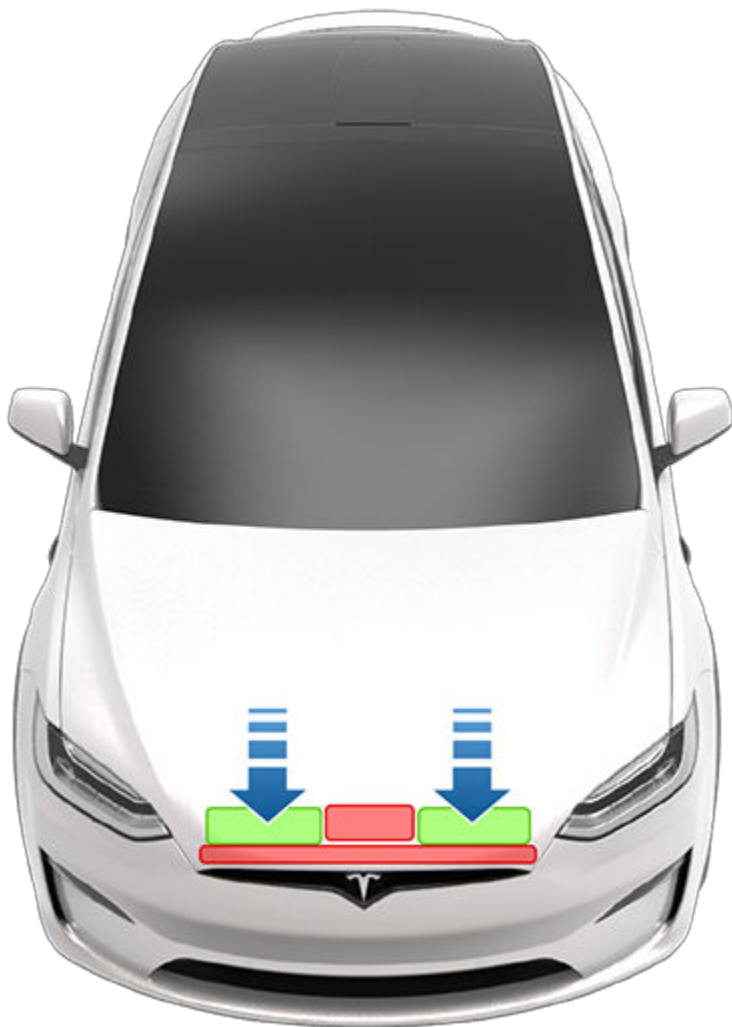
1. Lower the hood until the striker touches the latches.
2. Place both hands on the front of the hood in the areas shown (in green), then press down firmly to engage the latches.



3. Carefully try to lift the front edge of the hood to ensure that it is fully closed.







If a falcon wing door or the front trunk is left open when you attempt to shift out of Park, a notification requiring you to confirm your intent to drive appears on the touchscreen. The falcon wing doors may automatically close once you begin to accelerate. In addition, your vehicle speed is limited if you choose to keep the front trunk open while driving. It is your responsibility to ensure doors and trunks are properly closed before driving.



CAUTION: To prevent damage:

- Apply pressure only to the green areas shown. Applying pressure to the red areas can cause damage.
- Do not close the hood with one hand. Doing so applies concentrated force in one area and can result in a dent or crease.
- Do not apply pressure to the front edge of the hood. Doing so can crease the edge.
- Do not slam or drop the hood.
- To avoid scratches, don't have anything in your hands (keys). Jewelry can also cause scratches.



WARNING: Before driving, you must ensure that the hood is securely latched in the fully closed position by carefully trying to lift the front edge of the hood upward and confirming there is no movement.

The front trunk locks when:

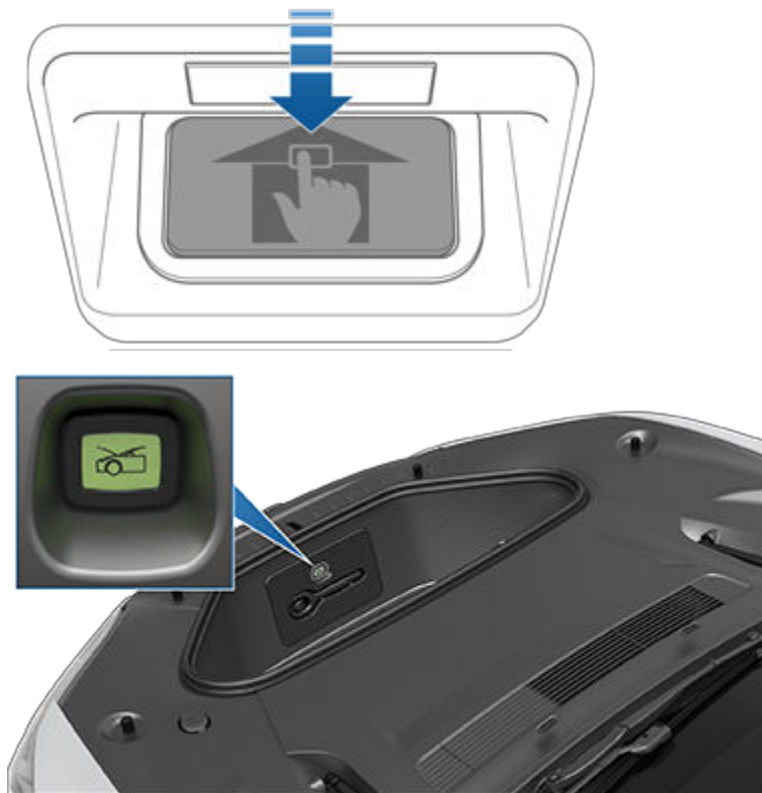
- You lock Model S/Model X using the touchscreen, key or mobile app.
- You leave Model S/Model X carrying your key (if [Walk-Away Door Lock](#) on page 55/[Walk-Away Door Lock](#) on page 41 is turned on).



- Valet mode is active (see [Valet Mode on page 183](#)).

Interior Emergency Release

An illuminated interior release button inside the front trunk allows a person locked inside to get out.



Press the interior release button to open the front trunk, then push up on the hood.

NOTE: The interior release button glows following a brief exposure to ambient light.



WARNING: People should never climb inside the front trunk. Never shut the front trunk when a person is inside.

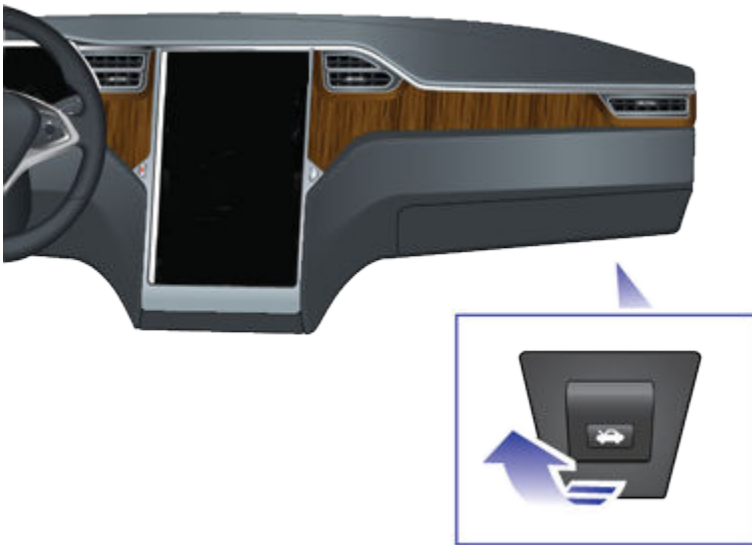


WARNING: Care should be taken to ensure that objects inside the front trunk do not bump against the release button, causing the hood to accidentally open.

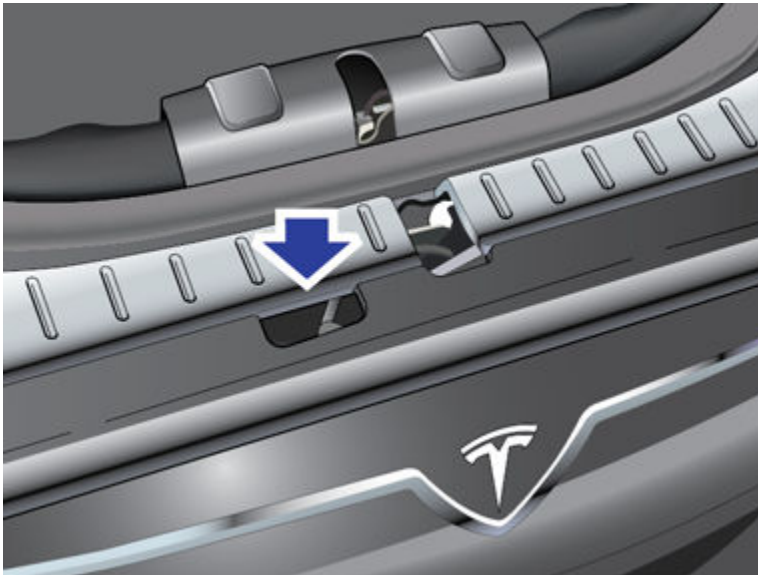
Opening Hood with No Power

NOTE: The mechanical release lever described below is not available on all versions of Model S or Model X. For All-Wheel Drive vehicles and on some newer models, contact Tesla for assistance.

If Model S or Model X has no electrical power, or if you are unable to open the front trunk using the touchscreen or key, pull the mechanical release lever located below the glove box. This releases the primary latch.



Then push down on the secondary latch lever and lift the hood. You may need to push the hood down slightly to release the pressure against the secondary latch.



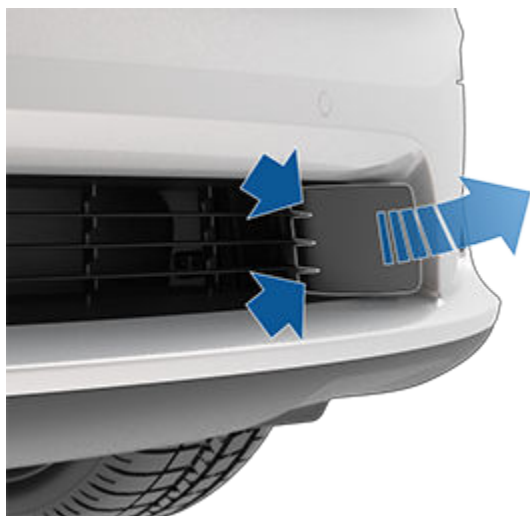
Opening Hood with No Power

In the unlikely event that Model S/Model X has no low voltage power, you will be unable to open the front trunk using the touchscreen, key fob, or mobile app. To open the front trunk in this situation:

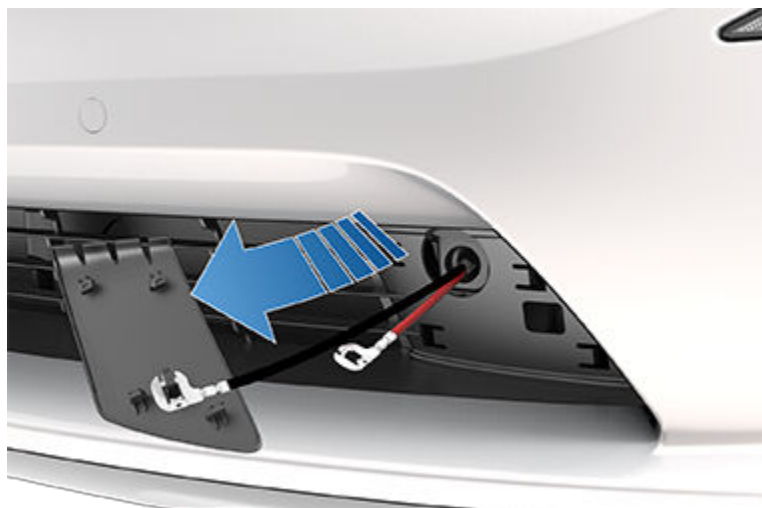
NOTE: The following steps do not open the front trunk if Model S/Model X is locked and has low voltage power.



1. Locate an external low voltage power supply (such as a portable jump starter).
2. Release the tow eye cover by pressing firmly on the top right perimeter of the cover until it pivots inward, then gently pulling the raised section toward you.
3. To remove the tow eye cover, insert a small, flat screwdriver into the top and bottom slots, release the snaps and pull the cover towards you.



4. Pull the two wires out of the tow eye opening to expose both terminals.



5. Connect the low voltage power supply's red positive (+) cable to the red positive (+) terminal.
6. Connect the low voltage power supply's black negative (-) cable to the black negative (-) terminal.



NOTE: Applying external low voltage power to these terminals only releases the hood latches. You cannot charge the low voltage battery using these terminals.

7. Turn on the external power supply (refer to the manufacturer's instructions). The hood latches are immediately released and you can now open the hood to access the front trunk area.
8. Disconnect both cables, beginning with the black negative (-) cable.
9. If pulling the vehicle onto a flatbed truck, do not replace the tow eye cover yet. If necessary, install the tow eye cover by inserting the wires into the tow eye opening and aligning the tow eye cover into position and snapping it into place.

Opening Hood with No Power

If Model X has no electrical power, or if you are unable to open the front trunk using the touchscreen or key, follow these steps to open it:

1. Remove the tow eye cover (see [Instructions for Transporters on page 503](#)[Instructions for Transporters on page 510](#)).
2. Locate the two straps. One of these straps is labeled 'A' and the other is labeled 'B'.
3. Pull strap 'A' to release the primary latch.
4. Pull strap 'B' to release the secondary latch.
5. Lift the hood. You may need to push the hood down slightly to release the pressure against the secondary latch.



NOTE: It is important to pull the straps in the correct sequence or the appropriate latch does not release and the front trunk can not open.

When opening the front trunk using this method, the latches remain in the open position and you can not close it again without electrical power. To close a front trunk that has been opened by pulling the manual straps:

1. Charge the low voltage battery (for instructions, contact Tesla).
2. Press the **Front Trunk** button on the touchscreen to reset the primary and secondary latches.

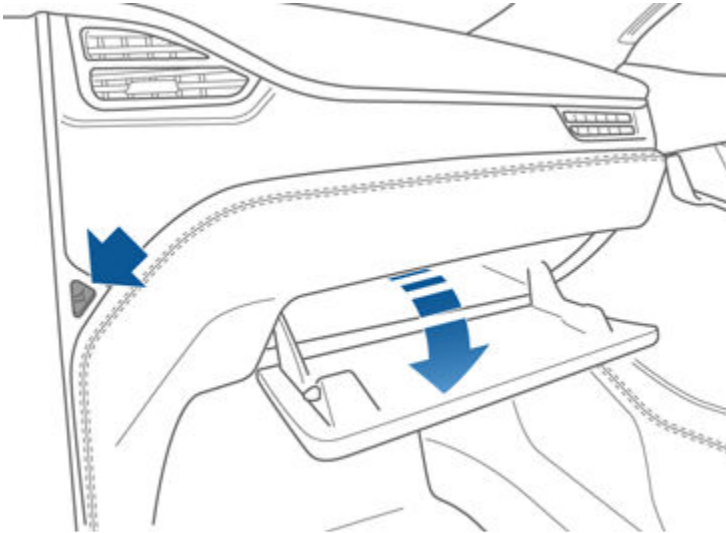


Interior Storage and Electronics

Glovebox

To open the glovebox, press the switch located on the side of the touchscreen. The glovebox locks whenever Model S/Model X is locked externally, using the key or walk-away locking. It also locks when Model S/Model X is in Valet mode (see [Valet Mode on page 183](#)). It does not lock when you lock Model S/Model X using the lock icon on the touchscreen's status bar.

For additional glovebox security, touch **Controls > Safety > Glovebox PIN** to set a 4-digit PIN (see [Glovebox PIN on page 394](#)).



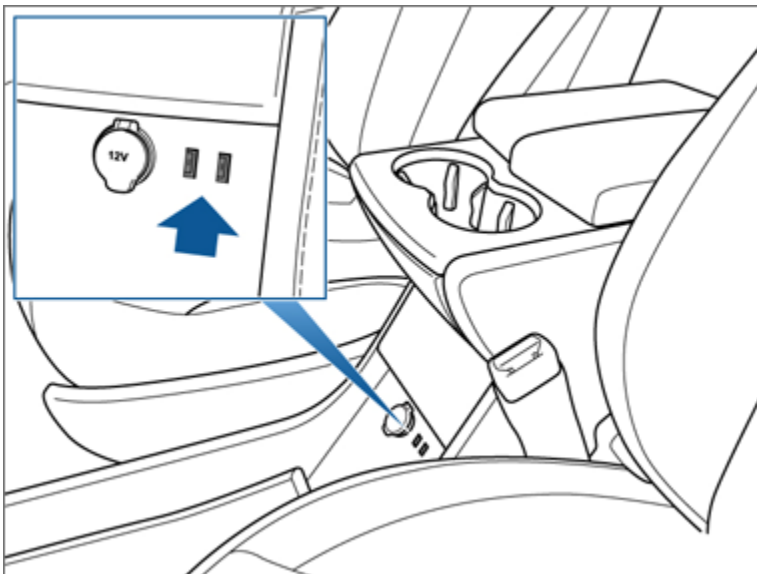
NOTE: If you leave the glovebox open, its light eventually turns off.



WARNING: When driving, keep the glovebox closed to prevent injury to a passenger if a collision or sudden stop occurs.

USB Ports

Your Model S/Model X has two USB ports located on the front of the center console that you can use to connect USB devices. To play audio files stored on a USB drive connected to these ports, see [Playing Media from Devices on page 377](#). You can also use these ports to charge USB devices.



In addition, Model X has two charge-only USB ports located at the rear of the center console, and another charge-only connection located between the third row seats.



NOTE: Do not connect multiple devices using a USB hub. This can prevent connected devices from charging or from being recognized by the Media Player.

NOTE: You can charge four devices simultaneously using the two ports at the front of the center console and the two at the rear of the console.

NOTE: Power is available whenever the vehicle is considered "awake" The vehicle may be awake for many reasons. For example, when using features such as Summon, or when features such as Preconditioning, Cabin Overheat Protection, Keep Climate On, Dog Mode, Camp Mode, Sentry Mode, etc. are enabled. The vehicle is also awake whenever the low voltage battery is being charged or is in use, during HV charging, when the vehicle is communicating with the mobile app, etc. Leaving an accessory plugged in does not deplete the low voltage battery.

USB Drive Requirements for Recording Videos

NOTE: For saving Sentry Mode and Dashcam footage, Tesla recommends using the USB port located in the glovebox. Doing so increases security and minimizes power consumption.

One or more features on your Model S/Model X requires the use of a flash drive (for example, Dashcam, Sentry Mode and Track Mode (if equipped)) that meets these requirements:

- Minimum storage capacity of 64 GB. Use a flash drive with as much available storage as possible. Video footage can occupy a large amount of space.
- A **sustained** write speed of at least 4 MB/s. Note that *sustained* write speed differs from *peak* write speed.
- USB 2.0 compatible. If using a USB 3.0 flash drive, it must support USB 2.0.
- Properly formatted (described below).

NOTE: In some market regions you can purchase recommended USB drives on <http://www.tesla.com>.

Formatting a USB Flash Drive

To save and retrieve video footage, Model S/Model X requires a USB flash drive formatted as exFAT, MS-DOS FAT (for Mac), ext3, or ext4 (NTFS is currently not supported). For use with Dashcam and Sentry Mode, the flash drive must contain a base-level folder called **TeslaCam** and for use with Track Mode (if equipped), the flash drive must contain a base-level folder called **TeslaTrackMode**.

Model S/Model X can format a USB flash drive for you. Insert the flash drive into a front USB port, and touch **Controls** > **Safety** > **Format USB Drive**. Doing so automatically formats the drive as exFAT and creates a folder for TeslaCam and TeslaTrackMode (if equipped). The USB flash drive is now ready to record and save video footage. **Format USB Drive** is available only when a USB flash drive (with one or fewer partitions) is inserted into a front USB port. Choosing **Format USB Drive** erases any existing content on the flash drive—before using this feature, you must move any content you want to keep to a different device.

If Model S/Model X is unable to format the flash drive, you must format it using a computer. Remember to manually create the **TeslaCam** folder, and the **TeslaTrackMode** folder.

Once the USB flash drive is formatted and contains the necessary folder(s), insert it into a front (or glovebox, if equipped) USB port. Do not use a rear USB port—these are used only to charge USB devices. Once inserted, it can take up to 15 seconds for Model S/Model X to recognize the flash drive. When recognized, icons for Dashcam and Sentry Mode appear at the top of your touchscreen. Icons for Dashcam and Sentry Mode are available when you touch **Controls** and your vehicle is ready to record videos. You may need to first enable Sentry Mode by touching **Controls** > **Sentry** > **Sentry Mode**.

Viewing Video Recordings

You can view recorded footage on the touchscreen when Model S/Model X is in Park. Touch the Dashcam icon located in the app launcher or the Dashcam icon at the top of the touchscreen on the **Controls** screen. Touch the menu icon in the top corner of the screen. The tabs display a list of all video clips, organized by location and timestamp. Pause, rewind, fast forward, and delete video recordings as needed. You can also navigate to **Controls** > **Safety** > **Delete Dashcam Clips** to delete all dashcam and Sentry Mode footage, including recent and saved clips.

NOTE: Dashcam recording pauses when you launch the Viewer.

You can also view video footage by removing and inserting the USB flash drive into a computer and navigating to the TeslaCam or TeslaTrackMode folder.

The TeslaCam folder contains three sub-folders:



- **Recent Clips:** When recording, Dashcam continuously saves footage to Recent Clips in 60-minute cycles. Footage is overwritten every hour unless you manually save it. Four videos are recorded for each clip, one from each camera (front, rear, left, and right).

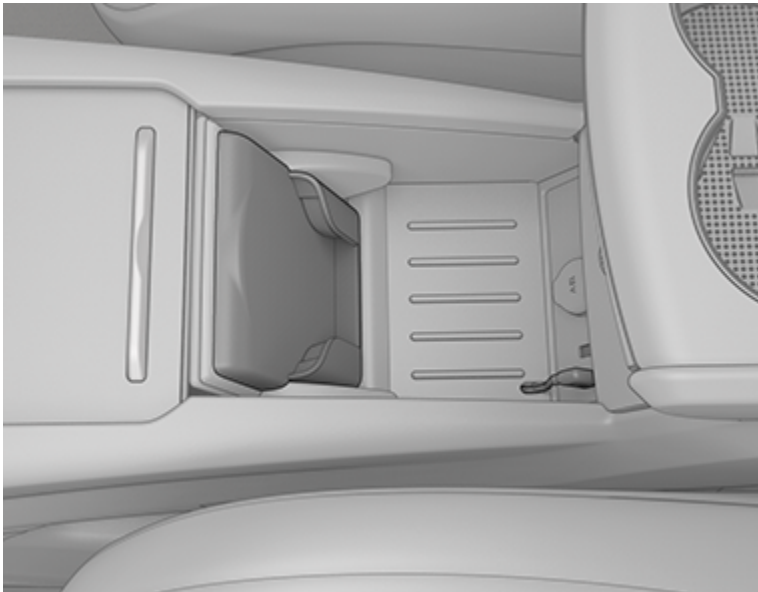
NOTE: Rear camera recordings are available only on vehicles manufactured after approximately February 2018.

- **Saved Clips:** Contains all recordings that are saved using Dashcam.
- **Sentry Clips:** Contains the last 10 minutes of footage from all Sentry Mode events that triggered an Alert or Alarm state. If storage space on the USB flash drive becomes limited, the oldest Sentry Clips are deleted to provide space for new ones. Once deleted, you cannot retrieve them.

When the USB flash drive runs out of storage space, video footage can no longer be saved. To prevent the flash drive from getting full, regularly move saved videos to another device and delete them from the flash drive.

Wireless Phone Charger

If equipped, the Model S Model X wireless phone charger provides up to 7.5W/6.5W to charge a Qi-enabled phone. Simply open the center console and place your phone in the charger, located on the back of the bin cover. The wireless phone charger uses a front USB port. Your device may feel warm while charging, but this is a normal effect of inductive charging.



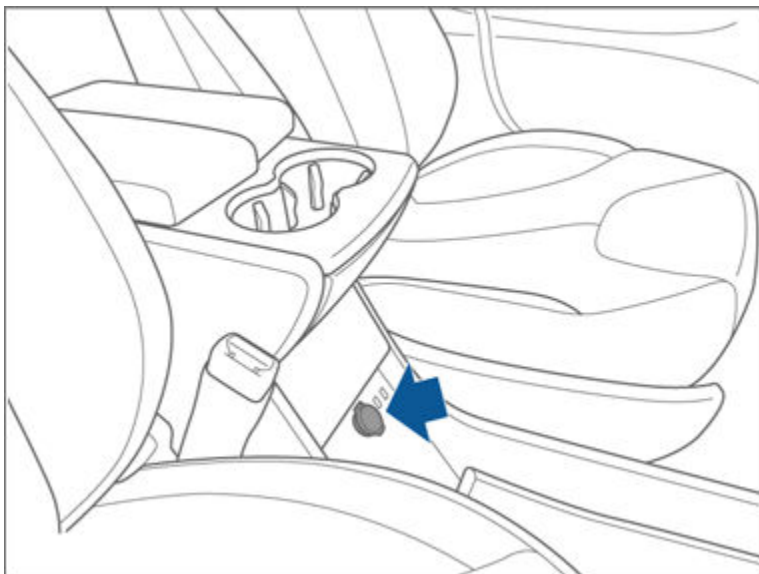
Model S Model X will charge your phone only when the vehicle is powered on (the touchscreen is on and you are in the vehicle). Your phone will not charge after exiting the vehicle. Model S Model X will also not charge if the vehicle's Battery is discharged.

NOTE: Ensure your phone supports inductive charging.

NOTE: The wireless phone charger may not work if your phone case is too large or is made of metal. Try removing the phone from its case before placing in the charger.

Low Voltage Power Socket

Your Model S Model X has a power socket located on the front of the center console. An additional low voltage power socket is located in the rear trunk. Power is available whenever the instrument panel and touchscreen are on.



The low voltage power socket is suitable for accessories requiring up to 11A continuous draw (15A peak) or a maximum of 150 continuous watts (180 watts peak).

NOTE: Power is available whenever the vehicle is considered "awake." The vehicle may be awake for many reasons. For example, when using features such as Summon, or when features such as Preconditioning, Cabin Overheat Protection, Keep Climate On, Dog Mode, Camp Mode, Sentry Mode, etc. are enabled. The vehicle is also awake whenever the low voltage battery is being charged or is in use, during HV charging, when the vehicle is communicating with the mobile app, etc. Leaving an accessory plugged in does not deplete the low voltage battery.

NOTE: In situations where Model S/Model X is unable to detect the key fob (low battery, interference, etc.), place it immediately below the low voltage power socket in the center console where Model S/Model X can best detect it.

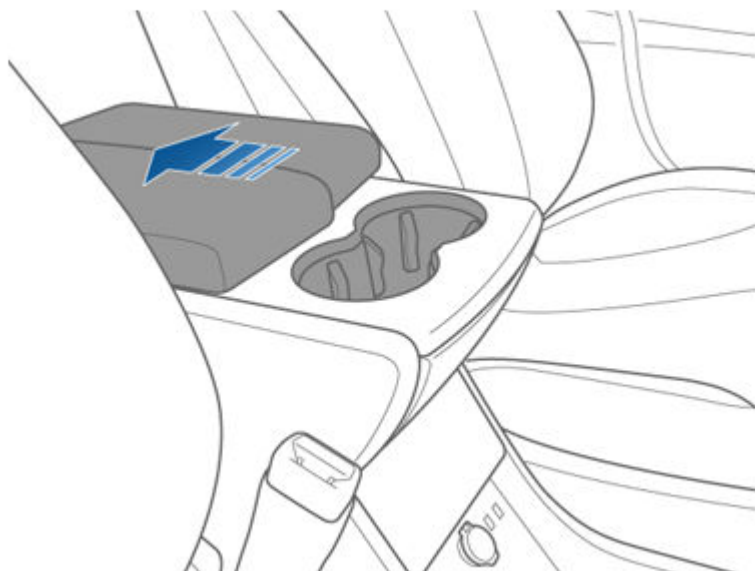


WARNING: The power socket and an accessory's connector can become hot.

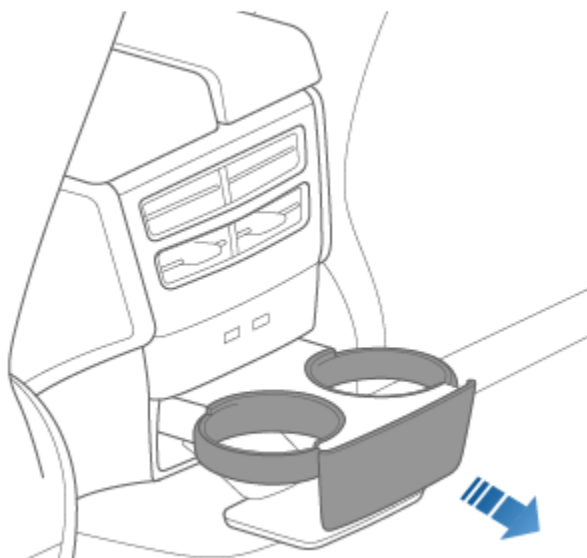


Cup Holders

To expose a front cup holder, slide back the armrest.



To expose rear cup holders (if equipped), press and release the cup holder face plate located at the back of the center console.





Interior Storage and Electronics

Center Console

In addition to housing an RFID transmitter that reads key fobs and key cards (see [Keys on page 20](#)), the center console includes cup holders, two storage compartments, wireless phone chargers, and a rear touchscreen.

To open the main storage compartment, pull its cover upward. Open the front storage compartment by sliding its cover forward.

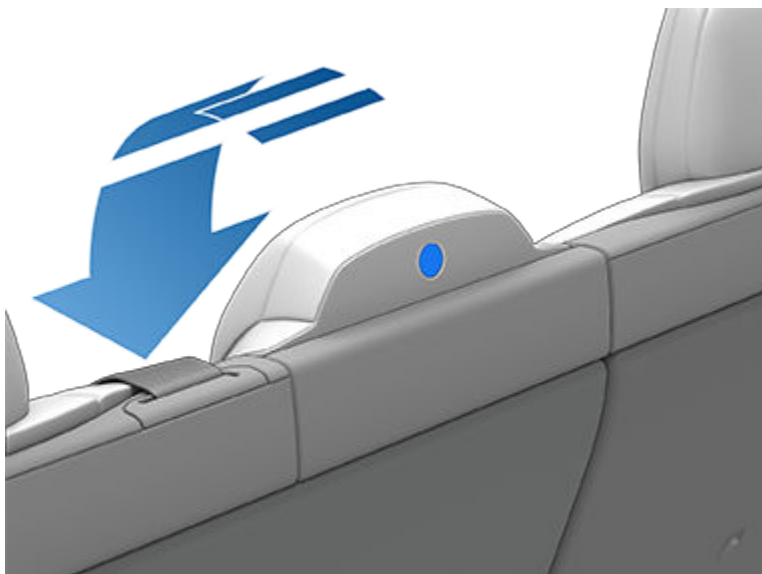


Model SModel X has two cupholders that slide out under the rear touchscreen.

Second Row Console

Your Model SModel X has a rear console integrated in the center of the second row. This console can serve as an arm rest for rear passengers.

To lower the console, press the button on the back of the center seat's headrest. To raise the console, push it all the way upwards.



To access the storage tray and wireless phone charger (see [Wireless Phone Chargers on page 89](#)), raise the cover by pressing the latch on the underside of it and pulling it up.



Glovebox

To open the glovebox, touch **Controls > Glovebox**. The glovebox automatically opens and the light turns on.



To close the glovebox, push it upward until it latches into the closed position.

For additional glovebox security, touch **Controls** > **Safety** > **Glovebox PIN** to set a 4-digit PIN (see [Glovebox PIN on page 394](#)).

NOTE: If you leave the glovebox open, its light eventually turns off.

NOTE: The glovebox locks whenever closed and you lock Model S/Model X using the mobile app, key card, you leave Model S/Model X carrying your phone key (if Walk-Away Door Lock is turned on), or if Valet mode is active (see [Valet Mode on page 183](#)). It does not lock when Model S/Model X is locked by touching the lock icon on the touchscreen.

 **WARNING:** When driving, keep the glovebox closed to prevent injury to a passenger if a collision or sudden stop occurs.

USB Ports

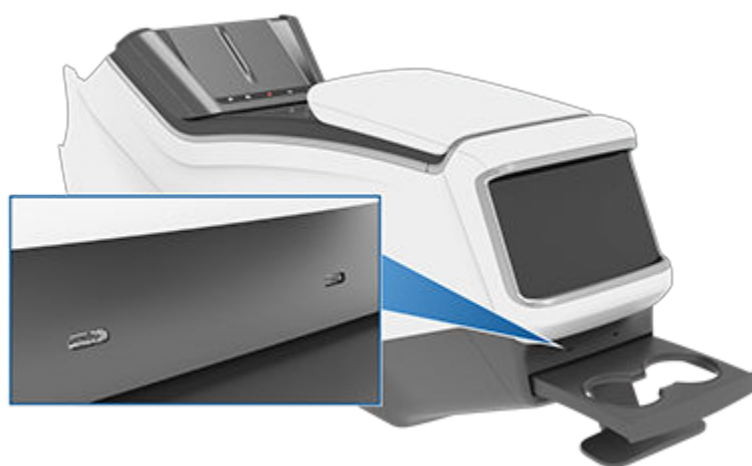
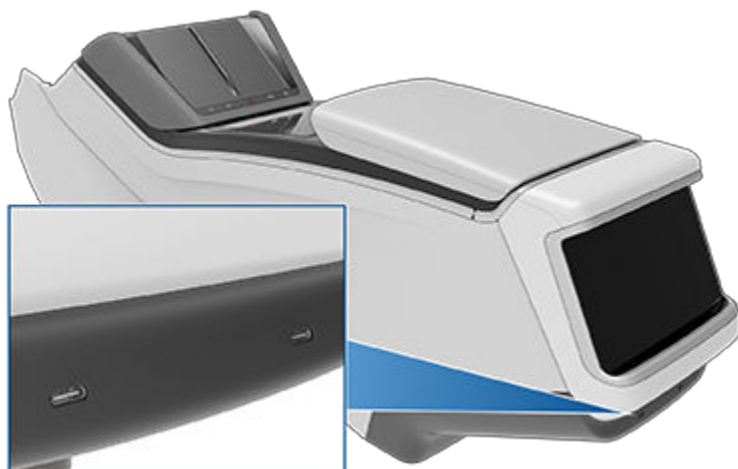
Model S/Model X has five USB ports:

- Two USB ports are located in the front compartment of the center console. These can be used to charge USB devices and to play audio files from a phone or USB device (see [Playing Media from Devices on page 377](#)).
- Two USB ports are located below the rear touchscreen that can be used to charge USB devices.
- One USB port is located inside the glovebox. This port is equipped with a USB flash drive. The secure location of this USB port makes it ideal for saving Sentry Mode and Dashcam video footage.

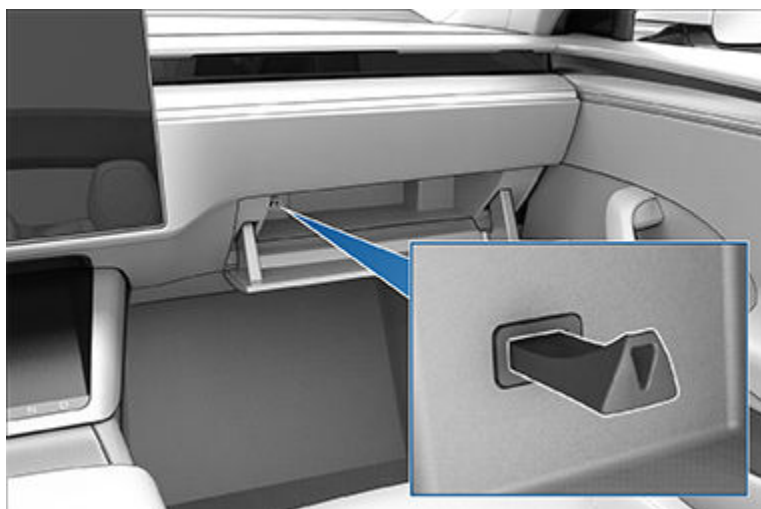
To access the front USB ports, open the front compartment of the center console. The front USB ports are located on the rear wall of the compartment:



Rear USB ports are located below the rear touchscreen:



Glovebox USB port:



NOTE: Power is available whenever the vehicle is considered "awake". The vehicle may be awake for many reasons. For example, when using features such as Summon, or when features such as Preconditioning, Keep Climate On, Dog Mode, Camp Mode, or Sentry Mode are enabled. The vehicle is also awake whenever the low voltage battery is being charged or is in use, during high voltage charging, when the vehicle is communicating with the mobile app, etc. Leaving an accessory plugged in does not deplete the low voltage battery.

NOTE: Use USB 3.0 compliant cables to connect a device to a USB port. Using non-compliant cables can result in slower charging, potential connection problems or degraded performance.



NOTE: Do not connect multiple devices using a USB hub. This can prevent connected devices from charging or from being recognized by Media Player, Sentry Mode, Dashcam, etc.

USB Drive Requirements for Recording Videos

NOTE: For saving Sentry Mode and Dashcam footage, Tesla recommends using the USB port located in the glovebox. Doing so increases security and minimizes power consumption.

One or more features on your Model S/Model X requires the use of a flash drive (for example, Dashcam, Sentry Mode and Track Mode (if equipped)) that meets these requirements:

- Minimum storage capacity of 64 GB. Use a flash drive with as much available storage as possible. Video footage can occupy a large amount of space.
- A **sustained** write speed of at least 4 MB/s. Note that *sustained* write speed differs from *peak* write speed.
- USB 2.0 compatible. If using a USB 3.0 flash drive, it must support USB 2.0.
- Properly formatted (described below).

NOTE: In some market regions you can purchase recommended USB drives on <http://www.tesla.com>.

Formatting a USB Flash Drive

To save and retrieve video footage, Model S/Model X requires a USB flash drive formatted as exFAT, MS-DOS FAT (for Mac), ext3, or ext4 (NTFS is currently not supported). For use with Dashcam and Sentry Mode, the flash drive must contain a base-level folder called **TeslaCam** and for use with Track Mode (if equipped), the flash drive must contain a base-level folder called **TeslaTrackMode**.

Model S/Model X can format a USB flash drive for you. Insert the flash drive into a front USB port, and touch **Controls** > **Safety** > **Format USB Drive**. Doing so automatically formats the drive as exFAT and creates a folder for TeslaCam and TeslaTrackMode (if equipped). The USB flash drive is now ready to record and save video footage. **Format USB Drive** is available only when a USB flash drive (with one or fewer partitions) is inserted into a front USB port. Choosing **Format USB Drive** erases any existing content on the flash drive—before using this feature, you must move any content you want to keep to a different device.

If Model S/Model X is unable to format the flash drive, you must format it using a computer. Remember to manually create the **TeslaCam** folder, and the **TeslaTrackMode** folder.

Once the USB flash drive is formatted and contains the necessary folder(s), insert it into a front (or glovebox, if equipped) USB port. Do not use a rear USB port—these are used only to charge USB devices. Once inserted, it can take up to 15 seconds for Model S/Model X to recognize the flash drive. When recognized, icons for Dashcam and Sentry Mode appear at the top of your touchscreen. Icons for Dashcam and Sentry Mode are available when you touch **Controls** and your vehicle is ready to record videos. You may need to first enable Sentry Mode by touching **Controls** > **Sentry** > **Sentry Mode**.

Viewing Video Recordings

You can view recorded footage on the touchscreen when Model S/Model X is in Park. Touch the Dashcam icon located in the app launcher or the Dashcam icon at the top of the touchscreen on the **Controls** screen. Touch the menu icon in the top corner of the screen. The tabs display a list of all video clips, organized by location and timestamp. Pause, rewind, fast forward, and delete video recordings as needed. You can also navigate to **Controls** > **Safety** > **Delete Dashcam Clips** to delete all dashcam and Sentry Mode footage, including recent and saved clips.

NOTE: Dashcam recording pauses when you launch the Viewer.

You can also view video footage by removing and inserting the USB flash drive into a computer and navigating to the TeslaCam or TeslaTrackMode folder.

The TeslaCam folder contains three sub-folders:

- **Recent Clips:** When recording, Dashcam continuously saves footage to Recent Clips in 60-minute cycles. Footage is overwritten every hour unless you manually save it. Four videos are recorded for each clip, one from each camera (front, rear, left, and right).

NOTE: Rear camera recordings are available only on vehicles manufactured after approximately February 2018.

- **Saved Clips:** Contains all recordings that are saved using Dashcam.



- **Sentry Clips:** Contains the last 10 minutes of footage from all Sentry Mode events that triggered an Alert or Alarm state. If storage space on the USB flash drive becomes limited, the oldest Sentry Clips are deleted to provide space for new ones. Once deleted, you cannot retrieve them.

When the USB flash drive runs out of storage space, video footage can no longer be saved. To prevent the flash drive from getting full, regularly move saved videos to another device and delete them from the flash drive.

Wireless Phone Chargers

Wireless phone chargers are integrated into both the front and rear consoles, each providing up to 15W of power to charge Qi-enabled phones. Simply place your phone on the charger. Your device may feel warm while charging, but this is a normal effect of inductive charging.



When placed on the wireless charger, your phone charges whenever the vehicle is powered on (the touchscreen is on and you are in the vehicle). Your phone does not charge when you leave the vehicle unless a feature, such as Sentry mode is enabled.

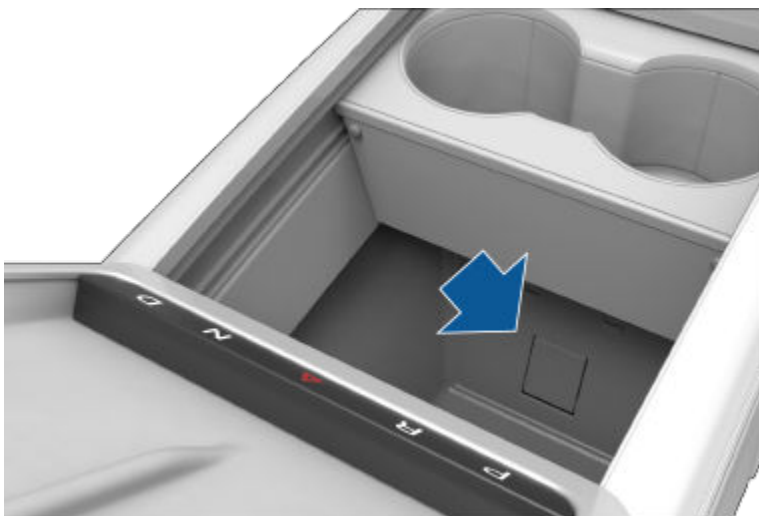
NOTE: The phone must be in direct contact with the wireless charger. Do not place objects between the phone and the charger (for example, credit cards, key cards, coins, keys, metal objects, etc.).

NOTE: The wireless phone charger may not work if your phone case is too large or is made of metal. Try removing the phone from its case before placing it on the charger.

NOTE: The wireless phone charger does not charge if the vehicle's high voltage Battery is discharged.

Low Voltage Power Socket

Your Model S/Model X has a power socket located in the center console's rear compartment. To access the low voltage socket, open the front compartment of the center console.



The power socket is suitable for accessories requiring up to 12A continuous draw (16A peak).

NOTE: Power is available whenever the vehicle is considered "awake". The vehicle may be awake for many reasons. For example, when using features such as Summon, or when features such as Preconditioning, Cabin Overheat Protection, Keep Climate On, Dog Mode, Camp Mode, Sentry Mode, etc. are enabled. The vehicle is also awake whenever the low voltage battery is being charged or is in use, during high voltage charging, when the vehicle is communicating with the mobile app, etc. Leaving an accessory plugged in does not deplete the low voltage battery.

⚠ WARNING: The power socket and an accessory's connector can become hot.

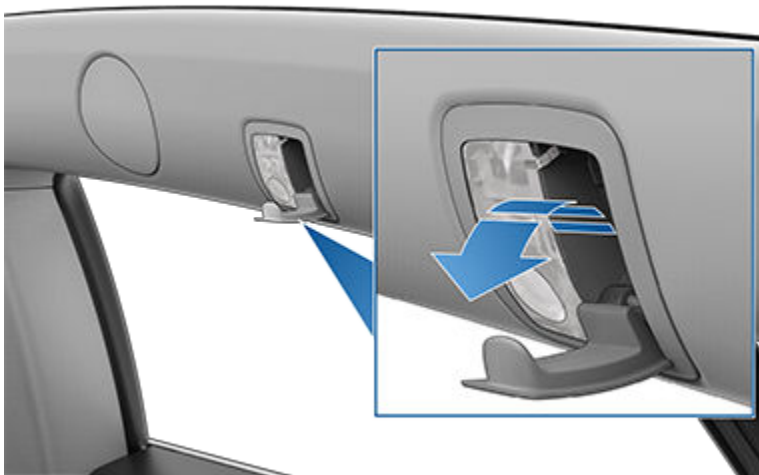
⚠ WARNING: To prevent excessive interference with the vehicle's electronics, Tesla recommends that you do not plug any non-Tesla accessories, including power inverters, into the low voltage power socket. However, if you do use a non-Tesla accessory and notice any malfunctions or unexpected behavior, such as indicator lights, alert messages, or excessive heat from the accessory, unplug the accessory from the low voltage power socket immediately.

NOTE: A power inverter plugged into the low voltage power socket must support 16V DC input to function.

⚠ CAUTION: Do not attempt to jump start Model SModel X using the low voltage power socket. Doing so can result in damage.

Coat Hangers

Your Model SModel X has a coat hanger on each side of the vehicle above the rear window in the second row, next to the reading light. Push the coat hanger to release it. Push it again to retract it.





Active Road Noise Reduction

Model S Model X is equipped with Active Road Noise Reduction which reduces low-frequency road noise while driving on rough surfaces. To accomplish this, the vehicle uses the seat microphones to measure noise in the cabin, then generates anti-noise through the speakers to intelligently create quiet zones around each occupant the front occupants depending on vehicle and environmental factors.



To turn Active Road Noise Reduction on or off, open the Media Player and touch **Audio Settings icon > Options > Active Road Noise Reduction**. This may require several minutes of driving time to calibrate before enabling.

NOTE: To ensure active noise reduction operates effectively, avoid covering the microphones (with seat covers, etc.). Active Road Noise Reduction may disable if a window is rolled down, door is open, or the fan is turned up. Active Road Noise Reduction also disables if there is a rear passenger in the vehicle.



CAUTION: To prevent damage to these microphones when cleaning, do not over-saturate the area of the seats where the microphones are located.



Sunroof

Opening and Closing

If your Model S/Model X is equipped with a sunroof, you can vent and close the sunroof remotely using the mobile app or you can adjust the position of the sunroof by controlling it from the menu on your right scroll wheel.

For full control of the sunroof, touch **Controls** on the touchscreen. Drag, or tap on, the image of the sunroof or touch the buttons next to the image of your vehicle. The sunroof moves to the selected position. To stop the sunroof from moving at any time, touch the image of the sunroof.



- **OPEN:** touch once to open the sunroof to its comfort position (75% open). Touch twice to open the sunroof fully.
- **VENT:** touch to open the sunroof slightly.
- **CLOSE:** touch to fully close the sunroof.

NOTE: If the sunroof detects any obstruction, it does not close. If, after removing the obstruction, it still does not close, touch and hold **CLOSE** to override the sunroof's anti-trap mechanism.

NOTE: If you find wind noise (which varies depending on driving speed) excessive, even with the sunroof in the comfort position, open a window slightly.

 **CAUTION:** Remove snow and ice before opening the sunroof. Opening a sunroof covered in snow and ice can cause damage.

 **WARNING:** Do not allow occupants to extend any part of their body through the sunroof. Doing so can cause serious injury from flying debris, tree branches, or other obstructions.

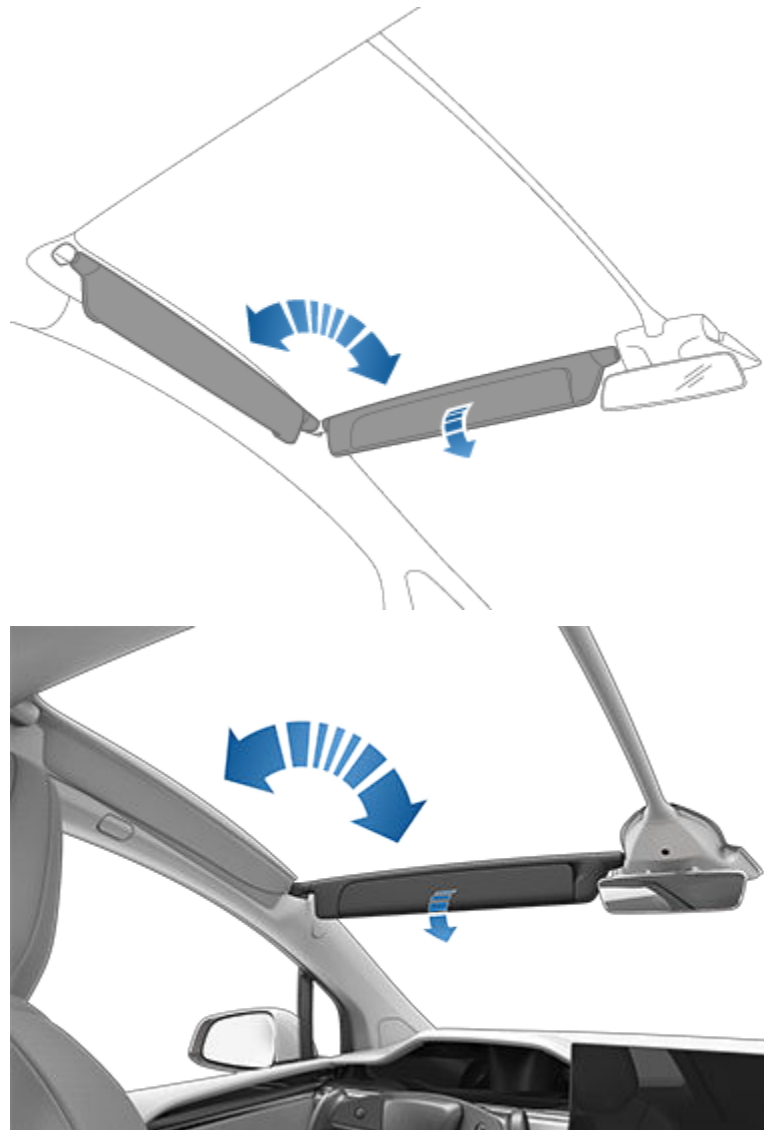
 **WARNING:** Before closing the sunroof, ensure that occupants, especially children, do not have any body part extended through the sunroof opening. Failure to do so can cause serious injury.

 **WARNING:** Do not carry an object that protrudes through the sunroof. Doing so can damage the sunroof's seals and anti-trap mechanism, and can cause injury to occupants.

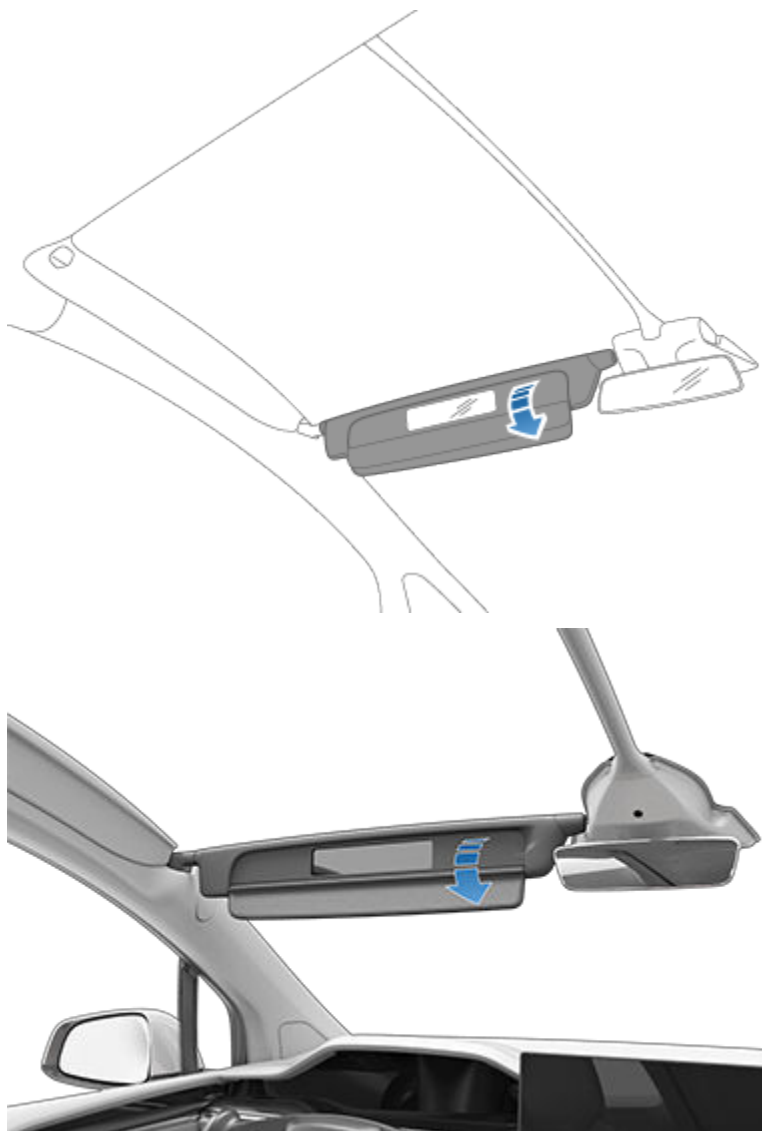


Sun Visors

The sun visors in Model X are held in place by magnets. To protect occupants from sunlight coming through the windshield, release the sun visor from the pillar and pivot it toward the rear view mirror until the magnet snaps into place. While held in place by the magnet, you can adjust the sun visor and lower the extender to provide maximum shade.



To expose the vanity mirror, lower the visor extender then lower the mirror cover. While the cover is lowered, the mirror is exposed and lights are illuminated.



To protect front seat occupants from sunlight coming through the side window, lower the sun visor from the pillar then lower the visor extender.

Seating and Safety Restraints

Front and Rear Seats

Correct Driving Position

The seat, head support, seat belt and airbags work together to maximize your safety. Using these correctly ensures greater protection.



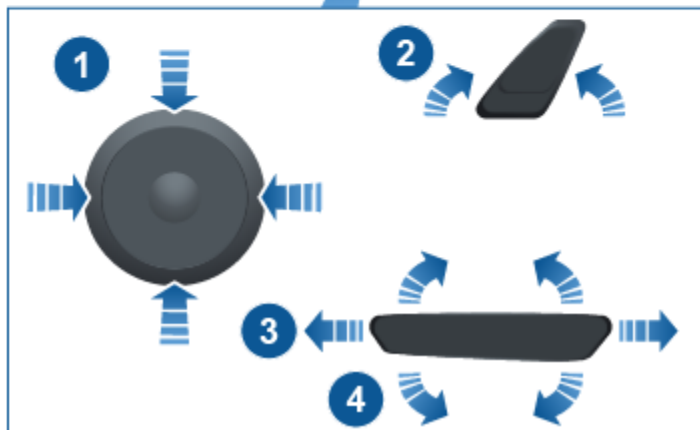
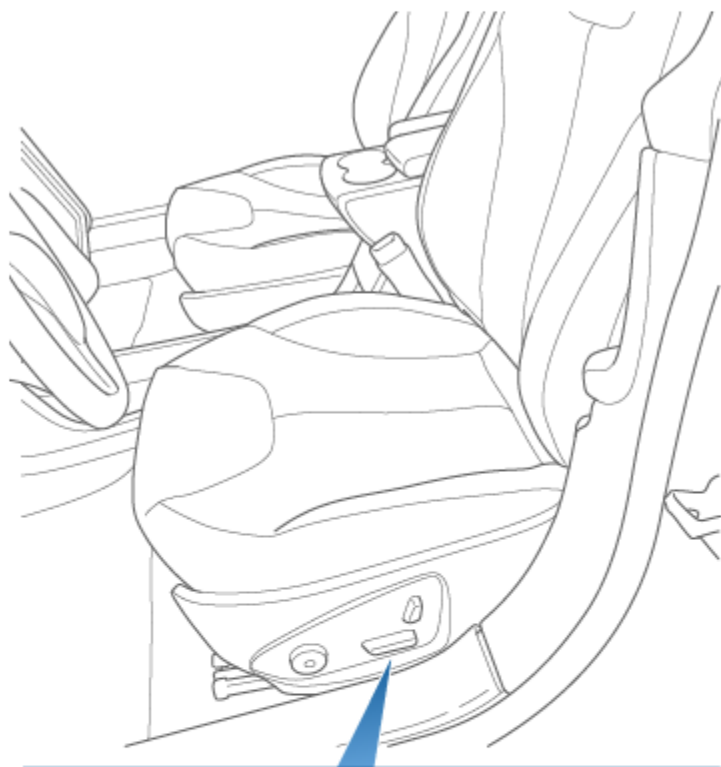
Position the seat so you can wear the seat belt correctly, while being as far away from the front airbag as possible:

1. Sit upright with both feet on the floor and the seat back reclined no more than 30 degrees.
2. Make sure you can easily reach the pedals and that your arms are slightly bent when holding the steering wheel. Your chest should be at least 10 inches (25 cm) from the center of the airbag cover.
3. Place the shoulder section of the seat belt mid-way between your neck and your shoulder. Fit the lap section of the belt tightly across your hips, not across your stomach.

Model S Model X seats include integrated head supports that cannot be adjusted or removed.



Adjusting the Driver's Seat



1. Adjust lumbar support.

NOTE: If your Model S is equipped with adjustable head supports, this button is also used to move the head support up or down. This button is also used to move the head support up or down (see [Head Supports/Restraints on page 104](#)). When you touch this button, the touchscreen displays a popup with an image of the seat. If the lumbar area on the image is not highlighted in blue, touch the lumbar area on the image to specify that you want to adjust lumbar support. The selection you choose is retained until you manually change it.

2. Adjust backrest.

3. Move seat forward/backward.

4. Adjust the seat's height and tilt angle.

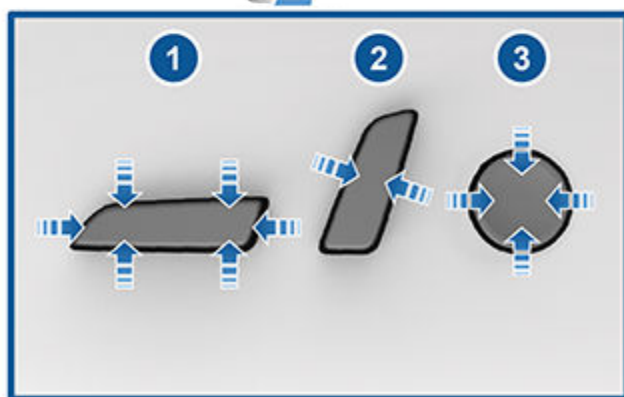
WARNING: Before adjusting a front seat, check that the area around the seat is free of obstacles (people and objects).

WARNING: Do not adjust seats while driving. Doing so increases the risk of a collision.



WARNING: Riding in a moving vehicle with the seat back reclined can result in serious injuries in a collision, as you could slide under the lap belt or be propelled into the seat belt. Ensure your seat back is reclined no more than 30 degrees when the vehicle is moving.

Adjusting the Front Seats



1. Move seat forward/backward and adjust the seat's height and tilt angle up/down.
2. Adjust backrest.
3. Adjust lumbar support.



- ⚠ WARNING:** Before adjusting a front seat, check that the area around the seat is free of obstacles (people and objects).
- ⚠ WARNING:** Do not adjust seats while driving. Doing so increases the risk of a collision.
- ⚠ WARNING:** Riding in a moving vehicle with the seat back reclined can result in serious injuries in a collision, as you could slide under the lap belt or be propelled into the seat belt. Ensure your seat back is reclined no more than 30 degrees when the vehicle is moving.

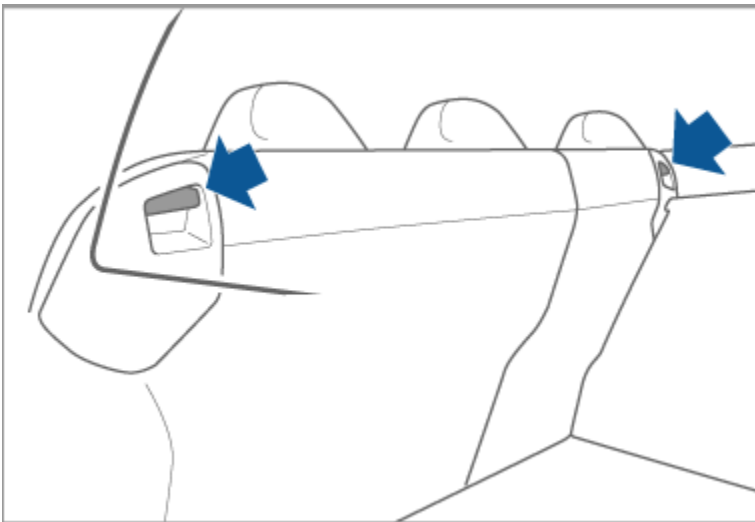
Folding Rear Seats

Model S Model X has a split rear seat that can fold forward.

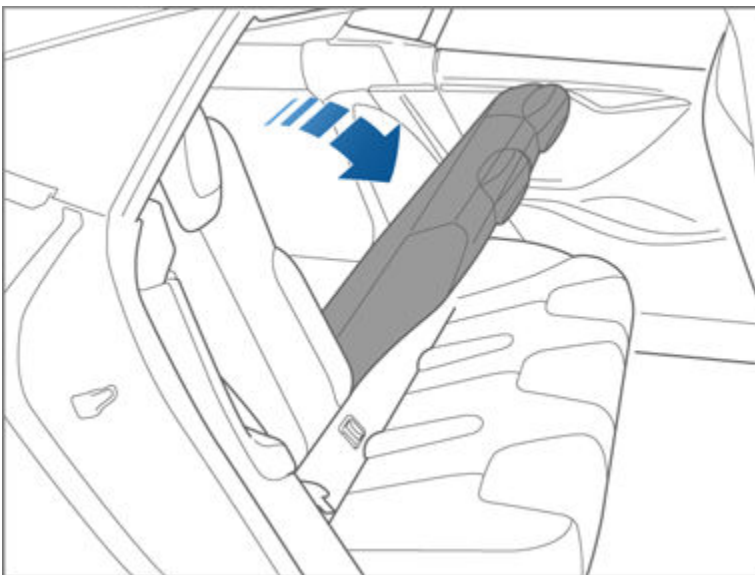
NOTE: If Model S is equipped with the optional executive rear seats, these seats do not fold forward.

NOTE: Driving with the rear seats folded forward can increase the amount of perceived noise and/or vibration coming from the rear of the vehicle (trunk, suspension, etc.).

Before folding, remove items from the seats and the rear footwell. To allow the rear seat backs to fold completely flat, you may need to move the front seats forward.



To fold a rear seat, pull the corresponding lever and fold the seat forward.



Raising Rear Seats

Before raising a rear seat, make sure that the seat belts are not trapped behind the backrest.



Pull the seat back upward until it locks into place.

To confirm that the seat back is locked in the upright position, try pulling it forward.

WARNING: Always ensure the seat backs are locked in their upright position by pushing it forward or rearward. Failure to do so increases the risk of injury.

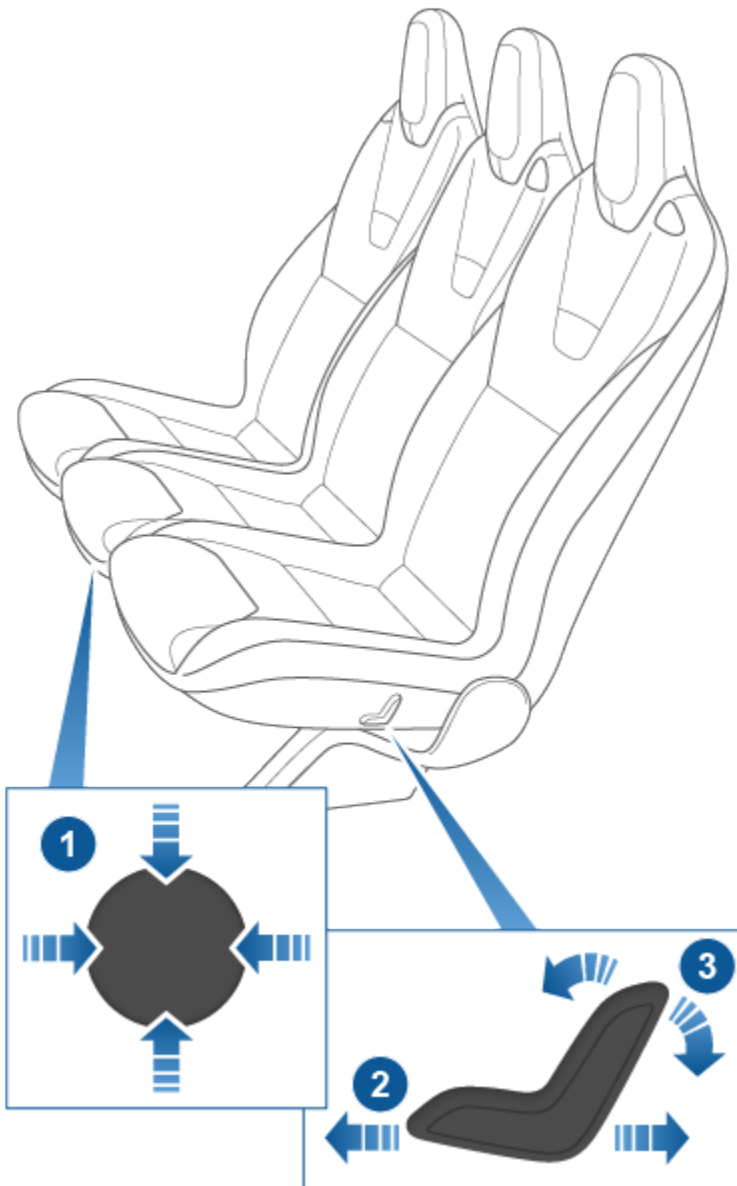
Adjusting Second Row Monopost Seats

A Model X equipped with monopost seats can accommodate two or three passengers in the second row, depending on the option chosen at time of purchase. There are two ways to adjust the position of these seats:

- Touch **Controls** > **Seats** on the touchscreen. Press and hold the icon associated with the seat you want to adjust. White icons indicate that the seat can be moved in that direction; gray icons indicate that the seat cannot be moved any farther in that direction.

NOTE: The front seats may move forward slightly to accommodate the forward movement of the second row seats.

- Use the manual adjustments illustrated below. In addition to moving a seat forward/rearward, the manual seat adjustments allow you to adjust the backrest. Although the control on the outboard seats is L-shaped, and the control on the middle seat is circular, they both provide the same functions.





1. Move seat forward/backward (up/down on the control) and adjust the backrest (left/right on the control).
2. Move seat forward/backward.
3. Adjust backrest.

NOTE: The backrest locks into position when you release the lever. If a backrest is not locked into position when a driving gear is engaged, the instrument panel displays an alert for the unlocked backrest. Adjust the backrest again, ensuring it locks into position.

WARNING: Before driving, ensure the seat is locked in position. You may need to pull the seat forward or backward until it clicks into place.

Adjusting Second Row Seat Backs (Bench Seats)

If your Model X is equipped with two seating rows, the second row bench seats can accommodate up to three passengers. Use the mechanical adjustment lever located at the side of each outboard seating position to adjust the seat backs. A bench seat is split 60/40 so the adjustment lever on the left side moves the seat backs for both the left and center seats, whereas the lever on the right side moves the rightmost seat back only. While pulling and holding the lever, move the seat back to the desired position, and then release the lever. When returning a seat back to its upright position, try moving it forward or back to ensure it is securely latched into position.



WARNING: Riding in a moving vehicle with the seat back reclined can result in serious injuries in a collision, as you could slide under the lap belt or be propelled into the seat belt. Ensure the backs of occupied seats are reclined no more than 30 degrees when the vehicle is moving.

Folding Second Row Seat Backs (Bench Seats)

The second row seat backs on bench seats can be folded fully forward so they lay flat and maximize cargo space. Pull up the mechanical lever located on the side of each outboard seat (the same lever you use to recline the seats, as described above), then push the seat back fully forward. The bench seats have a 60/40 split—therefore, the adjustment lever on the left side folds the seat backs for both the left and center seats, whereas the lever on the right folds the rightmost seat back only.

NOTE: Before folding seats fully forward, remove any items from the seats and the rear footwell. To allow the seat backs to fold completely flat, you may need to move the front seats forward.

Moving Second Row Bench Seats

NOTE: Only bench seats in seven-seat vehicles can be moved forward and rearward. The bench seats in five-seat vehicles are stationary.



Use the mechanical lever located beneath each outboard seating position to move the second row seats forward or rearward. The bench seats have a 60/40 split—therefore, the lever on the left side moves the seat for the left and center seats, whereas the lever on the right side moves only the rightmost seat. Pull and hold the lever while moving the seat forward or rearward. Release the lever when the seat is at the desired location.



NOTE: You can adjust the position of bench seats using the mechanical levers only. You cannot use the touchscreen to adjust bench seats.

Accessing Third Row Seats (if equipped) - Monopost Seating

A button is located on the backrest of each outboard monopost seat in the second row. This button makes it easy for passengers to enter and exit the third row seating positions. Touch **Controls > Seats > Easy Entry** and choose how you want this button to work:

- **ON** - Allows you to tilt and move the associated outboard seat fully forward, and the center seat partially forward, with a **single-press** of the button.
- **OFF** - When off, which is recommended if a child seat is installed in the second row, you must **hold** the button to move the second row seats forward.

After using the third row ingress button to access third row seats, simply press the button again to return the seats to their normal position.



WARNING: For vehicles with third row seats, do not use the third row ingress button located on the backrest of a second row outboard seat when a child is seated in the second row. Using the button tilts and moves the seats forward and can squeeze the occupant. Do not rely on Model X to recognize or accommodate occupants seated in the vehicle while using this button. Use this button only when the second row seats are unoccupied.

Guidelines for using the third row ingress button:

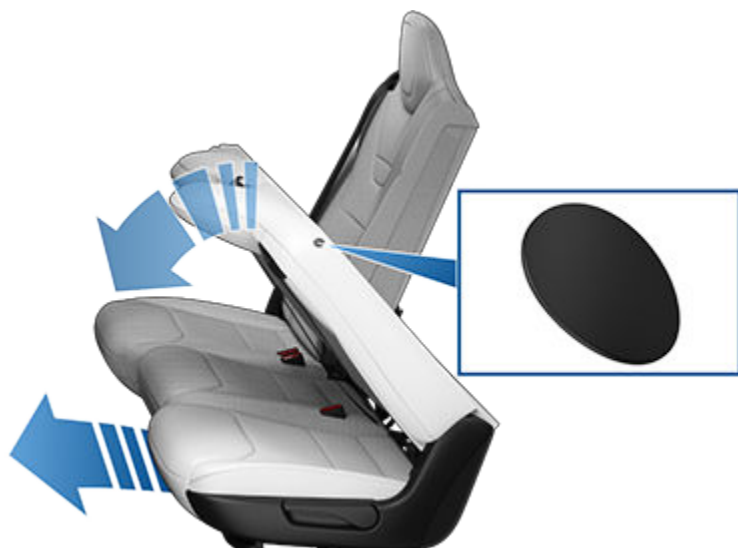
- If a front row seat is positioned such that the second row seat will collide with it during an easy entry operation, it automatically moves forward just enough to accommodate the forward position of the second row monopost seat.
- Forward movement of second row monopost seats cancels if an occupant adjusts a second row seat while it is moving.
- When an outboard seat tilts forward after pressing the button, its backrest resets to the forward position and may need to be re-adjusted for comfort.

WARNING: Use the third row ingress button to access the third row **ONLY** when the second row seats are unoccupied. Do not rely on Model X to recognize or accommodate occupants seated in the vehicle while using the button.

WARNING: Always ensure that the seat is locked in position before traveling. Failure to do so increases the risk of injury.

Accessing Third Row Seats (if equipped) - Bench Seating

A button is located on the backrest of each outboard bench seat in the second row. This button makes it easy for passengers to enter and exit the third row seating positions. Press and release the button on the left outboard seat to tilt and move the combined left and center seats forward. Press and release the button on the right outboard seat to tilt and move the right seat forward.



WARNING: For vehicles with third row seats, do not use the third row ingress button located on the backrest of a second row outboard bench seat when a child is seated in the second row. Using the button allows the combined left and center seats to be moved forward and can squeeze the occupant. Use this button only when the second row seats are unoccupied. Before driving, ensure the seat and the seat back are securely latched into position.

In some situations, such as when you are parked on an incline or when the seat's trim affects the movement of the bench seats after you press the button, the bench seats might not move forward completely, and you may need to push the seats forward gently until they reach the end of the track.

WARNING: After you use the third row ingress button to access the third row seats, push the bench seats back to their seating position, ensuring the seats are securely latched into position by trying to move them forward and rearward. Failure to do so increases the risk of injury.

WARNING: The seat must be fully latched into position before driving. Push or pull the seat until you hear the seat "click" into place.

Folding Third Row Seat Backs (if equipped)

To fold a third row seat, press the button located in the top outside corner of the seat. The button has two detents.





1. Fold head restraint forward.
2. Fold seat back forward.

NOTE: Before folding third row seat backs, remove any items from the seats and the footwell. To allow the seat backs to fold completely flat, you may need to move the second row seats forward.

NOTE: Driving with the third row seats backs folded forward might result in increased perceivable noise and/or vibration coming from the rear of the vehicle (trunk, suspension, etc.).

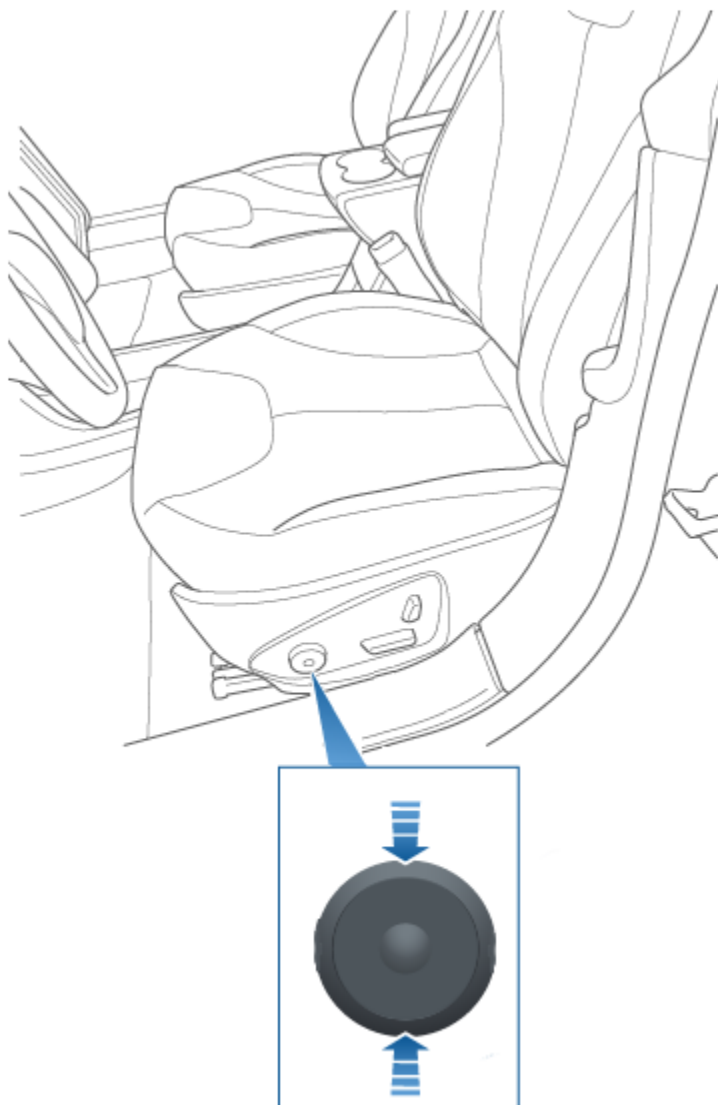
NOTE: To raise the seats, hold the button on the top outside corner of the seat then pull the seat back upward until it latches into place. Try pulling the seat back forward to confirm that it is locked in the upright position.

 **WARNING:** Always ensure the seats and seat backs are locked in their upright position before travel. Failure to do so increases the risk of injury.

Head Supports/Restraints

If your Model S is equipped with adjustable head supports, use the round button on the seat to move the head support up/down. Use the round button on the seat to move the head support up/down. The same button is used to adjust the seat's lumbar support (see [Adjusting the Driver's Seat on page 96](#)). Therefore, when you touch this button, the touchscreen displays a popup with an image of the seat. If the head support shown on the image is not highlighted in blue, touch this area on the image to specify that you want to adjust the head support. The selection you choose is saved until you manually change it. You can save the head support setting to your driver profile (see [Driver Profiles on page 182](#)).

NOTE: Head supports are not adjustable on early versions of Model S.



The second and third row seats have integrated non-removable head supports that cannot be adjusted. However, the head supports in the third row seats can be folded down (see [Folding Third Row Seat Backs \(if equipped\) on page 103](#)).

Seat Heaters

The front seats contain heating pads that operate at three levels from 3 (highest) to 1 (lowest). To operate the seat heaters, see [Climate Controls on page 360](#).

If Model S/Model X is equipped with the cold weather package, you can also control seat heaters in all rear seating positions, as well as heated wipers and washer nozzles by touching the climate controls on the touchscreen (see [Climate Controls on page 360](#)).



WARNING: To avoid burns resulting from prolonged use, individuals who have peripheral neuropathy, or whose capacity to feel pain is limited because of diabetes, age, neurological injury, or some other condition, should exercise caution when using the climate control system and seat heaters.

Seat Covers



WARNING: Do not use seat covers in Model S/Model X. Doing so could restrict deployment of the seat-mounted side air bags if a collision occurs. Also, if the vehicle is equipped with an occupant detection system that is used to determine the status of the passenger front airbag, seat covers may interfere with this system.



Front and Rear Seats

Correct Driving Position

The seat, head support, seat belt and airbags work together to maximize your safety. Using these correctly ensures greater protection.



Position the seat so you can wear the seat belt correctly, while being as far away from the front airbag as possible:

1. Sit upright with both feet on the floor and the seat back reclined no more than 30 degrees.
2. Make sure you can easily reach the pedals and that your arms are slightly bent when holding the steering wheelsteering yoke. Your chest should be at least 10 inches (25 cm) from the center of the airbag cover.
3. Place the shoulder section of the seat belt mid-way between your neck and your shoulder. Fit the lap section of the belt tightly across your hips, not across your stomach.

Model SModel X front seats include integrated head supports that cannot be adjusted or removed.



Adjusting the Front Seats



1. Move seat forward/backward and adjust the seat's height and tilt angle up/down.
2. Adjust backrest.
3. Adjust lumbar support.

WARNING: Before adjusting a front seat, check that the area around the seat is free of obstacles (people and objects).

WARNING: Do not adjust seats while driving. Doing so increases the risk of a collision.

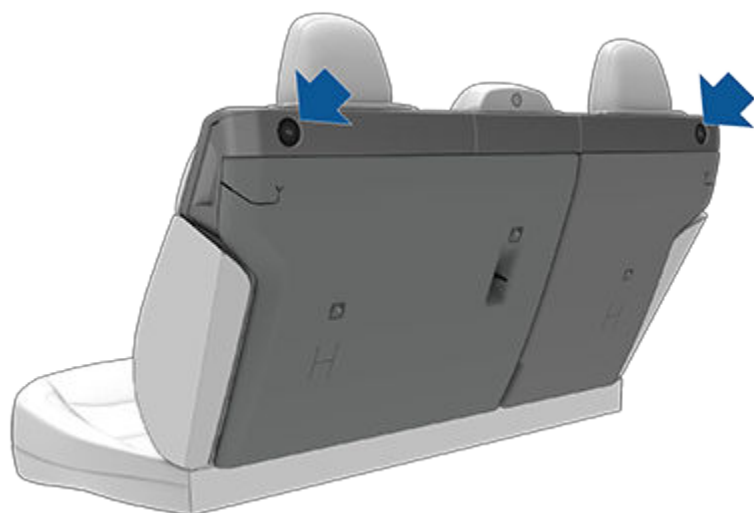
WARNING: Riding in a moving vehicle with the seat back reclined can result in serious injuries in a collision, as you could slide under the lap belt or be propelled into the seat belt. Ensure your seat back is reclined no more than 30 degrees when the vehicle is moving.

Folding Rear Seats

Model S Model X has a split rear seat that can fold forward.

NOTE: If Model S is equipped with the optional executive rear seats, these seats do not fold forward.

Before folding, remove items from the seats and the rear footwell. To allow the rear seats to fold completely flat, you may need to move the front seats forward. To fold a rear seat, push the corresponding button on the back of the seat.



You can also fold the rear seats fully forward by pressing the corresponding switch located on the left side of the rear trunk. Pressing the switch causes the seat to unlatch. You can then push it downward to lay it fully flat.



To return the seats to their upright position, pull upwards until it locks into place. To confirm that the seat is locked in the upright position, try pulling it forward.

NOTE: Driving with the rear seats folded may increase noise in the cabin area (for example, you may hear vibration sounds coming from the rear of the vehicle such as the trunk, suspension, etc.).

CAUTION: While raising a rear seat back, hold the seat belt out of the way to ensure that the seat belt is not trapped behind the backrest or caught in the seat latch.

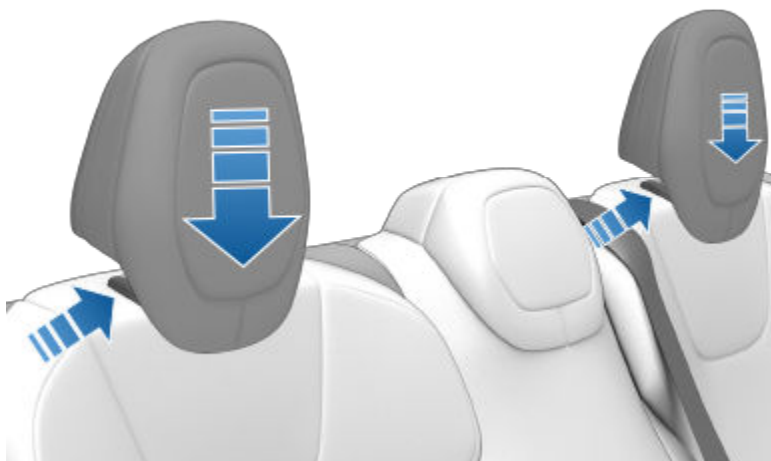
WARNING: Always ensure that the seats are locked in their upright position by attempting to push it forward or rearward, ensuring the latch is fully engaged. Failure to do so can increase the risk of injury.

Head Supports

The front seats include integrated head supports that you cannot adjust.

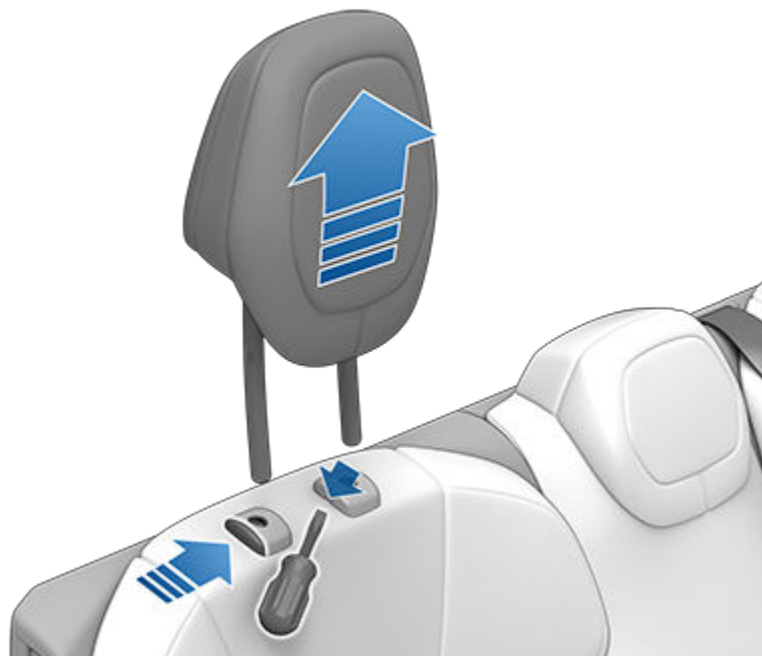
The rear outboard seating positions include an adjustable head support that can be raised/lowered or removed. The head support should always be raised and locked into position (so that the center is aligned with the center of the ears) when occupied by a passenger that is not in a child safety seat.

Lift the head support to the desired position. To lower the head support, press and hold the button on the base of the outer post while pushing down on the head support.



To remove a head support:

1. Lift the headrest to raise it.
2. Press and hold the button located at the base of the right post.
3. Insert a short, flat object (such as a small flat-head screwdriver) into the opening on the inside base of the opposite post and pull the head support upward.



Seat Heaters

All seats contain heating pads. In addition, both front seats are ventilated. To operate the seat heaters, see [Climate Controls](#) on page 360.



WARNING: To avoid burns resulting from prolonged use, individuals who have peripheral neuropathy, or whose capacity to feel pain is limited because of diabetes, age, neurological injury, or some other condition, should exercise caution when using the climate control system and seat heaters.



Seat Covers

WARNING: Do not use seat covers in Model SModel X. Doing so could restrict deployment of the seat-mounted side air bags if a collision occurs. Seat covers can also interfere with the occupant detection system that is used to determine the status of the passenger front airbag.

Front and Rear Seats

Correct Driving Position

The seat, head support, seat belt and airbags work together to maximize your safety. Using these correctly ensures greater protection.



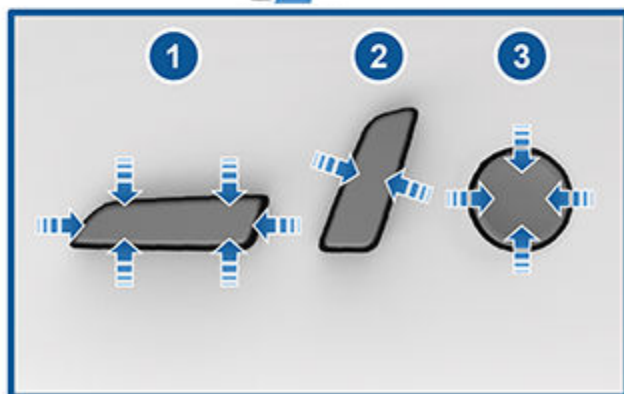
Position the seat so you can wear the seat belt correctly, while being as far away from the front airbag as possible:

1. Sit upright with both feet on the floor and the seat back reclined no more than 30 degrees.
2. Make sure you can easily reach the pedals and that your arms are slightly bent when holding the steering wheelsteering yoke. Your chest should be at least 10 inches (25 cm) from the center of the airbag cover.
3. Place the shoulder section of the seat belt mid-way between your neck and your shoulder. Fit the lap section of the belt tightly across your hips, not across your stomach.

Model SModel X seats include integrated head supports that cannot be adjusted or removed.



Adjusting Front Seats



1. Move seat forward/backward and adjust the seat's height and tilt angle up/down.
2. Adjust backrest.
3. Adjust lumbar support.



WARNING: Before adjusting a front seat, check that the area around the seat is free of obstacles (people and objects).



WARNING: Do not adjust seats while driving. Doing so increases the risk of a collision.



WARNING: Riding in a moving vehicle with the seat back reclined can result in serious injuries in a collision, as you could slide under the lap belt or be propelled into the seat belt. Ensure your seat back is reclined no more than 30 degrees when the vehicle is moving.

Adjusting Second Row Seats (Bench)

Second row bench seats can accommodate up to three passengers. Use the mechanical adjustment lever located at the side of each outboard seating position to adjust the seat backs. A bench seat is split 60/40 so the adjustment lever on the left side moves the seat backs for both the left and center seats, whereas the lever on the right side moves the rightmost seat back only. While pulling and holding the lever, move the seat back to the desired position, and then release the lever. When returning a seat back to its upright position, try moving it forward or back to ensure it is securely latched into position.



WARNING: Riding in a moving vehicle with the seat back reclined can result in serious injuries in a collision, as you could slide under the lap belt or be propelled into the seat belt. Ensure the backs of occupied seats are reclined no more than 30 degrees when the vehicle is moving.

Folding Second Row Seats (Bench)

The second row seat backs on bench seats can be folded fully forward so they lay flat and maximize cargo space. Pull up the mechanical lever located on the side of each outboard seat (the same lever you use to recline the seats, as described previously), then push the seat back fully forward. The bench seats have a 60/40 split—therefore, the adjustment lever on the left side folds the seat backs for both the left and center seats, whereas the lever on the right folds the rightmost seat back only.



NOTE: Before folding seats fully forward, remove any items from the seats and the rear footwell. To allow the seat backs to fold completely flat, you may need to move the front seats forward.

Moving Second Row Seats (Bench)

NOTE: Only bench seats in seven-seat vehicles can be moved forward and rearward. The bench seats in five-seat vehicles are stationary.

Use the mechanical lever located beneath each outboard seating position to move the second row seats forward or rearward. The bench seats have a 60/40 split—therefore, the lever on the left side moves the seat for the left and center seats, whereas the lever on the right side moves only the rightmost seat. Pull and hold the lever while moving the seat forward or rearward. Release the lever when the seat is at the desired location. Ensure the lever is locked in place before driving.



NOTE: You can adjust the position of bench seats using the mechanical levers only. You cannot use the touchscreen to adjust bench seats.

Adjusting Second Row Seats (Monopost)

A Model X equipped with monopost seats can accommodate two passengers in the second row. To adjust the position of these seats, use the manual adjustments.



Use the button near the top of the seat to move the seat back forward/backward.

Use the L-shaped button at the bottom of the seat to move the seat forward/backward (up/down on the control) and adjust the backrest by tilting the top of the L-shaped button forward/backward.

NOTE: The backrest locks into position when you release the lever. If a backrest is not locked into position when a drive mode is engaged, the instrument panel displays an alert for the unlocked backrest. Adjust the backrest again, ensuring it locks into position.

WARNING: Before driving, ensure the seat is locked in position. You may need to pull the seat forward or backward until it clicks into place.

Accessing Third Row Seats (if equipped)

Bench Seats

If your vehicle is equipped with bench seats, a button is located on the backrest of each second row outboard bench seat. This third row ingress button makes it easy for passengers to enter and exit the third row seating positions. Press and release the button on the left outboard seat to tilt and move the combined left and center seats forward. Press and release the button on the right outboard seat to tilt and move the right seat forward.



WARNING: For vehicles with third row seats, do not use the third row ingress button located on the backrest of a second row outboard bench seat when a child is seated in the second row. Using the button allows the combined left and center seats to be moved forward and can squeeze the occupant. Use this button only when the second row seats are unoccupied. Before driving, ensure the seat and the seat back are securely latched into position.



In some situations, such as when you are parked on an incline or when the seat's trim affects the movement of the bench seats after you press the button, the bench seats might not move forward completely, and you may need to push the seats forward gently until they reach the end of the track.

WARNING: After you use the third row ingress button to access the third row seats, push the bench seats back to their seating position, ensuring the seats are securely latched into position by trying to move them forward and rearward. The seat must be fully latched into position before driving. Push or pull the seat until you hear the seat "click" into place. Failure to do so increases the risk of injury.

Monopost Seats

If your vehicle is equipped with monopost seats, a third row ingress button is located on the backrest of each outboard monopost seat in the second row. This button makes it easy for passengers to enter and exit the third row seating positions. Touch **Controls > Safety > Third Row Easy Entry** and choose how you want this button to work:

- **ON** - Allows you to tilt and move the associated outboard seat fully forward, and the center seat partially forward, with a **single-press** of the button.
- **OFF** - When off, which is recommended if a child seat is installed in the second row, you must **hold** the button to move the second row seats.



After using the button to access third row seats, simply press the button again to return the second row seats to their normal position.

WARNING: Do not use the third row ingress button located on the backrest of a second row outboard seat when a child or occupant is seated in the second row. Use this button **ONLY** when second row seats are unoccupied. Using the button tilts and moves the seats forward and can squeeze an occupant. Do not rely on Model X to recognize or accommodate seated occupants while using this button.

Guidelines for using the third row ingress button:

- If a front seat is positioned such that the second row seat will collide with it during an easy entry operation, it automatically moves forward enough to accommodate the forward position of the second row monopost seat.
- When an outboard seat tilts forward after pressing the button, its backrest resets to the forward position and may need to be re-adjusted for comfort.
- Forward movement of the second row monopost seats cancels if an occupant adjusts a second row seat while it is moving.

WARNING: Always ensure that the seat is locked in position before traveling. Failure to do so increases the risk of injury.



Folding Third Row Seats (if equipped)

To fold a third row seat, press the button located in the top outside corner of the seat. The button has two detents.



1. Fold head restraint forward.
2. Fold seat back forward.

NOTE: Before folding third row seat backs, remove any items from the seats and the footwell. To allow the seat backs to fold completely flat, you may need to move the second row seats forward.

NOTE: Driving with the third row seats backs folded forward may result in increased perceivable noise and/or vibration coming from the rear of the vehicle (trunk, suspension, etc.).

NOTE: To raise the seats, hold the button on the top outside corner of the seat, then pull the seat back upward until it latches into the upright position. Try pulling the seat back forward to confirm that it is locked in position.

WARNING: Always ensure the seats and seat backs are locked in their upright position before travel. Failure to do so increases the risk of injury.

Seat Heaters

All seats contain heating pads. In addition, both front seats are ventilated. To operate the seat heaters, see [Climate Controls on page 360](#).

WARNING: To avoid burns resulting from prolonged use, individuals who have peripheral neuropathy, or whose capacity to feel pain is limited because of diabetes, age, neurological injury, or some other condition, should exercise caution when using the climate control system and seat heaters.

Seat Covers

WARNING: Do not use seat covers in Model S Model X. Doing so could restrict deployment of the seat-mounted side air bags if a collision occurs. Seat covers can also interfere with the occupant detection system that is used to determine the status of the passenger front airbag.



Seat Belts

Wearing Seat Belts

Using seat belts and child safety seats is the most effective way to protect occupants if a collision occurs. Therefore, wearing a seat belt is required by law in most jurisdictions.

Both the driver and passenger seats are equipped with three-point inertia reel seat belts. Inertia reel belts are automatically tensioned to allow occupants to move comfortably during normal driving conditions. To securely hold child safety seats, all passenger seating positions are equipped with an automatic locking retractor (ALR) feature that, by fully extracting the seat belt (beyond the length needed for a typical adult occupant), locks the belt into place until the seat belt is unbuckled. To securely hold child safety seats, all passenger seating positions are equipped with an automatic locking retractor (ALR) feature that, by fully extracting the seat belt (beyond the length needed for a typical adult occupant), locks the belt into place until the seat belt is unbuckled.

The seat belt reel automatically locks to prevent movement of occupants if Model S Model X experiences a force associated with hard acceleration, braking, cornering, or an impact in a collision.

Seat Belt Reminders



The seat belt reminder on the instrument panel alerts you if a seat belt for an occupied driver or passenger seat is unbuckled. If the belt remains unbuckled, the reminder flashes and an intermittent chime sounds. If all occupants are buckled up and the reminder stays on, re-buckle seat belts to ensure they are correctly latched. Also remove any heavy objects (such as a briefcase) from an unoccupied seat. If the reminder light continues to stay on, contact Tesla.

You can temporarily mute a seat belt reminder associated with a rear seating position. This is useful when you are carrying an object in a rear seat that triggers the seat belt reminder alert. To mute the reminder, touch the associated seat on the seat belt reminder popup message that displays on the touchscreen when a seat belt reminder is active. When a reminder is muted, the seat belt reminder icon is replaced by a seat icon. Touch the seat again to unmute the reminder. The reminder is disabled for the current drive only.



WARNING: Seat belts must be worn by passengers in all seating positions. Do not disable a seat belt reminder when the seating position is occupied by a passenger.

To Fasten a Belt

1. Ensure correct positioning of the seat (see [Correct Driving Position on page 94](#)) (see [Correct Driving Position on page 106](#)) (see [Correct Driving Position on page 110](#)).
2. Draw the belt out smoothly, ensuring the belt lays flat across the pelvis, chest and mid-point of your collar bone, between the neck and shoulder.
3. Insert the latch plate into the buckle and press together until you hear a click indicating it is locked in place.



4. Pull the belt to check that it is securely fastened.

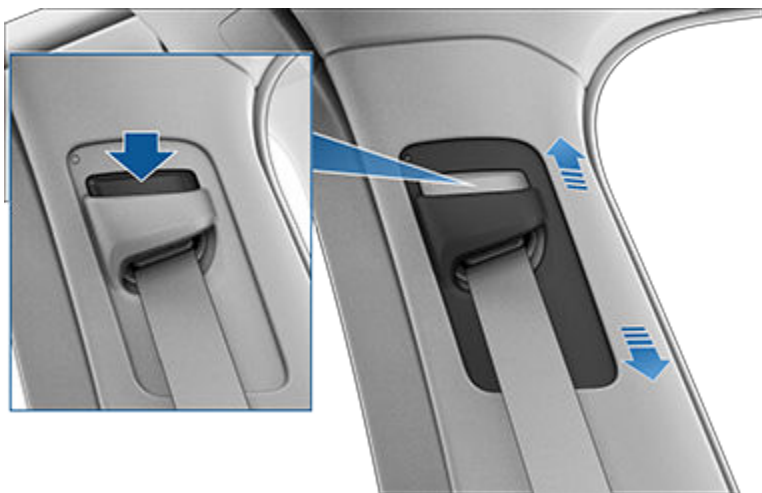


5. Pull the diagonal part of the belt toward the reel to remove excess slack.

To Adjust the Shoulder Anchor Height

Model S/Model X is equipped with an adjustable shoulder anchor for each front seat to ensure that the seat belt is positioned correctly. The seat belt should lay flat across the mid-point of your collar bone while in the correct driving position (see [Correct Driving Position on page 110](#)) (see [Correct Driving Position on page 106](#)) (see [Correct Driving Position on page 94](#)). Adjust the height of the shoulder anchor if the seat belt is not positioned correctly:

1. Press and hold the button on the shoulder anchor to release the locking mechanism.
2. While holding the button, move the shoulder anchor up or down as necessary so that the seat belt is positioned correctly.



3. Release the button on the shoulder anchor so that it locks into position.
4. Without pressing the button, pull on the seat belt webbing and attempt to move the shoulder anchor downwards to check that it is locked into position.

WARNING: Ensure that the seat belt is positioned correctly and that the shoulder anchor is locked into position before driving. Riding in a moving vehicle with the seat belt positioned incorrectly or with the shoulder anchor not locked into position can reduce the effectiveness of the seat belt in a collision.

To Release a Belt

Hold the belt near the buckle to prevent the belt from retracting too quickly, then press the button on the buckle. The belt retracts automatically. Ensure there is no obstruction that prevents the belt from fully retracting. The belt should not hang loose. If a seat belt does not fully retract, contact Tesla.

Wearing Seat Belts When Pregnant

Do not put the lap or shoulder sections of the seat belt over the abdominal area. Wear the lap section of the belt as low as possible across the hips, not the waist. Position the shoulder portion of the belt between the breasts and to the side of the abdomen. Consult your doctor for specific guidance.



WARNING: Never place anything between you and the seat belt to cushion the impact in the event of a collision.

Seat Belt Pre-tensioners

The front seat belts are equipped with pre-tensioners that work in conjunction with the airbags in a severe frontal collision. The pre-tensioners automatically retract both the seat belt anchor and the seat belt webbing, reducing slack in both the lap and diagonal portions of the belts, resulting in reduced forward movement of the occupant.

The rearsecond row outboard seats are equipped with shoulder pre-tensioners to retract the seat belt webbing to reduce forward movement of the occupant.





If the pre-tensioners and airbags did not activate in an impact, this does not mean they malfunctioned. It usually means that the strength or type of force needed to activate them was not present.

WARNING: Once the seat belt pre-tensioners have been activated, they must be replaced. After any collision, have the airbags, seat belt pre-tensioners and any associated components checked and, if necessary, replaced.

Testing Seat Belts

To confirm that seat belts are operating correctly, perform these three simple checks on each seat belt.

1. With the seat belt fastened, give the webbing nearest the buckle a quick pull. The buckle should remain securely locked.
2. With the belt unfastened, unreel the webbing to its limit. Check that unreeling is free from snags, and visually check the webbing for wear. Allow the webbing to retract, checking that retraction is smooth and complete.
3. With the webbing half unreeled, hold the tongue plate and pull forward quickly. The mechanism should lock automatically and prevent further unreeling.

If a seat belt fails any of these tests, contact Tesla immediately.

For information about cleaning seat belts, see [Seat Belts on page 448](#).

Seat Belt Warnings

WARNING: Seat belts should be worn by all occupants at all times, even if driving for a very short distance. Failure to do so increases the risk of injury or death if a collision occurs.

WARNING: Secure small children in a suitable child safety seat as described in the Child Safety Seat topic. Always follow the child safety seat manufacturer's instructions when installing.

WARNING: Ensure that all seat belts are worn correctly. An improperly worn seat belt increases the risk of injury or death if a collision occurs.

WARNING: Do not wear seat belts over hard, fragile or sharp items in clothing, such as pens, keys, eyeglasses, etc. The pressure from the seat belt on such items can cause injury.

WARNING: Seat belts should not be worn with any part of the strap twisted.

WARNING: Each seat belt assembly must be used by one occupant only. It is dangerous to put a seat belt around a child being carried on an occupant's lap.

WARNING: Seat belts that have been worn in a collision must be inspected or replaced by Tesla, even if damage to the assembly is not obvious.

WARNING: Seat belts that show signs of wear (such as fraying), or have been cut or damaged in any way, must be replaced by Tesla.

WARNING: Avoid contaminating a seat belt's components with any chemicals, liquids, grit, dirt or cleaning products. If a seat belt fails to retract or latch into the buckle, it must be replaced immediately. Contact Tesla.

WARNING: Do not make modifications or additions that can prevent a seat belt mechanism from taking up slack, or that can prevent a seat belt from being adjusted to remove slack. A slack belt greatly reduces occupant protection.

WARNING: Do not make modifications that can interfere with the operation of a seat belt, or that can cause a seat belt to become inoperable.

WARNING: Do not use after market comfort and convenience products that attach to the seat belts.

WARNING: When seat belts are not in use, they should be fully retracted and not hanging loose. If a seat belt does not fully retract, contact Tesla.

WARNING: The seat belt system has no user serviceable parts and may contain pyrotechnics. Do not disassemble, remove, or replace components.



Child Safety Seats

Guidelines for Seating Children

Your Model S Model X seat belts are designed for adults and larger children. You must restrain infants and small children in rear seats only, and you must use a suitable child safety seat appropriate for the child's age, weight, and size.

Never use child safety seats in the front passenger seat.

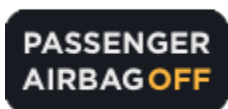
-  **WARNING:** Never seat a child in the front passenger seat, even if using a child safety seat.
-  **WARNING:** Never seat a child on a seat with an ACTIVE AIRBAG in front of it. DEATH or SERIOUS INJURY to the child can occur.
-  **WARNING:** For vehicles with third row seats, when a child is seated in a second row monopost seat, the setting for the button that moves a second row outboard seat forward for easy access into the third row should be **OFF** (touch **Controls > Seats > Easy Entry Controls > Safety > Third Row Easy Entry**). This ensures that you need to manually hold the button to move the seat, preventing a child seated in the second row from being pushed against the corresponding front seat. See [Adjusting Second Row Monopost Seats on page 99](#) [Adjusting Second Row Seats \(Monopost\) on page 113](#).

Refer to the following label located on the sun visors.

NOTE: The image(s) shown below are representative only and may not be identical to the labels in your vehicle.



Model S Model X has an occupancy sensor in the front passenger seat that controls the passenger front airbag (see [Airbags on page 161](#)).



The Passenger Airbag Off indicator displays in the top corner of the touchscreen only when the passenger front airbag is OFF. When the passenger front airbag is OFF, it will not inflate when a collision occurs. This indicator does not display when the airbag is ON or when the seat is unoccupied.



The Passenger Airbag Off indicator displays in the top corner of the touchscreen on the touchscreen when the passenger front airbag is OFF. When the passenger front airbag is OFF, it does not inflate when a collision occurs. This indicator does not display when the seat is unoccupied.



To protect an adult occupying the front passenger seat, always double-check the passenger front airbag to confirm that it is ON.

-  **WARNING:** Always ensure that all Model S Model X seats are locked in position before traveling. Failure to do so increases the risk of injury. Pay attention to all warnings displayed on the touchscreen.
-  **WARNING:** Do not associate the **Easy Entry** setting with the driver's profile when a child is seated in a second row seat. Doing so can cause the driver's seat to push against the child, especially when a child is seated in a forward-facing child seat or booster seat. Do not rely on Model S Model X to recognize or accommodate a child seated in the second row seats while using this setting (see [Driver Profiles on page 182](#)).



Choosing a Child Safety Seat

All children age 12 and under should ride in the second and third row seats. Always use a child safety seat suitable for a young child's age and weight. The following table is based on child safety seat recommendations determined by the National Highway Traffic Safety Administration (NHTSA) in the United States (for more information, go to www.nhtsa.gov/equipment/car-seats-and-booster-seats).

	Infants	Toddlers	Young children
Age	Birth to 1 year*	Over 1 year*	4 years and older, and less than 57 in. (145 cm) tall
Weight	Up to at least 20 lbs (9 kg)**	Over 20 lbs (9 kg) (minimum) and up to 40 lbs (18 kg)*	Over 40 lbs (18 kg)
Type of child safety seat	Rear-facing (or convertible)	Forward-facing (or convertible)*	Seat belt retained booster seat
Seat position	Rear-facing only*	Forward-facing*	Forward-facing
Recommended attachment method	If combined weight of child and safety seat is up to 65 lbs (29.5 kg), attach using either LATCH** (lower anchor only) or the seat belt only.*** If combined weight of child and safety seat is over 65 lbs (29.5 kg), attach using the seat belt only.***	If combined weight of child and safety seat is up to 65 lbs (29.5 kg), attach using either LATCH** (both lower anchors and top tether anchor), or the seat belt and upper tether strap.*** If combined weight of child and safety seat is over 65 lbs (29.5 kg), attach using the seat belt and upper tether strap.***	Attach booster seats using the seat belt only.

*** Many child safety seats currently available allow children to ride rear-facing using the child safety seat's integrated 5-point harness for a longer period of time BASED UPON SPECIFIC HEIGHT AND WEIGHT LIMITS. Keep your child in a rear-facing seat for as long as possible. CHECK THE CHILD SAFETY SEAT MANUFACTURER'S INSTRUCTIONS AND CAREFULLY FOLLOW ALL INSTRUCTIONS**

**** LATCH** ("Lower Anchors and Tethers for Children") and **ISOFIX** are international standards for attachment points for [child safety seats](#) in passenger cars that enable compliant child safety seats to be quickly and safely secured. The system has other regional names including **LUAS** ("Lower Universal Anchorage System") or **Canfix** in Canada. It has also been called the "Universal Child Safety Seat System" or **UCSSS**.

***** Subject to instructions provided by the child safety seat manufacturer.**

⚠ WARNING: Laws that govern how and where children should be carried when traveling in a vehicle are subject to change. It is the driver's responsibility to keep up to date on, and comply with, all current regulations in the region(s) where Model SModel X is driven. To check the child passenger safety laws for states in the U.S., go to: http://www.ghsa.org/html/stateinfo/laws/childsafety_laws.html.

⚠ WARNING: Do not use LATCH anchors with child safety seats or booster seats that have an integral safety belt where the combined weight of the child plus the child safety seat exceeds 65 lbs (29.5 kg).

Seating Larger Children

If a child is too large to fit into a child safety seat, but too small to safely fit into the standard seat belts, use a booster seat appropriate for the child's age and size. Carefully follow the manufacturer's instructions to secure the booster seat.

Installing Child Safety Seats

There are two general methods used to install child safety seats:

- Seat belt retained – these seats are secured using the vehicle's seat belts.
- LATCH retained – these seats attach to anchor bars built into the vehicle's second row outboard and third row seats.

Check the child safety seat manufacturer's instructions and the table in this manual to determine which installation method to use. Some child safety seats can be installed using either method. Always follow the child safety seat manufacturer's instructions.



Installing Seat Belt Retained Child Seats

First, make sure that the child safety seat is appropriate for the weight, height, and age of the child.

Avoid dressing the child in bulky clothing and do not place any objects between the child and the restraint system.

Adjust harnesses for every child, every trip.

To securely hold child safety seats, all passenger seating positions are equipped with an automatic locking retractor (ALR) feature that, by fully extracting the seat belt (beyond the length needed for a typical adult occupant), locks the belt into place until the seat belt is unbuckled and the webbing is fully retracted. The ALR mechanism operates as a ratchet, winding in slack and preventing the seat belt from extending any further until it has been completely rewound. When installing a child safety seat with integrated restraints, engage the belt's automatic locking retractor by pulling the seat belt webbing until it is **fully** extended. The ALR system engages only when the seat belt is at its maximum extension point.

The automatic locking retractor (ALR) feature is not used for booster seats in which a large child is restrained by the vehicle's seat belts directly, and therefore not using a child safety seat's integrated restraints.

NOTE: An automatic locking retractor disengages only when the seat belt is unbuckled and fully retracted. The belt can then be worn as a normal belt, sliding freely in and out and locking tight only in an emergency. Once disengaged, the belt must be fully extended to re-engage the locking mechanism whenever you install a child safety seat.

Always follow the detailed instructions provided by the child safety seat manufacturer. General guidelines are provided below.

1. Place the child safety seat in Model S Model X, and fully extend the seat belt. Route and buckle the seat belt in accordance with the child safety seat manufacturer's instructions.

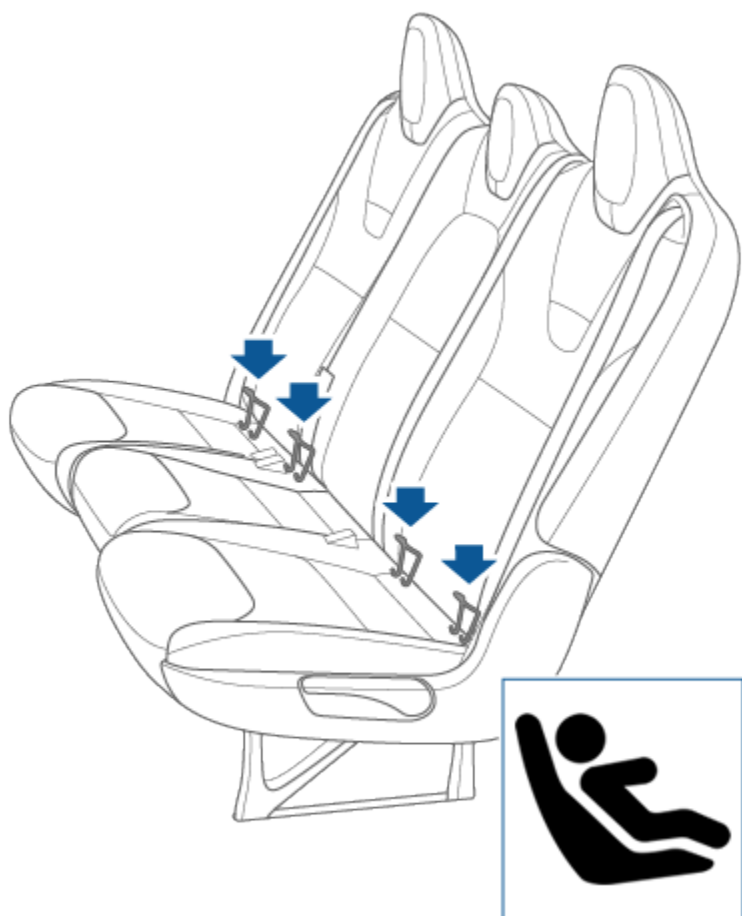


2. Allow the seat belt to retract, and remove all slack in the seat belt while firmly pushing the child safety seat into the Model S Model X seat.
3. If the seat belt retained child safety seat has an upper tether, attach it to the back of the seat (see [Attaching Upper Tether Straps on page 130](#)).

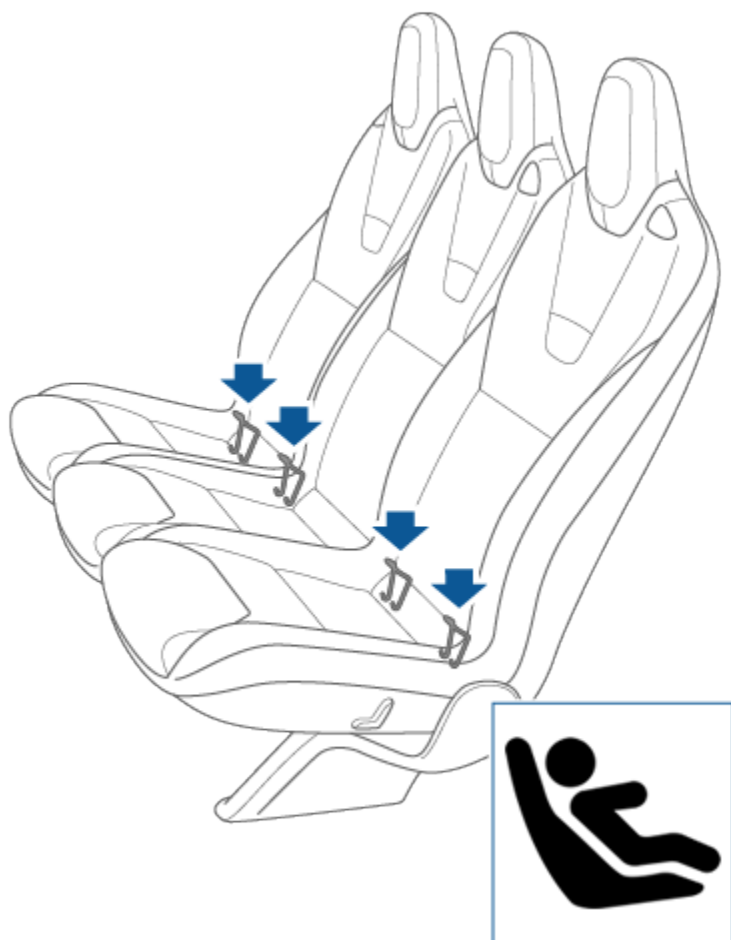
Installing LATCH (ISOFIX) Child Seats

Lower LATCH anchors are provided in the second row outboard seats and in both rear row seats (if equipped). The anchors are located between the seat's back rest and rear cushion. The exact location of each anchor is identified by a child safety seat identification button, illustrated below. The button is located on the seat back, directly above its associated anchor.

Bench Seats



Monopost Seats



In the second row, install LATCH child safety seats in the outboard seating positions only. Use only a seat belt retained seat in the center position.

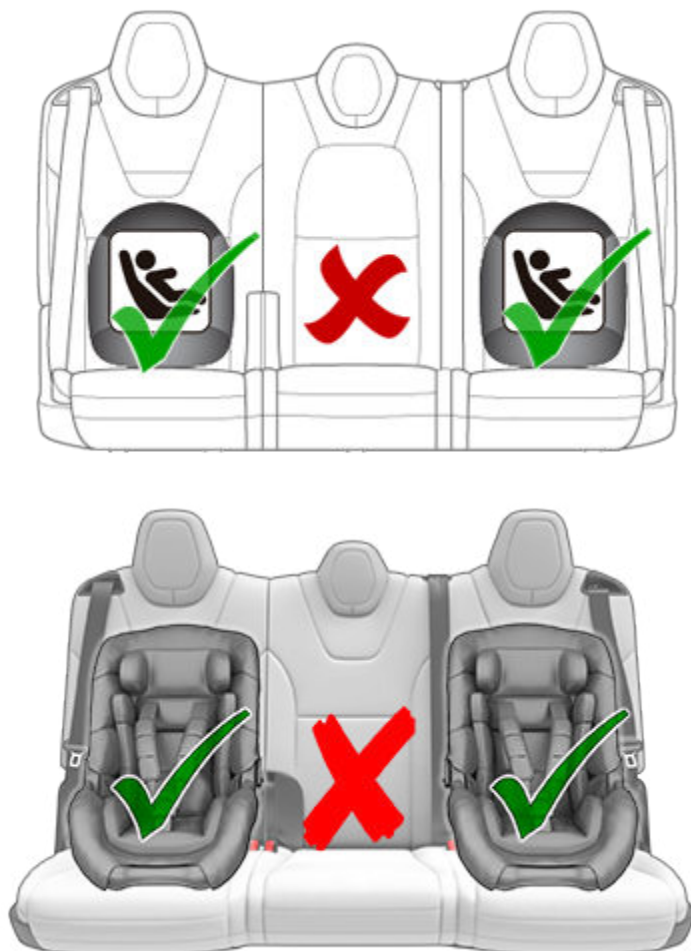
NOTE: If Model X is equipped with two seats in the second row, both seats support the use of LATCH child safety seats.



NOTE: Second row outboard seats support the use of upper tether straps (see [Attaching Upper Tether Straps on page 130](#)).

WARNING: Before driving after installing a child seat in the second row, ensure that a "seat unlocked" warning does NOT display on the touchscreen or instrument panel. This warning indicates that the seat is unsafe for an occupant because it was not returned to its safe, locked position. If the touchscreen or instrument panel displays the warning message, move the seat or backrest slightly forward or backward until it locks firmly into position and the message no longer displays.

Bench Seats



NOTE: To accommodate large rear-facing LATCH child safety seats, you may need to move the seat in the full rearward position, and move the corresponding front seat forward to the mid-track position (up to 13 cm forward of the rearmost position), raise the seat upward (3 cm from its lowest position), and angle the seat back to 15 degrees (or 10 degrees rearward from its forward-most position).

WARNING: Do not associate the **Easy Entry** setting with the driver's profile when a child is seated in the second row. Doing so can cause the driver's seat to push against the child, especially when a child is seated in a forward-facing child seat or booster seat. Do not rely on Model S/Model X to recognize or accommodate a child seated in the second row while using this setting (see [Driver Profiles on page 182](#)).

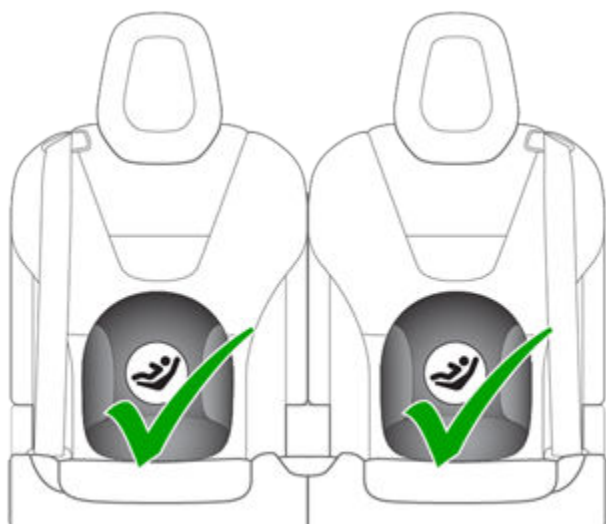
Monopost Seats



NOTE: To accommodate large rear-facing LATCH child safety seats, you may need to move the seat in the full rearward position, and move the corresponding front seat forward to the mid-track position (up to 13 cm forward of the rearmost position), raise the seat upward (3 cm from its lowest position), and angle the seat back to 15 degrees (or 10 degrees rearward from its forward-most position).

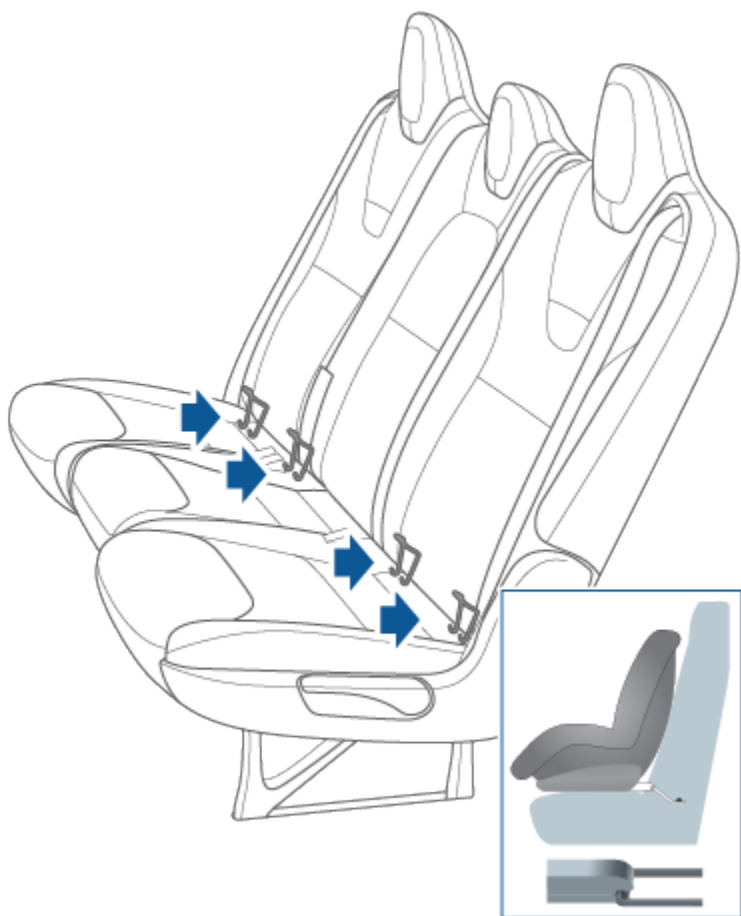
WARNING: For vehicles with third row seats, when a child is seated in a second row monopost seat, the setting for the button that moves a second row outboard seat forward for easy access into the third row should be **OFF** (touch **Controls** > **Seats** > **Easy Entry Controls** > **Safety** > **Third Row Easy Entry**). This ensures that you need to manually hold the button to move the seat, preventing a child seated in the second row from being pushed against the corresponding front seat. See [Accessing Third Row Seats \(if equipped\) - Monopost Seating on page 101](#) [Adjusting Second Row Seats \(Monopost\) on page 113](#).

In the third row (if equipped), you can install LATCH child safety seats in both seating locations.



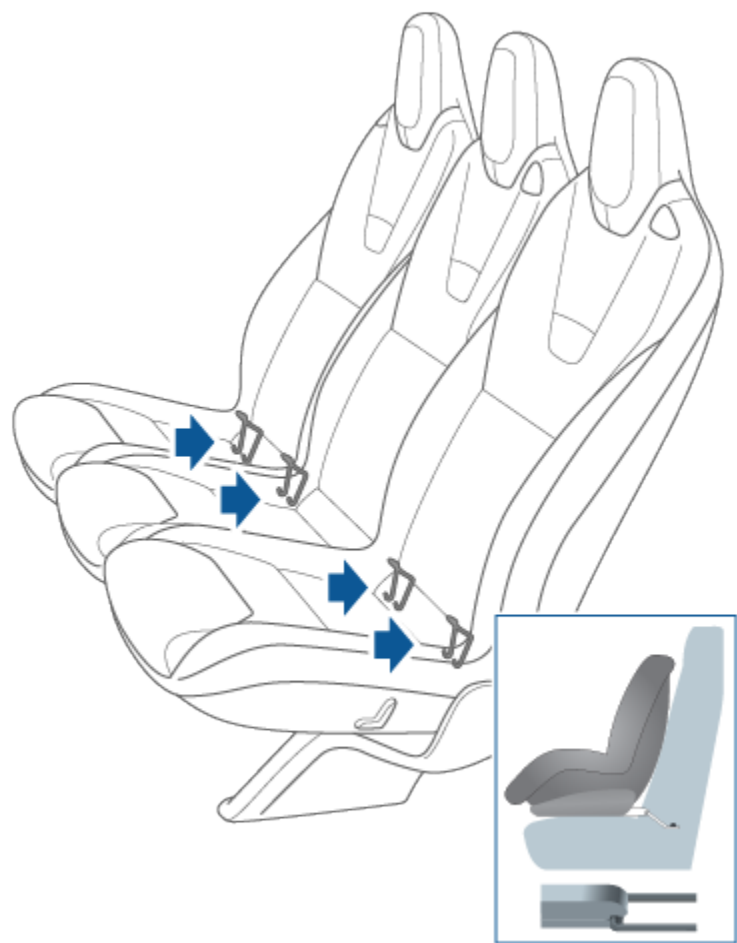
To install a LATCH child safety seat, slide the safety seat latches onto the anchor bars until they click into place. Carefully read and follow the instructions provided by the child safety seat manufacturer.

Bench Seats





Monopost Seats





Once installed, test the security of the installation before seating a child. Attempt to twist the child safety seat from side to side and try to pull it away from the seat, then check to ensure the anchors remain securely in place.

NOTE: Lower LATCH anchors should not be used with child seats or booster seats that have an integrated safety belt in situations where the combined weight of the child plus the child safety seat is more than 65 lbs (29.5 kg). In these situations, use the seat belt instead.

Attaching Upper Tether Straps

If an upper tether strap is provided, attach its hook to the anchor point located on the back of the second and third row (if equipped) seats.

NOTE: The location of anchor points may not be readily visible but can be found by identifying a slice in the seat's material.

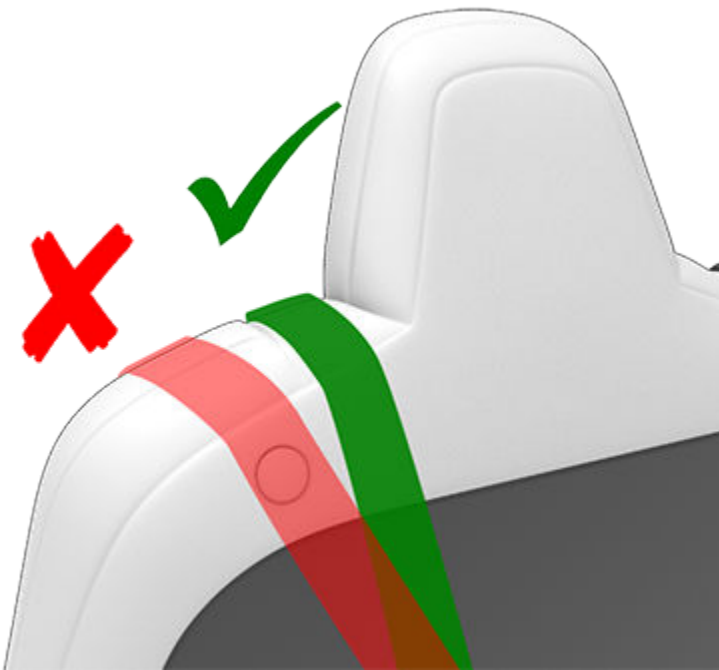
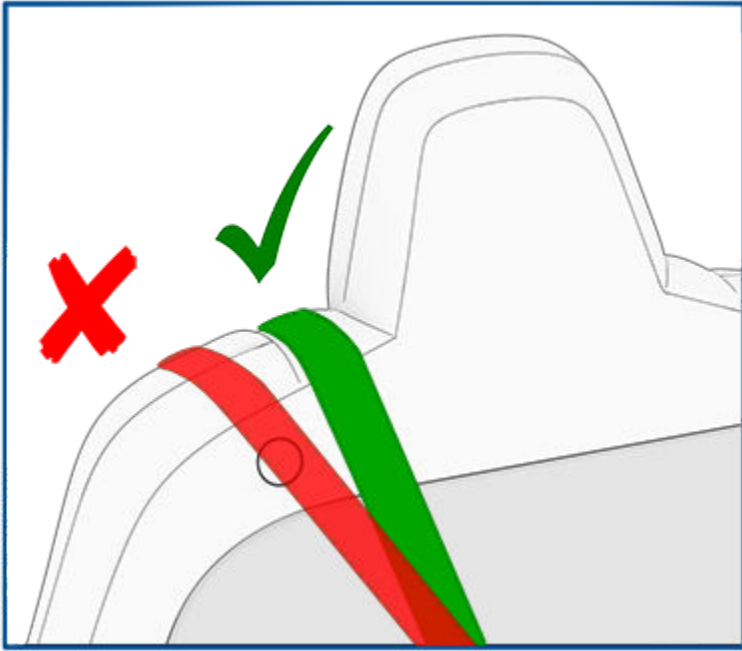
⚠ WARNING: Tighten upper tether straps according to the instructions provided by the manufacturer of the child safety seat.

⚠ WARNING: USE ONLY SEAT BELT RETAINED CHILD SAFETY SEATS IN THE CENTER SEATING POSITION.

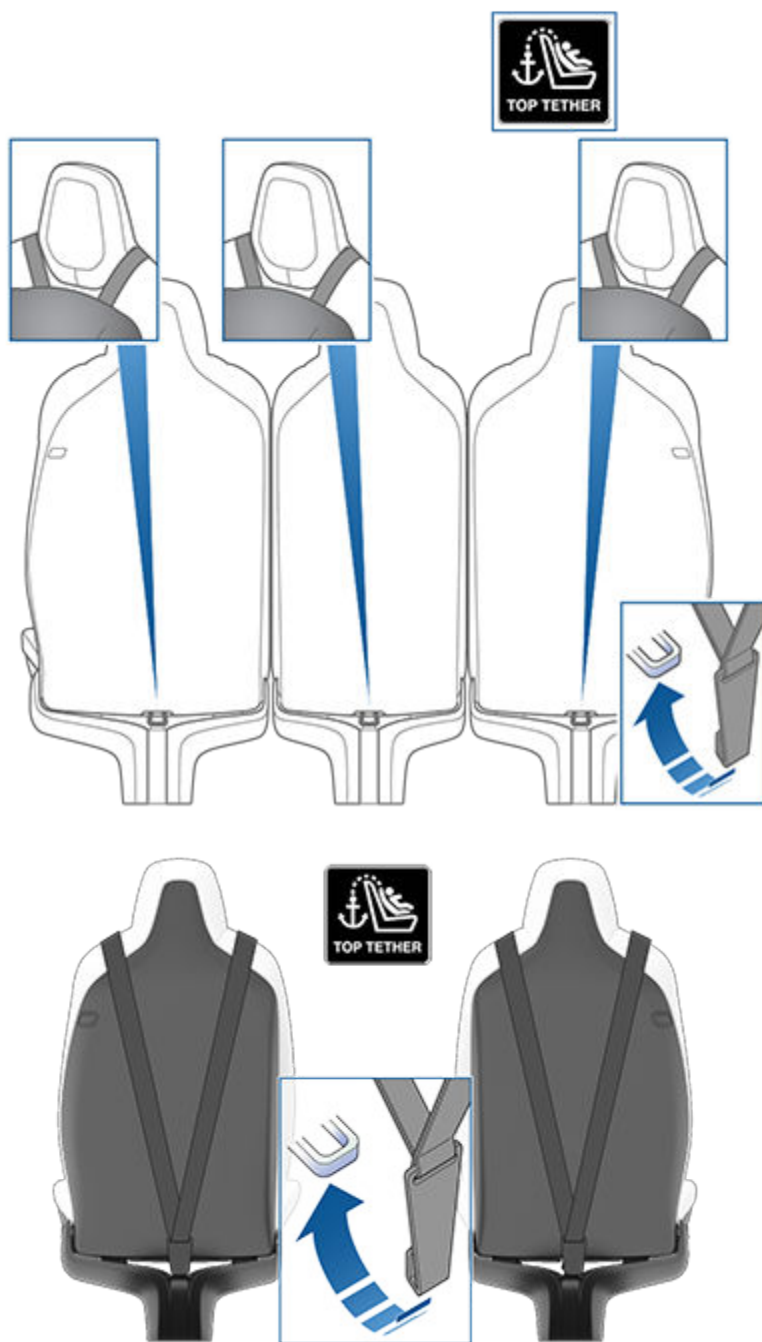
For dual-strap tethers, position a strap on each side of the head restraint.

NOTE: If Model X is equipped with the optional six seat interior, a center seating position is not available in the second row.

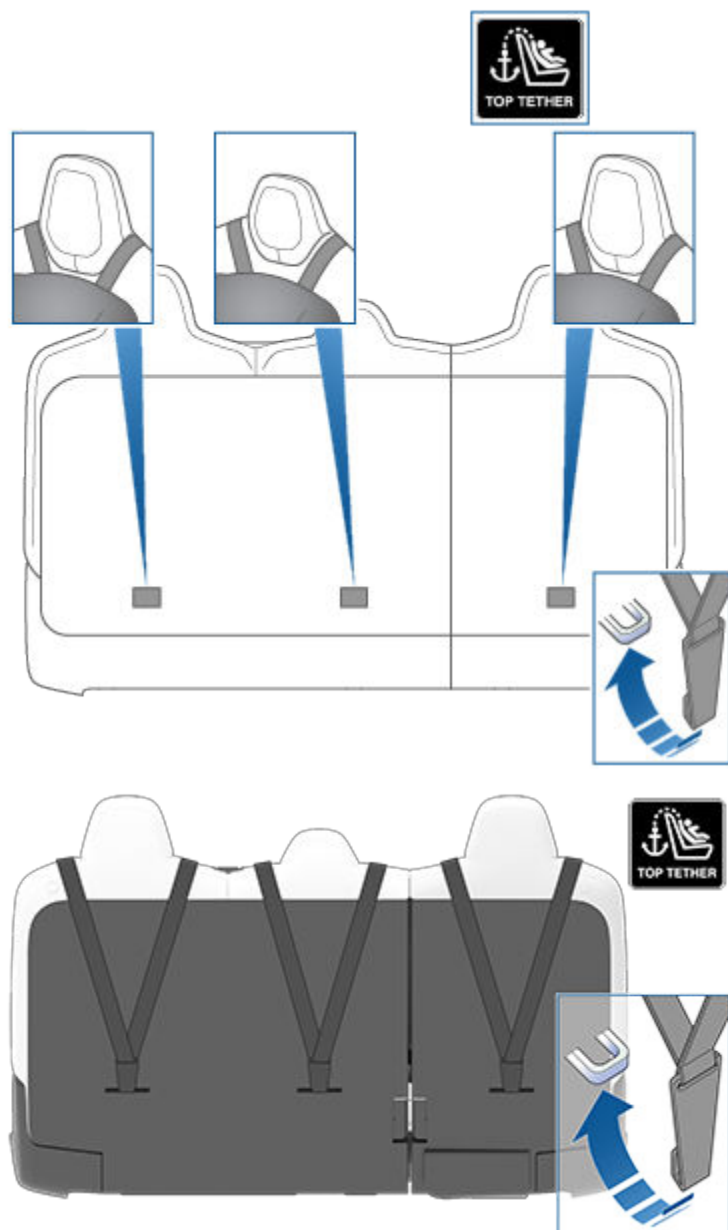
⚠ WARNING: When routing tether straps, keep the strap close to the headrest as illustrated below. On a Model X equipped with third row seats, do not allow a tether strap to cover the third row access button on the rear shoulder of the seat.



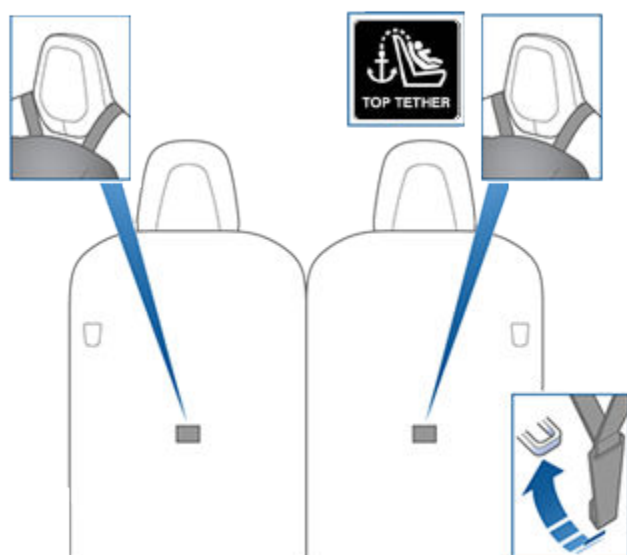
Dual Straps - Second Row Monopost Seats



Dual Straps - Second Row Bench Seats

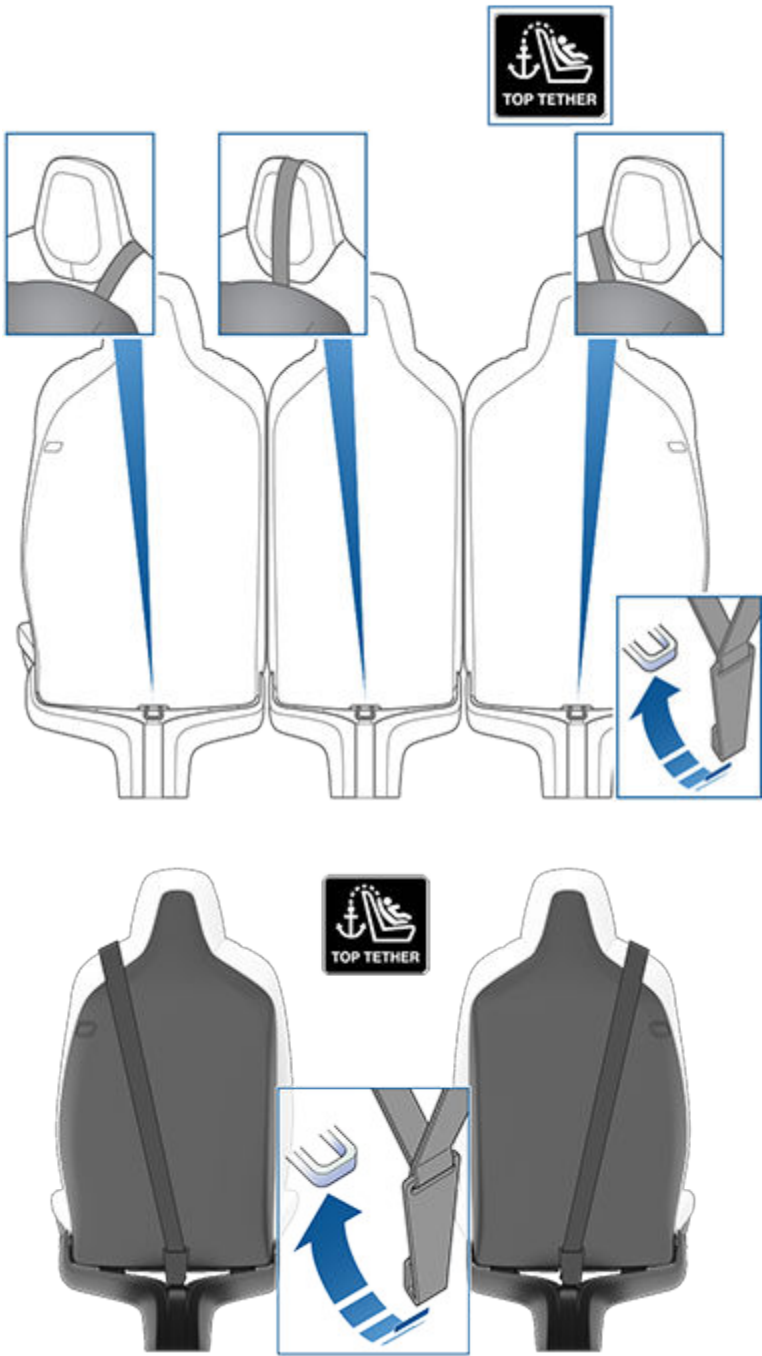


Dual Straps - Third Row Seats:

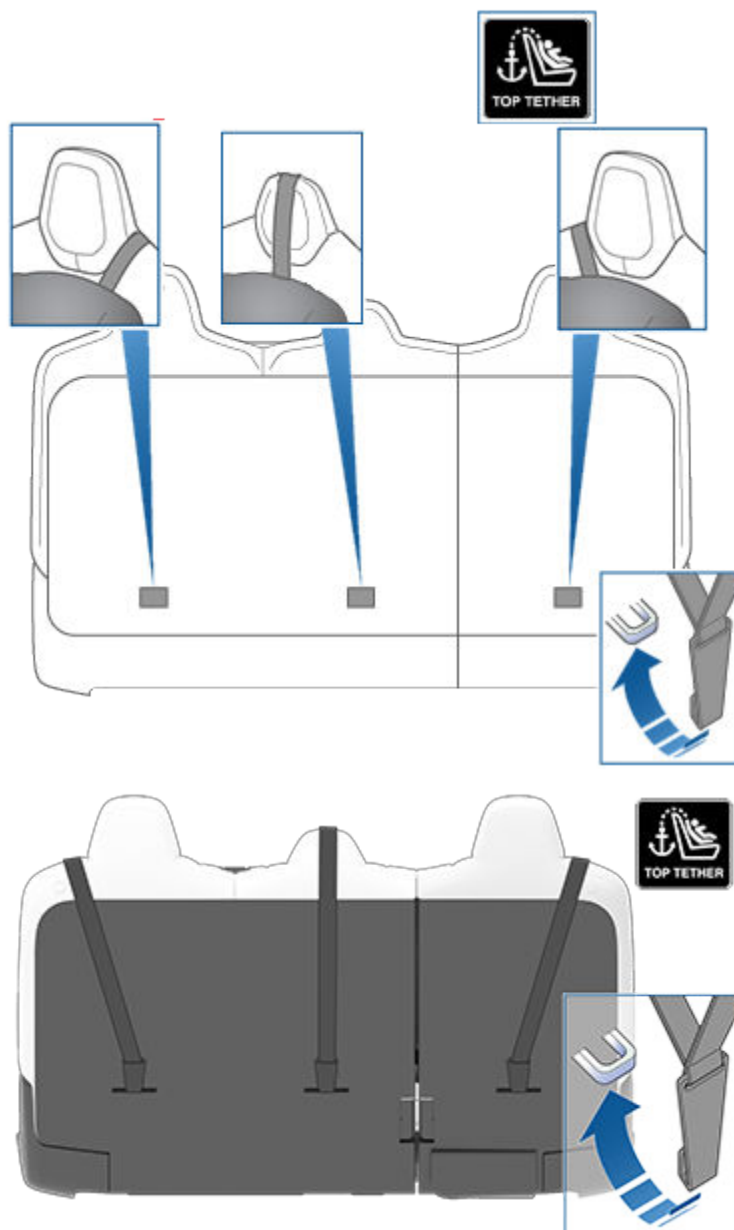


For single-strap tethers, position the strap in the outboard seating positions over the outside-facing side of the head restraint (the same side of the head restraint as the seat belt retraction mechanism). In the center seating position (if equipped), center and position the strap over the top of the head restraint.

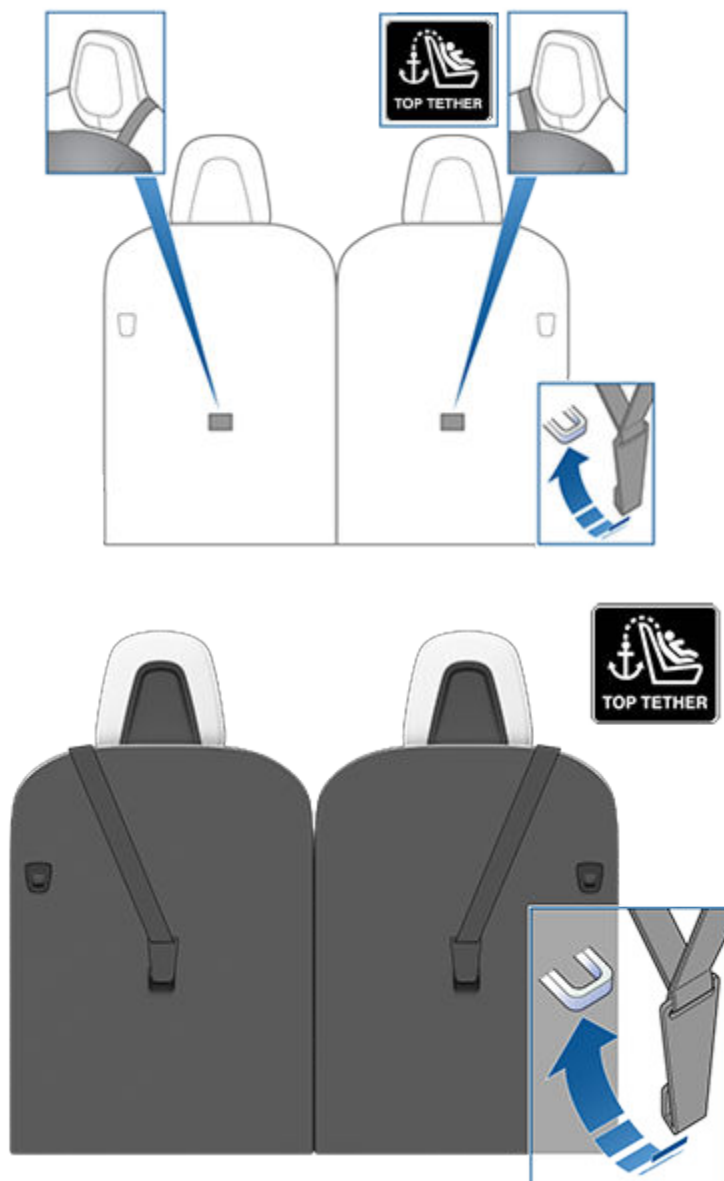
Single Strap - Second Row Monopost Seats



Single Strap - Second Row Bench Seats



Single Strap - Third Row Seats



Testing a Child Safety Seat

Before seating a child, always make sure the child safety seat is not loose:

1. Hold the child safety seat by the belt path and try to slide the safety seat from side to side and front to back.
2. If the seat moves more than one inch (2.5 cm), it is too loose. Tighten the belt or reconnect the LATCH retained child safety seat.
3. If you are unable to reduce slack, try a different seat location or try another child safety seat.

Child Safety Seat Warnings

-  **WARNING:** Extreme hazard! Do not seat a child on the front passenger seat even if you are using a child safety seat. This seat has an airbag in front of it. Although this airbag is disabled when Model SModel X detects a lightweight passenger, do not rely on technology to protect your child.
-  **WARNING:** Child safety seats are designed to be secured in vehicle seats by lap belts or the lap belt portion of a lap-shoulder belt. A child could be endangered in a crash if a child safety seat is not properly secured in the vehicle.
-  **WARNING:** According to collision statistics, children are safer when properly restrained in a rear seating position than in the front passenger seat.



-  **WARNING:** Do not use a forward-facing child safety seat until your child weighs over 20 lbs (9 kg) and can sit independently. Up to the age of two, a child's spine and neck are not sufficiently developed to avoid injury in a frontal impact.
-  **WARNING:** Do not allow a baby or infant to be held on a lap. All children should be restrained in an appropriate child safety seat at all times.
-  **WARNING:** To ensure children are safely seated, follow all instructions provided in this document and by the manufacturer of the child safety seat.
-  **WARNING:** Children should ride in a rear-facing child safety seat using the seat's integrated 5-point harness for as long as possible.
-  **WARNING:** Do not use seat belt extenders on a seat belt that is being used to install a child safety seat or booster seat.
-  **WARNING:** When seating larger children, make sure the child's head is supported and the child's seat belt is properly adjusted and fastened. The shoulder portion of the belt must be away from the face and neck, and the lap portion must not be over the stomach.
-  **WARNING:** Never attach two child safety seats to one anchor point. In a collision, one anchor point may be incapable of securing both seats.
-  **WARNING:** Child safety seat anchors are designed to withstand only those loads imposed by a correctly fitted child safety seat. Under no circumstances are they to be used for adult seat belts, harnesses, or for attaching other items or equipment to the vehicle.
-  **WARNING:** Always check harnesses and tether straps for damage and wear.
-  **WARNING:** Never leave a child unattended, even if the child is secured in a child safety seat.
-  **WARNING:** Never use a child safety seat that has been involved in a collision. Have the seat inspected or replaced as described in the child safety seat manufacturer's instructions.



Child Safety Seats

Guidelines for Seating Children

Your Model S Model X seat belts are designed for adults and larger children. You must restrain infants and small children in the rear seats only, and you must use a suitable child safety seat appropriate for the child's age, weight, and size.

Never use child safety seats in the front row passenger seat.



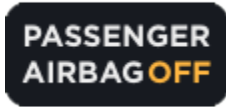
WARNING: Never seat a child on a seat with an ACTIVE AIRBAG in front of it. DEATH or SERIOUS INJURY to the child can occur.

Refer to the following label located on the sun visors.

NOTE: The image shown below is representative only and may not be identical to the label in your vehicle.



Model S Model X has an occupancy sensor in the front passenger seat that controls the status of the passenger front airbag (see [Airbags on page 172](#)).



The Passenger Airbag Off indicator displays in the top corner of the touchscreen only when the passenger front airbag is OFF. When the passenger front airbag is OFF, it will not inflate when a collision occurs. This indicator does not display when the airbag is ON or when the seat is unoccupied. Before driving with a child seated on the front passenger seat, always double-check the status of the passenger front airbag to confirm that it is OFF.



When driving with a child seat on the front passenger seat, always double-check the status of the passenger front airbag to confirm that it is OFF.



To protect an adult subsequently occupying the front passenger seat, always double-check the passenger front airbag to confirm that it is ON.

If your Model S is equipped with the optional Tesla built-in rear facing child seats, these seats are child safety seats and are designed only for children within a specific height and weight range (see [Tesla Built-In Rear Facing Child Seats on page 155](#)).



Choosing a Child Safety Seat

All children age 12 and under should ride in the second row seats. Always use a child safety seat suitable for a young child's age and weight. The following table is based on child safety seat recommendations determined by National Highway Traffic Safety Administration (NHTSA). For more information, go to www.nhtsa.gov/ChildSafety/Guidance.

Category	Infants	Toddlers	Young children
Age	Birth to 1 year*	Over 1 year*	4 years and older, and less than 57 in. (145 cm) tall
Weight	Up to at least 20 lbs (9 kg)*	Over 20 lbs (9 kg) (minimum) and up to 40 lbs (18 kg)*	Over 40 lbs (18 kg)
Type of child safety seat	Rear facing (or convertible)	Forward facing (or convertible)*	Forward facing or seat belt retained booster seat****
Seat position	Rear facing only*	Rear facing as long as possible, then forward facing*	Forward facing
Recommended attachment method	If combined weight of child and safety seat is up to 65 lbs (29 kg), attach using either LATCH** (lower anchor only) or the seat belt only.*** If combined weight of child and safety seat is over 65 lbs (29 kg), attach using the seat belt only.***	If combined weight of child and safety seat is up to 65 lbs (29 kg), attach using either LATCH** (both lower anchors and top tether anchor), or the seat belt and upper tether strap.*** If combined weight of child and safety seat is over 65 lbs (29 kg), attach using the seat belt and upper tether strap.***	Attach booster seats using the seat belt only

*** Many child safety seats currently available allow children to ride rear-facing using the child safety seat's integrated 5-point harness for a longer period of time BASED UPON SPECIFIC HEIGHT AND WEIGHT LIMITS. Keep your child in a rear facing seat for as long as possible. CHECK THE CHILD SAFETY SEAT MANUFACTURER'S INSTRUCTIONS AND CAREFULLY FOLLOW ALL INSTRUCTIONS.**

**** LATCH** ("Lower Anchors and Tethers for Children") and **ISOFIX** are international standards for attachment points for [child safety seats](#) in passenger cars that enable compliant child safety seats to be quickly and safely secured. The system has other regional names including **LUAS** ("Lower Universal Anchorage System") or **Canfix** in Canada. It has also been called the "Universal Child Safety Seat System" or **UCSSS**.

***** Subject to instructions provided by the child safety seat manufacturer.**

******Keep your child in a forward facing child safety seat with a harness and tether until the child reaches the child safety seat's maximum allowable height or weight as specified by the manufacturer of the child safety seat.**

⚠ WARNING: Do not use **Easy Entry** (as described in [Driver Profiles on page 182](#)) to automatically move the driver's seat to the full rearward position if a child safety seat is installed on a rear seat behind the driver's seat. With reduced clearance, the movement of the seat may impact a child's legs, cause injury, or dislodge the seat.

⚠ WARNING: Do not use LATCH anchors with child safety seats or booster seats that have an integral safety belt where the combined weight of the child plus the child safety seat exceeds 65 lbs (29.5 kg).

⚠ WARNING: Laws that govern how and where children should be carried when traveling in a vehicle are subject to change. It is the driver's responsibility to keep up to date on, and comply with, all current regulations in the region(s) where Model SModel X is driven. To check the child passenger safety laws for states in the U.S., go to: http://www.ghsa.org/html/stateinfo/laws/childsafety_laws.html.



Seating Larger Children

If a child is too large to fit into a child safety seat, but too small to safely fit into the standard seat belts, use a booster seat appropriate for the child's age and size. Carefully follow the manufacturer's instructions to secure the booster seat.

Installing Child Safety Seats

There are two general methods used to install child safety seats:

- Seat belt retained - these seats are secured using the vehicle's seat belts.
- LATCH retained - these seats attach to anchor bars built into the vehicle's rear seats.

Check the child safety seat manufacturer's instructions and the table in this manual to determine which installation method to use. Some child safety seats can be installed using either method. Always follow the child safety seat manufacturer's instructions.

Installing Seat Belt Retained Child Seats

First, make sure that the child safety seat is appropriate for the weight, height, and age of the child.

Avoid dressing the child in bulky clothing and do not place any objects between the child and the restraint system.

Adjust harnesses for every child, every trip.

To securely hold child safety seats, all passenger seating positions are equipped with an automatic locking retractor (ALR) that, by pulling the seat belt beyond the length needed for a typical adult occupant, locks the belt into place until the seat belt is unbuckled and the webbing is fully retracted. The ALR mechanism operates as a ratchet, winding in slack and preventing the seat belt from extending any further until it has been completely rewound. When installing a child safety seat, engage the belt's automatic locking retractor by pulling the seat belt webbing until it is **fully** extended. The ALR system engages only when the seat belt is at its maximum extension point.

NOTE: An automatic locking retractor disengages only when the seat belt is unbuckled and fully retracted. The belt can then be worn as a normal belt, sliding freely in and out and locking tight only in an emergency. Once disengaged, the belt must be fully extended to re-engage the locking mechanism whenever you install a child safety seat.

Always follow the detailed instructions provided by the child safety seat manufacturer. General guidelines are provided below.

1. Place the child safety seat in Model S Model X, and fully extend the seat belt. Route and buckle the seat belt in accordance with the child safety seat manufacturer's instructions.

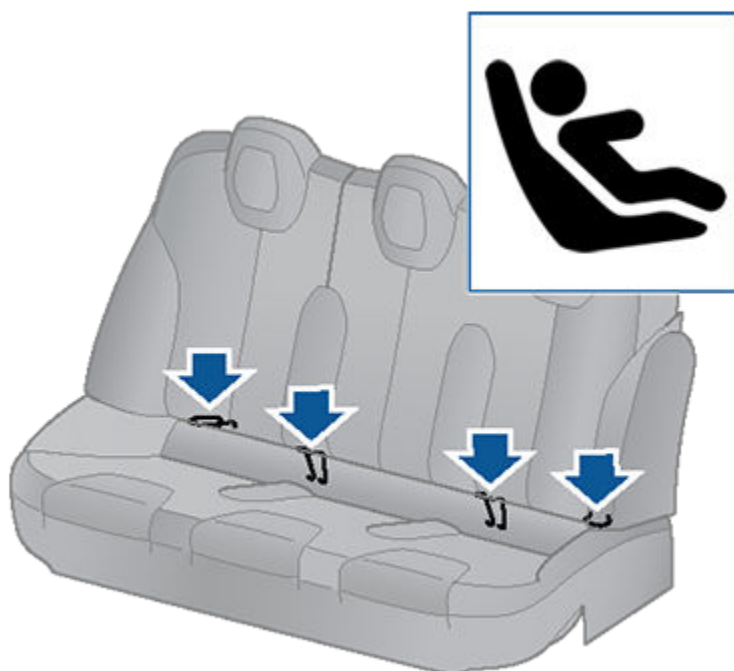




2. Allow the seat belt to retract, and remove all slack in the seat belt while firmly pushing the child safety seat into the Model S/Model X seat.
3. Attach the upper tether strap(s), as required by the manufacturer of the child restraint system (see [Attaching Upper Tether Straps on page 144](#)).

Installing ISOFIX (LATCH) Child Seats

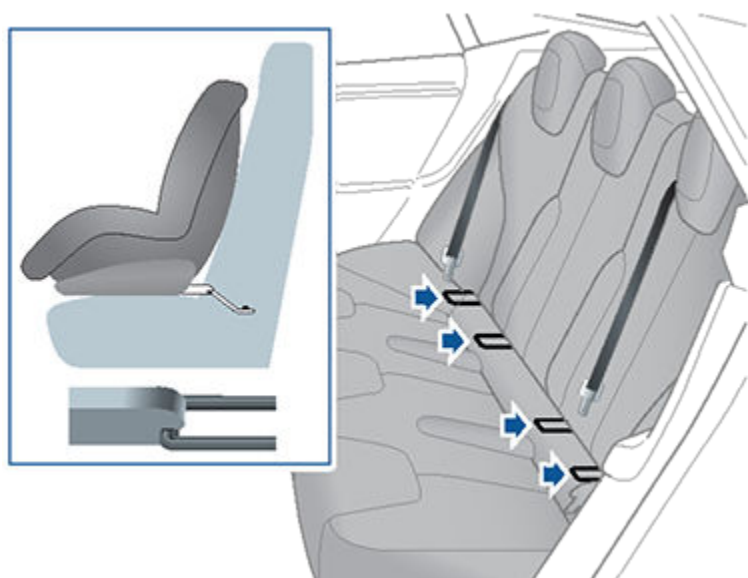
Lower LATCH anchors are provided in the second row outboard seats. The anchors are located between the seat's back rest and rear cushion. The exact location of each anchor is identified by a child safety seat identification button, illustrated below. The button is located on the seat back, directly above its associated anchor.



In the rear seats, install LATCH child safety seats in the outboard seating positions only. Use only a seat belt retained seat in the center position.



To install a LATCH child safety seat, carefully read and follow the instructions provided by the manufacturer of the child restraint system. These instructions describe how to slide the child restraint system onto the seat's anchor bars until you hear it "click" into place. You may need to push the child restraint system firmly against the seat back to ensure it fits snugly.



Adjust until the child restraint system is fitted firmly against the seat back. Ensure the child restraint system fits snugly.



Before seating a child, ensure that the child restraint system is securely installed. Grasp the front of the child restraint system with one hand on each side, and attempt to:

- Twist the child restraint system from side to side.
- Pull the child restraint system away from the seat.

If the child restraint system moves away from the seat, both latches are not fully engaged onto the seat's anchor bars. You must reinstall it and try again. It is critical that both latches on the child restraint system are fully engaged.

NOTE: Do not use LATCH anchors with child seats or booster seats that have an integrated safety belt where the combined weight of the child plus the child restraint system exceeds 65 lbs (29.5 kg).

Attaching Upper Tether Straps

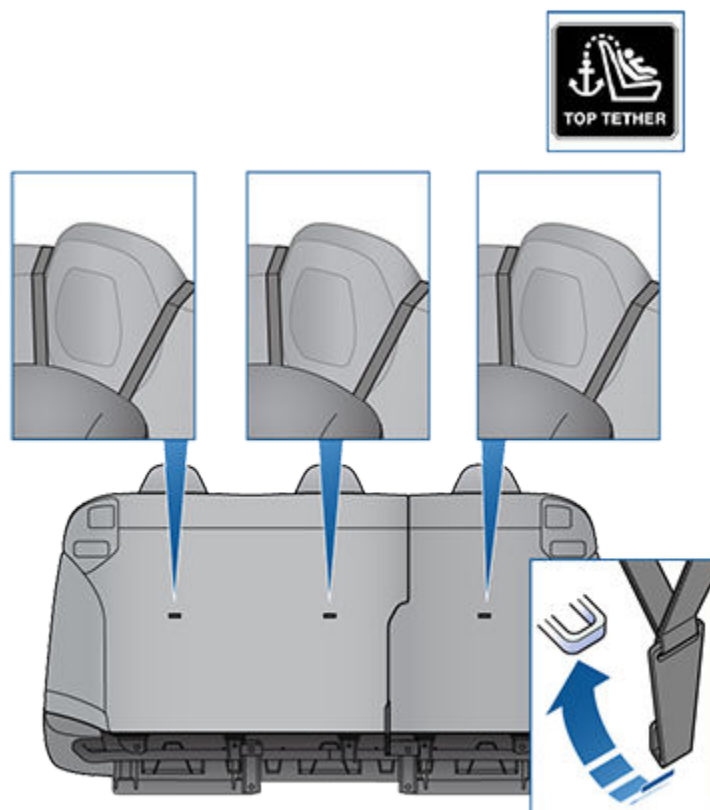
If an upper tether strap is provided, attach its hook to the anchor point located on the back of the rear seats.

NOTE: The location of anchor points may not be readily visible but can be found by identifying a slice in the seat's material.

 **WARNING:** Tighten upper tether straps according to the instructions provided by the manufacturer of the child safety seat.

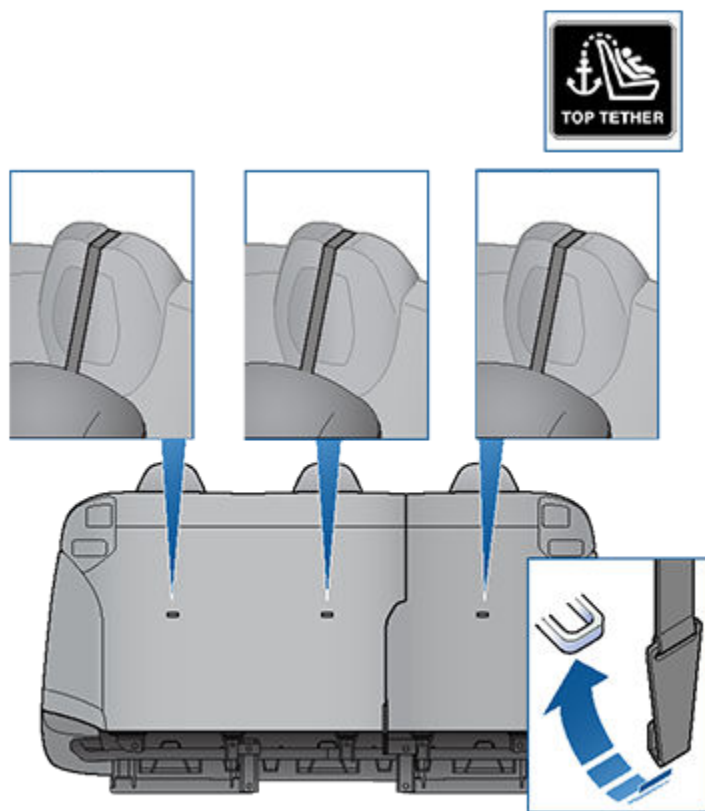
 **WARNING: USE ONLY SEAT BELT RETAINED CHILD SAFETY SEATS IN THE CENTER SEATING POSITION.**

For dual-strap tethers, position a strap on each side of the head support.



Always position single-strap tethers to run over the top of the head support.

NOTE: To prevent the single-strap tether from moving side to side, the top of the head support deforms.





Testing a Child Safety Seat

Before seating a child, always make sure the child safety seat is not loose:

1. Hold the child safety seat by the belt path and try to slide the safety seat from side to side and front to back.
2. If the seat moves more than one inch (2.5 cm), it is too loose. Tighten the belt or reconnect the LATCH retained child safety seat.
3. If you are unable to reduce slack, try a different seat location or try another child safety seat.

Child Safety Seat Warnings

-  **WARNING:** Extreme hazard! Do not seat a child on the front passenger seat even if you are using a child safety seat. This seat has an airbag in front of it. Although this airbag is disabled when Model SModel X detects a lightweight passenger, do not rely on technology to protect your child.
-  **WARNING:** Child restraint systems are designed to be secured in vehicle seats by lap belts or the lap belt portion of a lap-shoulder belt. Children could be endangered in a crash if their child restraints are not properly secured in the vehicle.
-  **WARNING:** According to collision statistics, children are safer when properly restrained in the rear seating positions than in the front seating positions.
-  **WARNING:** Do not use a forward facing child safety seat until your child weighs over 20 lbs (9 kg) and can sit independently. Up to the age of two, a child's spine and neck are not sufficiently developed to avoid injury in a frontal impact.
-  **WARNING:** Do not allow a baby or infant to be held on a lap. All children should be restrained in an appropriate child safety seat at all times.
-  **WARNING:** To ensure children are safely seated, follow all instructions provided in this document and by the manufacturer of the child safety seat.
-  **WARNING:** Children should ride in a rear facing child safety seat using the seat's integrated 5-point harness for as long as possible.
-  **WARNING:** Do not use seat belt extenders on a seat belt that is being used to install a child safety seat or booster seat.
-  **WARNING:** When seating larger children, make sure the child's head is supported and the child's seat belt is properly adjusted and fastened. The shoulder portion of the belt must be away from the face and neck, and the lap portion must not be over the stomach.
-  **WARNING:** Never attach two child safety seats to one anchor point. In a collision, one anchor point may be incapable of securing both seats.
-  **WARNING:** Child restraint anchors are designed to withstand only those loads imposed by correctly fitted child restraints. Under no circumstances are they to be used for adult seat belts, harnesses, or for attaching other items or equipment to the vehicle.
-  **WARNING:** Always check harnesses and tether straps for damage and wear.
-  **WARNING:** Never leave a child unattended, even if the child is secured in a child safety seat.
-  **WARNING:** Never use a child safety seat that has been involved in a collision. Have the seat inspected or replaced as described in the child safety seat manufacturer's instructions.



Child Safety Seats

Guidelines for Seating Children

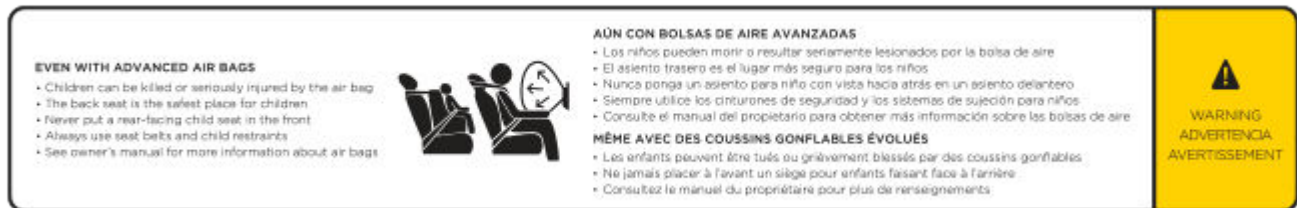
Your Model SModel X seat belts are designed for adults and larger children. You must restrain infants and small children in the rear seats only, and you must use a suitable child safety seat appropriate for the child's age, weight, and size.

WARNING: Never seat a child in the front row passenger seat, even if using a child safety seat.

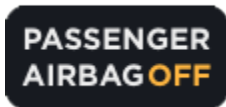
WARNING: Never seat a child on a seat with an ACTIVE AIRBAG in front of it. DEATH or SERIOUS INJURY to the child can occur.

Refer to the following label located on the sun visors.

NOTE: The image shown below is representative only and may not be identical to the label in your vehicle.



Model SModel X has an occupancy sensor in the front passenger seat that controls the status of the passenger front airbag (see [Airbags on page 172](#)).



The Passenger Airbag Off indicator displays in the lower right corner of the touchscreen only when the passenger front airbag is OFF. When the passenger front airbag is OFF, it does not inflate when a collision occurs. This indicator does not display when the airbag is ON or when the seat is unoccupied.



The Passenger Airbag Off indicator displays in the top corner of the touchscreen on the touchscreen when the passenger front airbag is OFF. When the passenger front airbag is OFF, it does not inflate when a collision occurs. This indicator does not display when the seat is unoccupied.



To protect an adult occupying the front passenger seat, always double-check the passenger front airbag to confirm that it is ON.

WARNING: Always ensure that all Model SModel X seats are locked in position before traveling. Failure to do so increases the risk of injury. Pay attention to all warnings displayed on the touchscreen.

WARNING: Do not associate the **Easy Entry** setting with the driver's profile when a child is seated in a rear seat. Doing so can cause the driver's seat to push against the child, especially when a child is seated in a forward-facing child seat or booster seat. Do not rely on Model SModel X to recognize or accommodate a child seated in the rear seats while using this setting (see [Driver Profiles on page 182](#)).



Choosing a Child Safety Seat

All children age 12 and under should ride in the rear seats. Always use a child safety seat suitable for a young child's age and weight. The following table is based on child safety seat recommendations determined by National Highway Traffic Safety Administration (NHTSA). For more information, go to www.nhtsa.gov/ChildSafety/Guidance.

Category	Infants	Toddlers	Young children
Age	Birth to 1 year*	Over 1 year*	4 years and older, and less than 57 in. (145 cm) tall
Weight	Up to at least 20 lbs (9 kg)*	Over 20 lbs (9 kg) (minimum) and up to 40 lbs (18 kg)*	Over 40 lbs (18 kg)
Type of child safety seat	Rear facing (or convertible)	Forward facing (or convertible)*	Forward facing or seat belt retained booster seat****
Seat position	Rear facing only*	Rear facing as long as possible, then forward facing*	Forward facing
Recommended attachment method	If combined weight of child and safety seat is up to 65 lbs (29 kg), attach using either LATCH** (lower anchor only) or the seat belt only.*** If combined weight of child and safety seat is over 65 lbs (29 kg), attach using the seat belt only.***	If combined weight of child and safety seat is up to 65 lbs (29 kg), attach using either LATCH** (both lower anchors and top tether anchor), or the seat belt and upper tether strap.*** If combined weight of child and safety seat is over 65 lbs (29 kg), attach using the seat belt and upper tether strap.***	Attach booster seats using the seat belt only

*** Many child safety seats currently available allow children to ride rear-facing using the child safety seat's integrated 5-point harness for a longer period of time BASED UPON SPECIFIC HEIGHT AND WEIGHT LIMITS. Keep your child in a rear facing seat for as long as possible. CHECK THE CHILD SAFETY SEAT MANUFACTURER'S INSTRUCTIONS AND CAREFULLY FOLLOW ALL INSTRUCTIONS.**

**** LATCH** ("Lower Anchors and Tethers for Children") and **ISOFIX** are international standards for attachment points for [child safety seats](#) in passenger cars that enable compliant child safety seats to be quickly and safely secured. The system has other regional names including **LUAS** ("Lower Universal Anchorage System") or **Canfix** in Canada. It has also been called the "Universal Child Safety Seat System" or **UCSSS**.

***** Subject to instructions provided by the child safety seat manufacturer.**

******Keep your child in a forward facing child safety seat with a harness and tether until the child reaches the child safety seat's maximum allowable height or weight as specified by the manufacturer of the child safety seat.**

⚠ WARNING: Do not use LATCH anchors with child safety seats or booster seats that have an integral safety belt where the combined weight of the child plus the child safety seat exceeds 65 lbs (29.5 kg).

⚠ WARNING: Laws that govern how and where children should be carried when traveling in a vehicle are subject to change. It is the driver's responsibility to keep up to date on, and comply with, all current regulations in the region(s) where Model SModel X is driven. To check the child passenger safety laws for states in the U.S., go to: http://www.ghsa.org/html/stateinfo/laws/childsafety_laws.html.

Seating Larger Children

If a child is too large to fit into a child safety seat, but too small to safely fit into the standard seat belts, use a booster seat appropriate for the child's age and size. Carefully follow the manufacturer's instructions to secure the booster seat.



Installing Child Safety Seats

There are two general methods used to install child safety seats:

- Seat belt retained - these seats are secured using the vehicle's seat belts. All passenger seating positions in Model S/Model X support the use of seat belt retained child safety seats.
- LATCH retained - these seats attach to anchor bars built into the vehicle's rear seats. The rear outboard seating positions in Model S/Model X support the use of LATCH retained child safety seats.

Check the child safety seat manufacturer's instructions and the table in this manual to determine which installation method to use. Some child safety seats can be installed using either method. Always follow the child safety seat manufacturer's instructions.

Installing Seat Belt Retained Child Seats

First, make sure that the child safety seat is appropriate for the weight, height, and age of the child.

Avoid dressing the child in bulky clothing and do not place any objects between the child and the restraint system.

Adjust harnesses for every child, every trip.

To securely hold child safety seats, all passenger seating positions are equipped with an automatic locking retractor (ALR) feature that, by fully extracting the seat belt (beyond the length needed for a typical adult occupant), locks the belt into place until the seat belt is unbuckled and the webbing is fully retracted. The ALR mechanism operates as a ratchet, winding in slack and preventing the seat belt from extending any further until it has been completely rewound. When installing a child safety seat with integrated restraints, engage the belt's automatic locking retractor by pulling the seat belt webbing until it is **fully** extended. The ALR system engages only when the seat belt is at its maximum extension point.

The automatic locking retractor (ALR) feature is not used for booster seats in which a large child is restrained by the vehicle's seat belts directly, and therefore not using a child safety seat's integrated restraints.

NOTE: An automatic locking retractor disengages only when the seat belt is unbuckled and fully retracted. The belt can then be worn as a normal belt, sliding freely in and out and locking tight only in an emergency. Once disengaged, the belt must be fully extended to re-engage the locking mechanism whenever you install a child safety seat.

Always follow the detailed instructions provided by the child safety seat manufacturer. General guidelines are provided below.

1. Place the child safety seat in Model S/Model X, and fully extend the seat belt. Route and buckle the seat belt in accordance with the child safety seat manufacturer's instructions.



2. Allow the seat belt to retract, and remove all slack in the seat belt while firmly pushing the child safety seat into the Model S/Model X seat.



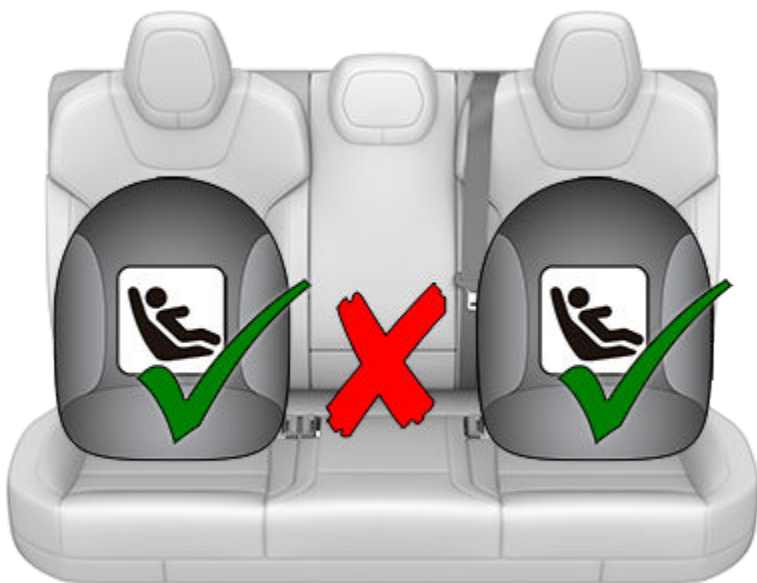
3. Attach the upper tether strap(s), as required by the manufacturer of the child restraint system (see [Attaching Upper Tether Straps on page 152](#)).

Installing ISOFIX (LATCH) Child Seats

Lower LATCH anchors are provided in the rear outboard seats. The anchors are located between the seat's back rest and rear cushion. The exact location of each anchor is identified by a child safety seat identification button, illustrated below. The button is located on the seat back, directly above its associated anchor.



In the rear seats, install LATCH child safety seats in the outboard seating positions only. Use only a seat belt retained seat in the center position.



To install a LATCH child safety seat, lift the flap (if equipped) to allow access to the anchors.



Carefully read and follow the instructions provided by the manufacturer of the child restraint system. The instructions describe how to slide the child restraint system onto the seat's anchor bars until you hear it "click" into place. You may need to push the child restraint system firmly against the seat back to ensure it fits snugly. The flap (if equipped) remains open when the child seat is installed.



Adjust until the child restraint system is fitted firmly against the seat back. Ensure the child restraint system fits snugly.



Before seating a child, ensure that the child restraint system is securely installed. Grasp the front of the child restraint system with one hand on each side, and attempt to:

- Twist the child restraint system from side to side.
- Pull the child restraint system away from the seat.

If the child restraint system moves away from the seat, both latches are not fully engaged onto the seat's anchor bars. You must reinstall it and try again. It is critical that both latches on the child restraint system are fully engaged.

⚠ WARNING: Do not use LATCH anchors with child seats or booster seats that have an integrated safety belt where the combined weight of the child plus the child restraint system exceeds 65 lbs (29.5 kg).

Attaching Upper Tether Straps

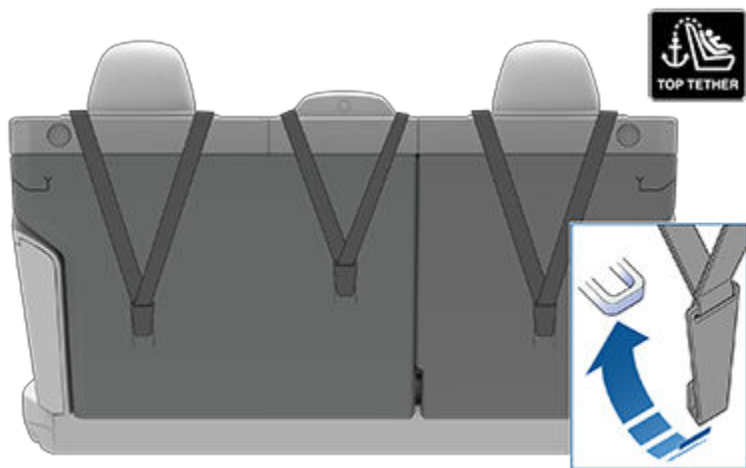
If an upper tether strap is provided, attach its hook to the anchor point located on the back of the rear seats.

NOTE: The location of anchor points may not be readily visible but can be found by identifying a slice in the seat's material.

⚠ WARNING: Tighten upper tether straps according to the instructions provided by the manufacturer of the child safety seat.

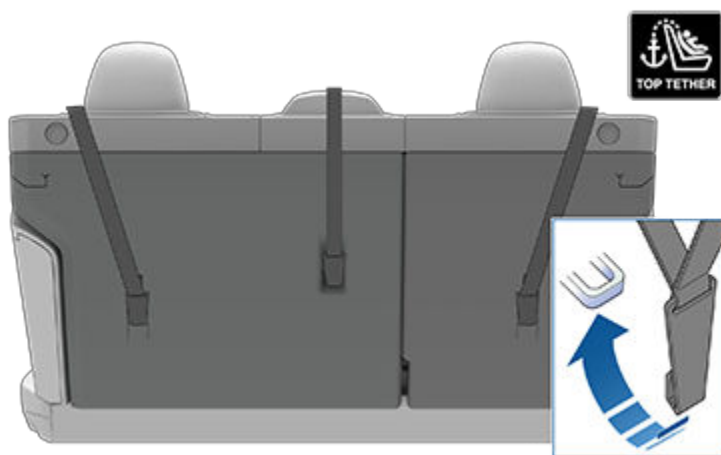
⚠ WARNING: USE ONLY SEAT BELT RETAINED CHILD SAFETY SEATS IN THE CENTER SEATING POSITION.

For dual-strap tethers, position the straps as shown.



Position single-strap tethers for the outboard seating positions to run on the outside of the head support. Position a single strap in the center seating position to run over the top of the seat as illustrated.

NOTE: To prevent the single-strap tether in the center seating position from moving side to side, the top of the seat deforms.



Testing a Child Safety Seat

Before seating a child, always make sure the child safety seat is not loose:

1. Hold the child safety seat by the belt path and try to slide the safety seat from side to side and front to back.
2. If the seat moves more than one inch (2.5 cm), it is too loose. Tighten the belt or reconnect the LATCH retained child safety seat.
3. If you are unable to reduce slack, try a different seat location or try another child safety seat.

Child Safety Seat Warnings

-  **WARNING:** Extreme hazard! Do not seat a child on the front passenger seat even if you are using a child safety seat. This seat has an airbag in front of it. Although this airbag is disabled when Model SModel X detects a lightweight passenger, do not rely on technology to protect your child.
-  **WARNING:** Child restraint systems are designed to be secured in vehicle seats by lap belts or the lap belt portion of a lap-shoulder belt. Children could be endangered in a crash if their child restraints are not properly secured in the vehicle.
-  **WARNING:** According to collision statistics, children are safer when properly restrained in the rear seating positions than in the front seating positions.
-  **WARNING:** Do not use a forward facing child safety seat until your child weighs over 20 lbs (9 kg) and can sit independently. Up to the age of two, a child's spine and neck are not sufficiently developed to avoid injury in a frontal impact.



-  **WARNING:** Do not allow a baby or infant to be held on a lap. All children should be restrained in an appropriate child safety seat at all times.
-  **WARNING:** To ensure children are safely seated, follow all instructions provided in this document and by the manufacturer of the child safety seat.
-  **WARNING:** Children should ride in a rear facing child safety seat using the seat's integrated 5-point harness for as long as possible.
-  **WARNING:** Do not use seat belt extenders on a seat belt that is being used to install a child safety seat or booster seat.
-  **WARNING:** When seating larger children, make sure the child's head is supported and the child's seat belt is properly adjusted and fastened. The shoulder portion of the belt must be away from the face and neck, and the lap portion must not be over the stomach.
-  **WARNING:** Never attach two child safety seats to one anchor point. In a collision, one anchor point may be incapable of securing both seats.
-  **WARNING:** Child restraint anchors are designed to withstand only those loads imposed by correctly fitted child restraints. Under no circumstances are they to be used for adult seat belts, harnesses, or for attaching other items or equipment to the vehicle.
-  **WARNING:** Always check harnesses and tether straps for damage and wear.
-  **WARNING:** Never leave a child unattended, even if the child is secured in a child safety seat.
-  **WARNING:** Never use a child safety seat that has been involved in a collision. Have the seat inspected or replaced as described in the child safety seat manufacturer's instructions.



Tesla Built-In Rear Facing Child Seats

Usage Restrictions

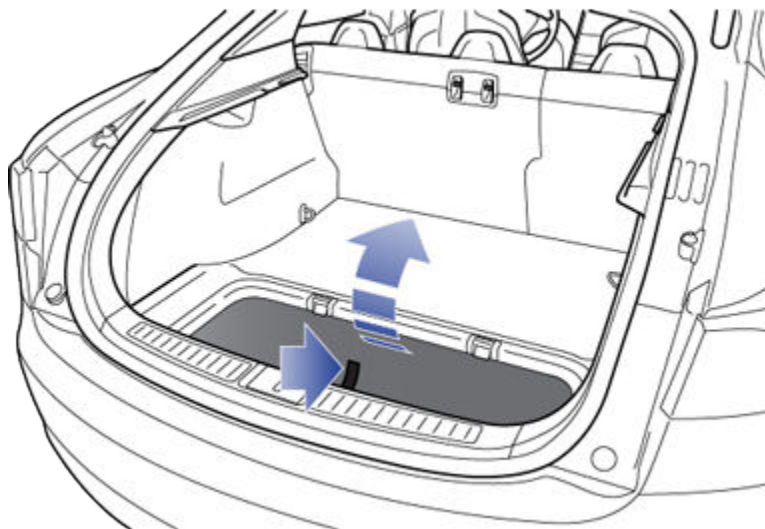
The optional Tesla built-in rear facing child seats are child restraint systems and must only be used for children over 37" (94 cm) tall and weighing between 35 and 77 lbs (16.2 to 35.2 kg).

Always ensure the top of the child's head cannot contact the vehicle and that the child is seated comfortably with the seat belts positioned and latched correctly. The child's pelvis must be held securely in place by the lap belt. Follow all instructions provided and **do not use supplemental child safety seats in these seats**.

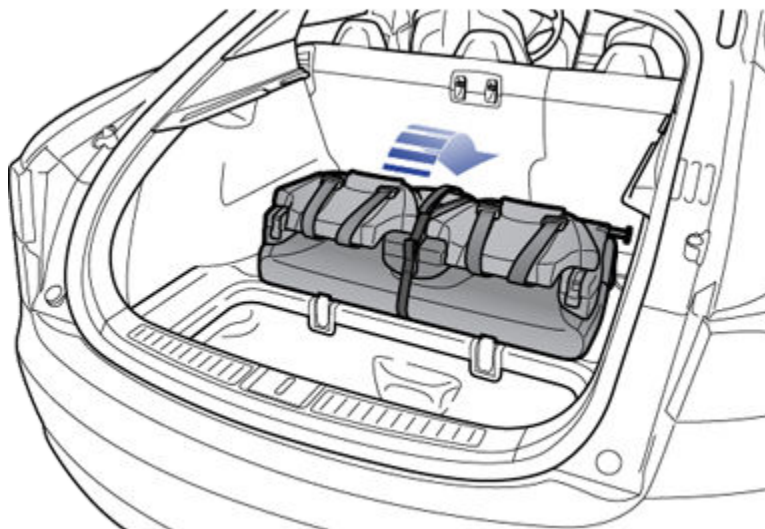
NOTE: Whenever a child is seated in the Tesla built-in rear facing child seats, it is recommended that you set the climate control system to draw outside air into Model S/Model X instead of recirculating the air. This draws more air into the rear seating areas. See [#unique_235 on page .](#)

Opening

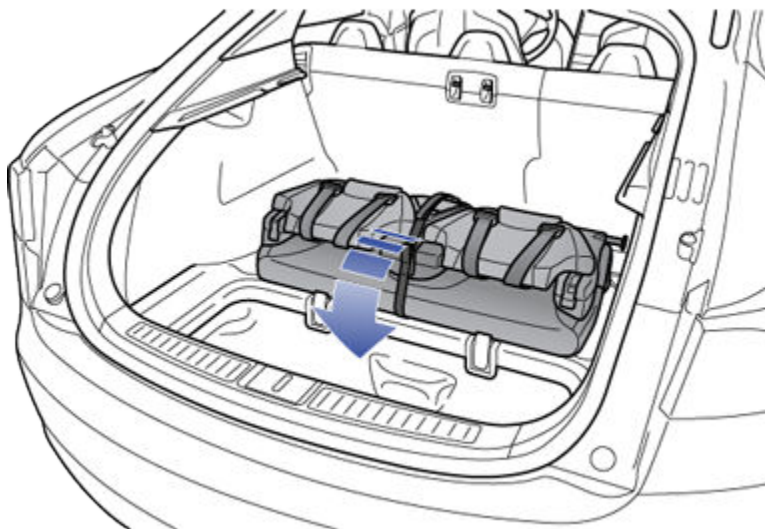
1. Remove the cover from the trunk floor and pull the strap to lift the seat assembly upward.



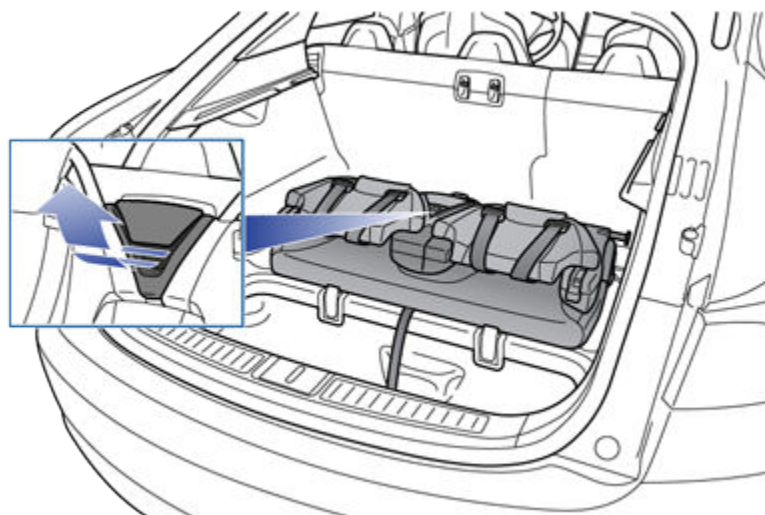
2. Push the seat assembly into position.



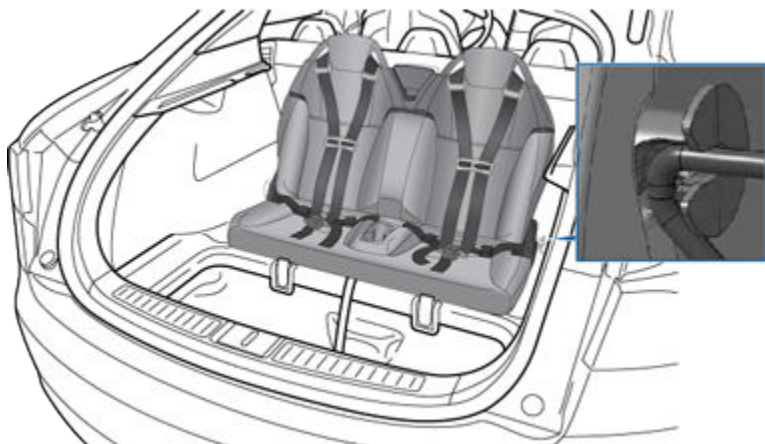
3. Undo the Velcro strap.



4. Pull the handle to release the head supports from the seat back, then pull the head supports toward you to unfold them.



5. Raise the seat back to the upright position and push until it locks into position. Visually check to ensure that the retaining catches are engaged.



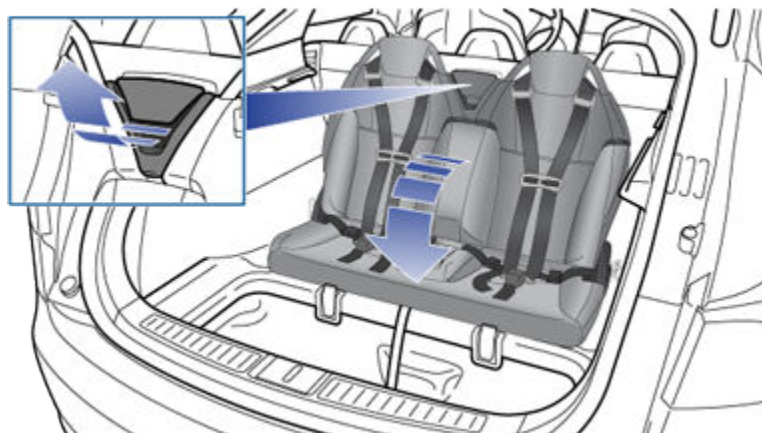
6. Check that the seat back and seat base are securely retained in the upright position by trying to pull the seat back toward you.



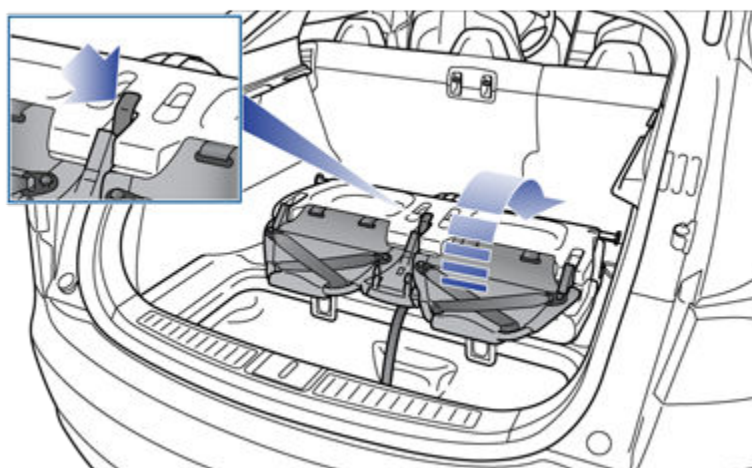
Folding

CAUTION: Before folding the seats, fasten the seat belts to prevent them from getting trapped in the seat mechanism and being damaged.

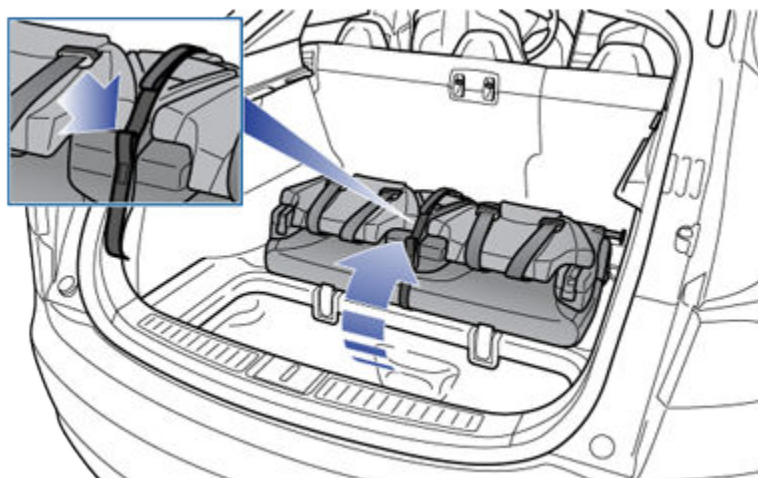
1. Pull the handle to release the seat back and pull the seat back fully forward.



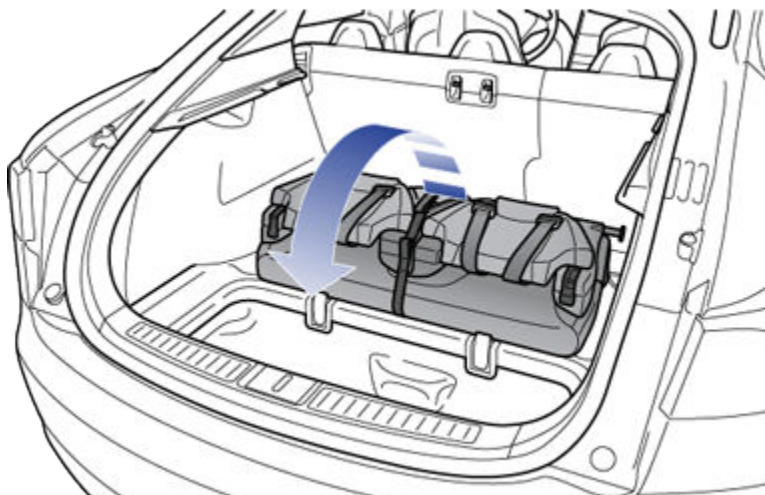
2. Push the lever to release the head supports from the seat back, then fold back onto the seat.



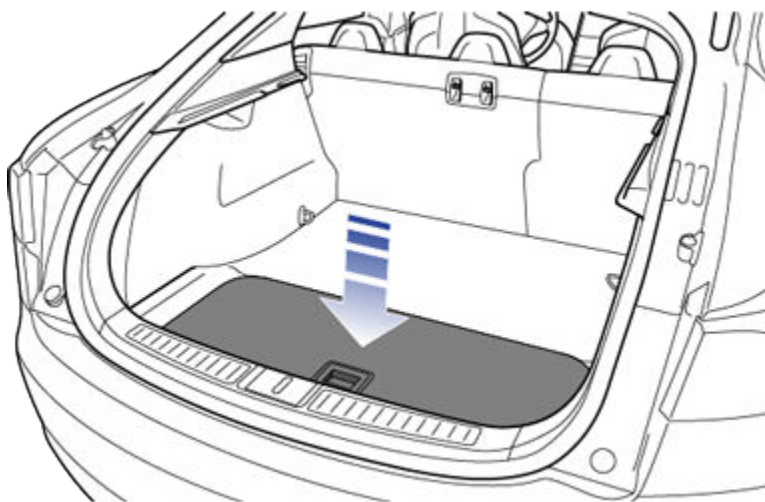
3. Secure the Velcro strap.



4. Pull the strap at the rear of the seat to fold the seat assembly into the trunk floor.



5. Replace the cover on the trunk floor.



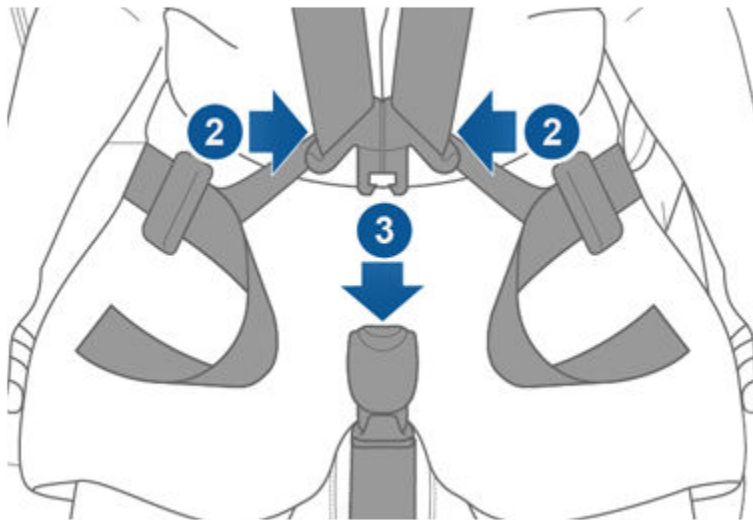
Seating a Child

The Tesla built-in rear facing child seats are child restraint systems and must only be used for children over 37" (94 cm) tall and weighing between 35 and 77 lbs (16.2 to 35.2 kg).

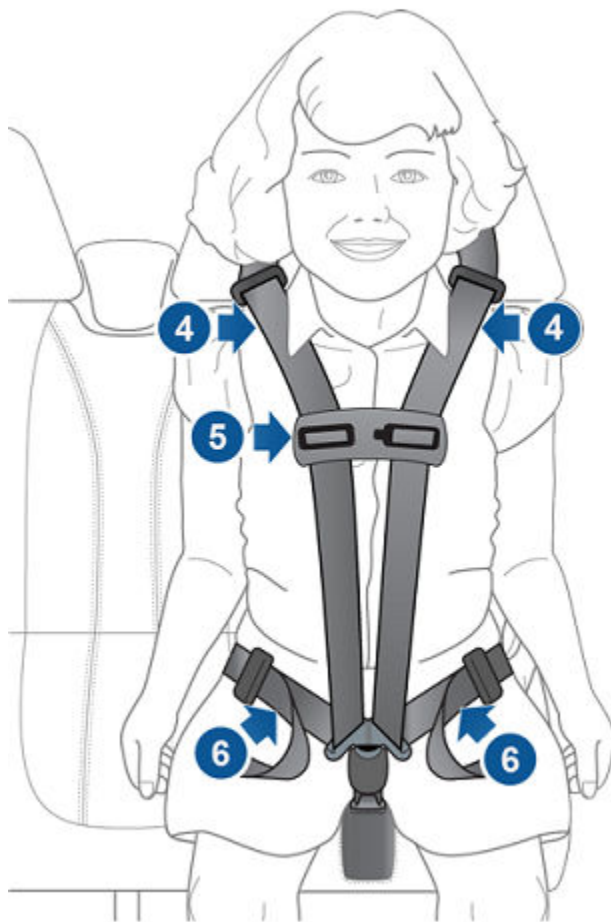
Always ensure the top of the child's head cannot contact the vehicle and that the child is seated comfortably with the seat belts positioned and latched correctly. The child's pelvis must be held securely in place by the lap belt. Follow all instructions provided and **do not use supplemental child safety seats in these seats.**

NOTE: Whenever a child is seated in the Tesla built-in rear facing child seats, it is recommended that you set the climate control system to draw outside air into Model S/Model X instead of recirculating the air. This draws more air into the rear seating areas. See [#unique_235 on page](#) .

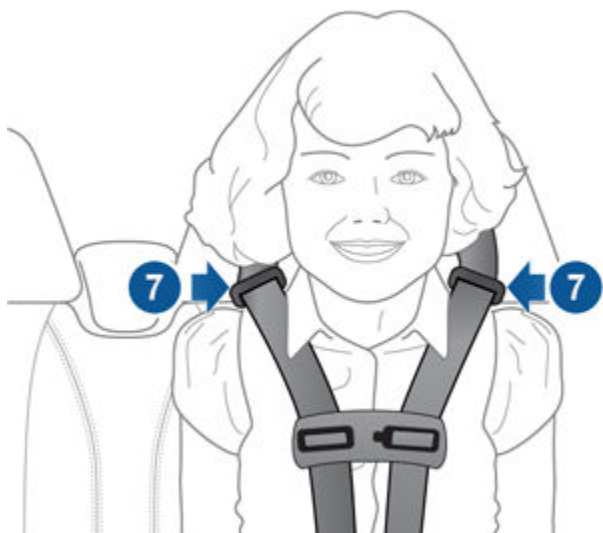
1. Position the child in the seat with arms through the loops of the seat belts.
2. Connect the two halves of the seat belt tongue.
3. Insert the seat belt tongue into the buckle and ensure it is securely fastened.



4. Adjust the shoulder belts so they run over the top of the child's shoulders and away from the face.
5. Connect the chest clip and adjust it to be as high as possible without causing the shoulder belts to touch the child's neck.
6. Pull the lower straps until the child is securely held in the seat.



7. Slide the shoulder clips into place to ensure the upper portion of the belts remain positioned over the child's shoulders.



To release, press the button on the buckle, release the chest clip, and separate the two halves of the seat restraint.

Warnings - Tesla Child Seats

-  **WARNING:** The Tesla built-in rear facing seats are child restraint systems and must only be used for children over 37" (94 cm) tall and weighing between 35 and 77 lbs (16.2 to 35.2 kg).
-  **WARNING:** Do not use supplemental child restraint systems, including booster seats, in the Tesla built-in rear facing child seats.
-  **WARNING:** Always ensure that the top of the child's head cannot touch the vehicle and that the child is seated comfortably with the seat belts correctly fastened.
-  **WARNING:** Follow all instructions and heed all warnings related to the Tesla built-in rear facing child seats. Failure to do so can compromise occupant safety.
-  **WARNING:** Read all safety warnings and labels attached to the seats.
-  **WARNING:** Do not leave children unattended in Model S/Model X, even if the child is secured in a child safety seat or a Tesla built-in rear facing child seat. In hot weather, the interior temperature can reach dangerous levels that can result in dehydration, serious injury or death.
-  **WARNING:** Do not remove or replace the fabric on a Tesla built-in rear facing child seat. The covers are an integral part of the restraint's performance and should not be removed or replaced with any other type than those supplied by Tesla.
-  **WARNING:** If the Tesla built-in rear facing child seats have been worn in an accident, they must be inspected or replaced by Tesla, even if damage is not obvious.
-  **WARNING:** Before allowing a child to ride in the Tesla built-in rear facing child seats, check that the seat is securely held in the upright position by trying to pull the seat back toward you.
-  **WARNING:** Do not remove the built-in rear facing child seats for any reason, including cleaning. To ensure safety of occupants, removal and installation must be performed by qualified Tesla service technicians.
-  **WARNING:** Do not make modifications or additions that can interfere with the operation of the Tesla built-in rear facing child seats.
-  **WARNING:** To prevent injury, ensure all loose items (bags, luggage, etc.) are secured. In an accident, or during hard braking and sharp turns, loose items could cause injury.

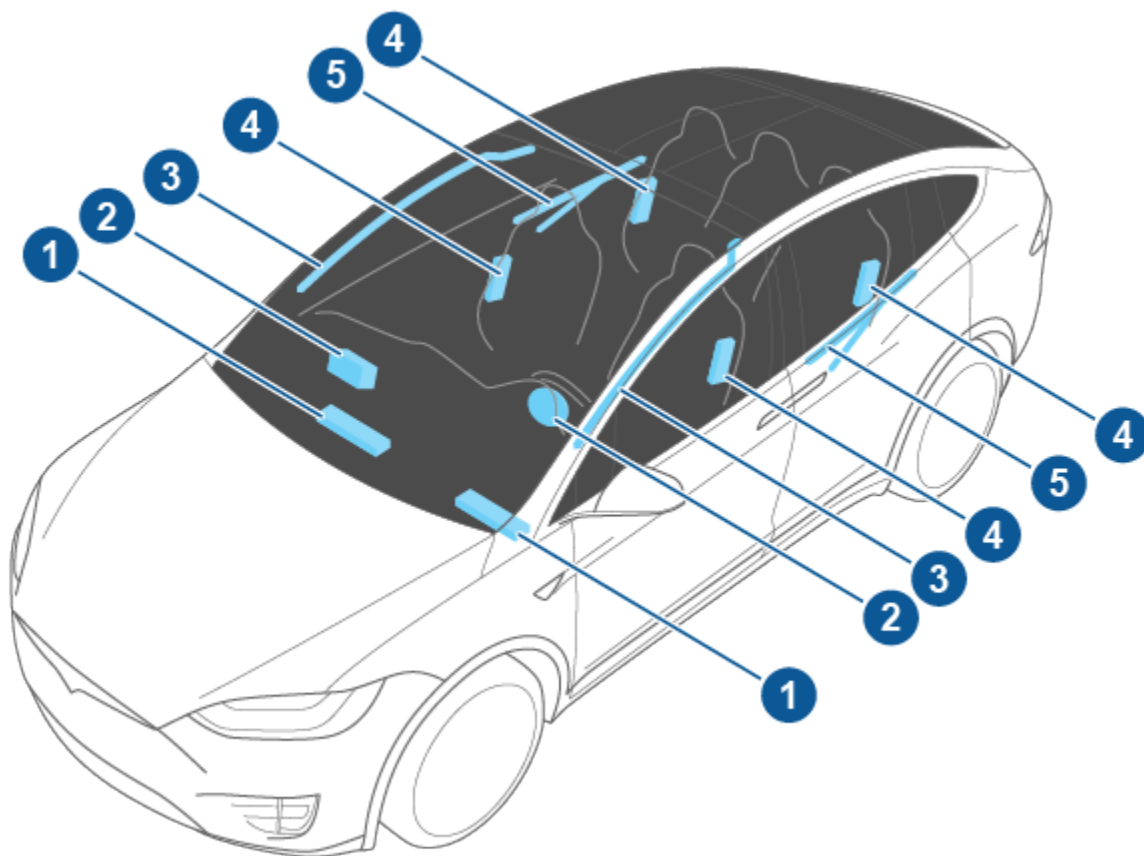


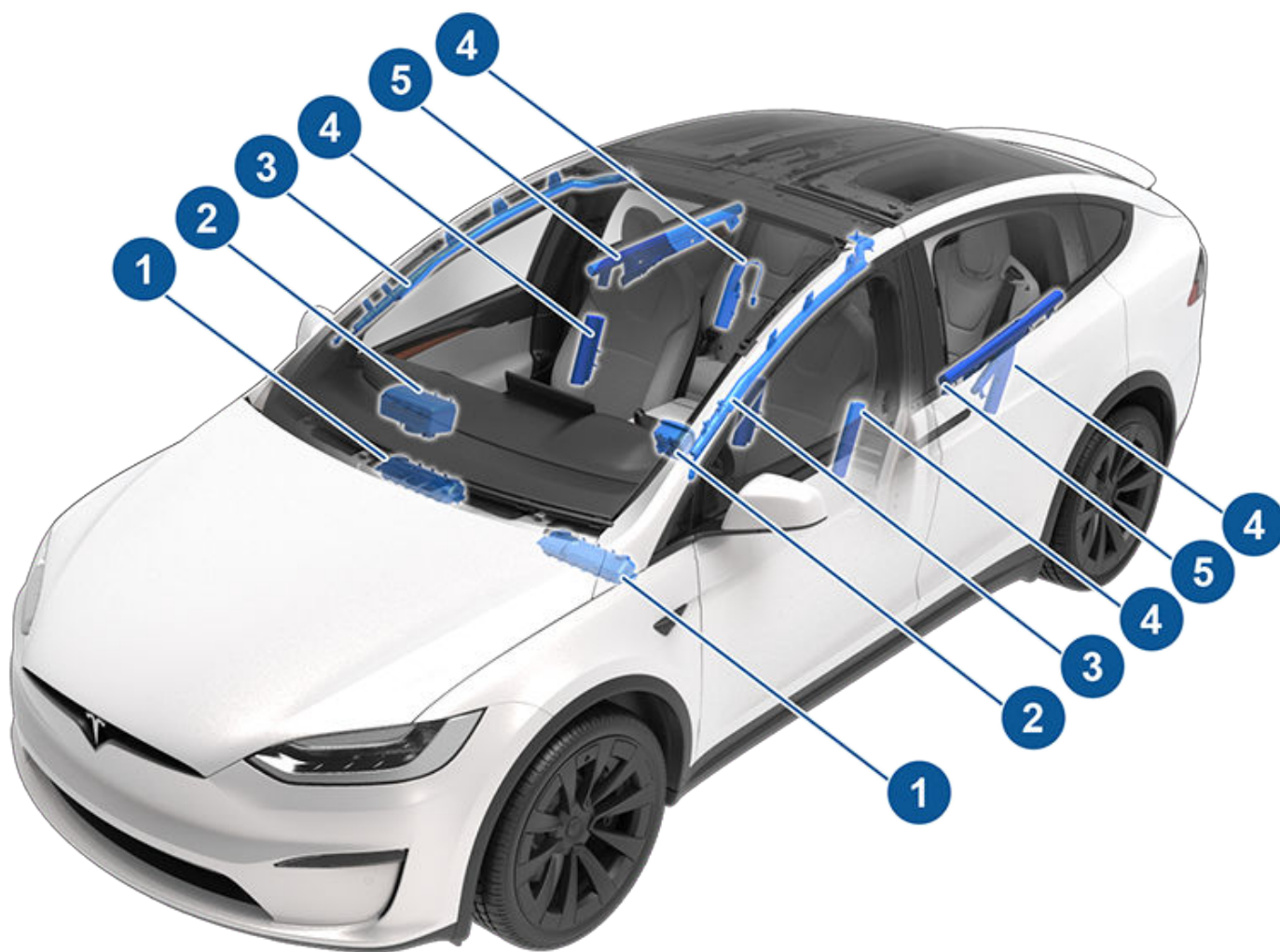
Airbags

Location of Airbags

Airbags are located in the approximate areas shown below. Airbag warning information is printed on the sun visors.

Model S Model X is equipped with an airbag and lap/shoulder belt at both front seating positions. The airbag is a supplemental restraint at those seating positions. All occupants, including the driver, should always wear their seat belts whether or not an airbag is also provided at their seating position to minimize the risk of severe injury or death in the event of a crash.





1. Knee airbags
2. Front airbags
3. Curtain airbags
4. Seat-mounted side airbags
5. Door-mounted airbags



How Airbags Work

Airbags inflate when sensors detect an impact that exceeds deployment thresholds. These thresholds are designed to predict the severity of a crash in time for the airbags to help protect the vehicle's occupants. Airbags inflate instantly with considerable force accompanied by a loud noise. The inflated bag, together with the seat belts, limits movement of occupants to reduce the risk of injury.

Front airbags are not ordinarily designed to inflate in rear collisions, rollovers, side collisions and when braking heavily or driving over bumps and potholes. Likewise, front airbags may not inflate in all frontal collisions, such as minor front collisions, underride collisions, or minor impacts with narrow objects (such as posts or poles). Significant superficial damage can occur to the vehicle without the airbags inflating and, conversely, a relatively small amount of structural damage can cause airbags to inflate. Therefore, the external appearance of the vehicle after a collision does not represent whether or not the front airbags should have inflated.



WARNING: Before modifying your vehicle to accommodate a person with disabilities in a way that may affect the airbag system, contact Tesla.

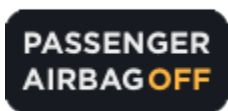
Types of Airbags

Model S Model X has the following types of airbags:

- **Front airbags:** The front airbags are designed to reduce injuries if larger children or adults are riding in the front seats. Follow all warnings and instructions related to seating a child on the front passenger seat (if permitted in your market region).
- **Knee airbags:** Knee airbags and the front airbags work together. The knee airbags limit the forward motion of the front seat occupants by restricting leg movement, thereby positioning the occupants so that the front airbags work more effectively. Whether or not knee airbags deploy in a collision is partially dependent on the track position of the associated seat.
- **Seat-mounted side airbags:** A seat-mounted side airbag in the front driver, front passenger and second row outboard seats help protect the pelvis and the thorax region of the torso. The seat-mounted side airbags on both the impacted and non-impacted side of the vehicle will inflate in the event of severe side impact or severe offset frontal impact.
- **Curtain airbags:** A curtain airbag on each side of Model X in the front roof-rail help protect the head. Curtain airbags on both the impacted and non-impacted side of the vehicle will inflate if a severe side impact occurs, a severe offset frontal impact occurs, or if the vehicle rolls over.
- **Door-mounted airbags:** There is an airbag on each side of Model X mounted in the trim on the falcon wing doors. These are the same as the curtain airbags in that they help protect the head and typically inflate in the event of a severe side impact, a severe offset frontal impact, or if the vehicle rolls over. The door-mounted airbags on both the impacted and non-impacted side of the vehicle will inflate.

Passenger Front Airbag Status

The status of the passenger front airbag displays on the touchscreen:



The Passenger Airbag Off indicator displays on the touchscreen only when the passenger front airbag is OFF. When the passenger front airbag is OFF, it will not inflate when a collision occurs. This indicator does not display when the airbag is ON or when the seat is unoccupied.



The Passenger Airbag Off indicator displays only when the passenger front airbag is OFF. When the passenger front airbag is OFF, it does not inflate when a collision occurs. This indicator does not display when the airbag is ON or when the seat is unoccupied.



To protect an adult occupying the front passenger seat, ensure the passenger front airbag is ON. When the passenger airbag is ON, it may inflate when a collision occurs.

Disabling the Passenger Front Airbag

Model S Model X has an occupancy sensor in the front passenger seat that controls the status of the passenger front airbag.

NOTE: The occupancy sensor system meets the regulatory requirement of FMVSS 208 and automatically detects when inflating the passenger front airbag would be unnecessary or potentially harmful.



Weight in front passenger seat	Passenger airbag status	Indicator status
Empty	OFF	PASSENGER AIRBAG OFF
Up to 20 lbs (9 kg)	OFF	PASSENGER AIRBAG OFF
20-100 lbs (9-45 kg)*	OFF or ON	OFF - PASSENGER AIRBAG OFF ON - PASSENGER AIRBAG ON
Over 100 lbs (45 kg)	ON	PASSENGER AIRBAG ON

*Values are approximate. A weight detected near the threshold can cause the airbag status to occasionally turn on and off depending on seating position and physique.

NOTE: It takes approximately six seconds after you power on Model SModel X for the occupancy sensor to report accurate status of the front passenger airbag. As a result, when you first power on Model SModel X, even in situations when it should be OFF because the seat is occupied by a weight of 20 lbs (9 kg) or less, it will take the touchscreen approximately six seconds to display the status, PASS AIRBAG OFF. If it fails to do so, contact Tesla service immediately and do not seat a child in the front passenger seating position.

To make sure the sensing system can correctly detect occupancy status, eliminate the following:

- Objects lodged under the seat.
- Heavy objects sitting on the seat (briefcase, large purse).
- Objects wedged between the seat back and seat cushion.
- Cargo interfering with the seat.
- Aftermarket items attached to, or sitting on or between, the seat and occupant including but not limited to covers, mats, blankets, etc.

These conditions can interfere with the occupancy sensor. If you have eliminated the above possibilities, and the airbag status is still incorrect, ask passengers to ride in the rear seats and contact Tesla to have the airbag system checked.

NOTE: The front passenger occupancy sensor affects the operation of the passenger front airbags only. The side airbags are not affected.



WARNING: If the front passenger airbag is not turning on or off as expected based on the weight thresholds previously described, contact Tesla immediately.



WARNING: If seating a child in the front passenger seat is legally permissible in your market region, it is the driver's responsibility to ensure that the passenger front airbag is OFF. Never seat a child in a rear facing safety seat in the front passenger seat with an active airbag. DEATH or SERIOUS INJURY to the child can occur. Per recommendations by the National Highway Traffic Safety Administration, all occupants age 12 and under must ride in the rear seats.



WARNING: Do not use seat covers on Model SModel X. Doing so could restrict deployment of the seat-mounted side air bags if a collision occurs. It can also reduce the accuracy of the occupant detection system, if equipped.



Controlling the Passenger Front Airbag

Model S Model X has an occupancy classification system (OCS) that controls the status of the passenger front airbag.

NOTE: The occupancy classification system (OCS) meets the regulatory requirement of FMVSS 208 and automatically detects when inflating the passenger front airbag would be unnecessary or potentially harmful.



WARNING: Seating an infant in a rear facing child safety seat on a seat equipped with an operational airbag can cause serious injury or death.

Object Classification	OCS Passenger Airbag Status*	Indicator status	Notes
Empty	OFF	PASSENGER AIRBAG OFF	
Object	OFF or ON	PASSENGER AIRBAG OFF or PASSENGER AIRBAG ON	Depends on material/contents
Rear facing child seat designed for children up to a year old	OFF	PASSENGER AIRBAG OFF	20 lbs (9 kg) or less
Forward facing child seat	OFF	PASSENGER AIRBAG OFF	35 lbs (16 kg) or less
Child in a booster seat	OFF or ON	PASSENGER AIRBAG OFF or PASSENGER AIRBAG ON	20-100 lbs (9-45 kg)*
Large child	OFF or ON	PASSENGER AIRBAG OFF or PASSENGER AIRBAG ON	
5th percentile female or larger (by weight)	ON	PASSENGER AIRBAG ON	Over approximately 100 lbs (45 kg)
*If the passenger airbag status indicator does not match the situation, do not use the seat. The passenger must ride in a different seat. Contact Tesla Service.			

NOTE: It takes approximately six seconds after you power on Model S Model X for the occupant classification system (OCS) to report accurate status of the front passenger airbag. As a result, when you first power on Model S Model X, even in situations when it should be OFF because the seat is occupied by a weight of 20 lbs (9 kg) or less, it will take the touchscreen approximately six seconds to display the status, PASS AIRBAG OFF. If it fails to do so, contact Tesla Service and do not seat a child in the front passenger seating position.

To make sure the sensing system can correctly detect occupancy status, eliminate the following:

- Objects lodged under the seat.
- Heavy objects sitting on the seat (briefcase, large purse).
- Objects wedged between the seat back and seat cushion.
- Cargo interfering with the seat.
- Aftermarket items attached to, or sitting on or between, the seat and occupant including but not limited to covers, mats, blankets, etc.

These conditions can interfere with the occupancy sensor. If you have eliminated the above possibilities, and the airbag status is still incorrect, ask passengers to ride in the rear seats and contact Tesla to have the airbag system checked.

NOTE: The front passenger occupancy sensor affects the operation of the passenger front airbags only. The side airbags are not affected.



WARNING: If the front passenger airbag is not turning on or off as expected based on the weight thresholds previously described, contact Tesla immediately.



WARNING: Never seat a child in the front passenger seat. DEATH or SERIOUS INJURY to the child can occur. Per recommendations by the National Highway Traffic Safety Administration, all occupants age 12 and under must ride in the rear seats.



WARNING: To ensure accuracy of the occupant detection system, do not make any modifications to the front passenger seat.



WARNING: Do not use seat covers on Model S/Model X. Doing so could restrict deployment of the seat-mounted side air bags if a collision occurs. It can also reduce the accuracy of the occupant detection system and the noise-canceling microphones, if equipped.

Ensuring Accurate Occupant Classification

To help ensure an occupant in the front passenger seat can be accurately classified, the passenger must:

- Wear a seat belt.
- Sit upright on the center of the seat cushion, with shoulders resting against the seat back and legs extended comfortably in front with feet on the floor. See [Examples of Correct and Incorrect Seating Positions on page 168](#) [Examples of Correct and Incorrect Seating Positions on page 166](#).
- Remain positioned on the seat cushion and not lift their weight off the seat (for example, by pushing their feet against the floor or pressing on the center console or armrest to lift up).
- Never wear thick, wet, or bulky clothing (such as ski wear or padded clothing).

In addition to the items listed above, the following situations can interfere with the accuracy of the occupant classification system:

- Placing a radio transmitter (for example, a hunting radio or walkie-talkie) on the front passenger seat.
- Placing an AC/DC inverter, or a device that is being powered by the inverter (for example, a cell phone, tablet, or computer) on the front passenger seat cushion.
- Placing liquid (such as a bottled drink) or food containers on a car seat when a child seat is present.
- Incorrectly placing a child safety seat so that the entire lower section is not positioned against the seat cushion.
- Objects lodged under the seat or wedged between the seat back and cushion.
- Heavy objects sitting on the seat (briefcase, large purse).
- Cargo interfering with the seat.
- Aftermarket items attached to or placed between the seat and the occupant, such as covers, mats, blankets, etc.

These conditions can interfere with the occupancy sensor. If you have eliminated the above possibilities, and the airbag status is still incorrect, instruct passengers to ride in the rear seats and contact Tesla to have the airbag system checked.

NOTE: Tesla follows NHTSA (National Highway Traffic Safety Administration) recommendations that all occupants age 12 and under must ride in the rear seating positions.

NOTE: The front passenger occupancy sensor affects the operation of the passenger front airbags only. The side airbags are not affected.

WARNING: Failure to follow the above instructions can adversely affect the Occupant Classification System (OCS) which can cause serious injury or death.

WARNING: If the front passenger airbag is not turning on or off as expected, do not seat a passenger in the front passenger seat. Contact Tesla Service.

WARNING: To ensure accuracy of the occupant detection system, do not make any modifications to the front passenger seat.

WARNING: Do not use seat covers on Model S/Model X. Doing so could restrict deployment of the seat-mounted side air bags if a collision occurs. It can also reduce the accuracy of the occupant classification system.

Examples of Correct and Incorrect Seating Positions

Correct seating position:



Incorrect seating position - the passenger's feet must be on the floor:



Incorrect seating position - the passenger must not slide forward on the seat cushion:



Incorrect seating position - the passenger must not recline the backrest to a laying down position when the vehicle is moving:



Examples of Correct and Incorrect Seating Positions

Correct seating position:



Incorrect seating position - the passenger's feet must be on the floor:



Incorrect seating position - the passenger must not slide forward on the seat cushion:



Incorrect seating position - the passenger must not recline the backrest to a laying down position when the vehicle is moving:





Inflation Effects

 **WARNING:** When airbags inflate, a fine powder is released. This powder can irritate the skin and should be thoroughly flushed from the eyes and from any cuts or abrasions.

After inflation, the airbags deflate to provide a gradual cushioning effect for the occupants and to ensure the driver's forward vision is not obscured.

If airbags have inflated, or if your vehicle has been in a collision, always have the airbags, seat belt pre-tensioners and any associated components checked and, if necessary, replaced by Tesla.

In a collision, in addition to the airbags inflating:

- Doors and liftgate unlock.
- Hazard warning lights turn on.
- Interior lights turn on.
- High voltage is disabled.

To restore high voltage power, use the touchscreen to manually power off Model S/Model X (see [Powering Off on page 196](#)), then press the brake to power it back on again.

Airbag Warning Indicator



The airbag indicator on the touchscreen remains lit if the airbag system is malfunctioning. The only time this indicator should light up is briefly when Model S/Model X first powers up, in which case it turns off within a few seconds. If it remains lit, contact Tesla immediately and do not drive.

Airbag Warnings

-  **WARNING:** All occupants, including the driver, should always wear their seat belts, whether or not an airbag is also provided at their seating position, to minimize the risk of severe injury or death in the event of a collision.
-  **WARNING:** Front seat occupants should not place their arms over the airbag module, as an inflating airbag can cause fractures or other injuries.
-  **WARNING:** Do not use seat covers on Model S/Model X. Doing so could restrict deployment of the seat-mounted side airbags if a collision occurs. It can also reduce the accuracy of the occupant detection system, if equipped.
-  **WARNING:** Airbags inflate with considerable speed and force, which can cause injury. To limit injuries, ensure that occupants are wearing seat belts and are correctly seated, with the seat positioned as far back as possible. The National Highway Traffic Safety Administration (NHTSA) recommends a minimum distance of 10" (25 cm) between an occupant's chest and an airbag.
-  **WARNING:** Children should not be seated on the front passenger seat. Follow all regulations in your region for the appropriate way to seat a child based on the child's weight, size, and age. The safest place to seat infants and young children is in a rear seating position. Seating an infant or child on a seat equipped with an operational front airbag can cause serious injury or death.
-  **WARNING:** Do not use a rear-facing child safety seat on a seat with an operational airbag in front of it. Doing so can cause injury or death if the airbag inflates.
-  **WARNING:** To ensure correct inflation of the side airbags, maintain an unobstructed gap between an occupant's torso and the side of Model S/Model X.
-  **WARNING:** Passengers shouldn't lean their heads against doors. Doing so can cause injury if a curtain airbag inflates.
-  **WARNING:** Do not allow passengers to obstruct the operation of an airbag by placing feet, knees or any other part of the body on or near an airbag.
-  **WARNING:** Do not attach or place objects on or near the front airbags, the side of the front seats, the headliner at the side of the vehicle, or any other airbag cover that could interfere with inflation of an airbag. Objects can cause serious injury if the vehicle is in a collision severe enough to cause the airbag to inflate.
-  **WARNING:** Following inflation, some airbag components are hot. Do not touch until they have cooled.

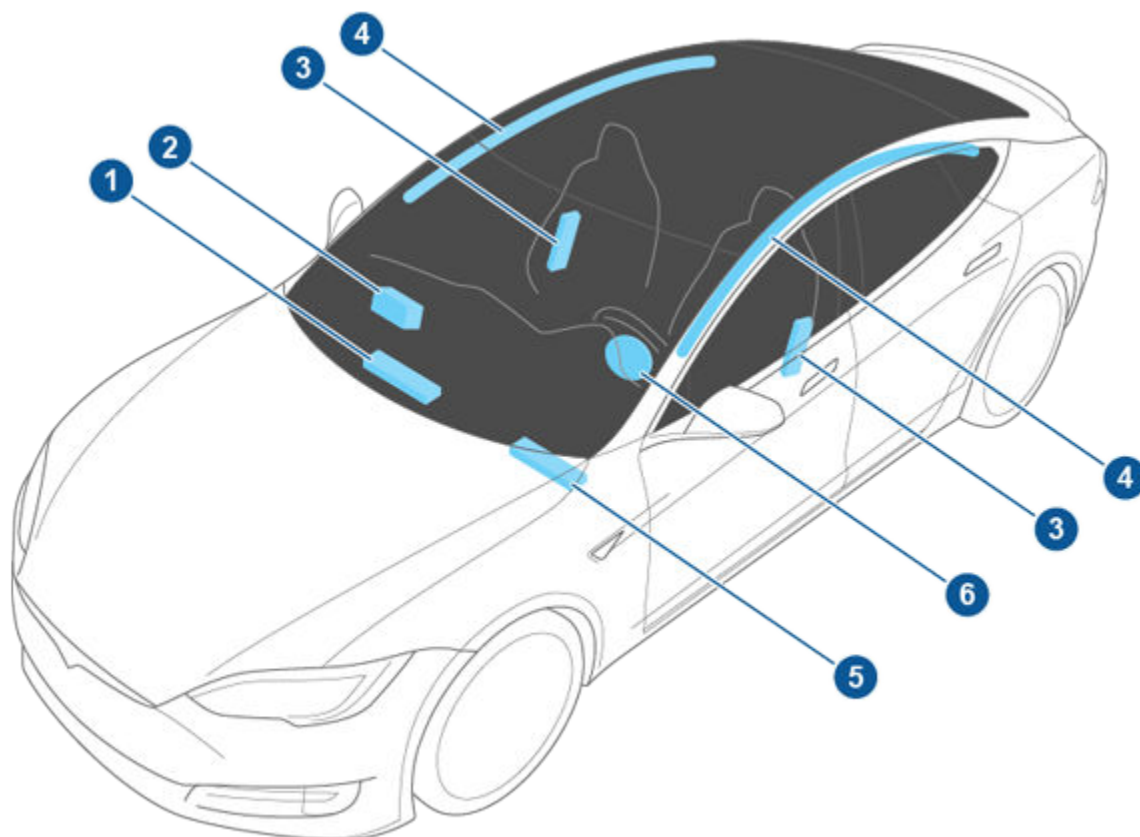


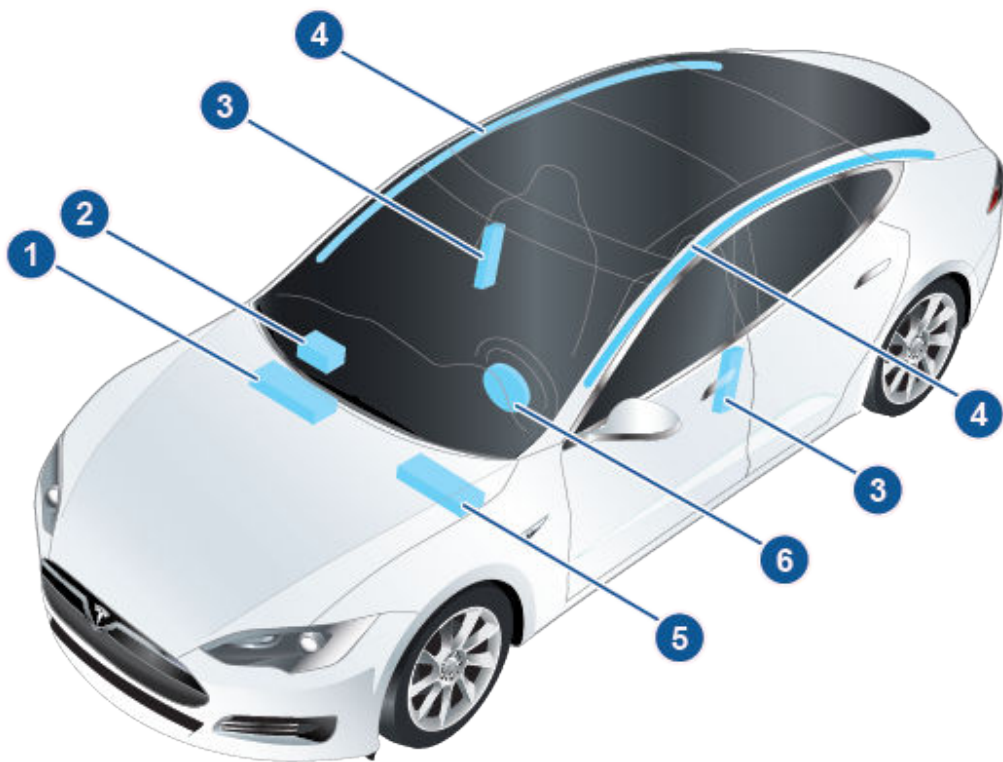
Airbags

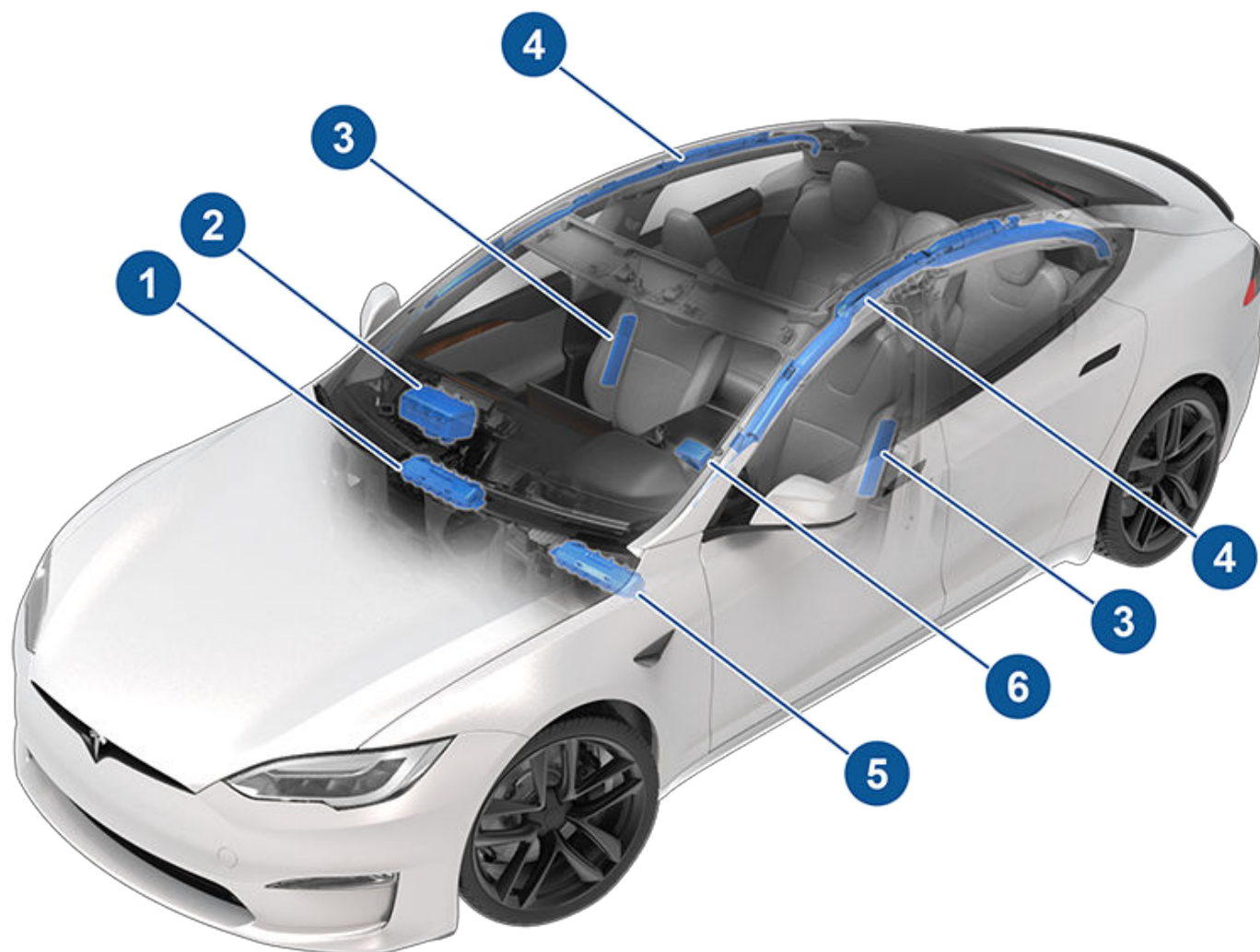
Location of Airbags

Airbags are located in the approximate areas shown below. Airbag warning information is printed on the sun visors.

Model S Model X is equipped with an airbag and lap/shoulder belt at both front seating positions. The airbag is a supplemental restraint at those seating positions. All occupants, including the driver, should always wear their seat belts whether or not an airbag is also provided at their seating position to minimize the risk of severe injury or death in the event of a crash.







1. Passenger knee airbag.
2. Passenger front airbag.
3. Side airbags.
4. Curtain airbags.
5. Driver's knee airbag.
6. Driver's front airbag.



How Airbags Work

Airbags inflate when sensors detect an impact that exceeds deployment thresholds. These thresholds are designed to predict the severity of a crash in time for the airbags to help protect the vehicle's occupants. Airbags inflate instantly with considerable force accompanied by a loud noise. The inflated bag, together with the seat belts, limits movement of occupants to reduce the risk of injury.

Front airbags are not ordinarily designed to inflate in rear collisions, rollovers, side collisions and when braking heavily or driving over bumps and potholes. Likewise, front airbags may not inflate in all frontal collisions, such as minor front collisions, underride collisions, or minor impacts with narrow objects (such as posts or poles). Significant superficial damage can occur to the vehicle without the airbags inflating and, conversely, a relatively small amount of structural damage can cause airbags to inflate. Therefore, the external appearance of the vehicle after a collision does not represent whether or not the front airbags should have inflated.



WARNING: Before modifying your vehicle to accommodate a person with disabilities in a way that may affect the airbag system, contact Tesla.

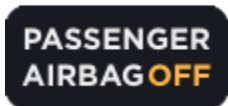
Types of Airbags

Model S Model X has the following types of airbags:

- **Front airbags:** The front airbags are designed to reduce injuries if larger children or adults are riding in the front seats. Follow all warnings and instructions related to seating a child on the front passenger seat (if permitted in your market region).
- **Knee airbags:** Knee airbags and the front airbags work together. The knee airbags limit the forward motion of the front seat occupants by restricting leg movement, thereby positioning the occupants so that the front airbags work more effectively.
- **Side airbags:** Side airbags protect the thorax region of the torso and the pelvis. They inflate only if a severe side impact occurs. Side airbags on the non-impacted side of the vehicle do not inflate.
- **Curtain airbags:** Curtain airbags help protect the head. Curtain airbags on both the impacted and non-impacted side of the vehicle inflate only if a severe side impact occurs, or if the vehicle rolls over.

Passenger Front Airbag Status

The status of the passenger front airbag displays in the top corner of the touchscreen on the touchscreen:



The Passenger Airbag Off indicator displays in the top corner of the touchscreen only when the passenger front airbag is OFF. When the passenger front airbag is OFF, it does not inflate when a collision occurs. This indicator does not display when the airbag is ON or when the seat is unoccupied.



The Passenger Airbag Off indicator displays in the top corner of the touchscreen on the touchscreen when the passenger front airbag is OFF. When the passenger front airbag is OFF, it does not inflate when a collision occurs. This indicator does not display when the seat is unoccupied.



To protect an adult occupying the front passenger seat, ensure the passenger front airbag is ON. When the passenger airbag is ON, it may inflate when a collision occurs.



Controlling the Passenger Front Airbag

Model S Model X has an occupancy sensor in the front passenger seat that controls the status of the front airbag.

NOTE: The occupancy classification system (OCS) meets the regulatory requirement of FMVSS 208 and automatically detects when inflating the passenger front airbag would be unnecessary or potentially harmful.

WARNING: Seating an infant in a rear facing child safety seat on a seat equipped with an operational airbag can cause serious injury or death.

Object Classification	OCS Passenger Airbag Status*	Indicator status	Notes
Empty	OFF	PASSENGER AIRBAG OFF	
Object	OFF or ON	PASSENGER AIRBAG OFF or PASSENGER AIRBAG ON	Depends on material/contents.
Rear facing child seat designed for children up to a year old	OFF	PASSENGER AIRBAG OFF	20 lbs (9 kg) or less
Forward facing child seat	OFF	PASSENGER AIRBAG OFF	35 lbs (16 kg) or less
Child in a booster seat	OFF or ON	PASSENGER AIRBAG OFF or PASSENGER AIRBAG ON	20–100 lbs (9–45 kg)*
Large child	OFF or ON	PASSENGER AIRBAG OFF or PASSENGER AIRBAG ON	
5th percentile female or larger (by weight)	ON	PASSENGER AIRBAG ON	Over approximately 100 lbs (45 kg)
*If the passenger airbag status indicator does not match the situation, do not use the seat. The passenger must ride in a different seat. Contact Tesla Service.			

NOTE: It takes approximately six seconds after you power on Model S Model X for the occupant classification system (OCS) to report accurate status of the front passenger airbag. As a result, when you first power on Model S Model X, even in situations when it should be OFF because the seat is occupied by a weight of 20 lbs (9 kg) or less, a delay of approximately six seconds can occur before the touchscreen displays the PASS AIRBAG OFF status. If it fails to do so, contact Tesla Service and do not seat a child in the front passenger seating position.

To make sure the sensing system can correctly detect occupancy status, eliminate the following:

- Objects lodged under the seat.
- Heavy objects sitting on the seat (briefcase, large purse).
- Objects wedged between the seat back and seat cushion.
- Cargo interfering with the seat.
- Aftermarket items attached to, or sitting on or between, the seat and occupant including but not limited to covers, mats, blankets, etc.

These conditions can interfere with the occupancy sensor. If you have eliminated the above possibilities, and the airbag status is still incorrect, ask passengers to ride in the rear seats and contact Tesla to have the airbag system checked.

NOTE: The front passenger occupancy sensor affects the operation of the passenger front airbags only. The side airbags are not affected.

WARNING: If the front passenger airbag is not turning on or off as expected based on the weight thresholds previously described, contact Tesla immediately.

WARNING: Never seat a child in the front passenger seat. DEATH or SERIOUS INJURY to the child can occur. Per recommendations by the National Highway Traffic Safety Administration, all occupants age 12 and under must ride in the rear seats.



WARNING: Do not use seat covers on Model S/Model X. Doing so could restrict deployment of the seat-mounted side air bags if a collision occurs. It can also reduce the accuracy of the occupant detection system and the noise-canceling microphones, if equipped.

Ensuring Accurate Occupant Classification

To help ensure an occupant in the front passenger seat can be accurately classified, the passenger must:

- Wear a seat belt.
- Sit upright on the center of the seat cushion, with shoulders resting against the seat back and legs extended comfortably in front with feet on the floor. See [Examples of Correct and Incorrect Seating Positions on page 177](#) [Examples of Correct and Incorrect Seating Positions on page 179](#).
- Remain positioned on the seat cushion and not lift their weight off the seat (for example, by pushing their feet against the floor or pressing on the center console or armrest to lift up).
- Never wear thick, wet, or bulky clothing (such as ski wear or padded clothing).

In addition to the items listed above, the following situations can interfere with the accuracy of the occupant classification system:

- Placing a radio transmitter (for example, a hunting radio or walkie-talkie) on the front passenger seat.
- Placing an AC/DC inverter, or a device that is being powered by the inverter (for example, a cell phone, tablet, or computer) on the front passenger seat cushion.
- Placing liquid (such as a bottled drink) or food containers on a car seat when a child seat is present.
- Objects lodged under the seat or wedged between the seat back and cushion.
- Heavy objects sitting on the seat (briefcase, large purse).
- Cargo interfering with the seat.
- Aftermarket items attached to or placed between the seat and the occupant, such as covers, mats, blankets, etc.

These conditions can interfere with the occupancy sensor. If you have eliminated the above possibilities, and the airbag status is still incorrect, instruct passengers to ride in the rear seats and contact Tesla to have the airbag system checked.

NOTE: The front passenger occupancy sensor affects the operation of the passenger front airbags only. The side airbags are not affected.

WARNING: Tesla follows NHTSA (National Highway Traffic Safety Administration) recommendations that all occupants age 12 and under must ride in a rear seating position.

WARNING: Failure to follow the above instructions can adversely affect the Occupant Classification System (OCS) which can cause serious injury or death.

WARNING: If the front passenger airbag is not turning on or off as expected, do not seat a passenger in the front passenger seat. Contact Tesla Service.

WARNING: To ensure accuracy of the occupant detection system, do not make any modifications to the front passenger seat.

WARNING: Do not use seat covers on Model S/Model X. Doing so could restrict deployment of the seat-mounted side air bags if a collision occurs. It can also reduce the accuracy of the occupant classification system.

Examples of Correct and Incorrect Seating Positions

Correct seating position:



Incorrect seating position - the passenger's feet must be on the floor:



Incorrect seating position - the passenger must not slide forward on the seat cushion:



Incorrect seating position - the passenger must not recline the backrest to a laying down position when the vehicle is moving:



Examples of Correct and Incorrect Seating Positions

Correct seating position:



Incorrect seating position - the passenger's feet must be on the floor:



Incorrect seating position - the passenger must not slide forward on the seat cushion:



Incorrect seating position - the passenger must not recline the backrest to a laying down position when the vehicle is moving:



Inflation Effects

WARNING: When airbags inflate, a fine powder is released. This powder can irritate the skin and should be thoroughly flushed from the eyes and from any cuts or abrasions.

After inflation, the airbags deflate to provide a gradual cushioning effect for the occupants and to ensure the driver's forward vision is not obscured.

If airbags have inflated, or if your vehicle has been in a collision, always have the airbags, seat belt pre-tensioners and any associated components checked and, if necessary, replaced by Tesla.

In a collision, in addition to the airbags inflating:

- Doors unlock, and the door handles extend.
- Hazard warning lights turn on.
- Interior lights turn on.
- High voltage is disabled (you must contact Tesla Service to restore high voltage power).

Airbag Warning Indicator



The airbag indicator on the instrument cluster remains lit if the airbag system is malfunctioning. The only time this indicator should light up is briefly when Model S/Model X first powers up, in which case it turns off within a few seconds. If it remains lit, contact Tesla immediately and do not drive.

Airbag Warnings

- WARNING:** Do not place objects over or near airbags because any such objects could cause harm if the vehicle is in a crash severe enough to cause the airbag to inflate.
- WARNING:** All occupants, including the driver, should always wear their seat belts, whether or not an airbag is also provided at their seating position, to minimize the risk of severe injury or death in the event of a collision.
- WARNING:** Front seat occupants should not place their arms over the airbag module, as an inflating airbag can cause fractures or other injuries.
- WARNING:** Do not use seat covers on Model S/Model X. Doing so could restrict deployment of the seat-mounted side airbags if a collision occurs. It can also reduce the accuracy of the occupant detection system and the noise-canceling microphones, if equipped.
- WARNING:** Airbags inflate with considerable speed and force, which can cause injury. To limit injuries, ensure that occupants are wearing seat belts and are correctly seated, with the seat positioned as far back as possible. The National Highway Traffic Safety Administration (NHTSA) recommends a minimum distance of 10" (25 cm) between an occupant's chest and an airbag.



-  **WARNING:** Children should not be seated on the front passenger seat. Follow all regulations in your region for the appropriate way to seat a child based on the child's weight, size, and age. The safest place to seat infants and young children is in a rear seating position. Seating an infant or child on a seat equipped with an operational front airbag can cause serious injury or death.
-  **WARNING:** To ensure correct inflation of the side airbags, maintain an unobstructed gap between an occupant's torso and the side of Model S/Model X.
-  **WARNING:** Passengers shouldn't lean their heads against doors. Doing so can cause injury if a curtain airbag inflates.
-  **WARNING:** Do not allow passengers to obstruct the operation of an airbag by placing feet, knees or any other part of the body on or near an airbag.
-  **WARNING:** Do not attach or place objects on or near the front airbags, the side of the front seats, the headliner at the side of the vehicle, or any other airbag cover that could interfere with inflation of an airbag. Objects can cause serious injury if the vehicle is in a collision severe enough to cause the airbag to inflate.
-  **WARNING:** Following inflation, some airbag components are hot. Do not touch until they have cooled.

Driving

Driver Profiles

Creating a Driver Profile

When you first adjust the driver's seat, steering wheel/steering yoke position, or exterior side mirrors, the touchscreen prompts you to create a driver profile to save these adjustments. Your profile also saves various preferences you make while customizing Model S/Model X.



To add a new driver profile, touch the driver profile icon at the top of the touchscreen **Controls** screen. Then touch **Driver Profile Settings** > **Add New Driver**, type the driver's name and touch **Create Profile**. Follow the onscreen instructions to save mirror and steering wheel position to the driver profile. Check the **Use Easy Entry** checkbox if you want to save (or use existing) **Easy Entry** settings in which the driver's seat and the steering wheel/steering yoke are automatically adjusted to make it easy to enter and exit Model S/Model X.

If you change the position of the driver's seat, steering wheel/steering yoke, or exterior side mirrors after you have saved or chosen a driver profile, the touchscreen prompts you to **Save** the new position or **Restore** the previously saved position (other settings are automatically saved). To change a setting without saving or restoring, just ignore the prompt.

NOTE: Valet mode is a built-in driver profile that limits speed and restricts access to some Model S/Model X features (see [Valet Mode on page 183](#)).

NOTE: Depending on date of manufacture and options selected at time of purchase, some Model S vehicles are not equipped with the driver profile feature. Also, in cases where the vehicle is equipped with driver profiles, some features may not be automatically saved and adjusted based on the driver profile (for example, mirror position).

NOTE: To stop automatic adjustments that are in process based on a driver's profile, touch **Stop** on the Driver Profile dropdown menu. Automatic adjustments also stop if you manually adjust a seat, mirror, or the steering wheel/steering yoke.

Easy Entry

You can define an Easy Entry setting that moves the steering wheel/steering yoke and driver's seat to make it easy to enter and exit Model S/Model X. Any driver can use the Easy Entry setting by associating it with their driver's profile. When the Easy Entry setting is associated with a driver's profile, the steering wheel/steering yoke and driver's seat automatically adjust when in Park and the driver's seat belt is unbuckled, allowing an easy exit from Model S/Model X. When returning to the vehicle and stepping on the brake pedal, settings automatically adjust back to the settings used by the most recent driver profile (or based on the key if it's linked to a driver profile).

To use **Easy Entry** with a driver profile, ensure the **Use Easy Entry** box is checked.



WARNING: Never use Easy Entry to move the driver's seat to the full rearward position when a child safety seat is installed on a rear seat located behind the driver's seat. With reduced clearance, the movement of the seat may impact a child's legs, cause injury, or dislodge the seat.

Selecting Between Driver Profiles



To adjust Model S/Model X based on a driver's profile, touch the driver profile icon at the top of the touchscreen **Controls** screen. Then choose the driver, and Model S/Model X is adjusted based on the settings that have been saved to the chosen driver profile.

Saved Settings

A subset of the settings that you choose to customize your Model S/Model X are automatically saved to your driver's profile. Once saved, a green check mark appears next to the driver profile icon on the touchscreen. Examples of automatically saved driver profile settings are:

- Navigation, temperature, lights and display settings.
- Autopilot and driving preferences.

NOTE: The settings that are associated with driver profiles vary depending on the vehicle's date of manufacture and version of software installed.

Linking a Driver Profile to a Key Fob

You can link a driver profile to a specific key fob to allow Model S/Model X to automatically select the correct driver profile when the linked key fob is detected as you approach the vehicle and open the driver's door. To link a driver profile to a key fob, enter Model S/Model X with the key fob and touch the driver profile icon at the top of the touchscreen. Select the driver profile you would like to link to the key fob, then touch **Link to Key Fob**.

NOTE: Model S/Model X detects only one key fob at a time. The driver profile is linked to the key fob that is detected by the vehicle at that time. Therefore, if you want to link driver profiles to multiple key fobs, ensure that only the key fob that you would like to link the driver profile to is within detection range while performing the linking procedure. Move all other key fobs outside of the detection range (at least three feet (one meter) away from Model S/Model X).

NOTE: Model S/Model X can support up to threeseven linked key fobs. However, a driver profile can only be linked to one key fob.

To remove the link between a driver profile and key fob, touch the driver profile icon at the top of the touchscreen. Select the driver profile, then touch the **X** next to **Linked to Key Fob**.

Linking a Driver Profile to a Key

You can link a driver profile to a key (or keys) to allow Model S/Model X to automatically select the correct driver profile when the linked key is detected as you approach the vehicle and open the driver's door. To link a driver profile to a key, first ensure you are using your desired driver profile. Touch the driver profile icon at the top of the **Controls** screen. Follow the onscreen instructions to add a phone key, key card, or key fob (see [Adding and Removing Keys on page 29](#)). When finished, touch the driver icon to link the key to the desired driver profile. The name of the driver profile appears under the key to show that it is linked.

NOTE: Model S/Model X supports up to 10 driver profiles. You can link multiple keys to a driver profile, but you cannot link multiple driver profiles to a single key.

Valet Mode

When Model S/Model X is in Valet mode, the following restrictions apply:

- Speed is limited to 70 mph (113 km/h).
- Maximum acceleration and power are limited.
- Front trunk and glovebox are locked.
- Home and Work locations are not available in the navigation system.



- Voice commands are disabled.
- Cruise control is disabled.
- Autopilot convenience features are disabled.
- The Allow Mobile Access setting cannot be changed
- HomeLink (if applicable in your market region) is not accessible.
- Driver Profiles are not accessible.
- Wi-Fi and Bluetooth are disabled. When Model S/Model X is in Valet mode, you cannot pair new Bluetooth devices or view or delete existing paired devices. However, if a Bluetooth-paired device or a known Wi-Fi network is within range, Model S/Model X connects to it.

NOTE: Model S/Model X does not automatically shift when in Valet Mode.

Starting Valet Mode

With Model S/Model X in Park, touch the driver profile icon at the top of the touchscreen **Controls** screen, then touch **Valet Mode**.

The first time you enter Valet mode, the touchscreen prompts you to create a 4-digit PIN you will use to cancel Valet mode.

When Valet mode is active, the instrument panel displays the word **Valet** and the Valet mode driver profile displays on the touchscreen.

You can also use the mobile app to start and cancel Valet mode (provided Model S/Model X is in Park). When using the mobile app, you do not need to enter a PIN because you are already required to log into the app using your Tesla Account credentials.

NOTE: If the **PIN to Drive** setting is enabled (see [PIN to Drive on page 394](#)), you must enter the driving PIN before you can define or enter a Valet PIN. Once in Valet mode, Model S/Model X can be driven without the valet needing to enter the driving PIN.

NOTE: The **PIN to Drive** setting is not available when Valet mode is active.

If you forget your valet PIN, reset it from inside Model S/Model X by entering your Tesla Account credentials (which also cancels Valet mode). You can also reset your PIN using the mobile app.

 **WARNING:** Do not use Valet mode when towing a trailer. The torque limitations of Valet mode can make it difficult for Model S/Model X to pull a trailer up a hill.

Canceling Valet Mode

With Model S/Model X in Park, touch the **Valet Mode** driver profile icon at the top of the touchscreen **Controls** screen, and enter your 4-digit PIN.

When you cancel Valet mode, all settings associated with the most recently used driver profile and climate control settings are restored, and all features are available.

NOTE: You do not need to enter a PIN to cancel Valet mode from the mobile app.



Steering WheelSteering Yoke

Adjusting Steering WheelSteering Yoke Position

To adjust the steering wheelsteering yoke, touch **Controls** and touch the **Steering** icon.

Use the left scroll button on the steering wheelsteering yoke to move the steering wheelsteering yoke to the desired position:

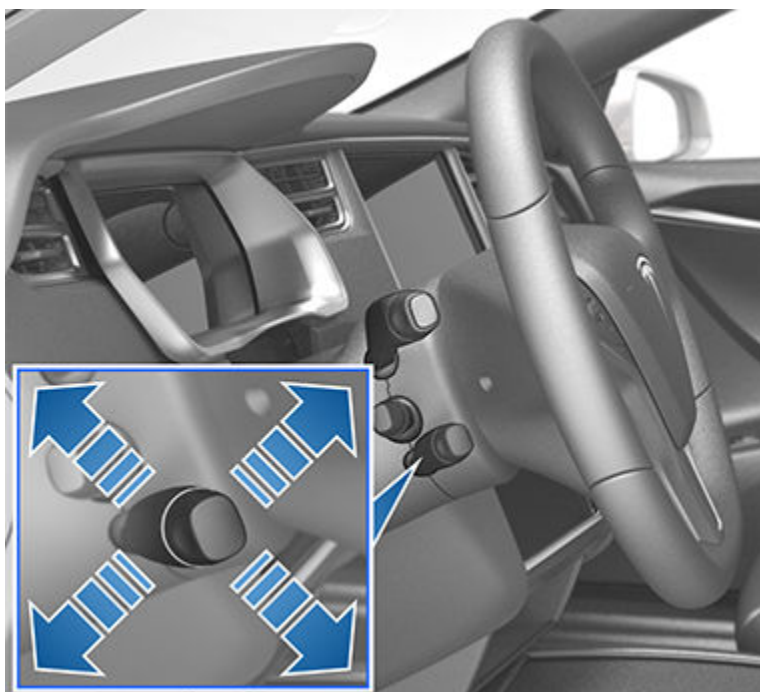
- To adjust the height/tilt angle of the steering wheelsteering yoke, roll the left scroll button up or down.
- To move the steering wheelsteering yoke closer to you, or further away from you, press the left scroll button to the left or right.

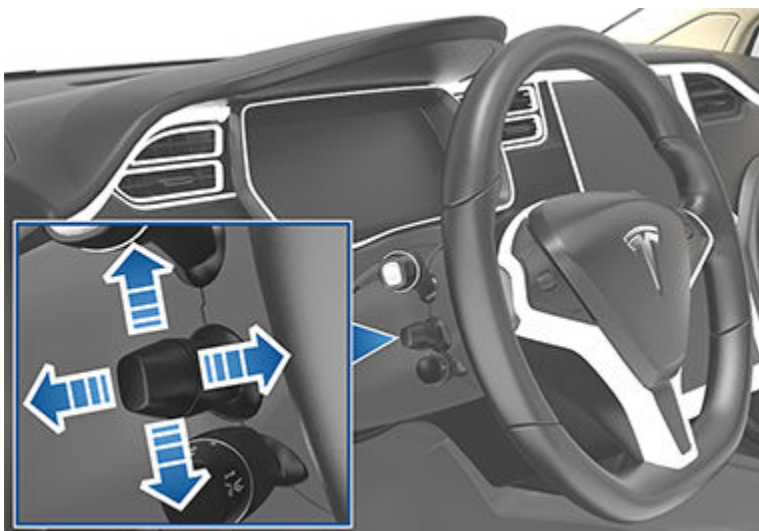


WARNING: Do not make steering wheelsteering yoke adjustments while driving.

Adjusting Steering Wheel Position

Adjust the steering wheel to the desired driving position by moving the control on the left side of the steering column. Using this control, you can move the steering wheel forward and backward and up and down.





WARNING: Do not make adjustments while driving.

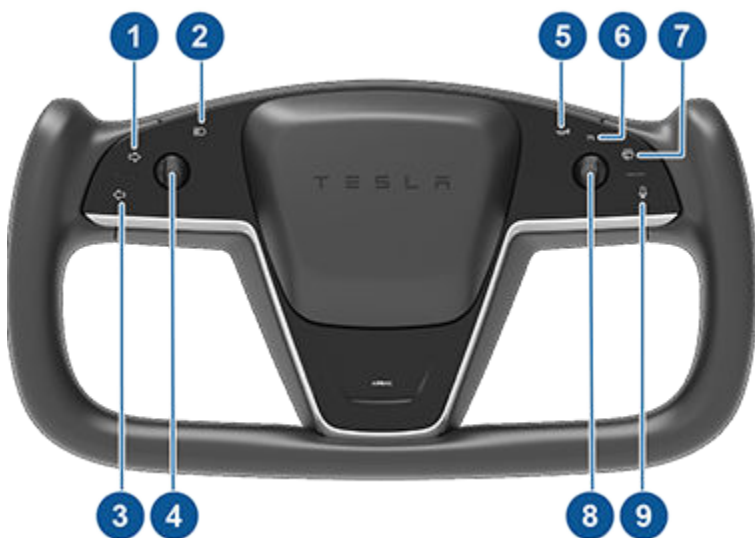
Adjusting Steering Effort

You can adjust the feel and sensitivity of the steering system to suit your personal preference:

1. On the touchscreen, touch **Controls** > **Pedals & Steering** > **Steering Mode**.
2. Choose a steering option:
 - **Comfort** - Reduces the effort required to turn the steering wheelsteering yoke. In town, Model SModel X feels easier to drive and park.
 - **Standard** - Tesla believes that this setting offers the best handling and response in most conditions.
 - **Sport** - Increases the effort required to turn the steering wheelsteering yoke. When driving at higher speeds, Model SModel X feels more responsive.

Overview of Steering Yoke Buttons

Your Model SModel X features stalkless driving in which all controls you need when driving are accessible on the steering yoke.



1. Right turn signal (see [#unique_45](#) on page).
2. High beam headlights* (see [#unique_44](#) on page).



3. Left turn signal (see [#unique_45](#) on page).
4. Left scroll button (see [Left Scroll Button](#) on page 187).
5. Horn (see [Horn](#) on page 190).
6. Identifier that is always illuminated to indicate that the right scroll wheel can be used with cruise control.
7. Wipers* (see [Wipers and Washers](#) on page 228).
8. Right scroll button (see [Right Scroll Button](#) on page 187).
9. Voice commands (see [Voice Commands](#) on page 391).

**The behaviors associated with the buttons for headlight high beams and wipers vary depending on whether you press or press and hold the button. Refer to the corresponding sections in this Owner's Manual for details.*

NOTE: Simultaneously holding down both the left and right scroll buttons while Model S/Model X is parked causes the touchscreen to restart (see [Restarting the Touchscreen](#) on page 197).

Left Scroll Button

Use the scroll button on the left side of the steering yoke to adjust the position of the mirrors and steering yoke. It also controls the wipers and media player.



- When using media player, push the button to the left to go back to the previous song or station or push it to the right to skip to the next song or station.
- To increase/decrease the volume of the sound system, roll the button up/down respectively.

NOTE: The scroll button adjusts the volume for media and phone calls based on what is currently in use. As you adjust the volume, the touchscreen displays the volume level and whether you are adjusting volume for media or phone.

- To mute the media volume, or to pause/play an audio file, push the scroll button.
- When adjusting mirrors, push the button to the left/right to move the associated mirror inward/outward and up/down to position the mirror upward or downward (see [Mirrors](#) on page 192).
- When adjusting the position of the steering wheel/steering yoke, roll the button up/down to adjust the tilt/angle and press the button to the left or right to move the steering wheel/steering yoke closer or further (see [Adjusting Steering Wheel/Steering Yoke Position](#) on page 185).
- When a menu displays on the instrument panel from which you can choose options (for example, wipers), use the scroll button to choose an option (up, down, left, or right).

Right Scroll Button

Use the scroll button on the right side of the steering yoke to control Autopilot features such as Autosteer and Traffic-Aware Cruise Control:

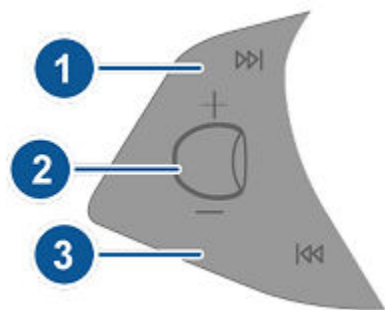


- When driving, push and release the button to engage Autosteer or Traffic-Aware Cruise Control (see [Autosteer on page 310](#)). If **Autosteer Activation** is set to **Double Click** (touch **Controls** > **Autopilot Activation** > **Autosteer Activation**), a single push engages Traffic-Aware Cruise Control (see [Traffic-Aware Cruise Control on page 299](#)) only and you must push and release twice to engage Autosteer. Once engaged, pushing the button cancels Autosteer and/or Traffic-Aware Cruise Control.
- When Model S/Model X is in Park, push the button twice to automatically engage Summon (if equipped) before exiting the vehicle (see [Starting Summon Before Exiting the Vehicle on page 332](#)).
- When Traffic-Aware Cruise Control is engaged, rolling the scroll button up/down increase/decreases the set cruising speed respectively.

NOTE: There is currently no action associated with pushing the right scroll button to the left and right.

Using Left Steering Wheel Buttons

Use the buttons on the left side of the steering wheel to change radio stations, control media player volume, and to choose what displays on the left side of the instrument panel (whenever the Navigation app is not displaying instructions).



1. Next

If you are listening to local or satellite radio and you have defined more than one radio preset, press to play the next preset in the radio band that is currently playing. If you have not defined more than one preset, press to go to the next available frequency.

If you are listening to Internet radio, or to an audio file on a connected Bluetooth or USB device, press to skip to the next song or station.

If you have more than one favorite defined, press and hold to cycle through favorites.

2. Scroll Button

- To adjust the media volume, roll up or down.



NOTE: The scroll button adjusts the volume for media, navigation instructions and phone calls based on what is currently in use. As you adjust volume, the instrument panel displays the volume level and whether you are adjusting volume for media, navigation or phone.

- To mute the media volume, or to pause/play an audio file, tap the scroll button.
- To choose what displays on the left side of the instrument panel, hold the scroll button briefly until the available options are displayed. Roll the scroll button to choose **Empty**, **Car Status**, **Clock**, **Media**, **Energy**, **Trips**, **Suspension**, etc. When the option you want is highlighted, tap the scroll button.

NOTE: The option you choose to display using the left scroll button is retained until you manually change it.

NOTE: Car status displays information such as status of doors and trunks, and on newer model vehicles, the tire pressure measurements.

3. Previous

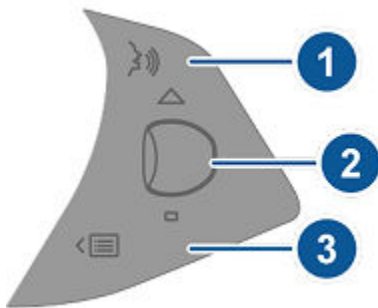
Same as described above for Next, except it skips to the previous song or station. If you have more than one favorite defined, press and hold to cycle through favorites.

NOTE: Regardless of how you customize the left side of the instrument panel, it automatically changes to display navigation instructions (if applicable), or to let you know if a door or trunk is open when Model S Model X is in Drive or Reverse.

Using Right Steering Wheel Buttons

Use the buttons on the right side of the steering wheel to access call options while on a phone call, to choose what displays on the right side of the instrument panel, to adjust Model S Model X features, and to use voice commands.

NOTE: Whenever you receive or make a phone call, the right side of the instrument panel automatically displays call options to help you easily handle phone calls on your Bluetooth-connected phone.



1. Press to use a voice command to call a contact, navigate, or listen to Internet music. When you hear the tone, speak your command. For details, see [Voice Commands on page 391](#).

2. Scroll Button

- During a phone call, touch the scroll button to display call options that allow you to perform an action on the call.
- Roll the scroll button to adjust the most recently used feature from the feature list (see Menu button).
- To choose what displays on the right side of the instrument panel, hold the scroll button briefly until the available options are displayed. Roll the scroll button to choose **Empty**, **Car Status**, **Clock**, **Media**, **Energy**, **Trips**, **Suspension**, etc. When the option you want is highlighted, tap the scroll button.

NOTE: Car status displays information such as status of doors and trunks, and on newer model vehicles, the tire pressure measurements.

NOTE: The option you choose to display using the right scroll button is retained until you manually change it.

- To restart the touchscreen, hold down both scroll buttons for approximately five seconds. See [Restarting the Touchscreen on page 197](#).
- **Suspension.** Display a real-time visualization of how the suspension system is dynamically adjusting each wheel's damping to account for changing road conditions. Roll the scroll button to choose Suspension and then press the scroll button. See [Air Suspension on page 385](#).

3. Menu button



Press to display a menu that allows you to control the following Model S Model X:

- **Temperature.** Roll the scroll button to change the driver side temperature, or press the wheel to turn the climate control system on and off.
- **Fan Speed.** Roll the scroll button to adjust the speed of the fan used to cool or heat the cabin.
- **Display Brightness.** Roll the scroll button to change the brightness level of the displays, or press the wheel to restore default settings.
- **Sunroof** (if equipped). Roll the scroll button to adjust the position of the sunroof.
- **Recent Calls.** If your phone is paired to Model S Model X, roll the scroll button to view your recent calls. Press the scroll button to call the contact that's displayed. To pair your phone, see [Pairing a Bluetooth Phone on page 381](#).
- **Contacts.** If your phone is paired to Model S Model X, roll the scroll button to navigate to contacts in your phone. Your contacts are listed alphabetically by their last name. To pair your phone, see [Pairing a Bluetooth Phone on page 381](#).

Press the menu button again to close the feature list.

Heated Steering WheelSteering Yoke

If Model S Model X is equipped with the cold weather package, you can warm up the steering wheel by touching climate controls on the touchscreen (see [Climate Controls on page 360](#)). When turned on, radiant heat keeps the steering wheel at a comfortable temperature.

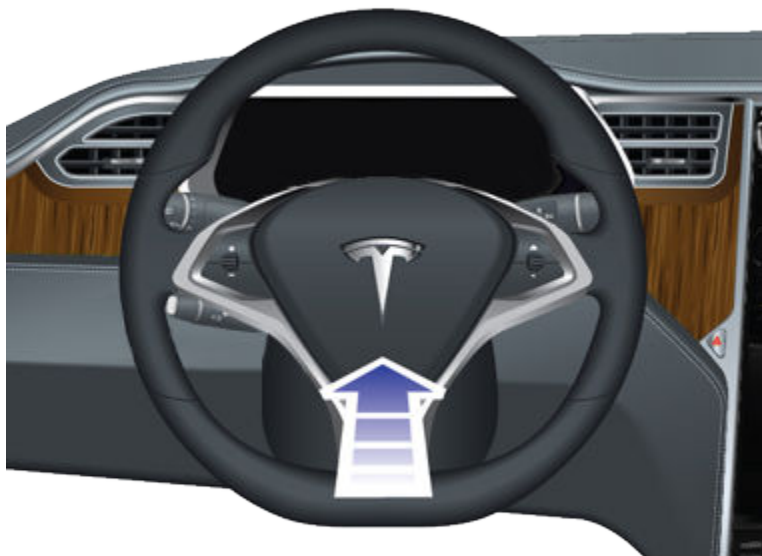
To warm up the steering wheelsteering yoke, touch the temperature icon on the touchscreen to display climate controls (see [Overview of Climate Controls on page 360](#)), then touch the steering wheelsteering yoke icon. When turned on, radiant heat keeps the steering wheelsteering yoke at a comfortable temperature.

NOTE: Depending on date of manufacture, your Model S may not include a heated steering wheel, even when equipped with the optional cold weather package.

Horn

To sound the horn, press and hold the center pad on the steering wheel.

To sound the horn, press and hold the horn button on the right side of the steering wheelsteering yoke.



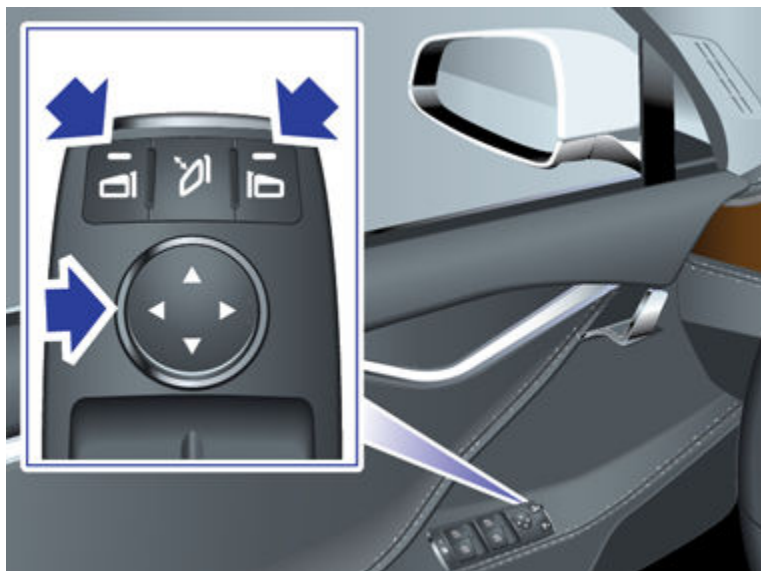




Mirrors

Adjusting Exterior Side Mirrors

Press the button associated with the mirror you want to adjust (left or right). The button's light turns on and you can then press the dial to move the mirror to the desired position. Repeat for the other side mirror. If prompted, touch **Save** on the touchscreen to save the mirror adjustment in your driver profile.



To fold and unfold exterior mirrors, press the center button. You can set the mirrors to fold automatically whenever Model S/Model X is locked by touching **Controls > Vehicle > Mirror Auto-Fold**. The mirrors unfold automatically whenever you unlock Model S/Model X.

When you use the center button to fold the mirrors in for parking in a tight space, the mirrors remain folded in until your driving speed reaches 31 mph (50 km/h), or until you use the center button to unfold the mirrors.

NOTE: You can override the automatic folding/unfolding of mirrors at any time (for example, Model S/Model X has no power) by pushing the mirror assembly away from you to unfold, or pulling it toward you to fold.

NOTE: You cannot fold a mirror if driving above 31 mph (50 km/h).



The driver's side mirror automatically dims at night, in proportion to the level of glare from the headlights of a vehicle behind you (except when in Reverse). Also, both exterior side mirrors have heaters that turn on and off with the rear window defroster.



NOTE: Depending on date of manufacture and options selected at time of purchase, some Model S vehicles are not equipped with a side mirror that automatically dims at night and may not include heated side mirrors. In addition, mirror adjustments may not be saved to your driver profile.

NOTE: See [Cold Weather Best Practices on page 284](#) for information to ensure your mirrors function properly in cold weather.

Auto-Fold Mirrors Based on Location

Model S Model X can automatically fold and unfold the side mirrors based on location, which saves you from having to manually position them each time you need to fold or unfold the mirrors when at a frequented place (such as narrow garages, tight parking spaces, etc.).

To set up, Model S Model X must be driving at a low speed (less than 3 mph/5 kph) or stopped at the location you want your vehicle to remember. Go to **Controls > Vehicle > Always Fold Mirrors at this Location**. Next time you approach the saved location, your mirrors fold and unfold within 25 feet (7.5 meters) of the specified location.

You can also integrate auto-folding mirrors with HomeLink (see [HomeLink Universal Transceiver on page 400](#)). To enable, go to **HomeLink > Auto-Fold Mirrors when Nearby**.



CAUTION: Mirrors may not automatically fold or unfold if you return to a saved location and are driving faster than 3 mph/5 kph.

Mirror Auto-tilt When Reversing

Both exterior mirrors can automatically tilt downward when backing up. To adjust the auto-tilt position, shift into Reverse, then adjust the mirrors (press the button associated with the mirror you want to adjust, then press the dial to move the mirror to the desired position).

When you shift into another drive mode, the mirrors tilt back to their normal (upward) position. But now that you have adjusted them for backing up, they automatically tilt to the selected downward position whenever you shift into Reverse.

You can turn the auto-tilt feature on or off using the touchscreen, Touch **Controls > Vehicle > Mirror Auto-Tilt**.

NOTE: Depending on date of manufacture and options selected at time of purchase, some Model S vehicles are not equipped with Mirror Auto-Tilt.

Adjusting Exterior Mirrors

Adjust the exterior mirrors by touching **Controls > Mirrors**. Press the left scroll button on the steering wheelsteering yoke to choose whether you are adjusting the **Left** or **Right** mirror. Then use the left scroll button as follows to adjust the selected mirror to its desired position:

- To move the mirror up or down, roll the left scroll button up or down.
- To move the mirror inward or outward, press the left scroll button to the left or right.



NOTE: Both exterior mirrors have heaters that turn on and off with the rear window defroster.

You can fold the mirrors inward for parking in tight spaces by touching **Controls > Fold Mirrors**. The mirrors remain folded until your driving speed reaches 31 mph (50 km/h), or until you touch **Fold Mirrors** again to unfold the mirrors.



NOTE: You can override the automatic folding/unfolding of mirrors at any time (for example, Model SModel X has no power) by pushing the mirror assembly away from you to unfold, or pulling it toward you to fold.

NOTE: See [Cold Weather Best Practices on page 284](#) for information on how to ensure your mirrors function properly in cold weather.

NOTE: You cannot fold a mirror if driving faster than 31 mph (50 km/h).

Auto-Fold Mirrors Based on Location

Model SModel X can automatically fold and unfold the side mirrors based on location, which saves you from having to manually position them each time you need to fold or unfold the mirrors when at a frequented place (such as narrow garages, tight parking spaces, etc.).

To set up, Model SModel X must be driving at a low speed (less than 3 mph (5 km/h)) or stopped at the location you want your vehicle to remember. Touch **Controls > Fold Mirrors > Save Location**. Next time you approach the saved location, your mirrors fold and unfold within approximately 25 feet (7.5 meters) of the specified location.

You can also integrate auto-folding mirrors with HomeLink (see [HomeLink Universal Transceiver on page 400](#)). To enable, touch the **HomeLink** icon on the top of the **Controls** screen and enable **Auto-Fold Mirrors when Nearby**.



CAUTION: Mirrors may not automatically fold or unfold if you return to a saved location and are driving faster than 3 mph (5 km/h).

Mirror Auto Tilt

Both exterior mirrors can automatically tilt downward when Model SModel X is shifted into Reverse. When you shift back into another drive mode, the mirrors return to their normal upward position.

To turn this feature on or off, touch **Controls > Mirrors > Mirror Auto Tilt**. You can adjust the position of the mirrors only when you are in Reverse.

Mirror Auto Fold

Both exterior mirrors can automatically fold inward whenever you exit and lock Model SModel X. When you unlock Model SModel X, the exterior mirrors then automatically unfold.

To turn this feature on or off, touch **Controls > Mirrors > Mirror Auto Fold**.

NOTE: If you expect ice to accumulate when Model SModel X is parked, turn off **Mirror Auto Fold**. Accumulation of ice can prevent exterior side mirrors from folding or unfolding.

Mirror Auto Dim

When certain environmental conditions are met, the rear view mirror and exterior side mirrors dim automatically (for example, in low light conditions or to reduce glare when driving at night). To enable or disable this feature, touch **Controls > Mirrors > Mirror Auto Dim**.

Rear View Mirror

The rear view mirror is adjusted manually. When in Drive or Neutral, the rear view mirror automatically dims in low lighting conditions based on the time of day (for example, when driving at night).



Starting and Powering Off

Starting

When you open a door to enter Model SModel X, the instrument panel and touchscreen power on and you can operate all controls. To drive Model SModel X:

1. **Press the brake pedal** - Model SModel X powers on and is ready to drive.
2. **Select a drive mode** - move the drive stalk down for Drive or up for Reverse (see [Shifting on page 198](#)).

When you open a door to enter Model SModel X, the instrument panel and touchscreen power on and you can operate all controls. To shift Model SModel X, press the brake pedal and swipe up for Drive or down for Reverse on the touchscreen's drive mode strip (see [Shifting on page 200](#)).

If **Auto Shift out of Park** is enabled, Model SModel X automatically selects Drive or Revers based on inputs from various sensors. Pressing the brake pedal shifts the vehicle into the selected drive mode displayed on the instrument panel (provided the driver's door is closed and the driver's seat belt is buckled), and pressing the accelerator moves the vehicle in that direction (see [Auto Shift out of Park on page 200](#)).

NOTE: To turn **Auto Shift out of Park** on or off, touch **Controls > Pedals & Steering > Auto Shift out of Park**.

Before accelerating when **Auto Shift out of Park** is enabled, check the instrument panel to make sure that Model SModel X has shifted into the drive mode you want (Drive or Reverse). If the selection is not correct, or if **Auto Shift out of Park** is not enabled, swipe up for Drive or down for Reverse on the touchscreen's drive mode strip to choose a new drive mode. See [Shifting on page 200](#).

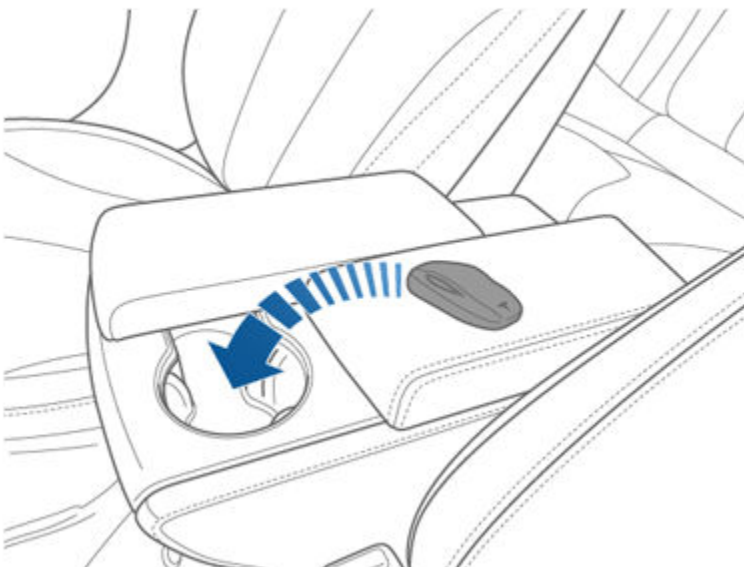
NOTE: If the **PIN to Drive** feature is enabled (see [PIN to Drive on page 394](#)), you must also enter a valid PIN on the touchscreen before you can drive Model SModel X.

Everything you need to know when driving Model SModel X displays on the instrument panel.

Key Fob Not Inside

If Model SModel X does not detect a key fob when you press the brake, the instrument panel displays a message telling you that a key fob is not inside.

If you receive this message, press the brake and place the key fob in the center console cup holder where Model SModel X can best detect it.





If Model SModel X still does not detect the key fob, try holding it against the center console, immediately below the low voltage power socket (see [Low Voltage Power Socket on page 81](#)). If the key fob is still not detected, remove the key fob's battery and try again. See [Replacing the Key Fob Battery on page 45](#). Or try using another key fob. If another key fob does not work, contact Tesla.

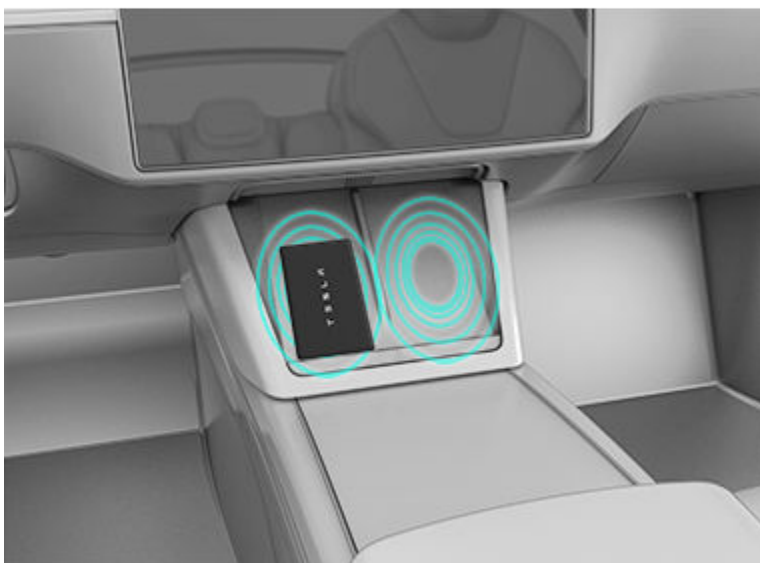
A number of factors can affect whether Model SModel X can detect the key fob. These include a low battery in the key fob, interference from other devices using radio signals, and objects between the key fob and receiver.

Always keep the key fob with you. After driving, the key fob is needed to restart Model SModel X after it powers off. And when you leave Model SModel X, you must bring the key fob with you to lock Model SModel X, either manually or automatically.

Drive Disabled - Requires Authentication

If Model SModel X does not detect a key when you press the brake (a key fob or phone key is not detected or two minutes have passed since you used the key card), the touchscreen displays a message telling you that driving requires authentication.

If you see this message, place the key card in either phone dock where the RFID transmitter can read it. The two-minute authentication period restarts and you can start Model SModel X by pressing the brake pedal.



A number of factors can affect whether Model SModel X can detect a phone key or key fob (for example, the device's battery is low or dead and is no longer able to communicate using Bluetooth).

Always keep your phone key, key fob, or a key card with you. After driving, your key is needed to restart Model SModel X after it powers off. And when you leave Model SModel X, you must bring your key with you to lock Model SModel X, either manually or automatically.

Powering Off

When you finish driving, shift into Park by pressing the button on the end of the drive stalk. When you finish driving, simply exit the vehicle. When you leave Model SModel X with the key fob your phone key and key fob, it powers off automatically, turning off the instrument panel and touchscreen.

Model SModel X also powers off automatically after being in Park for 15 minutes, even if you are sitting in the driver's seat.

Although usually not needed, you can power off Model SModel X while sitting in the driver's seat, provided the vehicle is not moving. Touch **Controls > Safety > Power Off**. Model SModel X automatically powers back on again if you press the brake pedal or touch the touchscreen.

NOTE: Model SModel X automatically shifts into Park whenever it determines that you are exiting the vehicle (for example, the driver's seat belt is unbuckled and the vehicle is almost at a standstill). If you shift into Neutral, Model SModel X shifts into Park when you open the door to exit. To keep Model SModel X in Neutral, see [Instructions for Transporters on page 517](#)[Instructions for Transporters on page 510](#).

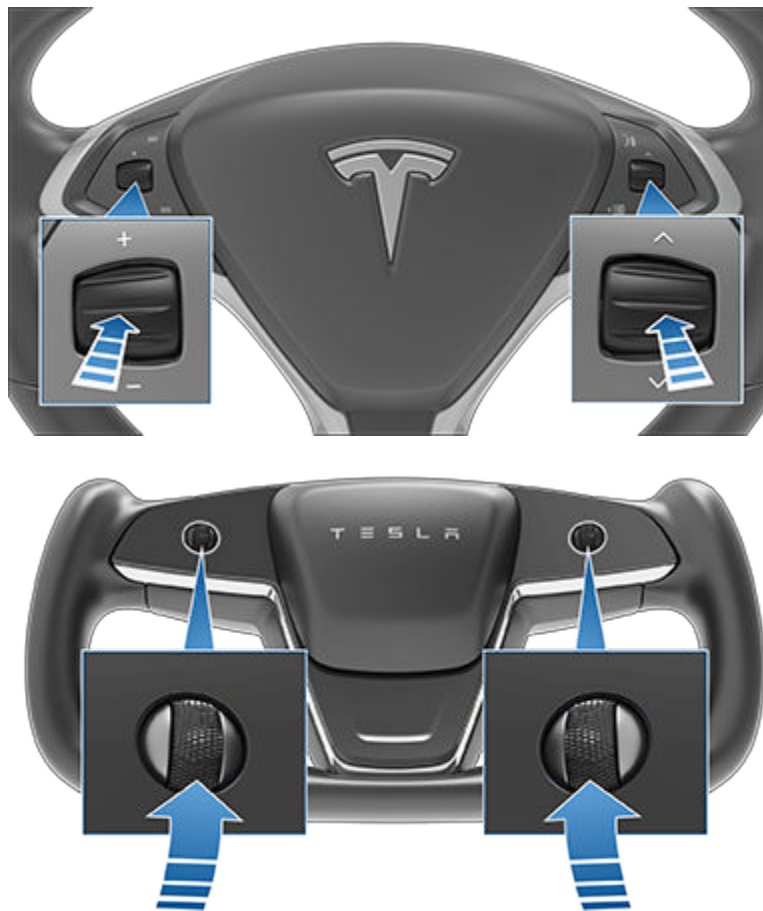


Restarting the Touchscreen

You can restart your touchscreen if it is unresponsive or demonstrates unusual behavior.

NOTE: To ensure the safety of occupants as well as other road users, restart the touchscreen only when the vehicle is in Park.

1. Shift into Park.
2. Hold down both scroll buttons on the steering wheelsteering yoke until the touchscreen turns black.



3. After a few seconds, the Tesla logo appears. Wait approximately 30 seconds for the touchscreen to restart. If the touchscreen is still unresponsive or demonstrating unusual behavior after a few minutes, try power cycling the vehicle. See [Power Cycling the Vehicle on page 197](#).

NOTE: Restarting the touchscreen also activates the drive mode selector on the center console.

NOTE: Restarting the touchscreen using the scroll buttons does not power Model SModel X off and on.

Power Cycling the Vehicle

You can power cycle Model SModel X if it demonstrates unusual behavior or displays a nondescript alert.

1. Shift into Park.
2. On the touchscreen, touch **Controls** > **Safety** > **Power Off**.
3. Wait for at least two minutes without interacting with the vehicle. Do not open the doors, touch the brake pedal, touch the touchscreen, etc.
4. After two minutes, press the brake pedal or open the door to wake the vehicle.

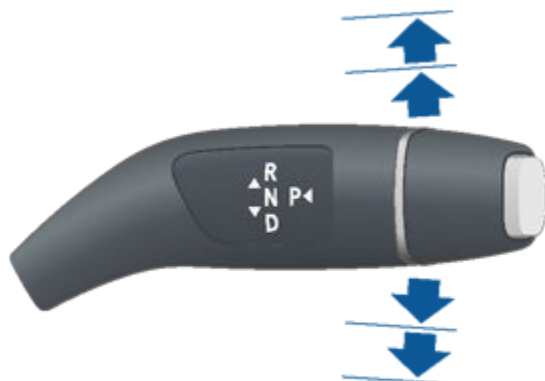


Shifting

How to Shift

When Model S Model X is in Park, you must press the brake pedal to shift.

Move the drive stalk up or down to shift into different drive modes.



If you try to shift when it is prohibited by the current driving speed, a chime sounds and the drive mode does not change.

Reverse

Push the drive stalk all the way up and release. You can only shift into Reverse when Model S Model X is stopped or moving less than 5 mph (8 km/h).

Neutral

Push the drive stalk up or down to the first position and release to shift into Neutral. Neutral allows Model S Model X to roll freely when you are not pressing the brake pedal.

NOTE: If Autosteer or Traffic-Aware Cruise Control is active, you must push the drive stalk up or down to the first position and hold it there for more than 1 second to shift into Neutral. In doing so, Autosteer or Traffic-Aware Cruise Control is disabled.

NOTE: You must press the brake pedal to shift out of Neutral if driving slower than approximately 5 mph (8 km/h).

If Model S Model X is in Park and you use the touchscreen to release the parking brake (**Controls > Safety > Parking Brake**), Model S Model X shifts into Neutral (see [Parking Brake on page 235](#)).

Drive

Push the drive stalk all the way down and release. You can shift into Drive when Model S Model X is stopped or moving less than 5 mph (8 km/h) in Reverse.

Park

Press the end of the drive stalk while Model S Model X is stopped.



Model SModel X automatically shifts into Park whenever you connect a charge cable or if two or more of the following conditions are met simultaneously while traveling slower than approximately 1.5 mph (2 km/h):

- The driver's seat belt is unbuckled.
- The occupancy sensor in the driver's seat does not detect an occupant.
- The driver's door is opened.

To make it convenient to pick up passengers, you can also unlock all doors and/or extend the door handles at any time by shifting into Park then pressing the Park button a second time.

NOTE: You must press the brake pedal to shift out of Park.

NOTE: The above conditions do not reflect a comprehensive list of reasons why Model SModel X may or may not automatically shift into Park and, in certain scenarios, it is possible for your vehicle to shift into Park when only one of the above conditions is true.



WARNING: In emergency situations, if the brakes are not functioning properly, press and hold the Park button on the drive stalk to bring the vehicle to a stop. Do not use this method to stop the vehicle unless absolutely necessary.



WARNING: It is the driver's responsibility to always ensure the vehicle is in Park before exiting. Never rely on Model SModel X to automatically shift into Park for you; it might not work in all circumstances (for example, if Creep or a slope causes the vehicle to travel greater than approximately 1.5 mph (2 km/h)).



Shifting

Auto Shift out of Park

NOTE: **Auto Shift out of Park** is a BETA feature and is disabled by default.

When **Auto Shift out of Park** is enabled, Model SModel X is designed to use inputs from various sensors to automatically select Drive or Reverse. The instrument panel displays the selected drive mode when the driver's door is closed and seat belt is buckled.

To override the selection, press the brake pedal and use the drive mode strip on touchscreen to shift into your desired drive mode (Drive, Reverse, Park; see [Shifting Using the Touchscreen on page 200](#)).

Confirm the drive mode selection and follow the instructions on the instrument panel before you press the accelerator.

 **WARNING:** As always, be aware of your vehicle and surroundings before driving. Never rely on Model SModel X to automatically select a suitable drive mode without confirming the selection before you start to drive.

If **Auto Shift out of Park** is unavailable, the instrument panel displays a message.

Model SModel X automatically selects a drive mode when:

- **Auto Shift out of Park** is enabled (touch **Controls** > **Pedals & Steering** > **Auto Shift out of Park**).
- Model SModel X is in Park.
- The driver's seat belt is fastened.
- The brake pedal is pressed.
- All doors and trunks are closed.
- The drive mode selector on the center console is not activated (see [Shift Using the Center Console on page 201](#)).

NOTE: Model SModel X does not automatically select drive modes in Valet Mode.

Auto Shift out of Park is disabled by default. When disabled, use the touchscreen or the center console to manually shift. To enable **Auto Shift out of Park**, touch **Controls** > **Pedals & Steering** > **Auto Shift out of Park**.

Shifting Using the Touchscreen

When you press the brake pedal when parked, the drive mode strip displays on one side of the touchscreen. Use the drive mode strip to shift Model SModel X: swipe up for Drive, swipe down for Reverse or touch the P for Park. The drive mode strip is always available on the touchscreen when you touch **Controls**.



NOTE: To shift from Drive into Reverse or vice versa, the driving speed must be less than 5 mph (8 km/h).

NOTE: The touchscreen's drive mode strip displays the **Park** button only when the brake pedal is pressed and shifting into Park is allowed based on the vehicle's driving speed (less than 5 mph (8 km/h)).

To shift into Neutral, open **Controls** to bring up the drive mode strip, then press and hold **Neutral** until Neutral engages.

NOTE: The touchscreen is the preferred method to manually shift. However, in the unlikely situation in which the touchscreen is unavailable and therefore can't be used, the drive mode selector on the center console automatically activates and must be used to shift (see [Shift Using the Center Console on page 201](#)).

If you try to shift when it is prohibited by the current driving speed, the instrument panel displays an alert, a chime sounds, and the drive mode does not change.

Shift Using the Center Console

In addition to manually shifting on the touchscreen, you can shift by pressing P, R, N or D located on the center console. In most situations, these buttons are not available until you press one of the buttons to activate it. When active, the LEDs associated with each button illuminate and when you select P, R, N or D, the associated LED illuminates amber.

In situations where the touchscreen is unavailable (for example, experiencing a technical issue), or Model S Model X is in Valet or Transport Mode, the drive mode selector on the center console activates automatically and there is no need to touch it.

NOTE: You can also activate the drive mode selector on the center console by simultaneously and *briefly* pressing both scroll buttons on the steering yoke. However, if you press and *hold* both buttons simultaneously, the drive mode selector activates and the touchscreen restarts (see [Restarting the Touchscreen on page 197](#)).

NOTE: The front trunk, rear trunk, and doors must be closed to shift using the center console.



1. Park
2. Reverse
3. Neutral
4. Drive

NOTE: When the touchscreen is available for shifting and you have manually activated the drive mode selector on the center console, the center console automatically deactivates if you don't shift within 10 seconds.

Park

Model SModel X automatically shifts into Park whenever it determines that you are exiting the vehicle. For example, the driver's seat belt is unbuckled and the vehicle is stopped. Model SModel X also automatically shifts into Park when the driver's door is opened or if no action is taken within one minute of shifting.

To manually shift into Park, press the brake pedal and touch the **Park** button on the touchscreen's drive mode strip. If the touchscreen is unavailable, press Park on the drive mode selector located on the center console.

NOTE: The touchscreen's drive mode strip displays the **Park** button only when the brake pedal is pressed and shifting into park is allowed based on the driving speed.

NOTE: You must always press the brake pedal to shift out of Park.



CAUTION: Model SModel X will not shift out of Park if a charge cable is plugged in, or if the charge port is unable to determine whether a charging cable is plugged in. In situations when Model SModel X does not shift out of Park, check the instrument panel or touchscreen for instructions on how to proceed.



WARNING: It is the driver's responsibility to always ensure the vehicle is in Park before exiting. Never rely on Model SModel X to automatically shift into Park for you; it may not work in all circumstances.

Drive

To manually shift into Drive, swipe up on the drive mode strip located on the touchscreen or, if the touchscreen is unavailable, press D on the drive mode selector located on the center console. You can shift into Drive when Model SModel X is stopped or moving less than 5 mph (8 km/h) in Reverse.

Reverse

To manually shift into Reverse, swipe down on the drive mode strip located on the touchscreen or, if the touchscreen is unavailable, press R on the drive mode selector located on the center console. You can shift into Reverse when Model SModel X is stopped or moving less than 5 mph (8 km/h) in Drive. You can manually close the park assist view on the touchscreen by touching the **X** in the upper corner.



Neutral

Neutral allows Model S/Model X to roll freely when you are not pressing the brake pedal. To shift into Neutral, do any of the following:

- Open **Controls**, then press and hold the **Neutral** icon on the drive mode strip until Model S/Model X engages Neutral.
- Choose **Neutral** from the drive mode selector on the center console.

NOTE: When Model S/Model X is traveling over 5 mph (8 km/h) and you swipe up or down on the touchscreen's drive mode strip, a **Neutral** icon displays at the bottom of the drive mode strip from which you can also choose to engage Neutral.

NOTE: You must press the brake pedal to shift out of Neutral if Model S/Model X is moving slower than approximately 5 mph (8 km/h).

Model S/Model X automatically shifts into Park when you open the driver's door to exit the vehicle. To stay in Neutral even when you leave Model S/Model X, you must engage Transport Mode (described next).

Keeping Your Vehicle in Neutral (Transport Mode)

Model S/Model X automatically shifts into Park whenever you finish driving and leave Model S/Model X. To keep Model S/Model X in Neutral when you exit, allowing it to roll freely (for example, pulling onto a flatbed truck), you must activate Transport mode:

1. Shift into Park.
2. Press the brake pedal.
3. Touch **Controls** > **Service** > **Towing**. The touchscreen displays a message reminding you how to properly transport Model S/Model X.
4. Press and hold the **Transport Mode** button until it turns blue. Model S/Model X is now free-rolling and can slowly be rolled (no faster than walking speed) for short distances or winched (for example, onto a flatbed truck).

For more information on Transport Mode, see [Activate Transport Mode on page 519](#).

NOTE: In Transport mode, Model S/Model X does not shift into a drive mode. You must first cancel Transport mode by touching **Transport Mode** again. Transport mode also cancels if you use the touchscreen or drive mode selector on the center console to shift into Park or if you manually apply the parking brake by touching **Controls** > **Safety** > **Parking Brake**.



Lights

Controlling Lights

Touch **Controls** > **Lights** to control the lights.

NOTE: You can also access an abbreviated lights menu while driving by touching the High Beam button on the steering wheel/steering yoke. A lights menu displays on the touchscreen, providing quick access to headlight controls.

In addition to the lights that you can control from the touchscreen, Model S/Model X has convenience lights that turn on and off automatically based on what you are doing. For example, interior lights, marker lights, tail lights, door handle lights, and puddle lights turn on when you unlock Model S/Model X, when you open a door, and when you shift into Park. They turn off automatically after a minute or two or when you shift or lock Model S/Model X.

Exterior Lights

Exterior lights (headlights, tail lights, side marker lights, parking lights, and license plate lights) are set to **Auto** each time you start Model S/Model X. When set to **Auto**, exterior lights automatically turn on when driving in low lighting conditions, or whenever the wipers are active. If you change to a different setting, lights always revert to **Auto** on your next drive.

Touch one of these options to change and retain the exterior light setting until adjusted again or the next time you drive:

- **Off:** Exterior lights turn off. When driving, daytime running lights may remain on based on regulations in various market regions.
- **Parking:** Parking lights, side marker lights, tail lights and license plate lights turn on.
- **On:** Low beam headlights, side marker lights, parking lights, tail lights, and license plate lights turn on.

If equipped, the headlights automatically adjust to improve your view based on your driving speed and steering angle. When driving at lower speeds with low beam headlights on, the headlights increase lateral illumination to make pedestrians and curbs more visible and to improve visibility when turning at a dark intersection, into a driveway, or when making a u-turn.



CAUTION: Ensure the headlights and rear lights are on during low visibility conditions (for example, when it is dark, foggy, snowy, or the road is wet, etc.). The rear tail lights are off while daytime running lights are on. Failure to do so can cause damage or serious injury.

NOTE: Headlights do not require adjustments when temporarily driving into a region where the traffic direction is different (for example, driving in right-hand traffic region, and then driving into a region with left-hand traffic).

NOTE: To comply with local traffic regulations when crossing from a left-hand traffic region to a right-hand traffic region, and vice versa, headlights should be adjusted. If you plan to drive to a region that requires headlights to be adjusted, schedule a service appointment using the mobile app.

NOTE: For vehicles manufactured prior to approximately June 2023: To comply with local traffic regulations when crossing from a left-hand traffic region to a right-hand traffic region, and vice versa, headlights should be adjusted. If you plan to drive to a region that requires headlights to be adjusted, schedule a service appointment using the mobile app.

NOTE: For vehicles manufactured as of approximately June 2023: Headlights do not require adjustments when temporarily driving into a region where the traffic direction is different (for example, driving in right-hand traffic region, and then driving into a region with left-hand traffic).

Fog Lights

If equipped, touch to turn the fog lights on or off. Fog lights operate only when low beam headlights are on. When headlights are turned off, fog lights also turn off.



The rear fog indicator displays on the instrument panel whenever rear fog lights (if equipped) are on.



The front fog indicator displays on the instrument panel whenever the optional front fog lights are on.

NOTE: Depending on the market region and vehicle options, your vehicle may not be equipped with front and/or rear fog lights.

NOTE: In some regions, there is no control for the front fog lights. They operate in conjunction with the headlights and turn on only in situations where low beam headlights are on.

Dome Lights

Turn the interior dome (map) lights on or off. If set to **Auto**, all interior dome lights turn on when you unlock Model SModel X, open a door upon exiting, or shift into Park.

You can also manually turn an individual dome light on or off by touching its lens. If you turn a dome light on, it turns off when Model SModel X powers off. If Model SModel X was already powered off when you manually turned the light on, it turns off after 60 minutes.

Ambient Lights

When enabled, interior ambient lights turn on whenever the headlights are on.

Headlights after Exit

When you stop driving and park Model SModel X in low lighting conditions, exterior lights temporarily remain illuminated. They automatically turn off after one minute or when you lock Model SModel X whichever comes first.

NOTE: If you lock Model SModel X using the Tesla mobile app or key card or key fob, the headlights immediately turn off. However, if the vehicle locks because Walk-Away Door Lock is enabled (see [Walk-Away Door Lock on page 41](#)[Walk-Away Door Lock on page 55](#)), the headlights automatically turn off after one minute.

To turn this feature on and off, touch **Controls > Lights > Headlights After Exit**. When **Headlights After Exit** is off, the headlights turn off immediately when you engage Park and open a door.

NOTE: Model S has lights along the rim of the headlights, also referred to as "signature" lights. These lights automatically turn on whenever Model S is powered on and a drive mode is engaged.

High Beam Headlights

Use the high beam headlight button on the left side of the steering wheelsteering yoke to control the headlights:

- Press and quickly release to flash high beam headlights.
- Press and hold to turn on high beam headlights – the instrument panel displays a brief timer and you must hold for the duration of the timer to latch the high beam headlights to the on position. When headlights are on, press the button a second time to turn them off.



The following indicator lights are visible on the instrument panel to show the status of the headlights:



Low beam headlights are on.



High beam headlights are on. Illuminates when high beams are on but the **Auto High BeamAdaptive Headlights** setting is turned off or if the **Auto High BeamAdaptive Headlights** setting is turned on but is temporarily unavailable.



High beams are currently turned on, and **Auto High BeamAdaptive Headlights** is ready to turn off the high beams if light is detected in front of the vehicle.



High beams are temporarily turned off because **Auto High BeamAdaptive Headlights** is operating and light is detected in front of your vehicle. When light is no longer detected, high beam headlights automatically turn back on.

Auto High BeamAdaptive Headlights

When **Auto High BeamAdaptive Headlights** is enabled, Model SModel X automatically switches between the high beam and low beam headlights based on whether or not there is light detected in front of Model SModel X.

The headlights also adjust to curves on the road ahead to provide greater visibility at night.

To control this feature, touch **Controls > Lights > Auto High Beam > Adaptive Headlights**, or by using the lights popup that displays on the touchscreen when you press the high beam headlight button on the left side of the steering wheelsteering yoke.

NOTE: **Auto High BeamAdaptive Headlights** is automatically enabled when Autosteer is engaged. To switch to low beam headlights, press the high beam headlight button on the steering wheelsteering yoke. **Auto High BeamAdaptive Headlights** is re-enabled every time Autosteer is activated.

WARNING: **Auto High BeamAdaptive Headlights** is a convenience only and is subject to limitations. It is the driver's responsibility to make sure that headlights are always appropriately adjusted for weather conditions and driving circumstances.



High Beam Headlights

Push the turn signal stalk away from you to turn the high beam headlights on continuously. To cancel, pull the stalk towards you.

To briefly flash the high beam headlights, pull the stalk towards you.



The high beam headlights can automatically switch to low beam when there is light detected in front of Model S/Model X (for example, from an oncoming vehicle). To turn this feature on or off, touch **Controls > Auto High Beam** or **Controls > Lights > Auto High Beam**.

NOTE: Your chosen setting is retained until you manually change it.

NOTE: **Auto High Beam** is automatically enabled when Autosteer is engaged.

In situations where high beams are turned off because **Auto High Beam** is turned on and light is detected in front of Model S/Model X, you can temporarily turn on high beams by pulling the stalk all the way toward you.

The following indicator lights are visible on the instrument panel to show the status of the headlights:

Low beam headlights are on.



High beam headlights are on. Illuminates when high beams are on but the **Auto High Beam** setting is turned off or if the **Auto High Beam** setting is turned on but is temporarily unavailable.



High beams are currently turned on, and **Auto High Beam** is ready to turn off the high beams if light is detected in front of Model S/Model X.



High beams are temporarily turned off because **Auto High Beam** is operating and light is detected in front of Model S/Model X. When light is no longer detected, high beam headlights automatically turn back on.



WARNING: **Auto High Beam** is a convenience only and is subject to limitations. It is the driver's responsibility to make sure that headlights are always appropriately adjusted for weather conditions and driving circumstances.



Rear Reading Lights

Model S/Model X is equipped with a reading light on each side of the rear seats, located above the door and next to the coat hangers (see [#unique_313 on page](#)). To turn a reading light on or off, press its lens. If you leave a reading light turned on, it automatically turns off when Model S/Model X powers off.

Adaptive Front Lighting System (AFS)

If equipped, the Adaptive Front Lighting System (AFS) automatically adjusts the beam of the headlights to improve your driving view. Electric sensors measure driving speed, steering angle and yaw (the rotation of the car around the vertical axis) to determine the optimum position of the headlights based on current driving conditions. For example, to improve visibility while driving on winding roads at night, the AFS casts the beam in the direction of the curve. When low beam headlights are turned on and when driving at lower speeds, AFS improves lateral illumination to increase the visibility of pedestrians and curbs, and to improve visibility when turning at a dark intersection, into a driveway, or when making a u-turn.

The Adaptive Front Lighting System (AFS) operates whenever headlights are on. If Model S/Model X isn't moving, or is moving in reverse, the adaptive headlights do not activate. This prevents the headlights from inadvertently blinding other drivers.



If the AFS fails, the instrument panel displays an alert. Contact Tesla Service.

Turn Signals

Move the turn signal stalk up (before turning right) or down (before turning left). The turn signals flash three times or continuously, depending on how far up or down you move the stalk. Lightly push the stalk up or down for a three-flash sequence. For a continuous signal, push the stalk fully up or down.



The turn signals stop operating when canceled by the steering wheel/steering yoke, or when you return the stalk to the central position.



When a turn signal is operating, the corresponding turn signal indicator lights up on the instrument panel and a clicking sound can be heard.

⚠ WARNING: When actively using Traffic-Aware Cruise Control, engaging a turn signal can cause Model S/Model X to accelerate in specific situations (see [Overtake Acceleration on page 811](#)/[Overtake Acceleration on page 305](#)).

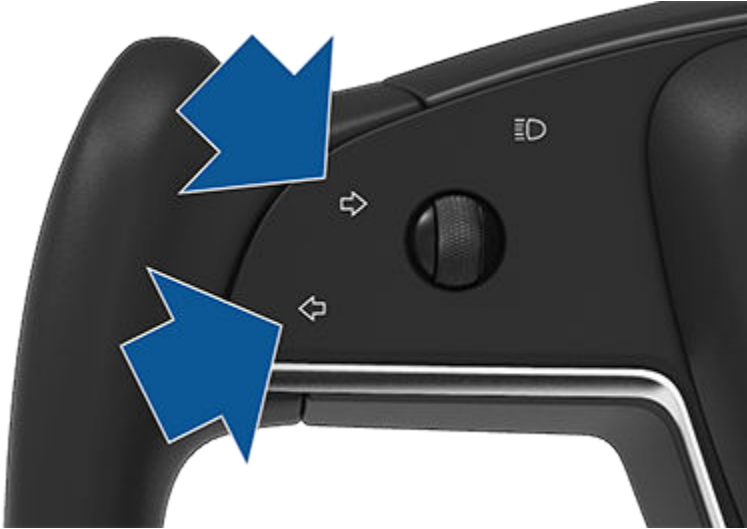
⚠ WARNING: When actively using Autosteer, engaging a turn signal can cause Model S/Model X to change lanes (see [Auto Lane Change on page 313](#)).



Turn Signals

To engage a turn signal, press the corresponding arrow button on the left side of the steering wheelsteering yoke. A turn signal cancels based on the angle of the steering wheelsteering yoke (for example, you finish making a turn). You can also cancel a turn signal by pressing the turn signal button a second time.

If **Controls > Lights > Automatic Turn Signals** is set to **Auto Cancel**, turn signals cancel automatically when Model SModel X detects completion of a maneuver such as a merge, lane change, or a fork in the roadway. You can override automatic cancellation at any time (for example, you want the turn signal to remain on because you are making more than one lane change). To override, engage the turn signal by pressing and momentarily holding the turn signal button (instead of just pressing). Then, when the first maneuver is complete, the turn signal remains on. If **Automatic Turn Signals** is set to **Off**, you must cancel the turn signal manually by pressing the turn signal button after maneuvers such as a merge, lane change, or fork in the roadway.



When a turn signal is operating, the corresponding indicator lights up on the instrument panel and you can hear a clicking sound.



Hazard Warning Flashers

To turn on the hazard warning flashers, press the button located on the side of the touchscreen closest to the steering wheelsteering yoke. All turn signals flash. Press again to turn off.

To turn on the hazard warning flashers, press the button on the drive mode selector located at the front of the center console. All turn signals flash. Press again to turn off.



If a severe crash is detected by your vehicle, the hazard warning flashers will automatically turn on and flash quickly to increase visibility. Pressing the hazard warning flashers once will return the lights to their normal cadence. Pressing a second time turns all hazard warning flashers off.

NOTE: Hazard warning flashers operate even without a key nearby.

Condensation in Head or Tail Lights

Due to weather changes, humidity levels, or recent exposure to water (such as a car wash), condensation may occasionally accumulate in your vehicle's head or tail lights. This is normal— as the weather gets warmer and humidity decreases, condensation often disappears on its own. If you notice water buildup within the exterior lenses, or if the condensation affects the visibility of the exterior lights, contact Tesla Service.



Instrument Panel

Instrument Panel Overview

The instrument panel changes depending on whether Model S/Model X is:

- Off (shown below).
- Driving (see [Instrument Panel - Driving on page 216](#)[Instrument Panel - Driving on page 218](#)[Instrument Panel - Driving on page 220](#)).
- Charging (see [Charging Status on page 420](#)).

When Model S/Model X is off, the instrument panel shows remaining estimated range, status of doors, and outside temperature. When you press the brake, indicator lights flash on briefly along the top. Unless an indicator light applies to a current situation, it should turn off. If an indicator light fails to turn on or off, contact Tesla.

NOTE: The following illustration is provided for demonstration purposes only. Depending on vehicle options, software version, and market region, the information displayed may be slightly different.





The following indicators illuminate on the instrument panel to advise you or alert you of a specific condition.

BRAKE

If the touchscreen displays this red brake indicator at any time other than briefly when you first start Model SModel X, a brake system fault is detected, or the level of the brake fluid is low. Contact Tesla immediately. Apply steady pressure and keep the brake pedal firmly pressed to stop the vehicle when safe to do so.

USA:



If the touchscreen displays this red brake indicator at any time other than briefly when you first start Model SModel X, a brake system fault is detected, or the level of the brake fluid is low. Contact Tesla immediately. Apply steady pressure and keep the brake pedal firmly pressed to stop the vehicle when safe to do so.

Canada:

BRAKE

The touchscreen displays this amber brake indicator if a brake booster fault is detected. Apply steady pressure and keep the brake pedal firmly pressed to stop the vehicle when safe to do so. Hydraulic Boost Compensation will be active (see [Hydraulic Boost Compensation on page 763](#)).

USA:



The touchscreen displays this amber brake indicator if a brake booster fault is detected. Apply steady pressure and keep the brake pedal firmly pressed to stop the vehicle when safe to do so. Hydraulic Boost Compensation will be active (see [Hydraulic Boost Compensation on page 763](#)).

Canada:

ABS

The ABS indicator briefly flashes amber on the touchscreen when you first start Model SModel X. If this indicator lights up at any other time, an ABS fault has occurred and the ABS is not operating. Contact Tesla. The braking system remains fully operational and is not affected by an ABS failure. However, braking distances may increase. Drive cautiously and avoid heavy braking.

USA:

Canada:



The ABS indicator briefly flashes amber on the touchscreen when you first start Model SModel X. If this indicator lights up at any other time, an ABS fault has occurred and the ABS is not operating. Contact Tesla. The braking system remains fully operational and is not affected by an ABS failure. However, braking distances may increase. Drive cautiously and avoid heavy braking.



When you manually apply the parking brake using the touchscreen, the red parking brake indicator lights up on the touchscreen.

USA:



When you manually apply the parking brake using the touchscreen, the red parking brake indicator lights up on the touchscreen.

Canada:



If the parking brake experiences an electrical issue, the amber parking brake indicator lights up and a fault message displays on the touchscreen.

USA:



If the parking brake experiences an electrical issue, the amber parking brake indicator lights up and a fault message displays on the touchscreen.

Canada:

Low beam headlights are on.



High beam headlights are on. Illuminates when high beams are on but the Auto High Beam setting is turned off or if the Auto High Beam setting is turned on but is temporarily unavailable. See [High Beam Headlights on page 207](#).



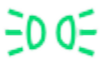
High beam headlights are currently turned on, and Auto High Beam is ready to turn off the high beams if light is detected in front of Model SModel X. See [High Beam Headlights on page 207](#).



High beam headlights are temporarily turned off because Auto High Beam is on and is detecting light in front of Model SModel X. When light is no longer detected, the high beams automatically turn back on. See [High Beam Headlights on page 207](#).



Parking lights (side marker lights, tail lights, and license plate lights) are on. See [Lights on page 204](#).



Front fog lights, if equipped. See [Lights on page 204](#).



Adaptive Front Lighting, if equipped. See [#unique_326 on page .](#)





Adaptive Front Lighting, if equipped. See [Adaptive Front Lighting System \(AFS\) on page 208](#).



Electronic stability control systems are actively minimizing wheel spin by controlling brake pressure and motor power (indicator flashes amber). See [Traction Control on page 237](#). If this indicator remains on, a fault is detected and you should immediately contact Tesla.



If a fault is detected that reduces the performance of the air suspension system, this amber indicator light displays (see [Air Suspension on page 385](#)[Air Suspension on page 387](#)[Air Suspension on page 389](#)). If the problem persists, contact Tesla.



If a fault is detected that disables the air suspension system, a red indicator lights up on the instrument panel (see [Air Suspension on page 385](#)[Air Suspension on page 387](#)[Air Suspension on page 389](#)). Contact Tesla.



Airbag safety. If this red indicator does not flash on briefly when Model SModel X prepares to drive, or if it remains on, contact Tesla immediately. See [Airbags on page 172](#)[Airbags on page 161](#).



Vehicle Hold is actively applying the brakes. See [Vehicle Hold on page 252](#).



Tire pressure warning. The pressure of a tire is out of range. If a fault with the Tire Pressure Monitoring System (TPMS) is detected, the indicator flashes. For a TPMS fault, contact Tesla. See [Tire Care and Maintenance on page 431](#).



A door or trunk is open. See [Keys and Doors on page 43](#), [Rear Trunk on page 60](#), or [Front Trunk on page 69](#).



A seat belt for an occupied seat is not fastened. See [Seat Belts on page 117](#).

NOTE: Depending on the date of manufacture, rear seating positions may not be equipped with a seat belt reminder.



Electronic stability control systems are no longer minimizing wheel spin. On a Rear Wheel Drive vehicle, the traction control system has been turned off, or on an All-Wheel Drive vehicle, Slip Start has been enabled. See [Traction Control on page 237](#).



Model SModel X is in Transport mode and can roll freely. It does not automatically shift into Park when you exit. See [Instructions for Transporters on page 503](#)[Instructions for Transporters on page 510](#).



Trailer mode (if equipped) is active. See [Towing and Accessories](#) on page 269.



Appears when some of the energy stored in the Battery may not be available due to cold weather conditions. During these cold weather conditions, charging rates may also be limited. If Model S/Model X is plugged in, you can heat your Battery by turning on climate control with the mobile app. The snowflake icon disappears when the Battery is sufficiently warm.



Vehicle power is currently being limited because the energy remaining in the Battery is low or the vehicle's systems are being heated or cooled.



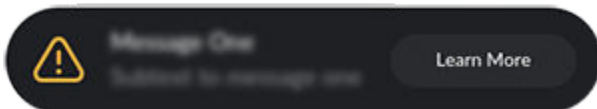
Flashes green when the left turn signal is operating. Both turn signal indicators flash green when the hazard warning flashers are operating.



Flashes green when the right turn signal is operating. Both turn signal indicators flash green when the hazard warning flashers are operating.

Popup Messages and Vehicle Alerts

Popup messages appear on the instrument panel. For example, a seat belt reminder appears if a seat belt is unfastened in an occupied seat, an alert appears to notify you of an incoming phone call, a text message appears (when applicable), and voice commands appear when in use.



You can view a list of vehicle alerts and notifications by touching the notifications icon on the touchscreen.

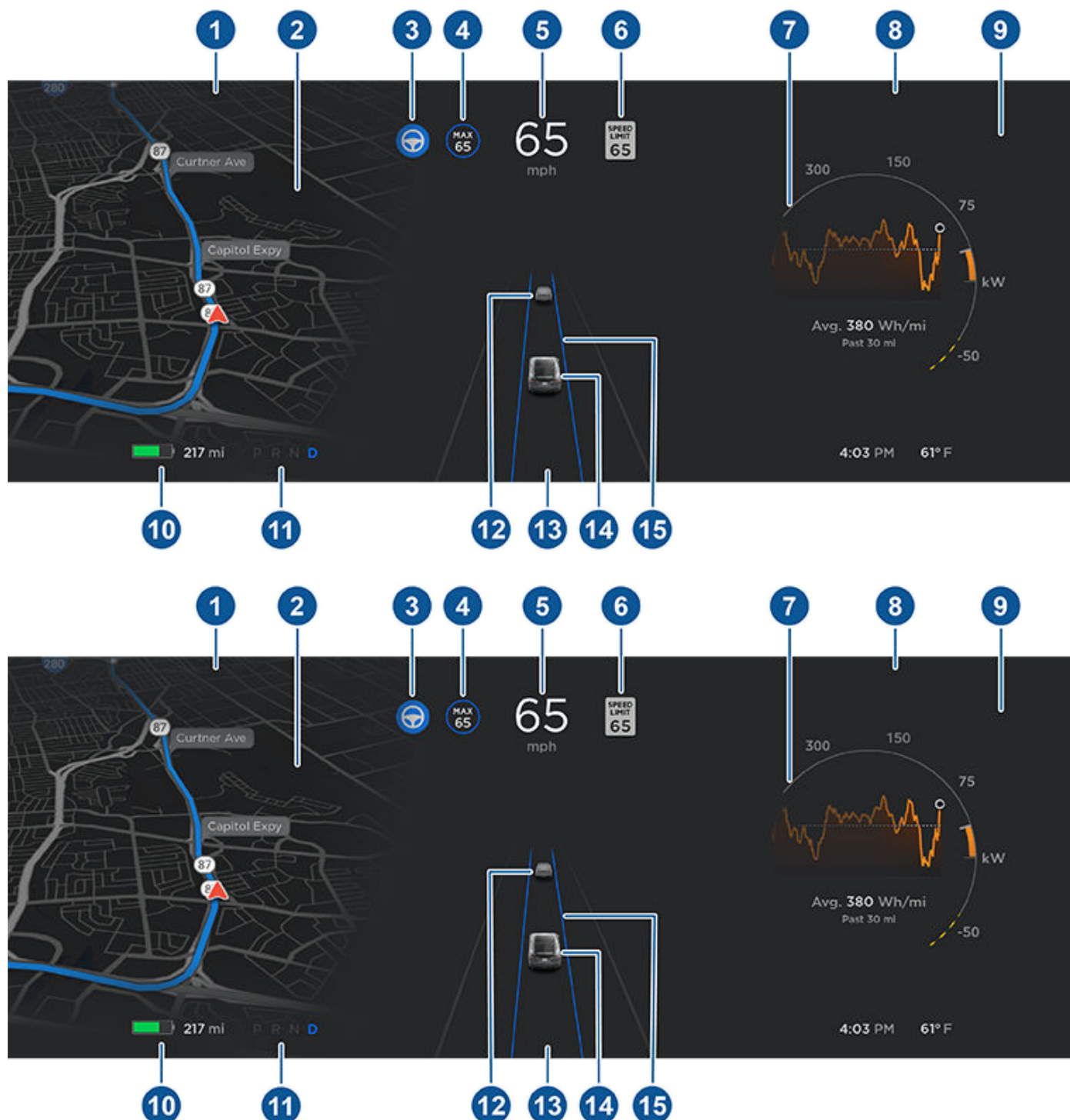
NOTE: Not all alerts provide additional information at this time.



Instrument Panel - Driving

When Model S/Model X is driving (or ready to drive), the instrument panel shows your current driving status and a real-time visualization of the road as detected by the Autopilot components (see [About Autopilot on page 798](#)). The visualization automatically zooms in and out as needed to inform you when a vehicle is detected in your blind spot.

NOTE: The following illustration is provided for demonstration purposes only. Depending on vehicle options, software version, and market region, the information displayed may be slightly different.



NOTE: Touch **Controls > Autopilot > Full Self-Driving Visualization Preview** (if equipped) to display more details about the roadway and its surroundings, such as road markings, stop lights, objects (such as trash cans and poles), etc.



1. Indicator lights display along the top to provide status (see [Instrument Panel Overview on page 211](#)).
2. When you are actively navigating to a destination, navigation instructions display here. Use the left steering wheel buttons to change what displays on the left side of the instrument panel whenever navigation instructions are not displayed (see [Using Left Steering Wheel Buttons on page 188](#)).
3. Autosteer is actively steering Model SModel X. When Autosteer is available but you haven't activated it, the icon is gray (see [Autosteer on page 310](#)).
4. Traffic-Aware Cruise Control is cruising at a set speed. When Traffic-Aware Cruise Control is available but you haven't set a cruising speed, the icon is gray and the speed is not shown (see [Traffic-Aware Cruise Control on page 299](#)).
5. Driving speed.
6. The speed limit (if available) that is currently being detected by Speed Assist (see [Speed Assist on page 344](#)).
NOTE: A blue outline may appear around the speed limit icon to notify that you are above the speed limit.
7. On the Energy graph, dashed lines appear on the power meter if Model SModel X is limiting power. The dashed lines appear on the top portion (energy being used) when power available for acceleration is being limited, and on the bottom portion (energy being gained) when power that can be gained by regenerative braking is limited. Model SModel X limits power for many reasons. Here are just a few examples:
 - Acceleration may be limited when the Battery is reaching a low state of charge or if the powertrain is hot.
 - Both acceleration and regenerative braking may be limited when the ambient temperature is either very high or very low.
 - Regenerative braking may be limited when the Battery is fully charged.**NOTE:** Use the right steering wheel buttons to control what displays on the right side of the instrument panel (see [Using Right Steering Wheel Buttons on page 189](#)).
8. Pay attention to important alert messages that display here. If any alerts are in effect, you can view information about them by touching the alert icon (exclamation mark) on the touchscreen's status bar (the topmost area of the touchscreen).
9. Use the right steering wheel buttons to change what displays on the right side of the instrument panel whenever a phone call is not active (see [Using Right Steering Wheel Buttons on page 189](#)).
10. Total estimated driving distance (or energy) available. Instead of driving distance, you can display the percentage of battery energy remaining. To do so, touch **Controls > Display > Energy Display**.
NOTE: When anticipating when you need to charge, use range estimates as a general guideline only.
11. Currently selected drive mode: Park, Reverse, Neutral, or Drive.
12. The car in front of you (if applicable).
NOTE: In situations where Autosteer is unable to detect lane markings, the driving lane is determined based on the vehicle you are following. In these situations, the car in front of you is highlighted in blue.
13. Pay attention to important driving-related messages that appear at the bottom center of the instrument panel.
14. Your Model SModel X.
15. When Autosteer is active and detects the driving lane, it is highlighted in blue (see [Autosteer on page 310](#)). Depending on the current driving scenario, you may see neighboring lanes.
NOTE: If Navigate on Autopilot is active, the driving lane displays as a single blue line in front of Model SModel X (see [Navigate on Autopilot on page 316](#)).



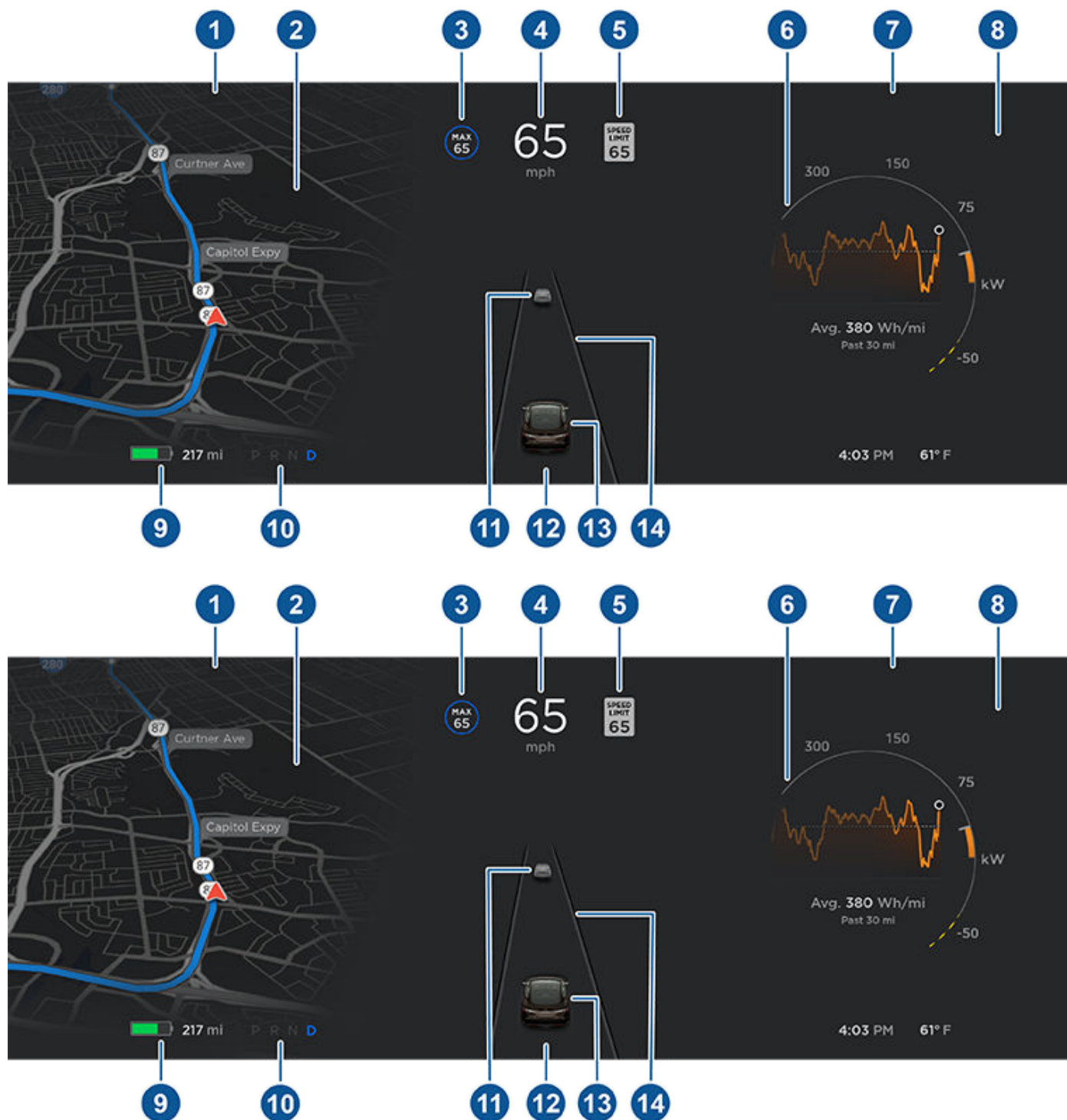
WARNING: Although the instrument panel shows surrounding traffic, some vehicles may not be displayed. Never rely on the instrument panel to determine if a vehicle is present (for example, in your blind spot). Always use your mirrors and perform shoulder checks.



Instrument Panel - Driving

When Model S/Model X is driving (or ready to drive), the instrument panel shows your current driving status. The visualization automatically zooms in and out to as needed to inform you when a vehicle is detected in your blind spot.

NOTE: The following illustration is provided for demonstration purposes only. Depending on vehicle options, software version, and market region, the information displayed may be slightly different.



1. Indicator lights display along the top to provide status (see [Instrument Panel Overview](#) on page 211).



2. When you are actively navigating to a destination, navigation instructions display here. Use the left steering wheel buttons to change what displays on the left side of the instrument panel whenever navigation instructions are not displayed (see [Using Left Steering Wheel Buttons on page 188](#)).
3. When you set a cruising speed using cruise control, the set speed displays on the cruise control icon (see [Cruise Control on page 239](#)).
4. Driving speed.
5. The speed limit (if available) that is currently being detected by Speed Assist (see [Speed Assist on page 344](#)).
6. On the Energy graph, dashed lines appear on the power meter if Model SModel X is limiting power. The dashed lines appear on the top portion (energy being used) when power available for acceleration is being limited, and on the bottom portion (energy being gained) when power that can be gained by regenerative braking is limited. Model SModel X limits power for many reasons. Here are just a few examples:
 - Acceleration may be limited when the Battery is reaching a low state of charge or if the powertrain is hot.
 - Both acceleration and regenerative braking may be limited when the ambient temperature is either very high or very low.
 - Regenerative braking may be limited when the Battery is fully charged.
7. Pay attention to important alert messages that display here. If any alerts are in effect, you can view information about them by touching the alert icon (exclamation mark) on the touchscreen's status bar (the topmost area of the touchscreen).
8. Use the right steering wheel buttons to change what displays on the right side of the instrument panel whenever a phone call is not active (see [Using Right Steering Wheel Buttons on page 189](#)).
9. Total estimated driving distance (or energy) available. Instead of driving distance, you can display the percentage of battery energy remaining. To do so, touch **Controls > Display > Energy Display**.

NOTE: When anticipating when you need to charge, use range estimates as a general guideline only.

NOTE: In cold weather, some of the stored energy in the Battery may not be available on your drive because the Battery is too cold. When this happens, a portion of the Battery meter is blue and the driving distance value has a snowflake image next to it. If Model SModel X is plugged in, you can heat your Battery using wall power by turning on climate control using the mobile app. When the Battery warms up, the blue portion on the meter and the snowflake image are no longer displayed.
10. Currently selected drive mode: Park, Reverse, Neutral, or Drive.
11. The car in front of you (if applicable).
12. Pay attention to important driving-related messages that appear at the bottom center of the instrument panel.
13. Your Model SModel X.
14. Driving lane (if detected). Depending on the current driving scenario, you may see neighboring lanes.



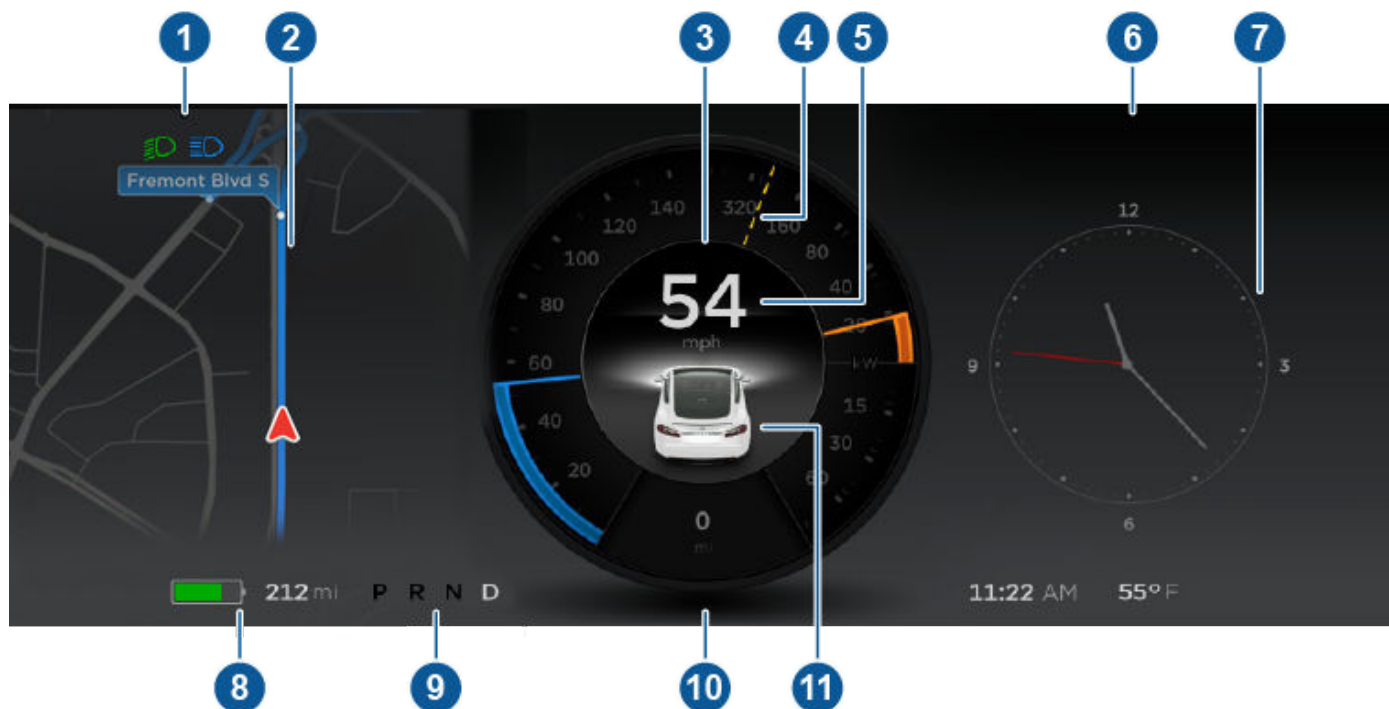
WARNING: Although the instrument panel shows surrounding traffic, some vehicles may not be displayed. Never rely on the instrument panel to determine if a vehicle is present (for example, in your blind spot). Always use your mirrors and perform shoulder checks.



Instrument Panel - Driving

When Model S/Model X is driving (or ready to drive), the instrument panel shows your current driving status.

NOTE: The following illustration is provided for demonstration purposes only. Depending on vehicle options, software version, and market region, the information displayed may be slightly different.



1. Indicator lights display along the top to provide status (see [Instrument Panel Overview on page 211](#)).
2. When you are actively navigating to a destination, navigation instructions display here. Use the left steering wheel buttons to change what displays on the left side of the instrument panel whenever navigation instructions are not displayed (see [Using Left Steering Wheel Buttons on page 188](#)).
3. Cruise control status displays here, if engaged (see [Cruise Control on page 239](#)).
4. Dashed lines appear on the power meter if Model S is limiting power. The dashed lines appear on the top portion (energy being used) when power available for acceleration is being limited, and on the bottom portion (energy being gained) when power that can be gained by regenerative braking is limited. Model S/Model X limits power for many reasons. Here are just a few examples:
 - Acceleration may be limited when the Battery is reaching a low state of charge or if the powertrain is hot.
 - Both acceleration and regenerative braking may be limited when the ambient temperature is either very high or very low.
 - Regenerative braking may be limited when the Battery is fully charged.
5. Driving speed.
6. Pay attention to important alert messages that display here. If any alerts are in effect, you can view information about them by touching the alert icon (exclamation mark) on the touchscreen's status bar (the topmost area of the touchscreen).
7. Use the right steering wheel buttons to change what displays on the right side of the instrument panel whenever a phone call is not active (see [Using Right Steering Wheel Buttons on page 189](#)).
8. Total estimated driving distance (or energy) available. Instead of driving distance, you can display the percentage of battery energy remaining. To do so, touch **Controls > Display > Energy Display**.

NOTE: When anticipating when you need to charge, use range estimates as a general guideline only.



NOTE: In cold weather, some of the stored energy in the Battery may not be available on your drive because the Battery is too cold. When this happens, a portion of the Battery meter is blue and the driving distance value has a snowflake image next to it. If Model S/Model X is plugged in, you can heat your Battery using wall power by turning on climate control using the mobile app. When the Battery warms up, the blue portion on the meter and the snowflake image are no longer displayed.

9. Currently selected drive mode: Park, Reverse, Neutral, or Drive.
10. Pay attention to important driving-related messages that appear at the bottom center of the instrument panel.
11. Your Model S/Model X.



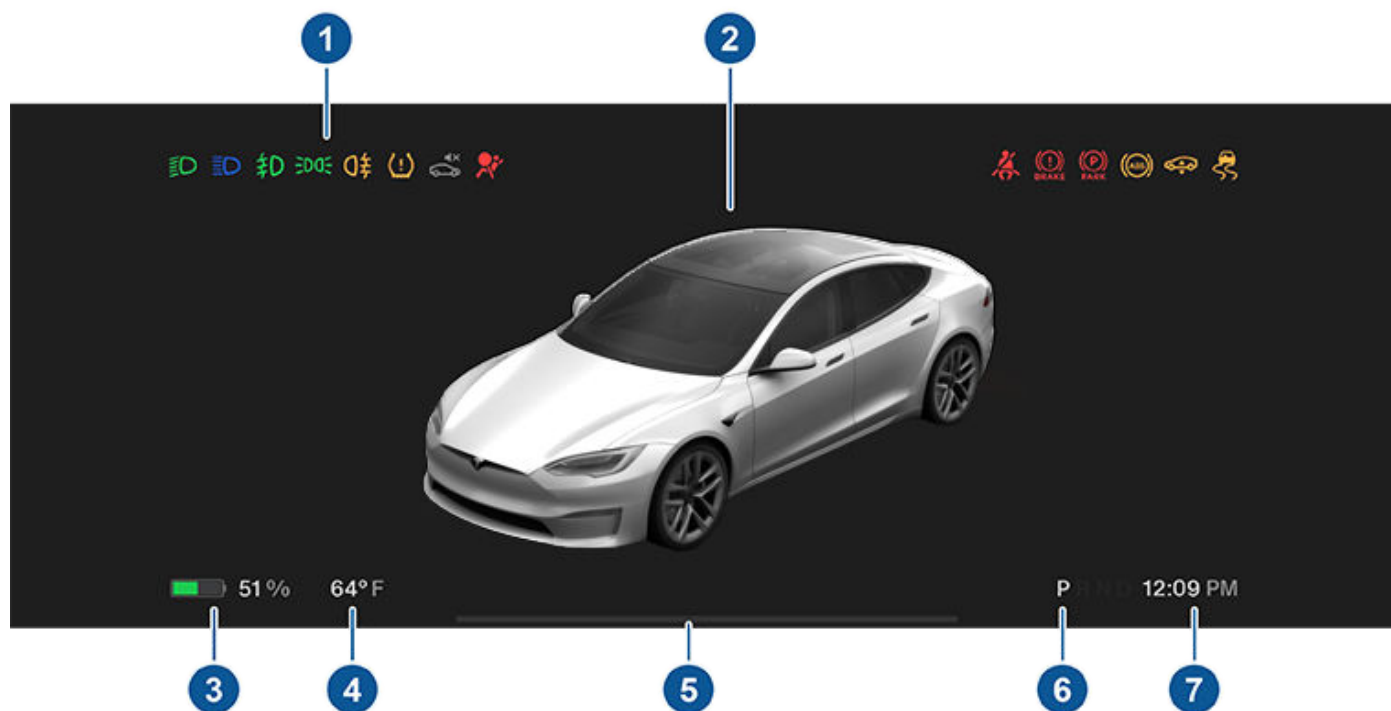
Instrument Panel

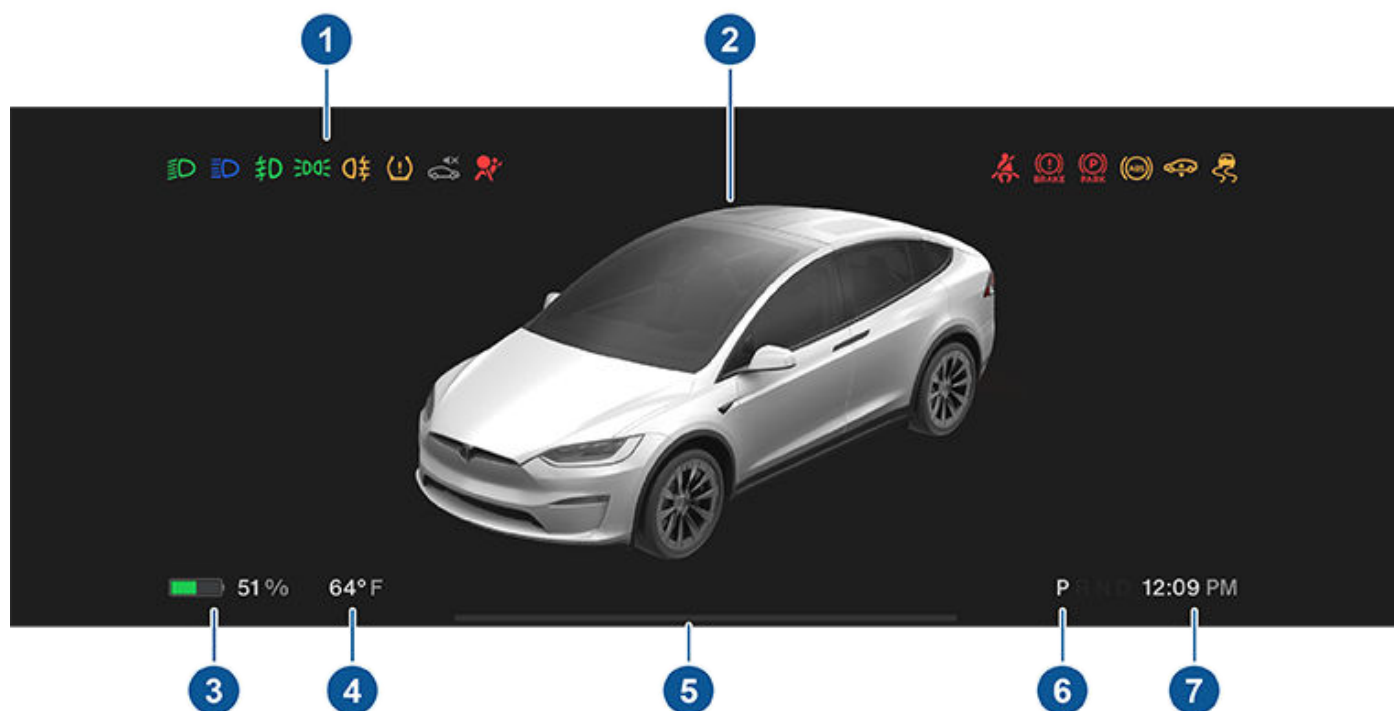
Instrument Panel Overview

The instrument panel changes depending on whether Model SModel X is:

- Off or Parked (shown below).
- Driving (see [Instrument Panel - Driving on page 224](#)).
- Charging (see [Charging Instructions on page 417](#)).

When Model SModel X is off or Parked, the instrument panel shows remaining estimated range, vehicle status, and outside temperature.





1. When the car is off and you initially press the brake, indicator lights flash briefly along the top of the instrument panel. Unless an indicator light applies to a current situation, it should turn off. If an indicator light fails to turn on or off, refer to [Indicator Lights on page 225](#).
2. An image of your car and its accompanying status (such as lights on, door open, etc.).
3. Total estimated driving distance (or energy) available. Instead of driving distance, you can display the percentage of battery energy remaining. To do so, touch **Controls** > **Display** > **Energy Display**.
NOTE: When anticipating when you need to charge, use estimates as a general guideline only.
4. Estimated outside temperature.
5. Pay attention to instructions or important alert messages that display here. If any alerts are in effect, you can view information about them by touching **Controls** and then touching the bell icon located at the top of the screen.
6. Currently selected drive mode: Park, Reverse, Neutral, or Drive. If **Auto Shift out of Park** is enabled, Drive or Reverse is automatically selected (based on sensor input) and displayed on the instrument panel when the driver's door is closed and seatbelt is buckled (see [Auto Shift out of Park on page 200](#)).
7. Current time of day.



Instrument Panel - Driving

When Model S/Model X is driving (or ready to drive), the instrument panel shows your current driving status and a real-time visualization of the road as detected by the Autopilot components (see [About Autopilot on page 286](#)). The visualization automatically zooms in and out based on the detected road type.



NOTE: Touch **Controls > Autopilot > Full Self-Driving Visualization Preview** (if equipped) to display more details about the roadway and its surroundings, such as road markings, stop lights, objects (such as trash cans and poles), etc.

1. The instrument panel displays your location on a map, a wiper menu, Auto Shift out of Park instructions, etc. When a navigation route is active, the upcoming portion of the route displays.



2. The speed limit (if available) that is currently being detected by Speed Assist (see [Speed Assist on page 344](#)).
3. Current driving speed.
4. The currently set cruising speed. When Traffic-Aware Cruise Control is available but you haven't set a cruising speed by engaging Traffic-Aware Cruise Control or Autosteer, the icon is gray (see [Traffic-Aware Cruise Control on page 299](#)).
5. Autosteer is actively steering Model SModel X. When Autosteer is available but you haven't activated it, the icon is gray (see [Autosteer on page 310](#)).
6. When navigating, upcoming instructions in the navigation route appear here.
7. Total estimated driving distance (or energy) available. Instead of driving distance, you can display the percentage of battery energy remaining (touch **Controls** > **Display** > **Energy Display**).

NOTE: When anticipating when you need to charge, use estimates as a general guideline only.

8. Surrounding road users are shown in their corresponding locations.



WARNING: Although the instrument panel shows surrounding traffic, some vehicles may not be displayed. Never rely on the instrument panel to determine if a vehicle is present (for example, in your blind spot). Always use your mirrors and perform shoulder checks.

9. Your Model SModel X.
10. The energy bar (a thin horizontal line at the bottom center of the instrument panel) displays real-time energy usage. The bar is colored gray (or white if the display is in Dark mode) and moves to the right to represent energy being used during acceleration. The bar is green and moves to the left to represent energy being gained through regenerative braking.
11. When Autosteer is active and detects the driving lane, it is highlighted in blue (see [Autosteer on page 310](#)). Depending on the current driving scenario, you may see neighboring lanes.

NOTE: In situations where Autosteer is unable to detect lane markings, the driving lane is determined based on the vehicle you are following.

NOTE: If Navigate on Autopilot is active, the driving lane displays as a single blue line in front of Model SModel X (see [Navigate on Autopilot on page 316](#)).

Indicator Lights

Indicator lights display along the top of the instrument panel to show status and alert you of specific vehicle conditions.

Indicator	Description
	A brake system fault is detected or the brake fluid level is low. See Braking and Stopping on page 231 . Contact Tesla immediately.
	A brake booster fault has been detected. See Braking and Stopping on page 231 .
	An ABS (Anti-lock Braking System) fault is detected. See Braking and Stopping on page 231 . Contact Tesla immediately.
	A parking brake fault is detected. Contact Tesla. See Parking Brake on page 235 .



Indicator	Description
	The parking brake is manually applied. See Parking Brake on page 235 .
	Tire pressure warning. The pressure of a tire is out of range. If a fault with the Tire Pressure Monitoring System (TPMS) is detected, the indicator flashes. For a TPMS fault, contact Tesla. See Tire Care and Maintenance on page 431 .
	A seat belt for an occupied seat is not fastened. See Seat Belts on page 117 .
	Airbag safety. If this red indicator does not flash on briefly when Model SModel X prepares to drive, or if it remains on, contact Tesla immediately. See Airbags on page 172 Airbags on page 161 .
	Front fog lights are on, if equipped. See Lights on page 204 .
	Parking lights (side marker lights, tail lights, and license plate lights) are on. See Lights on page 204 .
	Low beam headlights are on.
	High beam headlights are on. Illuminates when high beams are on but the Auto High Beam setting is turned off or if the Auto High Beam setting is turned on but is temporarily unavailable. See #unique_44 on page .
	High beam headlights are currently turned on, and Auto High Beam is ready to turn off the high beams if light is detected in front of Model SModel X. See #unique_44 on page .
	High beam headlights are temporarily turned off because Auto High Beam is on and is detecting light in front of Model SModel X. When light is no longer detected, the high beams automatically turn back on. See #unique_44 on page .



Indicator	Description
	If a fault is detected with the Adaptive Front Lighting this indicator displays, if equipped. See #unique_326 on page .
	If a fault is detected with the Adaptive Front Lighting this indicator displays, if equipped. See Adaptive Front Lighting System (AFS) on page 208.
	This indicator flashes amber when the electronic stability control systems are actively minimizing wheel spin by controlling brake pressure and motor power. See Traction Control on page 237. If this indicator remains on, a fault is detected and you should immediately contact Tesla.
	If a fault is detected that reduces the performance of the air suspension system, this amber indicator light displays (see Air Suspension on page 385). If the problem persists, contact Tesla.
	If a fault is detected that disables the air suspension system, this red indicator light displays (see Air Suspension on page 385). Contact Tesla.
	Vehicle Hold is actively applying the brakes. See Vehicle Hold on page 252.
	Electronic stability control systems are no longer minimizing wheel spin. See Traction Control on page 237.
	Model SModel X is in Transport mode and can roll freely. It does not automatically shift into Park when you exit. See Activate Transport Mode on page 519.
	Trailer mode (if equipped) is active. See Towing and Accessories on page 269.
	A blue snowflake appears when some of the energy stored in the Battery may not be available due to cold weather conditions. During these cold weather conditions, charging rates may also be limited. If Model SModel X is plugged in, you can heat your Battery by turning on climate control with the mobile app. The snowflake disappears when the Battery is sufficiently warm.
	Vehicle power is currently being limited because the energy remaining in the Battery is low, the vehicle's systems are being heated or cooled, or an error is detected by the drive inverter.



Wipers and Washers

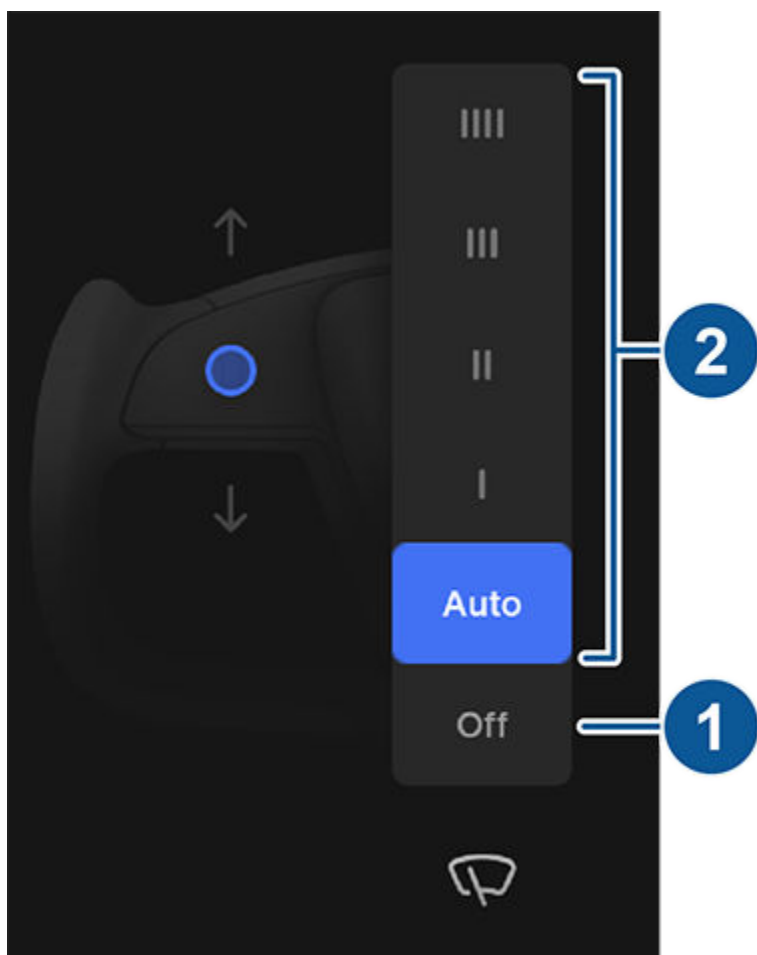
Wipers and Washers

You can access wiper settings by touching the wiper button on the steering wheelsteering yoke.

- Press the wiper button to wipe the windshield. If the wiper is already operating at a wiper setting and is not set to **Auto**, pressing the wiper button cycles through speeds. Wiper speeds cycle as follows: I > II > III > IIII > III > II > I.
- Press and hold the wiper button to spray washer fluid onto the windshield. After releasing the button, the wipers perform two additional wipes then, depending on vehicle and environmental conditions, a third wipe a few seconds later. You can also press and hold the wiper button for a continuous spray of washer fluid—the wipers perform the wipes after you release.

You can also access wiper settings by touching **Controls > Wipers**.

Whenever you press the wiper button, the instrument panel displays the wiper menu, allowing you to adjust wiper settings. Roll the left scroll button on the steering wheelsteering yoke up or down to choose your desired setting.



1. Turn the wipers off.
2. Choose how you want the wipers to operate:
 - IIII - Continuous, fast.
 - III - Continuous, slow.
 - II - Intermittent, fast.
 - I - Intermittent, slow.



- **Auto** – Model S/Model X detects precipitation and adjusts the wiping speed and intensity. Pressing the wiper button while the wipers are set to **Auto** temporarily increases the sensitivity of the wipers.

NOTE: When you engage Autosteer the wipers are set to **Auto**. Although you can change the wiper setting from **Auto** while using Autosteer, the wipers once again default to **Auto** the next time you engage Autosteer.

NOTE: The Auto setting is currently in BETA. If uncertain about using the Auto setting while in the BETA phase, Tesla recommends operating the wipers manually, as necessary.

NOTE: You can also adjust the windshield wiper speed and frequency using voice commands (see [Voice Commands on page 391](#)).

Periodically check and clean the edge of the wiper blades. If a blade is damaged, replace it immediately. For details on checking and replacing wiper blades, see [Wiper Blades and Washer Jets on page 450](#).

-  **CAUTION:** To avoid damaging the hood, ensure that the hood is fully closed before activating the windshield wipers.
-  **CAUTION:** Remove ice from the windshield before turning the wipers on. Ice has sharp edges that can damage the rubber on the wiper blades.
-  **CAUTION:** In harsh climates, ensure that the wiper blades are not frozen or adhered to the windshield.

Wipers

To wipe the windshield, rotate the end of the turn signal stalk away from you. You can rotate to five positions:

- 1st: Off.
- 2nd: Auto with low rain sensitivity.*
- 3rd: Auto with high rain sensitivity.*
- 4th: Continuous, slow.
- 5th: Continuous, fast.



For a single wipe, press and release the end of the stalk.

If the wipers are set to Auto and Model S/Model X detects no liquid on the windshield, the wipers do not wipe.

*To enable the **Auto** settings, touch **Controls > Vehicle > Autowipers (Beta)**. When wipers are set to Auto, Model S/Model X detects whether or not it is raining. The frequency at which they wipe depends on how much rain is detected on the windshield. When wipers are set to high rain sensitivity, the wipers turn on when Model S/Model X detects a light mist.

NOTE: When you engage Autosteer the wipers are set to **Auto**. Although you can change the wiper setting from **Auto** while using Autosteer, the wipers once again default to **Auto** the next time you engage Autosteer.

NOTE: The Auto setting is currently in BETA. If uncertain about using the Auto setting while in the BETA phase, Tesla recommends operating the wipers manually, as necessary.

NOTE: When you operate the wipers, headlights automatically turn on for approximately one minute (if they are not on already).

NOTE: You can also adjust the windshield wiper speed and frequency using voice commands (see [Voice Commands on page 391](#)).



CAUTION: Ensure the wipers are in the Off position before washing Model SModel X to avoid the risk of damaging the wipers.

To extend the life of wiper blades, remove ice from the windshield before turning wipers on. Ice has sharp edges that can damage the rubber on the wiper blades.

Periodically check and clean the edge of the wiper blade. If damaged, replace the wiper blade immediately. For details on checking and replacing wiper blades, see [Wiper Blades and Washer Jets on page 450](#).

CAUTION: In harsh climates, ensure that the wiper blades are not frozen or adhered to the windshield.

Defrosting Wipers

To make wiper blades easy to access so you can remove any ice and snow, shift Model SModel X into Park, turn the wipers off, then use the touchscreen to move them to the service position. Touch **Controls** > **Service** > **Wiper Service Mode**. When parking in cold outdoor climates, it is helpful to leave Model SModel X with the wipers in the service position. In this position, they are closer to the defrost vent, allowing you to thaw them by directing air from the climate control system towards the windshield.

If Model SModel X is equipped with the optional cold weather package, you can defrost wipers by touching the climate control on the touchscreen (see [Climate Controls on page 360](#)). Wiper defrosters automatically turn off after 15 minutes.

NOTE: Wipers automatically return to their normal position when you shift Model SModel X out of Park.

Washers

Press the button on the end of the turn signal stalk to spray washer fluid onto the windshield. You can press this button at two levels. Press partially for a single wipe, without any washer fluid. Press fully for both wipe and wash. When washing the windshield, the wipers turn on. After releasing the button, the wipers perform two additional wipes then a third wipe a few seconds later. After releasing the button, the wipers perform two additional wipes then, depending on vehicle and environmental conditions, a third wipe a few seconds later.



s

Periodically top up washer fluid (see [Wiper Blades and Washer Jets on page 450](#)).

Defrosting Washer Nozzles

If Model SModel X is equipped with the optional cold weather package, washer nozzles have defrosters that turn on whenever the ambient temperature nears freezing, or when you turn on the wiper defrosters (see [Climate Controls on page 360](#)). The washer defrosters turn off when the wiper defrosters turn off (after 15 minutes), provided the temperature is warm enough to prevent freezing.



Braking and Stopping

Braking Systems

WARNING: Properly functioning braking systems are critical to ensure safety. If you experience a problem with the brake pedal, brake calipers, or any component of a Model S/Model X braking system, contact Tesla immediately.

Model S/Model X has an anti-lock braking system (ABS) that prevents the wheels from locking when you apply maximum brake pressure. This improves steering control during heavy braking in most road conditions.

During emergency braking conditions, the ABS constantly monitors the speed of each wheel and varies the brake pressure according to the grip available.

The alteration of brake pressure can be felt as a pulsing sensation through the brake pedal. This demonstrates that the ABS is operating and is not a cause for concern. Keep firm and steady pressure on the brake pedal while experiencing the pulsing.

ABS

The ABS indicator briefly flashes amber on the instrument panel when you first start Model S/Model X. If this indicator lights up at any other time, an ABS fault has occurred and the ABS is not operating. Contact Tesla. The braking system remains fully operational and is not affected by an ABS failure. However, braking distances may increase. Drive cautiously and avoid heavy braking.

USA:

Canada:



The ABS indicator briefly flashes amber on the instrument panel when you first start Model S/Model X. If this indicator lights up at any other time, an ABS fault has occurred and the ABS is not operating. Contact Tesla. The braking system remains fully operational and is not affected by an ABS failure. However, braking distances may increase. Drive cautiously and avoid heavy braking.

BRAKE

If the instrument panel displays this red brake indicator at any time other than briefly when you first start Model S/Model X, a brake system fault is detected, or the level of the brake fluid is low. Contact Tesla immediately. Apply steady pressure and keep the brakes firm to bring the vehicle to a stop when safe to do so.

USA:



If the instrument panel displays this red brake indicator at any time other than briefly when you first start Model S/Model X, a brake system fault is detected, or the level of the brake fluid is low. Contact Tesla immediately. Apply steady pressure and keep the brakes firm to bring the vehicle to a stop when safe to do so.

Canada:

BRAKE

The instrument panel displays this amber brake indicator if a brake booster fault is detected. Apply steady pressure and keep the brakes firm to stop the vehicle when safety permits. Hydraulic Boost Compensation will be active (see [Hydraulic Boost Compensation on page 233](#)).

USA:



The instrument panel displays this amber brake indicator if a brake booster fault is detected. Apply steady pressure and keep the brakes firm to stop the vehicle when safety permits. Hydraulic Boost Compensation will be active (see [Hydraulic Boost Compensation on page 233](#)).

Canada:

WARNING: When driving a Model S Plaid equipped with the optional Carbon Ceramic Brake Kit in temperatures below 14 degrees Fahrenheit (-10 degrees Celsius), the instrument panel displays an alert indicating that stability and braking performance may be degraded in cold weather. You may need to increase the amount of pressure you apply to the brake pedal when driving in cold weather. Be aware of this reduced performance and drive cautiously in cold weather conditions.

WARNING: The **Apply Brakes When Regenerative Braking is Limited** feature is not available on Model S that have the "Carbon Ceramic Brake Kit" installed.



Emergency Braking

In an emergency, fully press the brake pedal and maintain firm pressure, even on low traction surfaces. The ABS varies the braking pressure to each wheel according to the amount of traction available. This prevents wheels from locking and ensures that you stop as safely as possible.

If an alternative method is needed to bring the vehicle to a stop, press and hold the Park button on the touchscreen's drive mode strip to apply the brakes and remove drive torque while the button is held. Touch **Controls** to display the drive mode strip.

If an alternative method is needed to bring the vehicle to a stop, press and hold the Park button on the drive stalk to apply the brakes and remove drive torque while the button is held.

 **WARNING:** Do not pump the brake pedal. Doing so interrupts operation of the ABS and can increase braking distance.

 **WARNING:** Always maintain a safe distance from the vehicle in front of you and be aware of hazardous driving conditions. While the ABS can improve stopping distance, it cannot overcome the laws of physics. It also does not prevent the danger of hydroplaning (where a layer of water prevents direct contact between the tires and the road).

 **CAUTION:** Automatic Emergency Braking (see [Collision Avoidance Assist on page 340](#)) may intervene to automatically brake in situations where a collision is considered imminent. Automatic Emergency Braking is not designed to prevent a collision. At best, it can minimize the impact of a frontal collision by attempting to reduce your driving speed. Depending on Automatic Emergency Braking to avoid a collision can result in serious injury or death.

 **CAUTION:** In emergency situations, if the brakes are not functioning properly, press and hold the Park button on the center console or touchscreen on the drive stalk to bring Model S/Model X to a stop. Do not use this method to stop the vehicle unless absolutely necessary.

Dynamic Brake Lights (if equipped)

If you are driving over 30 mph (50 km/h) and brake forcefully (or if Automatic Emergency Braking engages), the brake lights flash quickly to warn other drivers that Model S/Model X is rapidly slowing down. If Model S/Model X stops completely, the hazard warning lights flash. Flashing continues until you press the accelerator or manually press the hazard lights button to turn them off (see [Hazard Warning Flashers on page 209](#)).

NOTE: When towing a trailer (if applicable), the brake lights on the trailer also operate as described above, even when the trailer is not equipped with a separate braking system.

 **WARNING:** When towing a trailer (if applicable), always increase your following distance. Sudden braking may result in skidding, jack-knifing, and loss of control.

Brake Disc Wiping

To ensure brakes remain responsive in cold and wet weather, Model S/Model X is equipped with brake disc wiping. When cold and wet weather is detected, this feature repeatedly applies an imperceptible amount of brake force to remove water from the surface of the brake discs.

Hydraulic Fade Compensation

Model S/Model X is equipped with hydraulic fade compensation. This assists in monitoring brake system pressure and ABS activity for instances of reduced brake performance. If reduced brake performance is detected (for example, as a result of brake fade, or cold or wet conditions), you may hear a sound, feel the brake pedal pull away from your foot, and notice a strong increase in braking. Brake as you normally would and continue to press the brake pedal without releasing or pumping the brakes.

 **CAUTION:** In emergency situations, if the brakes are not functioning properly, press and hold the Park button on the center console or touchscreen on the drive stalk to bring Model S/Model X to a stop. Do not use this method to stop the vehicle unless absolutely necessary.

 **WARNING:** Always maintain a safe driving distance from the vehicle in front of you and exercise caution when driving conditions are hazardous. Brake disc wiping and hydraulic fade compensation is not a substitute for adequately applying the brakes.



Hydraulic Boost Compensation

Model S Model X is equipped with a brake booster that activates the brakes when the brake pedal is pressed. Hydraulic boost compensation provides mechanical assistance if the brake booster fails. If a brake booster failure is detected, the brake pedal feels stiffer to press and you may hear a sound when you press the brake pedal. To stop Model S Model X, apply steady force to the brake pedal without releasing or pumping. Drive cautiously and maintain a safe distance from other road users—brake pedal responsiveness and braking performance may be degraded.

Regenerative Braking

Whenever Model S Model X is moving and your foot is off the accelerator, regenerative braking slows down the vehicle and feeds any surplus power back to the Battery. By anticipating your stops and reducing or removing pressure from the accelerator pedal to slow down, you can take advantage of regenerative braking to increase driving range.

The power meter on the Energy app displays real-time feedback on the amount of power being used. You can also display the power meter on either side of the instrument panel by choosing **Energy** using the scroll button on the steering wheel/steering yoke (see [Steering Wheel/Steering Yoke on page 185](#)). When energy is being gained by regenerative braking, the power meter displays a green area that represents the amount of power that is being fed back to the Battery.

The amount of power fed back to the Battery using regenerative braking can depend on the current state of the Battery. For example, regenerative braking may be limited if the Battery is cold or is already fully charged. When regenerative braking is limited, the power meter displays a dashed line to indicate the amount of deceleration power that is not being fed back to the Battery.



Vehicle deceleration due to regenerative braking may vary depending on the current state of the Battery. For example, regenerative braking may be limited if the Battery is cold or is already fully charged.

To experience the same amount of deceleration whenever you release the accelerator pedal, regardless of the state of the Battery, you can choose to have the regular braking system automatically engage whenever regenerative braking is limited. Touch **Controls > Pedals & Steering > Apply Brakes When Regenerative Braking is Limited**.



WARNING: **Apply Brakes When Regenerative Braking is Limited** may not operate if the brakes are extremely hot.

NOTE: If **Apply Brakes When Regenerative Braking is Limited** is enabled and applying the brakes, the brake pedal may move and it may feel stiffer when pressed. This is expected and does not change your ability to slow down Model S Model X.

The power meter (a thin horizontal line centered at the bottom of the instrument panel) displays real-time power usage:



1. The left side of the power meter represents power generated from regenerative braking, or power that is used to slow down the vehicle. Power being fed back to the Battery displays in green whereas power used by the regular braking system displays in gray.
2. The right side of the power meter shows power being output by the Battery, such as that used to accelerate the vehicle. When you press the accelerator pedal, the power meter fills to the right with black (or white if the display is dark).

NOTE: Installing winter tires with aggressive compound and tread design may result in temporarily-reduced regenerative braking power. However, your vehicle is designed to continuously recalibrate itself, and after changing tires it will increasingly restore regenerative braking power after some straight-line accelerations. For most drivers this occurs after a short period of normal driving, but drivers who normally accelerate lightly may need to use slightly harder accelerations while the recalibration is in progress. Touch **Service > Wheel & Tire > Tires** to select winter tires and quicken this process.

NOTE: If regenerative braking is aggressively slowing Model SModel X (such as when your foot is completely off the accelerator pedal at highway speeds), the brake lights turn on to alert others that you are slowing down.

NOTE: Because Model SModel X uses regenerative braking, the brake pads are typically used less frequently than those in traditional braking systems. To avoid the accumulation of rust and corrosion, Tesla recommends frequently pressing the brake pedal to apply the mechanical brakes and dry the brake pads and rotors.

WARNING: In snowy or icy conditions, Model SModel X may experience loss of traction during regenerative braking, particularly when in the **Standard** setting and/or not using winter tires. Tesla recommends using the **Low** setting in snowy or icy conditions to help maintain vehicle stability.

To Set the Regenerative Braking Level

NOTE: The regenerative braking setting is not available on all vehicles.

You can use the touchscreen to change the level of regenerative braking:

1. Touch **Controls > Pedals & Steering > Regenerative Braking**.
2. Choose from two levels:
 - **Standard:** Provides the maximum amount of regenerative braking. When you release the accelerator, Model SModel X slows down.
 - **Low:** Limits regenerative braking. When you release the accelerator, Model SModel X takes longer to slow down and coasts farther than if set to "Standard".

Stopping Mode

Regenerative braking decelerates Model SModel X whenever you release the accelerator pedal when driving. You can choose what you want Model SModel X to do once the driving speed has been reduced to a very low speed (almost at a stop) and both the accelerator pedal and brake pedal are released. While in Park, touch **Controls > Driving > Stopping Mode** and choose from these options:

- **CREEP:** When close to, or at, a complete stop, the motor continues to apply torque, moving Model SModel X slowly forward (in Drive) or backwards (in Reverse), similar to a conventional vehicle with an automatic transmission. In some situations, such as on a steep hill or driveway, you may need to press the accelerator pedal to continue moving or to prevent Model SModel X from moving in the opposite direction.

WARNING: Never rely on CREEP to apply enough torque to prevent your vehicle from rolling down a hill. Always press the brake pedal to remain stopped or the accelerator pedal to proceed up the hill. Failure to do so can result in property damage and/or a collision.

- **HOLD:** Maximizes range and reduces brake wear by continuing to provide regenerative braking at speeds lower than with the Creep and Roll settings. When Model SModel X stops, the brakes are automatically applied without you having to put your foot on the brake pedal. Whether stopped on a flat surface or a hill, Vehicle Hold keeps the brake applied, provided your foot remains off the accelerator and brake pedals. See [Vehicle Hold](#) on page 252.



⚠ WARNING: Never rely on HOLD to adequately decelerate or fully stop your vehicle. Many factors can contribute to a longer stopping distance, including downward slopes, the low regenerative braking setting, and reduced or limited regenerative braking (see [Regenerative Braking on page 233](#)). Always be prepared to use the brake pedal to adequately decelerate or stop.

- **ROLL:** When close to, or at, a complete stop, Model SModel X becomes free rolling like a vehicle in Neutral. Therefore, if stopped on a slope, Model SModel X will roll downward. The brake does not engage, and the motor does not apply torque (until the accelerator pedal is pressed).

NOTE: If you choose CREEP or ROLL, you can still use Vehicle Hold to apply the brakes. However, you will need to briefly press the brake pedal when the vehicle is stopped. See [Vehicle Hold on page 252](#).

NOTE: Your preferred Stopping Mode setting does not sync to your driver profile.

⚠ WARNING: Press the brake pedal if Model SModel X moves when unsafe to do so. It is your responsibility to stay alert and be in control of the vehicle at all times. Failure to do so can result in serious damage, injury, or death.

⚠ WARNING: Do not rely on regenerative braking and your chosen Stopping Mode to keep you and your vehicle safe. Various factors such as driving with a heavy vehicle load, on a steep hill, or on wet or icy roads affect deceleration rate and the distance at which Model SModel X will come to a stop. Drive attentively and always stay prepared to use the brake pedal to stop as appropriate based on traffic and road conditions.

⚠ WARNING: Forward Collision Warning and Automatic Emergency Braking do not operate when driving at very low speeds (see [Collision Avoidance Assist on page 340](#)). Do not rely on these features to warn you, or to prevent or reduce the impact of a collision.

Parking Brake

To engage the parking brake, touch **Controls > Safety > Parking Brake**. Follow the onscreen instructions. You can also engage the parking brake by pressing and holding the button on the end of the drive stalk while in Park.



Use the touchscreen to manually release the parking brake (which also shifts Model SModel X into Neutral):

1. Touch **Controls > Safety**.
2. Press the brake pedal, then touch **Parking Brake**. If Model SModel X was previously in Park, it shifts into Neutral.

PARK

When you manually apply the parking brake using the touchscreen, the red parking brake indicator lights up on the touchscreen.

USA:



When you manually apply the parking brake using the touchscreen, the red parking brake indicator lights up on the touchscreen.

Canada:

PARK

If the parking brake experiences an electrical issue, the amber parking brake indicator lights up and a fault message displays on the touchscreen.

USA:



If the parking brake experiences an electrical issue, the amber parking brake indicator lights up and a fault message displays on the touchscreen.

Canada:

NOTE: The parking brake operates on the rear wheels only, and is independent of the pedal-operated brake system.

 **CAUTION:** In the unlikely event that Model SModel X loses electrical power, you cannot access the touchscreen and are therefore unable to release the parking brake without first jump starting (see [#unique_354 on page](#)).

 **WARNING:** In snowy or icy conditions the rear wheels may not have sufficient traction to prevent Model SModel X from sliding down a slope, particularly if not using winter tires. Avoid parking on hills in snowy or icy conditions. You are always responsible for parking safely.

 **WARNING:** Your Model SModel X may display an alert if the road is too steep to safely park on, or if the parking brakes are not properly engaged. These alerts are for guidance purposes only and are not a substitute for the driver's judgment of safe parking conditions, including specific road or weather conditions. Do not depend on these alerts to determine whether or not it is safe to park at any location. You are always responsible for parking safely.

Brake Wear

Model SModel X brake pads are equipped with wear indicators. A wear indicator is a thin metal strip attached to the brake pad that squeals as it rubs against the rotor when the pad wears down. This squealing sound indicates that the brake pads have reached the end of their service life and require replacement. To replace the brake pads, contact Tesla Service.

Brakes must be periodically inspected visually by removing the tire and wheel. For detailed specifications and service limits for rotors and brake pads, see [Subsystems on page 487](#). Additionally, Tesla recommends cleaning and lubricating the brake calipers every year or 12,500 miles (20,000 km) if in an area where roads are salted during winter months.

 **WARNING:** Neglecting to replace worn brake pads damages the braking system and can result in a braking hazard.



Traction Control

How It Works

The traction control system constantly monitors the speed of the front and rear wheels. If Model S/Model X experiences a loss of traction, the system minimizes wheel spin by controlling brake pressure and motor power. By default, the traction control system is on. Under normal conditions, it should remain on to ensure maximum safety.



This yellow indicator flashes on the instrument panel whenever the traction control system is actively controlling brake pressure and motor power to minimize wheel spin. If the indicator stays on, a fault is detected with the traction control system. Contact Tesla Service.



WARNING: If the above indicator remains illuminated in situations in which you have not disabled the traction control system (described next), the traction control system may not be operating correctly. Contact Tesla Service immediately.



WARNING: Traction control cannot prevent collisions caused by driving dangerously or turning too sharply at high speeds.

Disabling Traction Control

Under normal conditions, the traction control system should remain enabled. Disable it only in circumstances where you deliberately want the wheels to spin, such as:

- Starting on a loose surface, such as gravel or snow.
- Driving in deep snow, sand or mud.
- Rocking out of a hole or deep rut.

To allow the wheels to spin, touch **Controls > Pedals & Steering > Slip Start**.



The instrument panel displays an alert message when traction control is turned off.

Although the traction control system automatically reactivates the next time you start Model S/Model X, it is strongly recommended that you enable it immediately after the circumstances that required you to disable it have passed.

NOTE: Traction Control can not be disabled when you are actively using cruise control.

Allowing Wheel Slip

To allow the wheels to spin at a limited speed, you can enable Slip Start. Slip Start can be enabled only when Model S/Model X is moving 30 mph (48 km/h) or slower. Slip Start automatically disables when the speed exceeds 50 mph (80 km/h).

Under normal conditions, Slip Start should not be enabled. Enable it only in circumstances where you deliberately want the wheels to spin, such as:

- Starting on a loose surface, such as gravel or snow.
- Driving in deep snow, sand or mud.
- Rocking out of a hole or deep rut.

To allow the wheels to spin, touch **Controls > Pedals & Steering > Slip Start**.



The instrument panel displays an alert message when Slip Start is enabled.

Although Slip Start is automatically disabled the next time you start Model SModel X, it is strongly recommended that you disable it immediately after the circumstances that required you to enable it have passed.

NOTE: Slip Start can not be enabled when you are actively using cruise control.



Cruise Control

Cruise control makes it easy to maintain a consistent driving speed. Cruise control is primarily intended for driving on dry, straight roads, such as highways. It should not be used on city streets and in heavy traffic.

Operating Cruise Control

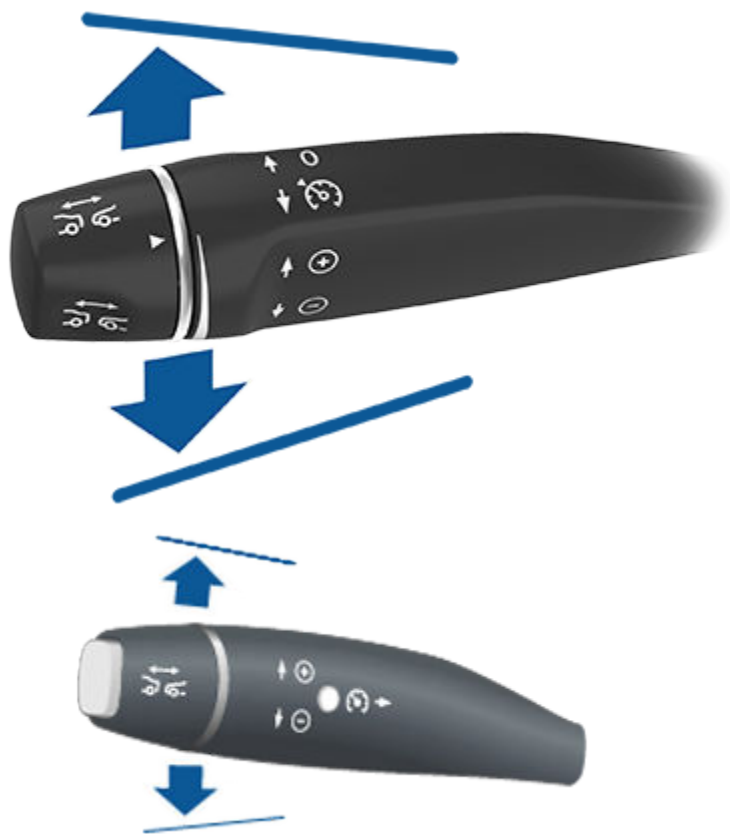
WARNING: Do not use cruise control on winding or slippery road surfaces, or when traffic conditions make it unsafe to drive at a consistent speed.

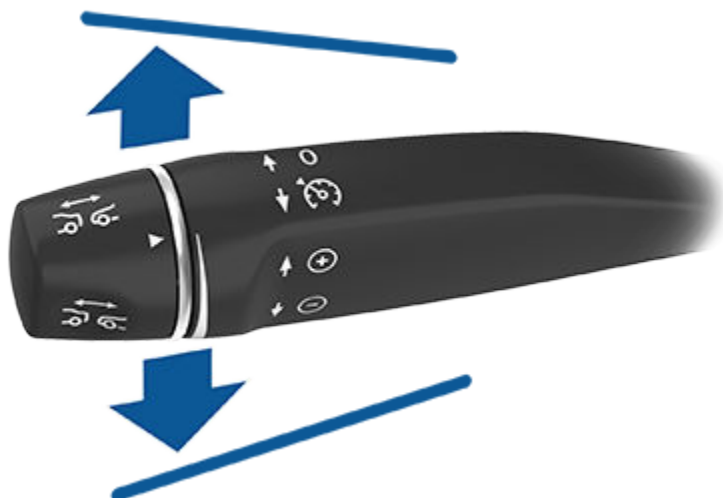
1. If there is a button on the end of your cruise stalk, press the button to turn the cruise control system on or off. An orange light is illuminated if the system is on.

2. Accelerate manually until you reach your desired cruising speed.

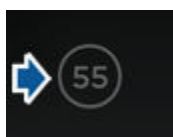
NOTE: Cruise control will not activate below 18 mph (29 km/h).

3. Move the cruise stalk up or down, then release.





Cruise control is now active.



The instrument cluster displays a gray speedometer icon to show your set speed.



The instrument panel displays the **CRUISE** message above the speedometer and an arrow displays on the speedometer to show your set speed.

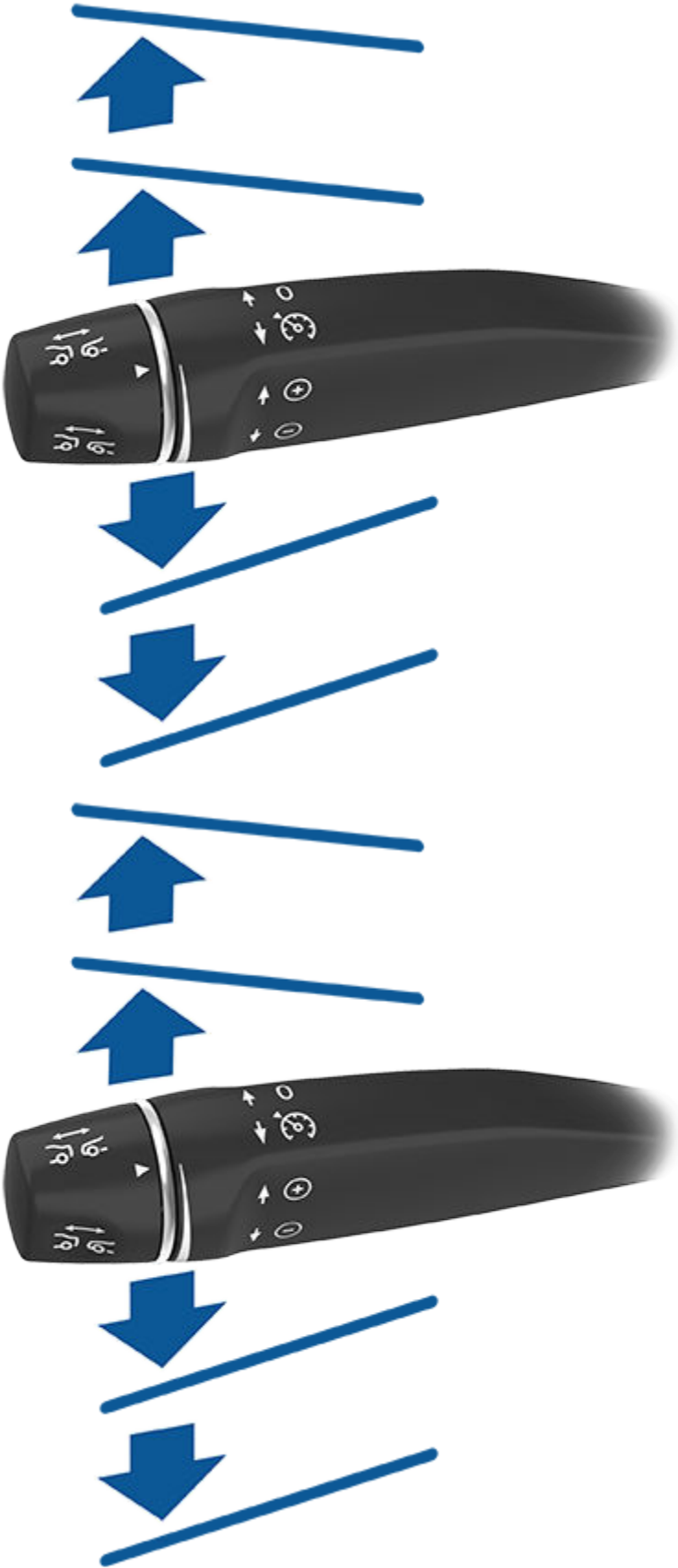
You can manually accelerate past the set speed at any time when cruise control is active. However, when you release the accelerator, Model S/Model X slows down to the set speed.

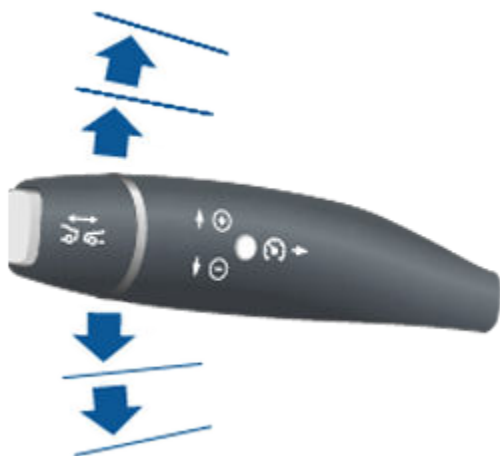
⚠ WARNING: Driving downhill can increase driving speed, causing Model S/Model X to exceed your cruising speed.

Changing the Cruising Speed

Move the cruise stalk up (increase) or down (decrease) until your desired cruising speed is reached.

- Move the cruise stalk up or down to the first position and release to increase/decrease the set speed by 1 mph.
- Move the cruise stalk up/down to the second position and release to increase/decrease the set speed by 5 mph.
- Hold the cruise stalk up or down to increase/decrease the cruising speed and set speed simultaneously.





NOTE: It may take a few seconds for Model S/Model X to reach the new set speed.

Canceling and Resuming

If equipped, press the button on the end of the cruise stalk to turn the cruise control system off (which will cancel cruise control and clear the set speed).

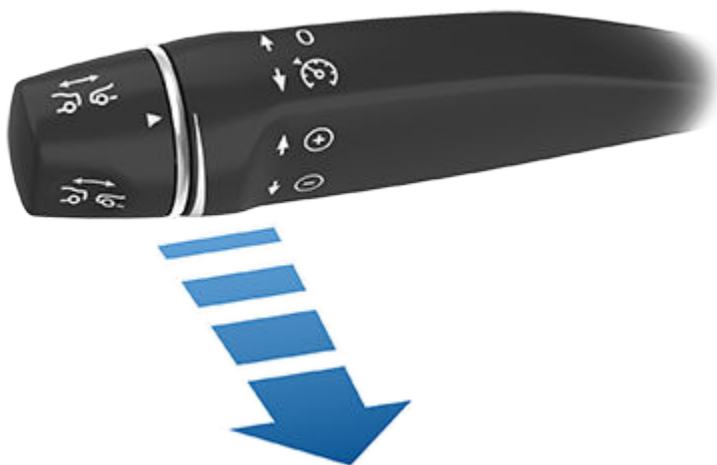
You can cancel cruise control if you do any of the following:

- Press the brake pedal.
- Push the cruise stalk away from you.

NOTE: Canceling cruise control does not clear the set speed until Model S/Model X powers off.

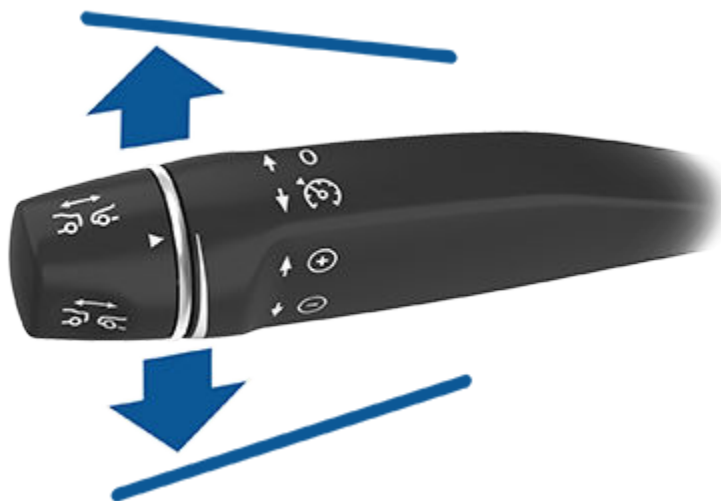
NOTE: When cruise control cancels, Model S/Model X does not coast. Instead, regenerative braking slows down Model S/Model X in the same way as when you move your foot off the accelerator when driving without cruise control (see [Regenerative Braking on page 233](#)).

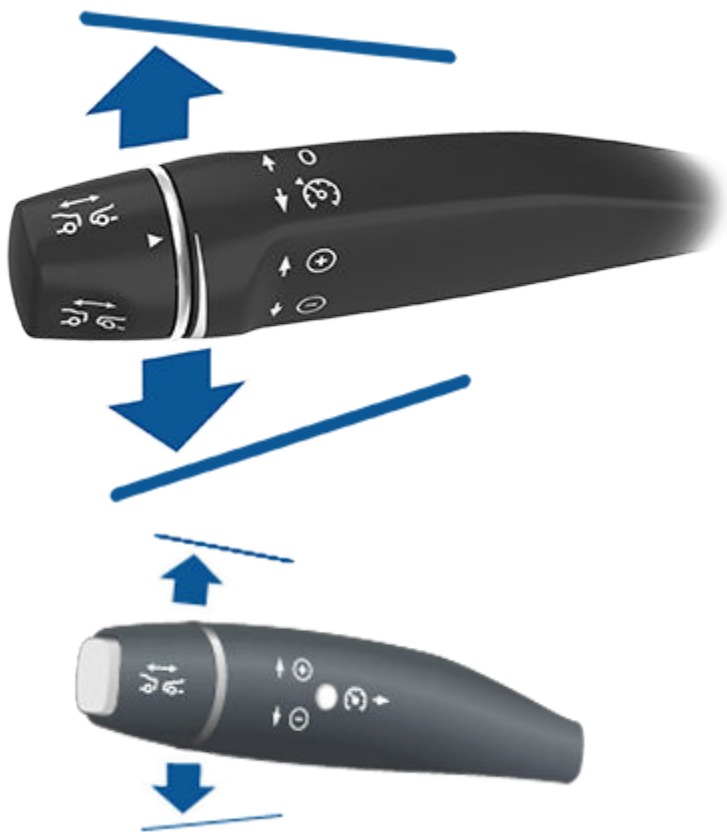
To resume cruising at the previous set speed, briefly pull the cruise stalk toward you. Cruise control resumes, provided your driving speed is over 18 mph (29 km/h).





To resume cruising at the current driving speed, move the cruise stalk up or down, then release.







Park Assist

How Park Assist Works

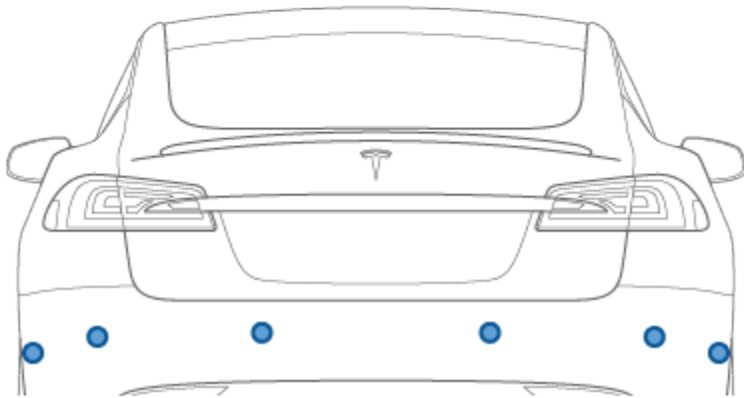
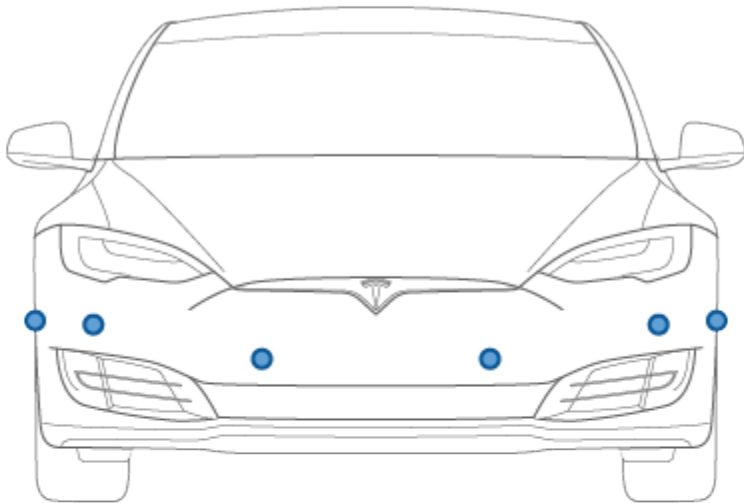
Model S/Model X has several sensors designed to detect the presence of objects. When driving slowly in Drive or Reverse (for example, when parking), the vehicle alerts you if an object is detected in close proximity of your Model S/Model X. Objects are only detected in your chosen direction; front objects in Drive, rear objects in Reverse.

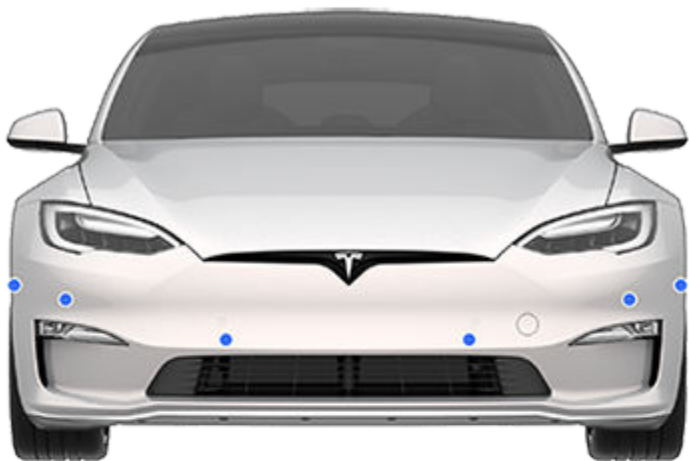
WARNING: You may not be alerted if Model S/Model X rolls freely in the opposite direction (for example, Park Assist does not display an alert if Model S/Model X rolls backwards down a hill while in Drive).

NOTE: Depending on date of manufacture and options selected at time of purchase, some Model S vehicles are not equipped with the parking sensors.

WARNING: The Park Assist images provided below are representative only. The exact number and location of sensors may vary depending on the date your Model S/Model X was manufactured.



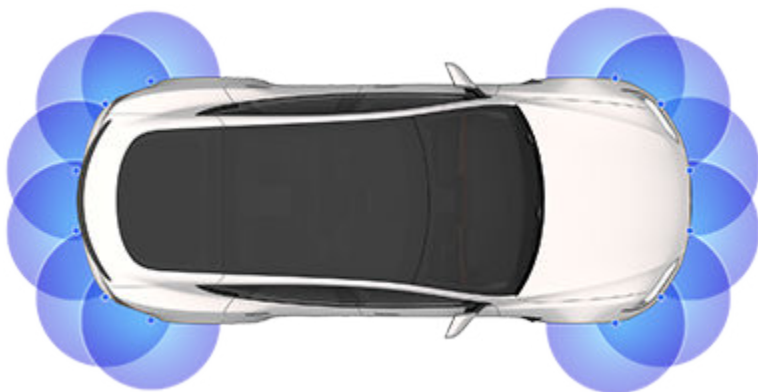


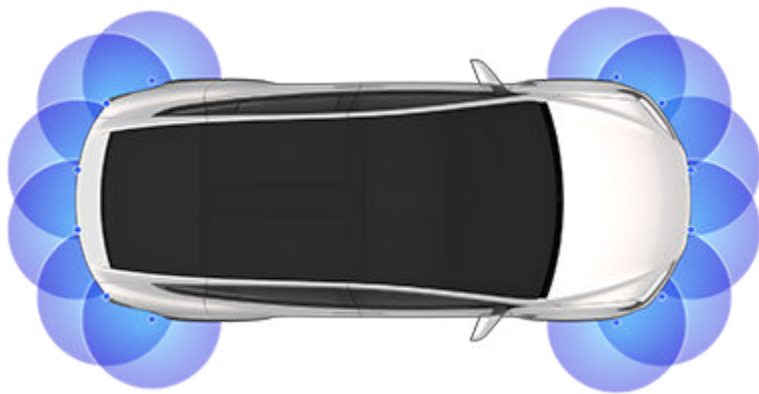






The sensors are activated when driving slower than 5 mph (8 km/h).





NOTE: Rear sensors are disabled when a bicycle is detected or Model S/Model X is in trailer mode.

WARNING: Never depend on Park Assist to inform you if an area you are approaching is free of objects and/or people. Several external factors can reduce the performance of Park Assist, causing either no readings or false readings (see [Limitations and False Warnings on page 250](#)). Therefore, depending on Park Assist to determine if Model S/Model X is approaching an obstruction can result in damage to the vehicle and/or objects, and can potentially cause serious injury. Always inspect the area with your own eyes. When reversing, perform shoulder checks and use all mirrors. Park assist does not detect children, pedestrians, bicyclists, animals, or objects that are moving, protruding, located too far above or below the sensors, or too close or too far from the sensors. Park Assist is for guidance purposes only and is not intended to replace your own direct visual checks. It is not a substitute for careful driving.

Visual and Audio Feedback

When you shift to Reverse, the Park Assist view displays on the left side of the instrument panel, showing objects that are in close proximity to the front and rear of Model S/Model X. This view closes when you shift into Drive unless an object is detected close to the front of Model S/Model X, in which case the Park Assist view closes automatically when your driving speed exceeds 5 mph (8 km/h). When reversing, visual feedback also displays on the touchscreen (see [Rear Facing Camera\(s\) on page 264](#)). You can manually close the park assist view on the touchscreen by touching the **X**.

When driving with the Camera app displayed on the touchscreen, you can switch to the Park Assist view when driving at speeds below 5 mph (8 km/h). Touch the button located in the upper left corner of the Camera app screen. This is useful if you need assistance with parallel parking.

If chimes are turned on (see [Controlling Audible Feedback on page 250](#)), an audible beep sounds as you approach an object. You can temporarily mute the chime by touching the speaker icon on the bottom corner of the Park Assist view.

NOTE: If a sensor is unable to provide feedback, the instrument panel displays an alert message.

CAUTION: Keep sensors clean from dirt, debris, snow, and ice. Avoid using a high pressure power washer on the sensors and do not clean a sensor with a sharp or abrasive object that can scratch or damage its surface.

CAUTION: Do not install accessories or stickers on or near the parking sensors.

Controlling Audible Feedback

You can use Park Assist with or without audible feedback. To turn chimes on or off, touch **Controls > Safety > Park Assist Chimes**.

To mute the chimes temporarily, touch the speaker icon in the bottom corner of the Park Assist view. The chimes are muted until you shift or drive over 5 mph (8 km/h).

Limitations and False Warnings

The parking sensors may not function correctly in these situations:

- One or more of the ultrasonic sensors is damaged, dirty, or obstructed (such as by mud, ice, or snow, or by a vehicle bra, excessive paint, or adhesive products such as wraps, stickers, rubber coating, etc.).
- The object is located below approximately 8 inches (20 cm) (such as a curb or low barrier).



CAUTION: Shorter objects that are detected (such as curbs or low barriers) can move into the blind spot of the sensors. Model SModel X cannot alert you about an object while it is in the blind spot of the sensors.

- Weather conditions (heavy rain, snow, or fog) are interfering with sensor operation.
- The object is thin (such as a sign post).
- A sensor's operating range has been exceeded.
- The object is sound-absorbing or soft (such as powder snow).
- The object is sloped (such as a sloped embankment).
- Model SModel X has been parked in, or being driven in, extremely hot or cold temperatures.
- The sensors are affected by other electrical equipment or devices that generate ultrasonic waves.
- You are driving in a location where the sensors' ultrasonic waves are deflected away from the vehicle (such as driving next to a wall or pillar).
- The object is located too close to the bumper.
- A bumper is misaligned or damaged.
- An object that is mounted to Model SModel X is interfering with and/or obstructing the sensor (such as a bike rack or bumper sticker).
- Model SModel X rolls freely in the opposite direction you selected (for example, Park Assist does not display an alert if Model SModel X rolls backwards down a hill while in Drive).

Other Parking Aids

In addition to Park Assist, when shifted into Reverse, the backup camera displays a view of the area behind Model SModel X (see [Rear Facing Camera\(s\) on page 264](#)).



Vehicle Hold

When Model S/Model X is stopped, Vehicle Hold can continue to apply the brakes even after you remove your foot from the brake pedal. When driving on a hill or on a flat surface, brake as you normally would. After coming to a complete stop, simply press the brake pedal again (until the instrument panel displays the Vehicle Hold indicator light) to enable Vehicle Hold. You can then release the brake pedal and remain stopped, even on a hill.



This indicator displays on the instrument panel whenever Vehicle Hold is actively braking Model S/Model X.

To disengage Vehicle Hold, press the accelerator pedal or press and release the brake pedal.

NOTE: Shifting into Neutral also disengages Vehicle Hold.

NOTE: After actively braking Model S/Model X for approximately ten minutes, Model S/Model X shifts into Park and Vehicle Hold cancels. Model S/Model X also shifts into Park if it detects that the driver has left the vehicle.

NOTE: When Stopping Mode is set to Hold, Vehicle Hold engages automatically whenever Model S/Model X stops while in Drive or Reverse. There is no need to press the brake to engage it.



Hill Start Assist

Hill Start Assist automatically engages the brakes for approximately one second when on a hill. This prevents Model S/Model X from rolling during the time it takes for you to move your foot from the brake pedal to the accelerator pedal. Hill Start Assist engages the brakes only if Model S/Model X is in Drive and facing uphill, or in Reverse and facing downhill.



WARNING: After approximately one second, Hill Start Assist no longer brakes your vehicle and it could roll. Therefore, quickly move your foot from the brake pedal to the accelerator pedal. Never rely on Hill Start Assist to prevent Model S/Model X from rolling for more than one second. Failure to do so can result in a collision.



Acceleration Modes

The acceleration settings available on your Model S/Model X vary depending on date of manufacture and options chosen at time of purchase:

- **Chill:** limits acceleration for a smooth and gentle ride (available on all vehicles equipped with Autopilot hardware).
- **Standard:** provides the normal level of acceleration (available on non-Performance All-Wheel Drive vehicles and Rear Wheel Drive Model S vehicles equipped with Autopilot hardware).
- **Sport:** provides the normal level of acceleration (available on Performance All-Wheel Drive vehicles).
- **Insane:** increases peak torque by approximately 30 percent (available on Performance All-Wheel Drive vehicles not equipped with the Ludicrous upgrade).
- **Ludicrous:** increases peak torque by approximately 60 percent (available on Performance All-Wheel Drive vehicles equipped with the Ludicrous upgrade).
- **Insane+:** increases peak torque by approximately 30 percent (available on Performance All-Wheel Drive vehicles not equipped with the Ludicrous upgrade) while also heating up the Battery to its ideal operating temperature to ensure access to 100% of available power. Before choosing this setting, read about [Using Insane+ or Ludicrous+ on page 254](#).
- **Ludicrous+:** increases peak torque by approximately 60 percent (available on Performance All-Wheel Drive vehicles equipped with the Ludicrous upgrade) while also immediately heating up the Battery to its ideal operating temperature to ensure access to 100% of available power. Before choosing this setting, read about [Using Insane+ or Ludicrous+ on page 254](#).

NOTE: Although Chill does not directly improve driving range, using the increased torque and power available in Insane or Ludicrous mode can reduce range and efficiency.

NOTE: When Chill is selected, Chill displays on the instrument panel above the driving speed.

In addition, a Performance All-Wheel Drive Model S/Model X also features Launch Mode to provide optimum acceleration on surfaces with good traction. For the specific driving instructions required to use Launch Mode, see [Launch Mode on page 255](#).

To choose an acceleration mode, touch **Controls > Driving > Acceleration**.

Using Insane+ or Ludicrous+

If you choose Insane or Ludicrous, additional power is available immediately. However, to achieve the absolute maximum power (designed for short term use), you can choose **Insane+** or **Ludicrous+** to heat the Battery to its ideal operating temperature. This ensures access to 100% of available power.

While the battery is being heated, the touchscreen displays a status message providing you with an approximate wait time, and letting you know when the additional power is available. In addition to heating the Battery, **Insane+** and **Ludicrous+** modes strive to keep the Battery within an optimal temperature range. Therefore, under aggressive driving scenarios, you may also see the "Cooling" status for several minutes until temperatures fall. Model S/Model X stays in the chosen mode for three hours, even if you leave the vehicle. After three hours, the feature times out.

NOTE: Insane+ and Ludicrous+ are designed to achieve maximum performance for short term acceleration. These settings are not intended for daily driving. The tradeoff for the additional power boost is extra energy consumption and earlier power fade on long drives. The Insane or Ludicrous acceleration settings provide a significant increase in performance even without choosing the Insane+ or Ludicrous+ setting to achieve maximum Battery power. In fact, in normal driving situations, the additional power that can be achieved using Insane+ and Ludicrous+ may be unnoticeable.

NOTE: To support Insane+ or Ludicrous+, the charge level must be 20% or higher. You cannot initiate these settings if the charge level is less than 20%. In addition, these settings immediately cancel if at any time during use, the charge level drops below 20%.

When using Insane+ or Ludicrous+, Model S/Model X consumes more energy to keep the Battery within an optimal temperature range.

To cancel Insane+ or Ludicrous+ at any time, change the acceleration level to another setting. To prevent excess and potentially unnecessary energy consumption (for example, you leave the vehicle and forget to cancel Insane+ or Ludicrous+), these settings cancel automatically in three hours, regardless of whether you are still driving or have left the vehicle.



NOTE: Insane+ or Ludicrous+ strives to keep the Battery within an optimal temperature range. In addition to heating the Battery, these settings also cool the battery when necessary (for example, while driving at high speeds, during rapid acceleration, driving for long periods, etc.).

Launch Mode

Launch Mode, available on Performance All-Wheel Drive vehicles only, provides optimum acceleration on surfaces with good traction.

NOTE: Hard acceleration including, but not limited to, using launch mode, increases stress on the vehicle's powertrain, and can cause premature wear and aging of various components. Model S Model X constantly monitors powertrain fatigue and damage, and notifies you if vehicle components need to be serviced.



WARNING: Use Launch Mode only in appropriate locations where there is no cross traffic or pedestrians present. Launch Mode is designed for use on closed circuit driving courses. It is the driver's responsibility to ensure that driving style and acceleration do not endanger or inconvenience other road users.

To Activate Launch Mode

1. Ensure the brakes are slightly warm by driving for a few minutes and using the brakes a few times.
2. Set the air suspension to Low (see [Air Suspension on page 385](#)[Air Suspension on page 387](#)[Air Suspension on page 389](#)).
3. Set the air suspension to Low or Very Low (see [Air Suspension on page 385](#)[Air Suspension on page 387](#)[Air Suspension on page 389](#)).
4. Set the acceleration level to **Insane+** or **Ludicrous+** (if equipped).

NOTE: If equipped with the **Ludicrous+** setting, you can achieve optimum performance by pressing and holding this setting for three seconds.

5. With Model S Model X shifted into Drive and at a complete stop with the steering wheel straight, firmly hold the brake pedal with your left foot, then fully press the accelerator pedal. Within one second, the instrument panel displays a message indicating that Launch Mode is enabled.

NOTE: Launch mode further lowers the front suspension, significantly reducing ground clearance.

6. Within twelve seconds of Launch Mode being enabled, release the brake pedal to launch the vehicle.

When you release the brake, Model S Model X launches forward.

NOTE: Launch Mode is not available if Traction Control has been disabled Slip Start has been enabled (which allows the wheels to spin). See [Traction Control on page 237](#).

NOTE: Launch Mode is available only if the ambient temperature is 37° F (3° C) or warmer.



Acceleration Modes

Touch **Controls > Pedals & Steering > Acceleration** to choose a preferred acceleration mode:

- **Chill** limits acceleration for a slightly smoother and gentler ride.

NOTE: When Chill is selected, **Chill** displays on the instrument panel, above the driving speed.

- **Sport** provides the normal level of acceleration.
- **Insane** (called **Plaid** on performance vehicles) (if equipped) provides access to the maximum level of acceleration immediately available.

NOTE: Using the increased torque and power available in Insane or Plaid mode can reduce range and efficiency.

NOTE: Insane or Plaid strives to keep the Battery within an optimal temperature range. In addition to heating the Battery, these settings also cool the battery when necessary (for example, while driving at high speeds, during rapid acceleration, driving for long periods, etc.).

In addition, Model S/Model X features Drag Strip Mode. Using Drag Strip Mode to precondition your Model S/Model X is useful before a short distance race.

Drag Strip Mode

Drag Strip Mode preconditions the Battery and drive unit to ideal operating temperatures for timed acceleration.

Model S/Model X stays in Drag Strip Mode for three hours, even if you leave the vehicle. After three hours, the feature times out to prevent unnecessary energy consumption (for example, you leave the vehicle and forget to cancel Drag Strip Mode).

When using Drag Strip Mode, Model S/Model X consumes more energy to keep the Battery within an optimal temperature range.

Cancel Drag Strip Mode at any time by toggling **Drag Strip Mode** off.

NOTE: Drag Strip Mode automatically disables Slip Start when enabled.



WARNING: Drag Strip Mode is designed for use on closed circuit driving courses only. It is the driver's responsibility to ensure that driving style and acceleration do not endanger or inconvenience other road users.

How to Launch the Vehicle

The touchscreen provides visual instructions on how to launch:

1. Touch **Controls > Pedals & Steering > Drag Strip Mode**.
2. Wait for the instrument panel to indicate that the vehicle is Peak Performance Ready.
3. With Model S/Model X shifted into Drive and at a complete stop, firmly hold the brake pedal with your left foot, then fully press the accelerator pedal.
4. Once step 3 is complete, the front suspension begins lowering into a "cheetah stance".
NOTE: Suspension lowering for "cheetah stance" significantly reduces ground clearance.
5. Wait for the instrument panel to indicate that Drag Strip Mode is Ready to Launch.
6. Once you see "Cheetah Stance Enabled" and "Ready to launch" on the instrument panel, release the brake pedal to launch the vehicle.



Track Mode

Track Mode, available only on Plaid Model S/Model X vehicles, is designed to modify the stability control, traction control, regenerative braking, and cooling systems to increase performance and handling while driving on closed circuit courses. Track Mode improves cornering ability by intelligently using the motors, and regenerative and traditional braking systems. When enabled, the cooling system runs at an increased level during and after aggressive driving sessions to allow your vehicle's systems to withstand the surplus heat.

In Track Mode, adaptive suspension damping is optimized for handling and vehicle body control to promote driver confidence in dynamic maneuvers. Ride height is automatically set to **Low** and the suspension no longer automatically raises for comfort over rough surfaces.



WARNING: Track Mode is designed for use on closed circuit driving courses only. It is the driver's responsibility to drive safely and ensure others are not endangered.



WARNING: Track Mode is designed for use by experienced track drivers familiar with the course. Do not use on public roads. It is the driver's responsibility to be in control of the vehicle at all times, including on the track. Because vehicle behavior (including traction and stability control) differs when using Track Mode, always use caution.

Using Track Mode

Track Mode is always disabled when you start Model S/Model X. To enable Track Mode for your current drive, shift into Park and follow these steps:

1. Touch **Controls > Pedals & Steering > Track Mode**.

When enabled, **TRACK** displays on the instrument panel above the driving speed, and a Track Mode popup appears on the map. The instrument panel displays a color-coded image of your Model S/Model X that provides you with important at-a-glance status information about the Battery, the motors, and the brakes. See [Monitoring Vehicle Health on page 258](#).

2. If desired, customize the Track Mode settings by touching **Track Mode Settings** on the Track Mode popup (see [Customizing Track Mode on page 258](#)). You can also access the Track Mode settings by touching **Pedals & Steering > Driving**, then touching **Customize** next to the Track Mode setting.
3. To use the Lap Timer, follow the onscreen instructions to drop a pin on the map to define the lap's start/finish location. Then press **START** on the Lap Timer to begin your driving session. Once started, the Lap Timer starts counting when you drive Model S/Model X past the lap's start/finish location where you dropped the pin. See [Using the Lap Timer on page 258](#).
4. Shift into gear and **GO!**

If you started the Lap Timer, each time you pass the start/finish location, the timer resets for the next lap. See [Using the Lap Timer on page 258](#).

A real-time accelerometer (G-meter) appears on the instrument panel. See [G-Meter on page 259](#).

When Track Mode is on:

- Autopilot features are unavailable.
- The Slip Start setting is overridden.
- Energy usage increases.
- Entertainment features are unavailable.

Use the touchscreen setting to turn Track Mode off at any time. Powering off Model S/Model X also turns off Track Mode (although it may still appear on the touchscreen if Post-Drive cooling is in progress). When Track Mode is off, all settings return to their previous state and all features return to their normal operating state.



Customizing Track Mode

To customize Track Mode, touch **Track Mode Settings** on the Track Mode popup that appears on the map when you enable Track Mode. You can also access the Track Mode settings by touching **Controls > Pedals & Steering**, then touching **Customize** next to the Track Mode setting. Choose an existing Track Mode setting from the list of pre-defined profiles provided by Tesla. Or create a new settings profile by touching **Add New Settings**, entering a name for the settings profile, then adjusting these settings to suit your preferences or driving scenario, or customize for a specific track:

- **Handling Balance** - Drag the slider to customize the balance of Model S/Model X in a turn. If Model S/Model X is too loose, you can choose a front-biased under-steering setup. Difficult to get the vehicle through a turn? Try a rear-biased setup to increase rotation. You can select any value, in 5% increments, between 100/0 (for 100% front biased used for under-steering) and 0/100 (for 100% rear biased used for over-steering).
- **Stability Assist** - Drag the slider to choose the level at which the stability control systems assist in controlling the vehicle. You can choose any level from -10 to +10. Choosing +10 engages all stability assist systems for controllable driving in which stability systems remain engaged, whereas -10 disables all stability systems and the stability of the drive rests solely on the driver. The default setting of 0 represents a balance which provides some stability being automatically controlled and leaving some control up to the driver.
- **Regenerative Braking** - Drag the slider to choose how much regenerative braking is available. You can choose any value, in 5% increments, between 0 and 100%. Tesla recommends the 100% setting to prevent overheating the brakes.
- **Post-Drive Cooling** - Enable if you want the cooling systems to continue cooling the vehicle's components even after you leave the vehicle. Cooling stops automatically when the components are sufficiently cool, or when you power Model S/Model X off and back on again. Post-Drive Cooling is useful if you want to quickly cool the components between driving sessions. If Post-Drive Cooling is set to OFF, the components eventually cool, but it takes longer.
- **Brake Temperatures** - Enable to display temperature warnings associated with the braking system. You may want to disable warnings if you have installed an aftermarket high performance braking system.
- **Save Dashcam for Laps** - Enable if you want to save a video and data on a USB flash drive when using the Lap Timer. A USB flash drive must be set up and inserted as described (see [USB Drive Requirements for Recording Videos on page 88](#)). The USB flash drive must contain a folder named **TeslaTrackMode**. When enabled, Track Mode stores a video and associated data for each lap. Track Mode also stores the car status and telemetry data with details about the vehicle's position, speed, acceleration, use of accelerator, etc. You can then view the video recordings and analyze this data, which is saved as a .CSV file on the USB flash drive, to determine where time is being lost or gained.

Track Mode allows you to save up to 20 settings profiles. To delete a chosen profile, touch **Delete** at the bottom of the settings screen.

NOTE: You can not change or delete a pre-defined profile provided by Tesla.

Using the Lap Timer

When you enable Track Mode, the map displays a Lap Timer. Follow the onscreen instructions to place a start/finish pin on the map. Once the pins are placed, press **START** to initiate the driving (lapping) session. When you drive Model S/Model X through the start/finish location, the Lap Timer automatically starts timing the duration of the lap, resetting the timer whenever you pass the start/finish location, and displaying the real-time delta between the current lap and the fastest lap so far in the driving session. The map highlights the track in blue.

At the completion of each lap, the Lap Timer displays the duration of the lap. It also displays the times associated with the previous and best laps in the driving session.

If **Save Dashcam for Laps** is enabled (see [Customizing Track Mode on page 258](#)), and a properly formatted USB flash drive is inserted, Track Mode saves a video of the driving session (as recorded by the front cameras), along with a .CSV file that provides detailed information about the lap.

NOTE: To stop the timer at the end of your driving session, touch **STOP** on the Lap Timer.

Monitoring Vehicle Health

You can easily monitor the health of Model S/Model X when using Track Mode by glancing at the instrument panel. The colors indicate the status of the various components, allowing you to determine the current operating state and make decisions accordingly. The components are displayed in green when operating within their ideal temperature range. Colors change as follows:



- The Battery displays blue when cold and red when hot.
- A brake displays blue when cold and orange when hot (an early warning for overheating brakes, which are shown in red).
- A motor displays blue when it's cold or red when it's hot.

NOTE: A component displayed in red may indicate a need to stop driving and allow the component to cool.



CAUTION: Any vehicle damage or injuries caused by using Track Mode is the driver's responsibility. The vehicle warranty does not cover damage caused by excessive overuse of vehicle components. It also does not cover racing, autocross, or driving in competition.

G-Meter

In Track Mode, a real-time G-Meter displays on the instrument panel. The G-Meter graphically displays peak lateral, acceleration, and deceleration values in the form of a circular meter. The history of your drive is represented in the shaded area. The G-Meter resets at the start of each driving session.



Trip Information

Displaying Trip Information

Trip information displays on the touchscreen when you touch **Controls > Trips**. For the current trip, you can display distance, duration and average energy usage. You can also show distance and total and average energy used since your last charge and for additional trips.

To name or rename a trip, touch the trip's name, enter a new name for the trip, then press **Save**. To reset a particular trip meter, touch its associated **Reset** button.

You can display information for up to three trips on the instrument panel. Use the checkboxes to specify the trip(s) you want to display. Then use the scroll bar on the steering wheel to display the chosen trip(s) (see [Using Left Steering Wheel Buttons on page 188](#) or [Using Right Steering Wheel Buttons on page 189](#)).

Odometer

To display the odometer, touch **Controls > Software** or open the mobile app. The odometer is also displayed on the instrument panel.



Getting Maximum Range

Factors Affecting Energy Consumption

While driving:

- Elevated driving speed.
- Environmental conditions such as cold or hot weather and wind.
- Using climate controls to heat or cool the cabin.
- Uphill travel: Driving uphill requires more energy and depletes range at a faster rate. However, driving downhill allows your vehicle to regain a portion of its expended energy through regenerative braking (see [Regenerative Braking on page 233](#)).
- Short trips or stop-and-go traffic: It takes energy to bring the cabin and Battery to a specified temperature when starting the vehicle. You may see a higher average consumption when the vehicle is used for very short trips or in heavy traffic.
- Heavy cargo load.
- Windows rolled down.
- Wheels and tires not maintained.
- Customized settings or third-party accessories (roof or trunk racks, third-party wheels).

While parked and not plugged in to a charger:

- Preconditioning the cabin or using climate controls.
- Summon.
- Vehicle infotainment and climate controls system.
- Sentry mode.
- Tesla or third-party mobile app requests.

Tips to Maximize Range

You can maximize your driving range using the same driving habits you use to conserve fuel in a gasoline-powered vehicle. To achieve maximum range:

- Slow down your driving and avoid frequent and rapid acceleration. Consider using Chill Mode (touch **Controls > Pedals & Steering > Acceleration**) and Speed Assist (see [Speed Assist on page 344](#)) to assist in controlling your acceleration and speed.
- If safe to do so, modulate the accelerator pedal instead of using the brake pedal when gradually slowing down. Whenever Model S/Model X is moving and you are not pressing the accelerator pedal, regenerative braking slows down the vehicle and feeds surplus energy back to the Battery (see [Regenerative Braking on page 233](#)).
- Limit the use of resources such as heating and air conditioning. Using seat and steering wheel/steering yoke heaters (if equipped) to keep warm is more efficient than heating the cabin using climate controls.
- With your vehicle plugged in, use the mobile app to precondition your vehicle to ensure the cabin is at a comfortable temperature and windows are defrosted (if needed) before your drive by touching **Climate > On** and customizing your preferences (see [Mobile App on page 406](#)).
- Touch **Schedule**, available on both the charging and climate control screens, to set a time when you want your vehicle to be ready to drive (see [Scheduled Charging and Scheduled Departure on page 425](#)).
- Set Stopping Mode to **Hold** to gain the benefit of regenerative braking at low driving speeds.
- Ensure the wheels are aligned to specification, the tires are kept at the recommended inflation pressures (see [Tire Care and Maintenance on page 431](#)), and are rotated when needed (see [Maintenance Schedule on page 429](#)).
- Lighten your load by removing any unnecessary cargo.
- Fully raise all windows.
- Turn on Range Mode (see [Range Mode on page 262](#)).
- Features such as Sentry Mode and Cabin Overheat Protection can impact range. Disable features when not needed.



- To prevent an excessive amount of energy consumption while the vehicle is idle, keep the vehicle plugged in when not in use.
- Minimize the use of DC chargers (such as Superchargers) for optimal Battery health.

It is normal for estimated range to decrease slightly over the first few months before leveling off. Over time, you may see a gradual, but natural, decrease in range at full charge – this depends on factors such as Supercharging regularly or the mileage and age of the Battery. Your Model SModel X will inform you in the unlikely event a hardware issue is causing excessive Battery or range degradation.

The power meter on the instrument panel provides feedback on energy usage.

You can also display the Energy app to view real-time and projected energy usage (see [Energy App on page 262](#)). With this feedback, you can become familiar with how driving habits and environmental conditions impact how much energy Model SModel X is using.

Range Assurance

The driving range displayed in Model SModel X is based on estimated remaining battery energy and EPA-rated consumption. It does not account for your personal driving patterns or external conditions. The displayed range on the instrument panel may decrease faster than the actual distance driven. To view estimated range based on your recent energy consumption, open the Energy app to display the graph.

Model SModel X helps protect you against running out of energy. Your vehicle continuously monitors its energy level and proximity to known charging locations.



Touch **Chargers** in the Navigation search bar to toggle between types of chargers, including Superchargers and destination charging sites.

When you are at risk of driving beyond the range of known charging locations, the touchscreen displays a message giving you the opportunity to display a list of charging locations that are within range. When you select a charging location from the list, Model SModel X provides navigation instructions and the turn-by-turn direction list displays the predicted amount of energy that will remain when you arrive at the charging destination.

Trip Planner routes you through Supercharger locations to minimize the amount of time you spend charging and driving. To enable, touch **Controls** > **Navigation** > **Trip Planner** (see [Trip Planner on page 373](#)).

Energy App

The Energy app provides a visual representation of your vehicle's real-time and projected energy usage. To use the Energy app, navigate to **Application Launcher** > **Energy** on the touchscreen. Choose from two types of charts:

- **Consumption:** Display how much energy Model SModel X has consumed over the past 5, 15 or 30 miles (10, 25 or 50 km).
Touch **Instant Range** or **Average Range** to adjust the projected range estimation. Instant Range uses only the latest few data points to estimate the projected range, whereas Average Range uses the past 5, 15 or 30 miles (10, 25 or 50 km) of energy consumption to provide a more accurate projected range.
- **Trip:** You can monitor the amount of energy being used while navigating to a destination. You can track actual usage against the initial prediction. The green line represents the actual usage whereas the gray line represents predicted usage. To change the zoom level, touch the zoom icon located in the top right corner of the chart.

NOTE: The Trip chart displays energy usage only if you are currently navigating to a destination.

Range Mode

Range Mode conserves energy by limiting the power of the climate control system and turns off the signature lights. Turn Range Mode on by touching **Controls** > **Driving** > **Range Mode**. When turned on in an All-Wheel Drive vehicle, Range Mode also optimizes torque distribution between the motors to maximize range.



Saving Energy

Model S Model X has an energy-saving feature that reduces the amount of energy being consumed when Model S Model X is not in use. On newer vehicles, this feature is automated to provide an optimal level of energy saving. However, on older vehicles, you can touch **Controls > Display > Energy Saving** and choose from the following options:

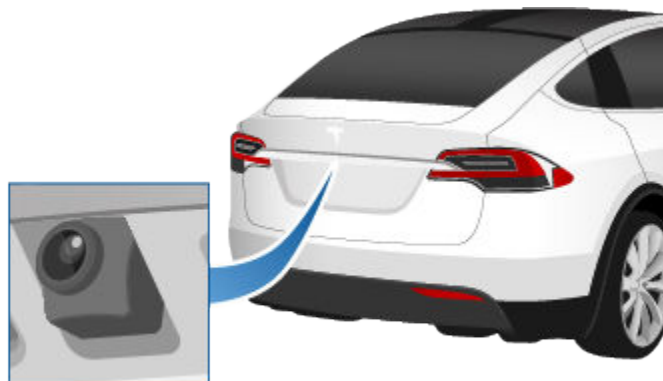
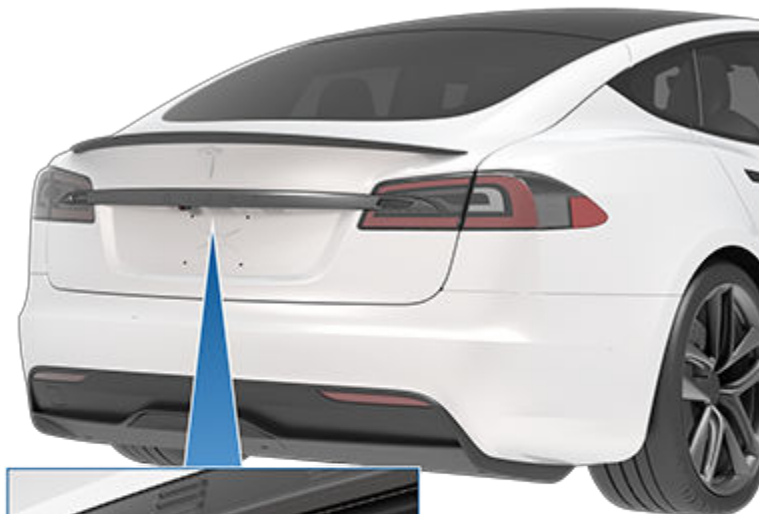
- **OFF** - Model S Model X automatically shifts to the energy-saving mode only at night (10 pm to 5 am). Idle energy consumption may increase.
- **ON** - Significantly less energy is consumed whenever Model S Model X is not in use. The start-up time of the instrument panel and Bluetooth could be slower.
- **Always Connected** - Preserves cellular connectivity when energy saving is active. This allows the mobile app to connect to Model S Model X quicker, and provides immediate internet access when entering the car. Slightly more energy is consumed.



Rear Facing Camera(s)

Camera Location

Model S Model X is equipped with a rear view camera located above the rear license plate.





Whenever you shift into Reverse, the touchscreen displays the view from the camera. Lines show your driving path based on the position of the steering wheelsteering yoke. These lines adjust as you move the steering wheelsteering yoke.

Model SModel X also displays images from the side cameras. Simply swipe up or down to hide or show the side camera views.

NOTE: You may need to expand the camera window to see the images from the side cameras.

NOTE: Visual feedback from the parking sensors also appear on the instrument panel (see [Park Assist on page 245](#)).

NOTE: Depending on date of manufacture and options selected at time of purchase, some Model S vehicles are not equipped with parking sensors.

To display the view from the rear view cameras at any time, open the app launcher and touch the Camera app.



WARNING: Never depend on the cameracameras to inform you if the area behind you is free of objects and/or people. The cameracameras may not detect objects or barriers that can potentially cause damage or injury. In addition, several external factors can reduce the performance of the cameracameras, including a dirty or obstructed lens. Therefore, depending on the cameracameras to determine if Model SModel X is approaching an obstruction can result in damage to the vehicle and/or objects and can potentially cause serious injury. Always inspect the area with your own eyes. When reversing, perform shoulder checks and use all mirrors. Use the cameracameras for guidance purposes only. It is not intended to replace your own direct visual checks and is not a substitute for careful driving.

Cleaning a Camera

To ensure a clear picture, the camera lens must be clean and free of obstructions. Remove any build-up of dirt or debris by spraying water onto the camera lens with a spray bottle or pressure washer.



Owners Manual

-  **CAUTION:** Do not attempt to remove dirt or debris by wiping an exposed lens with your hands or a cloth. This debris can damage the surface of the lens when rubbed against it during wiping.
-  **CAUTION:** Do not use chemical-based or abrasive cleaners. Doing so can damage the surface of the lens.



Pedestrian Warning System

The Pedestrian Warning System causes Model SModel X to emit sound when driving below 19 mph (32 km/h) or while driving in reverse. Electric vehicles operate quietly and this sound helps to alert pedestrians of your oncoming vehicle. The sound, which activates whenever Model SModel X is shifted out of Park, gets louder as speed increases.

NOTE: The Pedestrian Warning System is not available in vehicles manufactured prior to September 1, 2020.



WARNING: If sound cannot be heard, pedestrians may not be aware of your oncoming vehicle, which may increase the likelihood of a collision resulting in serious injury or death. If the Pedestrian Warning System is not operating, immediately contact Tesla.



Active Spoiler

Model X has a rear spoiler designed to improve aerodynamics. If Model X is equipped with the active spoiler, the position of the spoiler can vary depending on the status and speed of Model X:

- When Model X is in Reverse or when driving speed is below 10 mph (16 km/h), the spoiler provides maximum visibility behind Model X.
- When driving speed exceeds 45 mph (72 km/h), the spoiler lowers to the position that provides the most effective aerodynamics.
- When Model X is powered off and locked, the spoiler retracts.

To allow the spoiler to automatically move as described above, touch **Controls > Service > Spoiler Mode > Automatic**. To disable automatic movement of the spoiler and keep it in its extended position, choose the **Extended** setting.

NOTE: If the spoiler can not automatically lower or raise, the instrument panel displays an alert. Contact Tesla Service.



Towing and Accessories

The towing package allows you to tow a trailer with your Model X. It also allows you to carry skis, snowboards, bicycles, etc. by attaching an accessory carrier to the hitch.

Carrying Accessories

The Model X towing package has a 2" hitch receiver that can support an accessory carrier.

The hitch receiver is designed to support vertical loads of up to 120 lbs (54 kg). When carrying bicycles or other items on the Model X hitch, always check to ensure that the maximum weight is not exceeded. When calculating weight, remember to include the weight of the accessory carrier. For example, assuming the carrier weighs 40 lbs, the weight threshold is sufficient for carrying two bicycles weighing approximately 40 lbs each, or four bicycles weighing approximately 20 lbs each.



CAUTION: The Model X hitch is designed to support up to 120 lbs (54 kg). Exceeding this maximum weight can cause significant damage.



CAUTION: Do not attempt to install a carrier on a Model X that is not equipped with the towing package. Doing so can cause significant damage.

To install and use an accessory carrier, the tow hitch must be connected (see [Connecting the Tow Hitch on page 276](#)). Then follow the instructions provided with your accessory carrier. Observe all regulations and legal requirements in your state/region that apply to carrying accessories.

The Model X towing package includes the wiring necessary for using an accessory carrier equipped with lights (see [Electrical Connections on page 281](#)). The package also includes Trailer Mode software (see [Trailer Mode on page 272](#)).



When you connect an accessory carrier's wiring harness, Model X detects a connection for trailer lights and this indicator illuminates on the instrument panel. Trailer Mode is disabled.

When carrying accessories, periodically confirm that the accessory carrier and its cargo remain secure at all times, and if applicable, that the lights on the accessory carrier are working.

NOTE: Go to www.tesla.com to purchase accessories for your Model X. Although third-party products are available, Tesla recommends and supports only Tesla-approved products (see [Parts and Accessories on page 465](#)). The accessory products available for your Model X vary based on market region. Before attempting to install a non-Tesla carrier, review the product information to ensure compatibility.

NOTE: When not in use, the hitch receiver should be removed and stored in a dry location to prevent rust and corrosion. Keep the dust cover over the hitch housing to prevent dirt and debris from entering (see [Disconnecting the Tow Hitch on page 280](#)).



CAUTION: A carrier may obscure your view from the rear view mirror, the rear camera(s), and/or the rear ultrasonic sensors. In addition, some Autopilot features may not function as expected.



WARNING: Tesla assumes no responsibility for damage or injuries resulting from installing and using an accessory carrier, for any omissions in the instructions accompanying an accessory carrier, or for your failure to follow the instructions. Damage caused by using an accessory carrier is not covered by the warranty.



Towing Capacity

The total trailer weight (including all cargo and additional equipment), and the trailer tongue weight, must never exceed the following:

Tires	Maximum Towing Capacity*	Maximum Tongue Weight**
245/45R19 110 V / Y	SAE Class III – 4960 lb (2250 kg)	SAE Class III – 500 lb (225 kg)
275/45R20 110 V / Y	SAE Class III – 5000 lb (2300 kg)	SAE Class III – 500 lb (230 kg)
285/35R22 106 W	SAE Class II – 3500 lb (1588 kg)	SAE Class II – 350 lb (158 kg)

*Tesla recommends a separate braking system on trailers with a loaded weight of over 1000 lbs (450 kg). The braking system must be appropriate for the weight of the trailer. Follow the instructions provided by the trailer brake manufacturer to ensure that trailer brakes are properly installed, adjusted, and maintained.

**The tongue weight is the downward force that the weight of the trailer exerts on the hitch. It must not be less than 10% of the trailer load. Carrying a significant amount of equipment, passengers, or cargo in the tow vehicle can reduce the tongue weight it can handle, which also reduces the maximum towing capacity. Maximum towing capacity is calculated assuming the GVWR (Gross Vehicle Weight Rating) is not exceeded. The GVWR is printed on the Vehicle Certification Label (see [Vehicle Certification Label on page 474](#)).

NOTE: If the towing capacity on the hitch label conflicts with the information provided in this owner's manual, this owner's manual takes precedence.

 **WARNING:** Do not overload the vehicle or trailer. Doing so can cause poor performance, vehicle damage and loss of vehicle control, resulting in serious injury.

 **WARNING:** Do not use the trailer hitch to tow/transport Model X.

 **CAUTION:** Tesla assumes no responsibility for damage or injuries resulting from towing a trailer, for any errors or omissions in the instructions accompanying towing equipment, or for your failure to follow the proper instructions. Damage caused by towing a trailer is not covered by the warranty.



Tire Pressures when Towing

When towing a trailer, tire pressures must be adjusted to accommodate the additional load. Keep tires inflated to the pressures shown below (these pressures override the pressures that are provided on the Tire and Loading information label):

Front Tires	Rear Tires	Cold Tire Inflation Pressure
245/45R19	245/45R19	45 psi (310 kPa)
255/45R20 265/45R20	275/45R20	46 psi (320 kPa)
265/35ZR22	285/35ZR22	50 psi (345 kPa)



WARNING: Check tire pressures using an accurate pressure gauge when tires are cold. Driving one mile (1.6 km) warms the tires sufficiently to affect tire pressures. Parking the vehicle in direct sunlight or in hot weather can also affect tire pressures. If you must check warm tires, expect increased pressures. Do not let air out of warm tires in an attempt to match recommended cold tire pressures. A hot tire at or below the recommended cold tire inflation pressure is dangerously under-inflated.



WARNING: Never attempt to tow a trailer when a Model X tire is faulty or has been inflated using a tire repair kit. A temporarily repaired tire is not designed to sustain the towing load. Towing using a faulty or temporarily repaired tire can result in tire failure and loss of vehicle stability.

Before Towing a Trailer

Before towing a trailer, you must do the following:

- Inflate tires to the cold tire inflation pressure specified in Tire Pressures when Towing.
- Set Suspension to **Standard** height (touch **Controls** > **Suspension** > **Standard**).
- Observe all regulations and legal requirements in your state/region that apply to trailer towing. Failure to comply with regulations can compromise your safety.
- Adjust side mirrors to provide a clear rearward view without a significant blind spot.
- Engage **Trailer Mode** (see [Trailer Mode on page 272](#)).

Confirm the following:

- Model X rests horizontally with the trailer attached. If the vehicle is tipped up at the front, and down at the rear, check that you are not exceeding the maximum towing capacity and tongue loads provided in Carrying Capacity.
- All trailer hitch parts and attachments, safety chains, and electrical connectors are in good condition and are properly connected. If any problems are apparent, do not tow the trailer.
- Trailer lights (brake lights, turn signal lights, and marker lights) are working properly.
- The trailer tongue is securely connected to the hitch ball.
- Safety chains are properly connected between the trailer and the tow vehicle. Cross the safety chains under the tongue of the trailer to help prevent the tongue from contacting the road if it separates from the hitch. Leave enough slack in the safety chains to allow for turns and ensure that the chains can never drag on the ground.
- All cargo is secured.
- Wheel chocks are available.
- The trailer load is evenly distributed such that the trailer tongue weight is approximately 10% of the total trailer weight, without exceeding the maximum tongue weights provided in Carrying Capacity.
- If the trailer is equipped with a separate braking system, check that the brakes work and are properly adjusted. To provide safe stopping ability, you must balance the trailer brakes with the vehicle brakes.



NOTE: For general information about trailer safety provided by the National Highway Traffic Safety Administration, go to: <http://www.nhtsa.gov/cars/problems/Equipment/towing/Towing.pdf>.

-  **WARNING:** The trailer tongue weight must be approximately 10% of the total trailer weight without exceeding the maximum tongue weights provided in Carrying Capacity. Loads that are balanced over the wheels or heavier in the rear can cause trailer sway, resulting in loss of vehicle control.
-  **WARNING:** Always ensure that cargo is secured in the trailer and will not shift. Dynamic load shifts can cause loss of vehicle control, resulting in serious injury or death.

Trailer Mode

Trailer Mode must always be active when towing a trailer. When you connect a trailer's electrical connection, Model X automatically engages Trailer Mode. When you disconnect the trailer's electrical connection, Trailer Mode disengages. To engage or exit Trailer Mode manually, touch **Controls > Pedals & Steering > Trailer Mode** on the touchscreen. One of the following indicators display on the instrument panel:

Trailer Mode is active.



Model X detects a connection for trailer lights but Trailer Mode is disabled. It is likely that a carrying accessory has been connected.



Model X detects a faulty electrical connection for the trailer lights. Some, or all, trailer lights may not be functioning. Pull over as soon as safety permits and inspect the trailer lights for faulty cabling or connections. If the issues are resolved and the red icon still persists, turn Trailer Mode off and on again.



NOTE: In situations where Model X detects a heavy load, it assumes that a trailer is connected and automatically engages Trailer Mode. A message displays on the instrument panel informing you that Trailer Mode has been engaged. When Trailer Mode is entered automatically due to detection of a heavy load, you can change the Trailer Mode setting only by stopping Model X, engaging Park or Neutral, then manually applying the parking brake using the touchscreen (**Controls > Safety > Parking Brake**).

Some Autopilot features (Autosteer, Summon, Lane Assist, etc.), as well as rear parking sensor functionality, may not be available when Trailer Mode is enabled. In addition, some features may operate differently. For example:

- Traffic-Aware Cruise Control increases the following distance from the car in front of you.
- The air suspension system will not make speed-based adjustments from **STANDARD** to **LOW**.
- The air suspension system does not automatically raise ride height based on saved locations.
- Side collision warnings are active but automatic steering interventions are disabled.
- The braking force provided by Automatic Emergency Braking (see [Collision Avoidance Assist on page 340](#)) is significantly limited.

-  **WARNING:** Do not rely on Model X to detect the trailer and automatically engage Trailer Mode. Always check that Trailer Mode is engaged before towing a trailer.
-  **WARNING:** Under no circumstances should you exit Trailer Mode when towing a trailer. Doing so can cause serious injury and/or death.
-  **WARNING:** Do not use the suspension setting to appropriately match the height of the hitch with the height of the trailer. You must choose a trailer hitch and trailer that have the appropriate height for suitable axle loading and trailer balance.

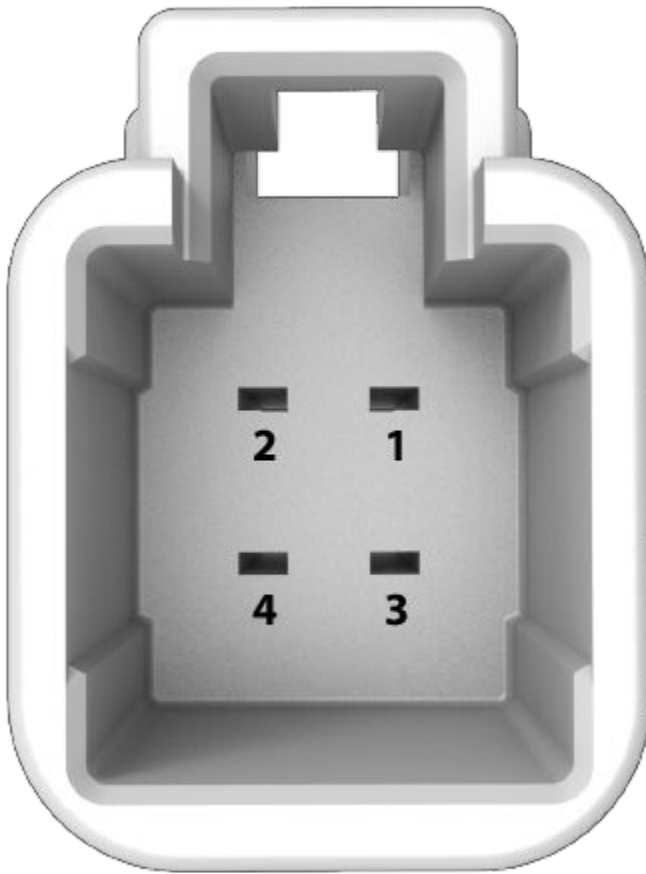
Trailer Brakes

When towing a loaded trailer that weighs more than 1000 lbs (450 kg), Tesla recommends that the trailer be equipped with its own brake system adequate for the weight of the trailer. Ensure compliance with local regulations. A brake controller must be purchased separately, and the required 4-pin pigtail connector can be ordered from Tesla Service.



Follow these steps to connect a brake controller:

1. Connect the wiring on the brake controller to the appropriate locations on the 4-pin pigtail connector.



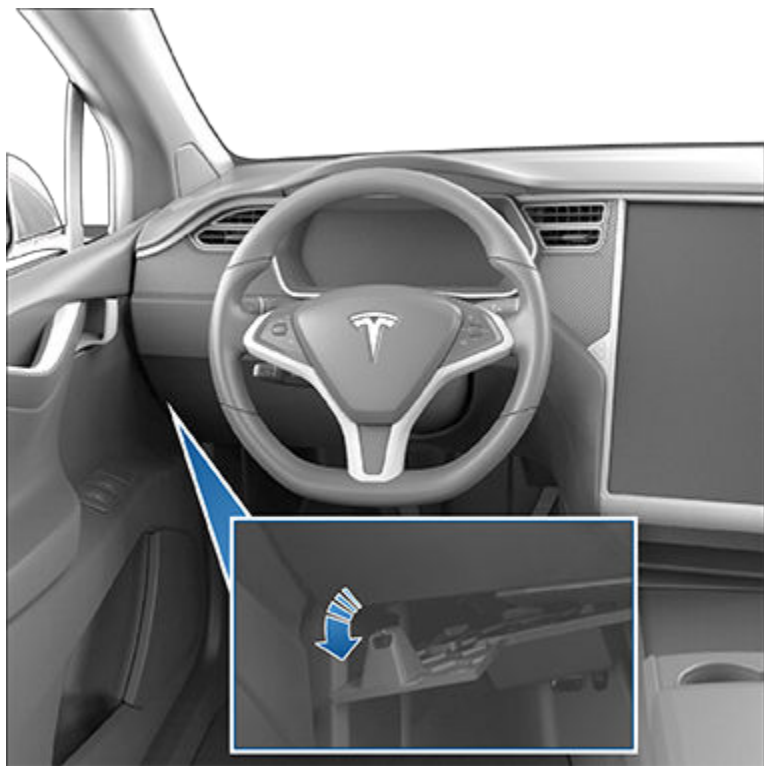
1 - Brake control output to trailer

2 - Ground

3 - Brake On Signal

4 - Low Voltage Power (20A)

2. Remove the cover located under the dashboard in the driver's side foot well.



3. Peel back the carpet to expose Model X's 4-pin connector on the wiring harness.



4. Connect the pigtail connector to the vehicle wiring connector.



WARNING: Towing increases your stopping distance, even when the trailer is equipped with its own braking system. When towing, increase your following distance and avoid situations that could potentially cause heavy braking. Failure to do so can result in a collision.



WARNING: Observe all regulations and legal requirements in your regional and national jurisdictions that apply specifically to trailer towing and brake requirements. Many regions require a breakaway switch, located on the tongue of the trailer, to activate the trailer brakes in the event that the trailer separates from the vehicle. Failure to comply with regulations can compromise your safety.



WARNING: Follow the instructions provided by the trailer brake manufacturer to ensure that trailer brakes are properly installed, adjusted, and maintained. Tesla is not responsible for damages caused by incorrect installation of trailer braking systems.



WARNING: Never attempt to connect trailer brakes directly to the vehicle braking system. Doing so can cause damage to the vehicle and the trailer, and can cause the braking system to malfunction, resulting in serious injury or death.

Towing Guidelines

Model X is designed primarily as a passenger-carrying vehicle. Towing a trailer puts additional load on the motor(s), drive train, brakes, tires, and suspension and significantly decreases range. If you decide to tow a trailer, proceed with caution and follow these general guidelines:

- Reduce your driving speed and avoid sudden maneuvers. Keep in mind that when towing a trailer, steering, stability, turning radius, stopping distance and braking performance are different when compared to driving without a trailer.
- Increase your following distance by maintaining at least twice the distance from a vehicle ahead. This helps to avoid situations that require heavy braking. Sudden braking may result in skidding or jack-knifing, and loss of control.
- Avoid sharp turns. Sharp turns can cause the trailer to contact the vehicle and cause damage. Keep in mind that the trailer wheels are closer to the inside of the turn than the vehicle's wheels. Therefore, make wider turns to prevent the trailer from hitting curbs, road signs, trees or other objects.
- Periodically check the trailer lights and turn signals to confirm that bulbs are still working. When towing a trailer, the turn signal arrows on the vehicle instrument cluster flash as normal, even if the bulbs on the trailer are burned out.
- Periodically confirm the cargo is secure.
- Periodically confirm the trailer brakes are working.
- Avoid parking on a grade (see [Parking with a Trailer on page 276](#)).
- Regularly confirm that all towing components are securely tightened.

Parking with a Trailer

Whenever possible, avoid parking on a grade. However, if parking on a grade is absolutely necessary, place wheel chocks under the trailer wheels:

- One person presses and holds the brake pedal.
- A second person places the wheel chocks under the wheels on the downgrade side of the vehicle's tires.
- When the chocks are in place, release the brake pedal and ensure the chocks hold the weight of the vehicle and trailer.

NOTE: When testing chocks, ensure that Vehicle Hold (see [Vehicle Hold on page 252](#)) is not engaged. If Vehicle Hold is braking Model X, the Vehicle Hold indicator light displays on the instrument panel. To disengage Vehicle Hold, press and release the brake pedal.

- Place the vehicle in Park.

WARNING: If parking on a grade is necessary, always ensure that all trailer wheels have been securely chocked. Failure to do so can result in serious damage, injury, or death.

Trailer Sway Mitigation

When trailer sway is detected, the Model X electronic stability control system attempts to apply the appropriate amount of braking to minimize trailer sway. The instrument panel briefly displays the traction control system indicator. Pressing the brake pedal when the system is actively braking to mitigate trailer sway does not cancel this automatic braking.

Connecting the Tow Hitch

The Model X towing package includes a weight-carrying hitch with a 2" x 2" removable hitch receiver. When not in use, the hitch receiver should be removed and stored in a dry location to prevent rust and corrosion. Keep the dust cover over the hitch housing to prevent dirt and debris from entering.



CAUTION: Always remove the ball mount before installing or removing the hitch receiver from the vehicle (see [Attaching and Removing the Ball Mount on page 280](#)).

WARNING: You must use the Model X trailer hitch when towing a trailer. Never attempt to attach a different type of trailer hitch.

NOTE: Always attach safety chains when towing. Cross the chains under the trailer tongue and attach to the trailer eyelets to ensure the security of the trailer load.

NOTE: The maximum permissible rear overhang for the coupling point is 47 inches (1186 mm).

NOTE: The trailer hitch assembly is attached to the body of the vehicle with 8 nuts.



To install the trailer hitch receiver:

1. Remove the dust cover from the hitch housing.



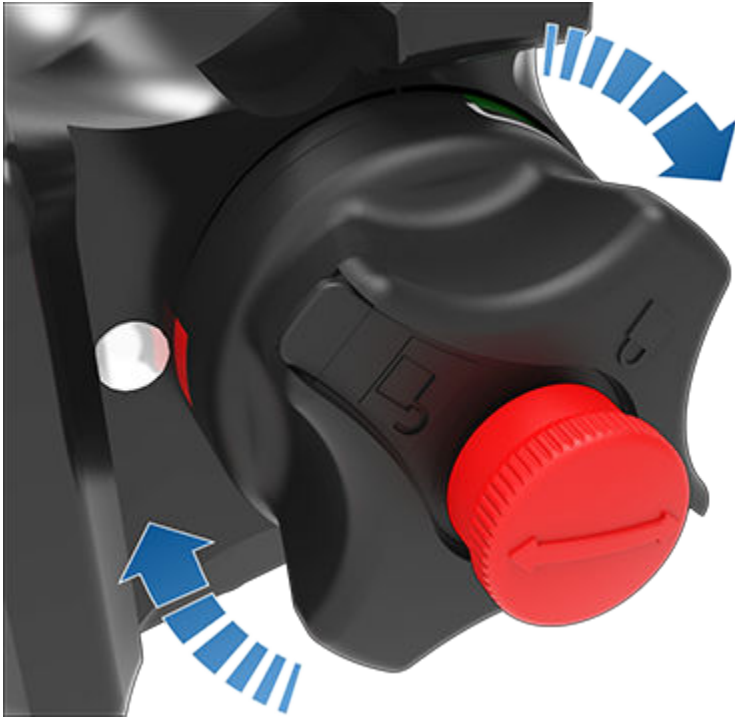
NOTE: Model X may have two push clips that secure the dust cover to the vehicle. To open, use a sharp object, such as a flat screwdriver, to carefully pry the clips open. Remove the dust cover.



2. Insert the key into the locking cylinder on the hitch, and turn the cylinder so the top of the key is aligned with the "unlocked" position.



3. Pull the locking cylinder out of the adapter approximately 1/8" (0.5 cm), and turn clockwise until the red marking on the cylinder aligns with the white dot.



WARNING: Be careful when turning the locking cylinder. If it does not lock into the "Open Position", it automatically retracts into its original "Closed Position" and can pinch your fingers.

4. Firmly grasp the hitch from the bottom and align the triangular-shaped guides at the sides of the hitch with the corresponding cutouts in the hitch housing.

NOTE: Do not grasp the locking cylinder because it needs to rotate freely.

5. Push the hitch into the hitch housing until the locking cylinder rotates approximately 120° counter-clockwise and automatically locks into the "Closed Position". The green area on the locking cylinder (above the white arrow) aligns with the white dot on the housing.
6. Visually check to confirm that the hitch is fully inserted into the housing. Try pulling down on the hitch. The hitch should not drop when you pull down.

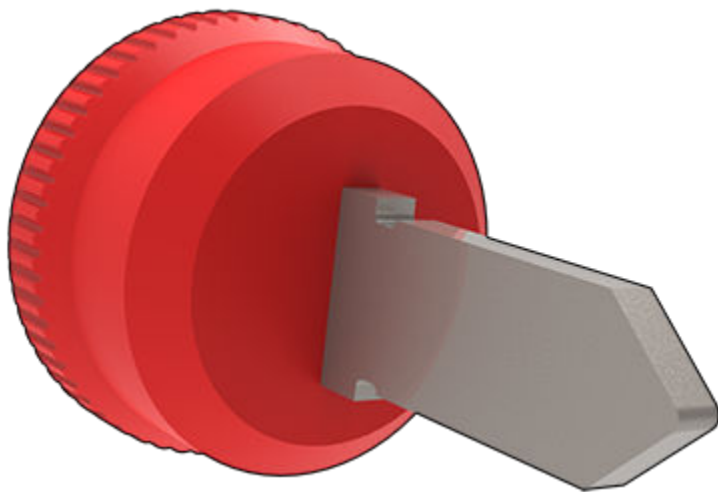
NOTE: If the hitch does not lock into the housing, it falls out when you pull down on it.

7. Turn the key so the arrows align with the "locked" marking on the locking cylinder.
8. Remove the key and store it in a safe place (preferably inside the vehicle).

NOTE: The key can be removed only if the hitch is locked. This indicates a proper connection. Do not use the hitch if the key is not removed.



NOTE: Tesla recommends making a note of the key code. You need this code if you lose the keys and need to order a replacement.



9. Close the dust cover to prevent dirt and debris from entering the lock. For newer version with push clips, reattach the dust cover, snap it in place and open the push clips before pushing them in.

NOTE: To maintain the hitch, regularly grease its surfaces with non-resinous grease.

Disconnecting the Tow Hitch

After towing, remove the hitch:

1. Insert the key and turn to align the top of the key with the "unlocked" position.
2. While firmly holding the bottom of the hitch (to prevent it from dropping to the ground), pull the locking cylinder out approximately 1/8" (0.5 cm), and turn it clockwise until the red marking on the locking cylinder aligns with the white dot. At this point, the locking cylinder is locked in the "open" and the hitch drops out of the housing.

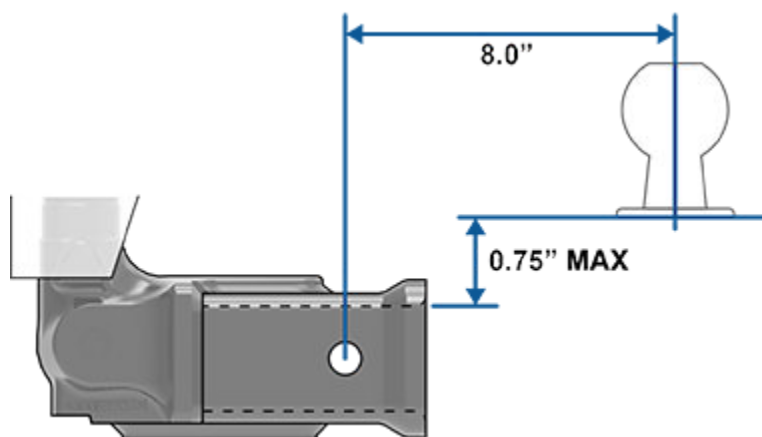


WARNING: Be careful when turning the locking cylinder. If it does not lock into the "Open Position", it automatically retracts into its original "closed" position and can pinch your fingers.

3. Reinstall the dust cover on the hitch housing to prevent dirt from accumulating inside the housing.
4. Close the dust cover on the hitch's locking cylinder and store the hitch in a secure location.

Attaching and Removing the Ball Mount

The Model X towing package does not include a ball mount. You must purchase a ball mount suitable for the type of trailer you are towing. The Model X hitch receiver supports a ball mount up to 8" with a rise of up to 0.75". Do not use any type of drop ball mount.



To attach a ball mount:

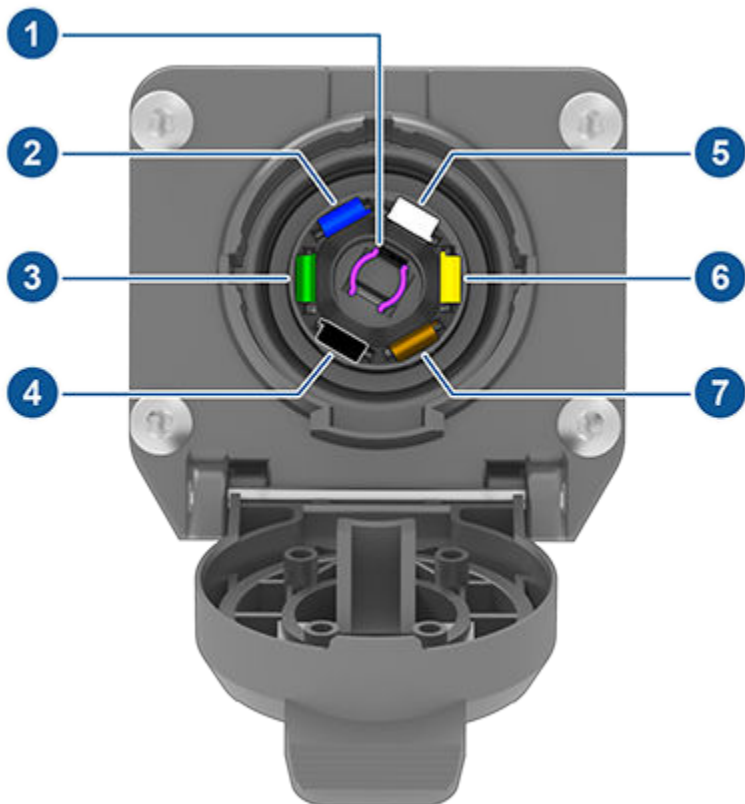
1. If necessary, remove the cotter pin from the locking bolt and slide the locking bolt out of the hitch assembly.
2. Slide the ball holder into the hitch assembly.
3. Align the hole in the ball holder with the one in the hitch assembly.
4. Slide the locking bolt through the hitch assembly/ball holder.
5. Insert the cotter pin in the hole at the end of the locking bolt.

To remove a ball mount:

1. Remove the cotter pin from the locking bolt and slide the locking bolt out of the ball holder/hitch assembly.
2. Pull the ball holder out of the hitch assembly.

Electrical Connections

Regulations require all trailers to be equipped with tail lights, brake lights, side marker lights, and turn signals. To provide power for trailer lighting, a built-in seven-way wiring connector (SAE J560) is attached near the tow hitch. Most trailer wiring plugs can be attached to this connector.



1. Reverse Lights (Purple)
2. Low Voltage Power (Red or Black)
3. Right Turn Signal and Brake Light (Green)
4. Brake Controller Output (Blue)
5. Tail Lights and Running Lights (Brown)
6. Left Turn Signal and Brake Light (Yellow)
7. Ground (White)

NOTE: It is the driver's responsibility to ensure that all electrical connections are working, and all trailer lights are operating before and during towing. Model X does not detect faulty trailer lights. You must perform manual checks.

NOTE: Loss of trailer lights when towing may be the result of a fault in the trailer wiring or excessive power consumption by the lights connected to the trailer output(s). When this occurs, a red Trailer Mode icon appears on the touchscreen. Fix any issues with the wiring and/or reduce the number of lights connected to the trailer output(s), then toggle Trailer Mode off and on again.

Plugging trailer wiring into the Model X electrical connector automatically engages Trailer Mode (see [Trailer Mode on page 272](#)).

WARNING: The brake controller output operates only when a brake controller is installed (see [Trailer Brakes on page 272](#)).

WARNING: Use only the electrical connection designed by Tesla. Do not attempt to directly splice or attempt to connect trailer electrical wiring using any other method. Doing so can damage the vehicle electrical system and cause malfunctions.

CAUTION: Always ensure that the trailer electrical cable does not contact or drag on the ground and there is enough slack in the cable to allow for turns.



Impact on Range

Towing a trailer and carrying accessories increases vehicle weight and drag. As a result, driving range can decrease significantly. Although Trip Planner attempts to adjust estimates based on Trailer Mode, actual energy consumption may vary. Plan trip length and charging destinations accordingly.



Cold Weather Best Practices

To ensure that Model S/Model X provides you with the best ownership experience possible in harsh cold weather conditions, follow these best practices.

Before Driving

When snow and ice accumulate on your vehicle, moving parts, such as the door handles, windows, mirrors, and wipers can freeze in place. To achieve maximum range and performance, it is helpful to warm the cabin and Battery before you leave. There are several ways to do so:

- Touch **Schedule**, available on both the charging and climate control screens, to set a time when you want your vehicle to be ready to drive (see [Scheduled Charging and Scheduled Departure on page 425](#)).
- On the mobile app, navigate to **Climate** to customize the temperature at which you want to heat the cabin. This also warms the high voltage Battery as needed.
- On the mobile app, navigate to **Climate > Defrost Car > Defrost** to melt snow, ice, and frost on the windshield, windows, and mirrors. This also warms the high voltage Battery as needed.

NOTE: Tesla recommends activating climate settings at least 30–45 minutes before departure (see [Climate Controls on page 360](#)). Preconditioning times depend on outside temperature and other factors. The Mobile App will notify you once your vehicle has reached the desired preconditioning temperature.

- In extremely cold weather or icy conditions, it is possible that your charge port latch may freeze in place. In cases where you cannot remove or insert the charge cable, or the vehicle is not Supercharging due to the latch being frozen in place, use your Tesla mobile app to precondition on **HI** for approximately 30–45 minutes (you must use your mobile app to precondition; setting your climate to **HI** using the touchscreen is not effective). This can help thaw ice on the charge port latch so the charge cable can be removed or inserted.
- In extremely cold weather or icy conditions, it is possible that your charge port latch may freeze in place. In cases where you cannot remove or insert the charge cable, or the vehicle is not Supercharging due to the latch being frozen in place, use the **Defrost Car** setting in the mobile app. This can help thaw ice on the charge port latch so the charge cable can be removed or inserted.
- Warming the Battery using Scheduled Departure or the mobile app before driving can also reduce charging time at a Supercharger or third party fast charger, especially if the Supercharger or third party fast charger is close enough that Trip Planner does not have sufficient time to precondition the Battery (see [Warming the Battery Before Supercharging on page 285](#)).

Windows

- On the mobile app, navigate to **Climate > Defrost** as mentioned previously.
- Use the mobile app to schedule a service appointment for Tesla to provide hydrophobic coating to your windows for a nominal fee.

Mirrors

If ice buildup is expected when parking, turn off **Auto-Fold Mirrors**. Touch **Controls > Vehicle > Auto-Fold**. Ice can prevent exterior side mirrors from folding or unfolding.

NOTE: Side mirrors automatically heat as needed during preconditioning, or when the rear defroster is turned on.

Wipers

If you expect snow or ice to build up when parked, touch **Controls > Service > Wiper Service Mode**. This raises wipers against the windshield so they can defrost when the windshield defrosts (see [Wipers and Washers on page 228](#)).

Tires and Tire Chains

- Use winter tires to increase traction in snowy or icy conditions. You can purchase winter tires on <http://www.tesla.com> (see [Seasonal Tire Types on page 438](#)).
- Tire chains provide additional traction when driving in snowy or icy conditions. Check local regulations to determine if tire chains are recommended or required during winter months. See [Using Tire Chains on page 439](#) for more information.



Your vehicle's tire pressures will drop in cold ambient temperatures. If the TPMS indicator light appears, inflate the tires before driving. The tires will lose one PSI for every 10° F (6° C) drop in outside temperature (see [Tire Care and Maintenance on page 431](#)). Proper tire pressures help protect tires from potholes and improve range when properly inflated.

While Driving

Cold weather can increase energy consumption because more power is required for driving, cabin and Battery heating. Follow these suggestions to reduce energy consumption:

- Use seat heaters to keep warm. Seat heaters use less energy than the cabin heater. Lowering the cabin temperature and using seat heaters reduces energy consumption (see [Climate Controls on page 360](#)).
- Slow down your driving and avoid frequent and rapid acceleration.
- Turn on Range Mode to automatically limit the power that the climate control system uses to maintain the temperature of the Battery and the cabin area. Range Mode also turns off signature lights (if equipped) and adjusts the front and rear motor torque split to maximize range (see [Getting Maximum Range on page 261](#)).

Regenerative Braking

Regenerative braking can be limited if the Battery is too cold. As you continue to drive, the Battery warms up and regenerative power increases (see [Regenerative Braking on page 233](#)).

NOTE: Limited regenerative braking can be avoided if you allow enough time to precondition your vehicle or if you use **Schedule** to precondition Model SModel X before your departure time (see [Scheduled Charging and Scheduled Departure on page 425](#)).

Blue Snowflake Icon



A blue snowflake icon appears on your instrument panel when some of the stored energy in the Battery is unavailable because the Battery is cold. This portion of unavailable energy displays in blue on the Battery meter. Regenerative braking, acceleration, and charging rates may be limited. The snowflake icon no longer displays when the Battery is sufficiently warm.

Warming the Battery Before Supercharging

By using Trip Planner (see [Trip Planner on page 373](#)) to navigate to a Supercharger, Model SModel X pre-heats the Battery to ensure when you arrive at the Supercharger, the Battery temperature is optimal and ready to charge. This reduces the amount of time it takes to charge.

NOTE: Tesla recommends using Trip Planner to navigate to a Supercharger for at least 30–45 minutes before arrival to ensure optimal Battery temperature and charging conditions. If the drive to the Supercharger is less than 30–45 minutes, consider preconditioning the Battery prior to driving (see [Before Driving on page 284](#)).

Autopilot

To ensure optimal Autopilot performance, keep the sensors and radar free of snow, ice, mud, and dirt (see [About Autopilot on page 286](#)).

After Driving

Leave Model SModel X plugged in when not in use. This uses the charging system, rather than the Battery itself, to keep the Battery warm (see [High Voltage Battery Information on page 415](#)).

Scheduled Departure

When parked, plug in Model SModel X and use the **Schedule** settings, available on both the charging and climate control screens, to set a time when you want to precondition Model SModel X (see [Scheduled Charging and Scheduled Departure on page 425](#)). Your vehicle determines the appropriate time to begin charging so it is complete during off-peak hours and the cabin and Battery are warm by your set departure time. For more information, see [Scheduled Charging and Scheduled Departure on page 425](#).



Charge Port

- If your charge port latch freezes in place and a charging cable becomes stuck in the charge port, try manually releasing the charge cable. See [Manually Releasing Charge Cable on page 426](#)[Manually Releasing Charge Cable on page 427](#)[Manually Releasing Charge Cable on page 426](#).
- Use the mobile app to precondition your vehicle to help thaw ice on the charge port latch so that the charge cable can be removed or inserted (see [Mobile App on page 406](#)).

NOTE: You can also prevent the occurrence of a charge port latch freezing in place by using the **Schedule** settings (see [Scheduled Charging and Scheduled Departure on page 425](#)).

NOTE: If your charge port latch is frozen in place, it may not lock the charging cable in place when inserted, but it can still charge at a slow AC rate even if the latch is not engaged.

Storage

If you leave Model SModel X parked for an extended period of time, plug the vehicle into a charger to prevent normal range loss and to keep the Battery at an optimal temperature. Your vehicle is safe to stay plugged in for any length of time.

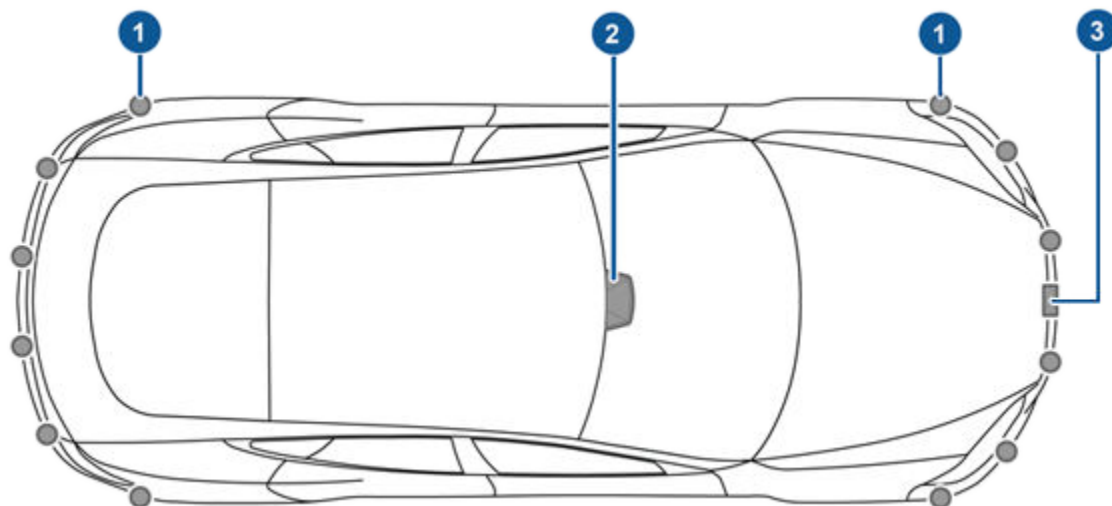
When not in use, Model SModel X enters a sleep mode to conserve energy. Reduce the number of times you check your vehicle's status on the mobile app, as this automatically wakes up your vehicle and starts normal energy consumption.

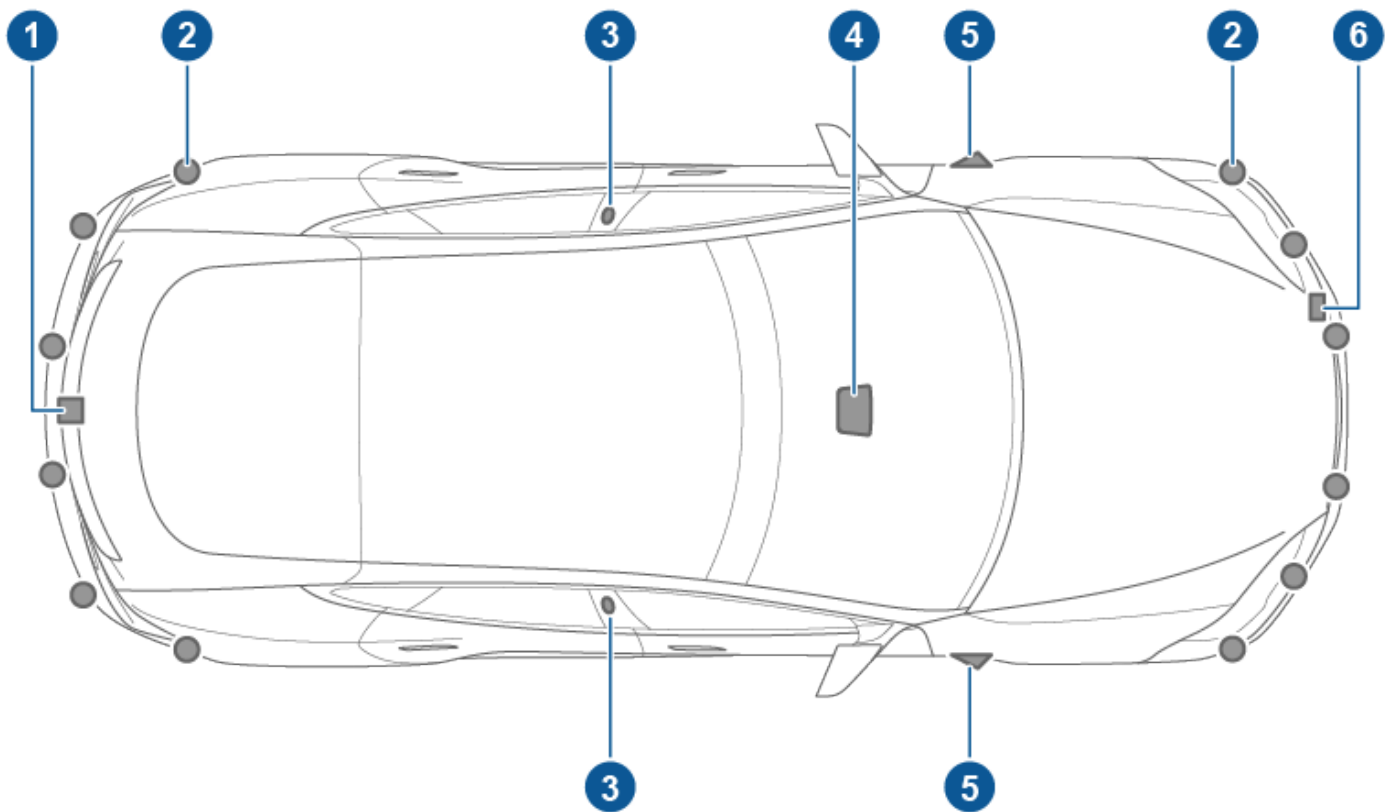
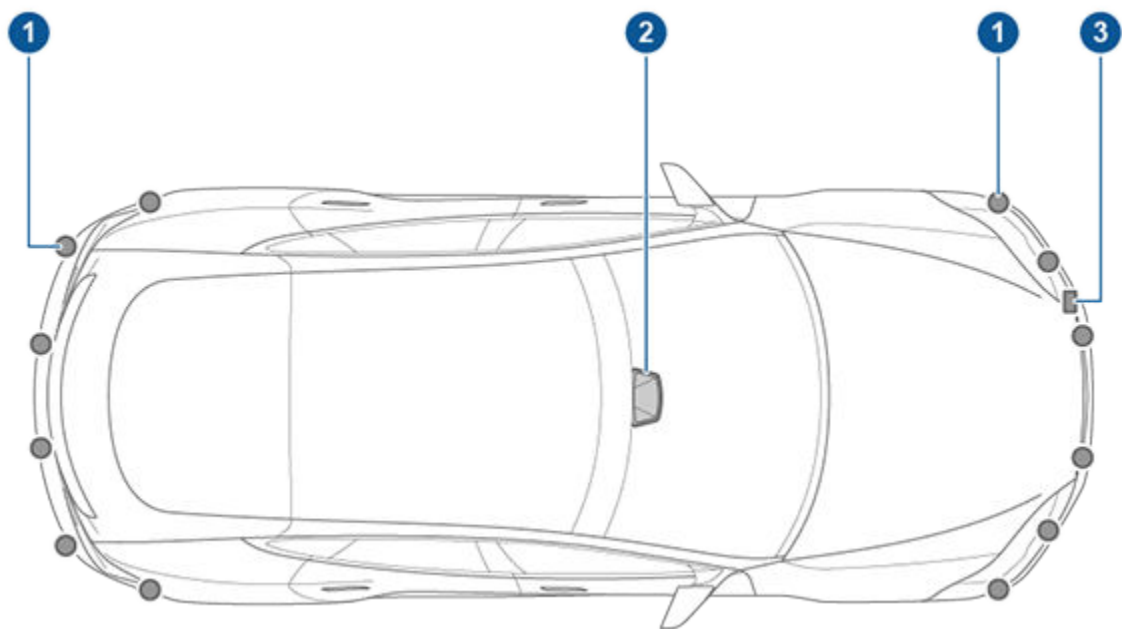
Autopilot

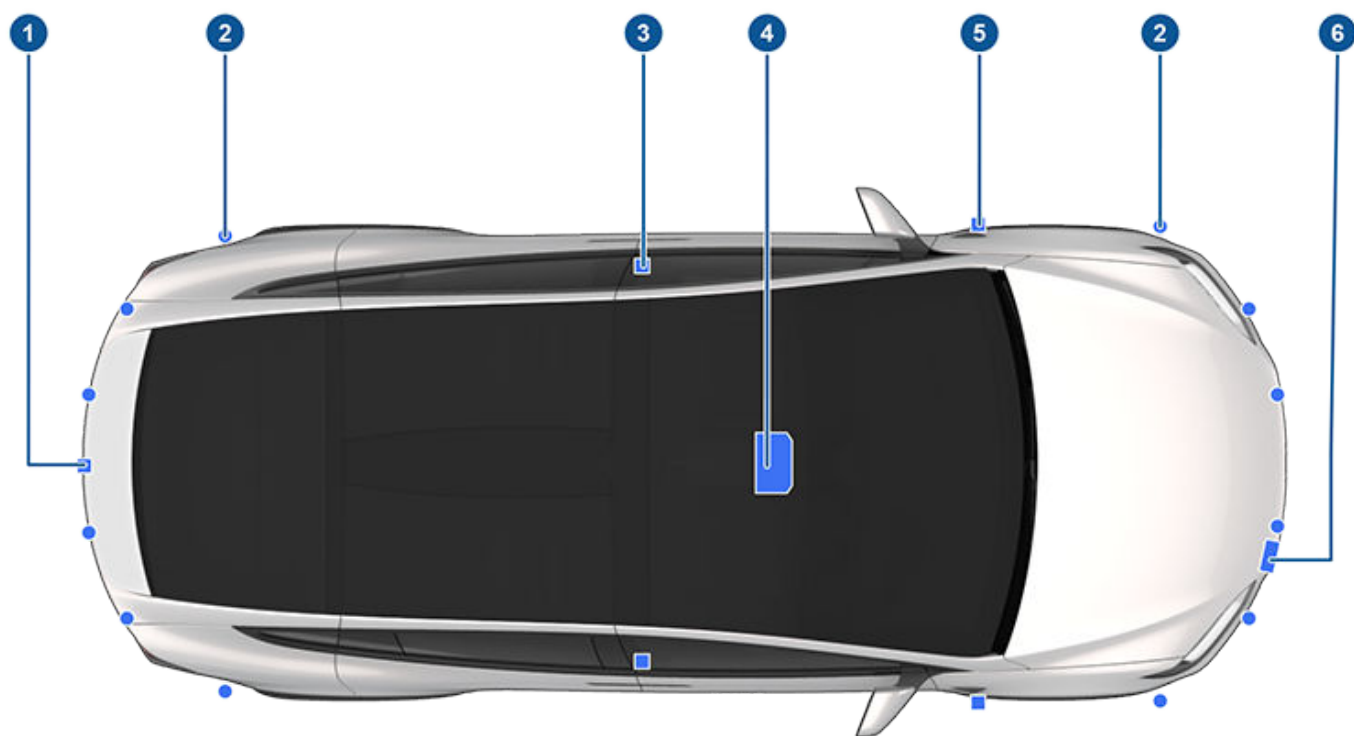
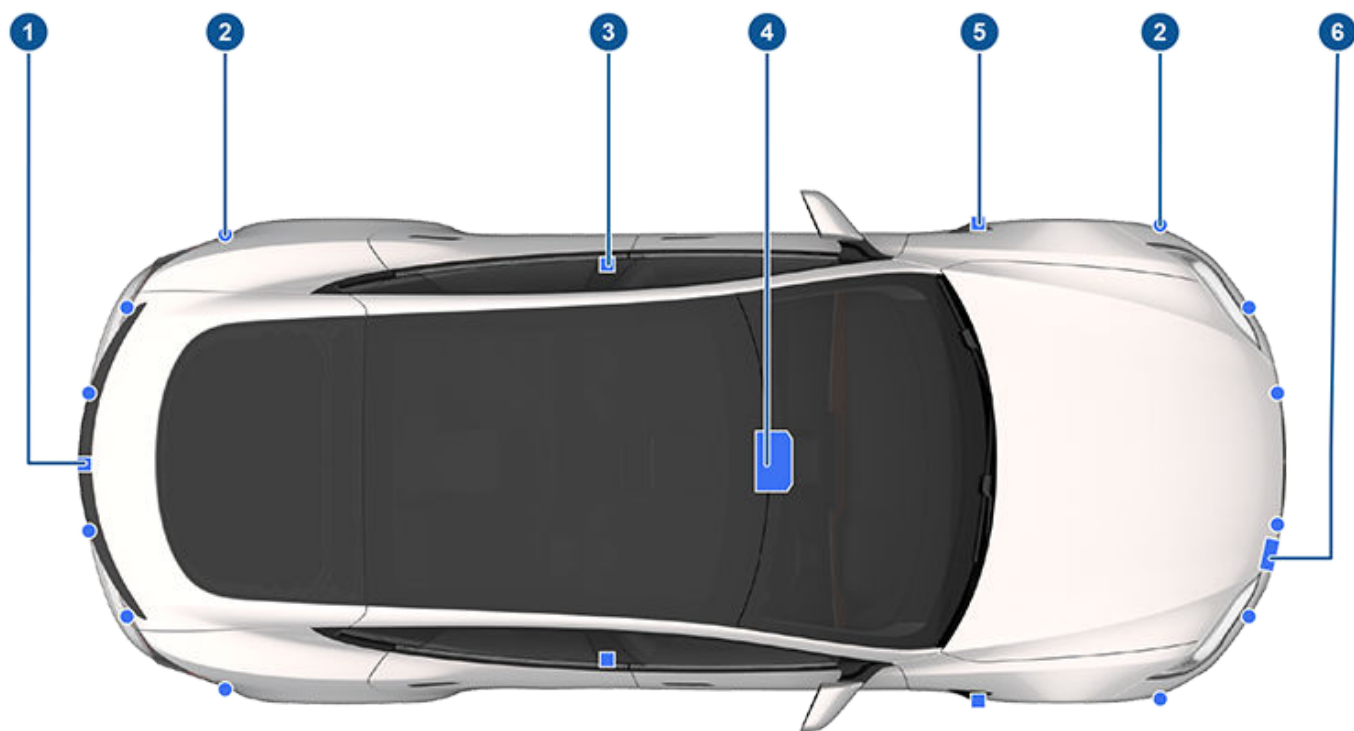
About Autopilot

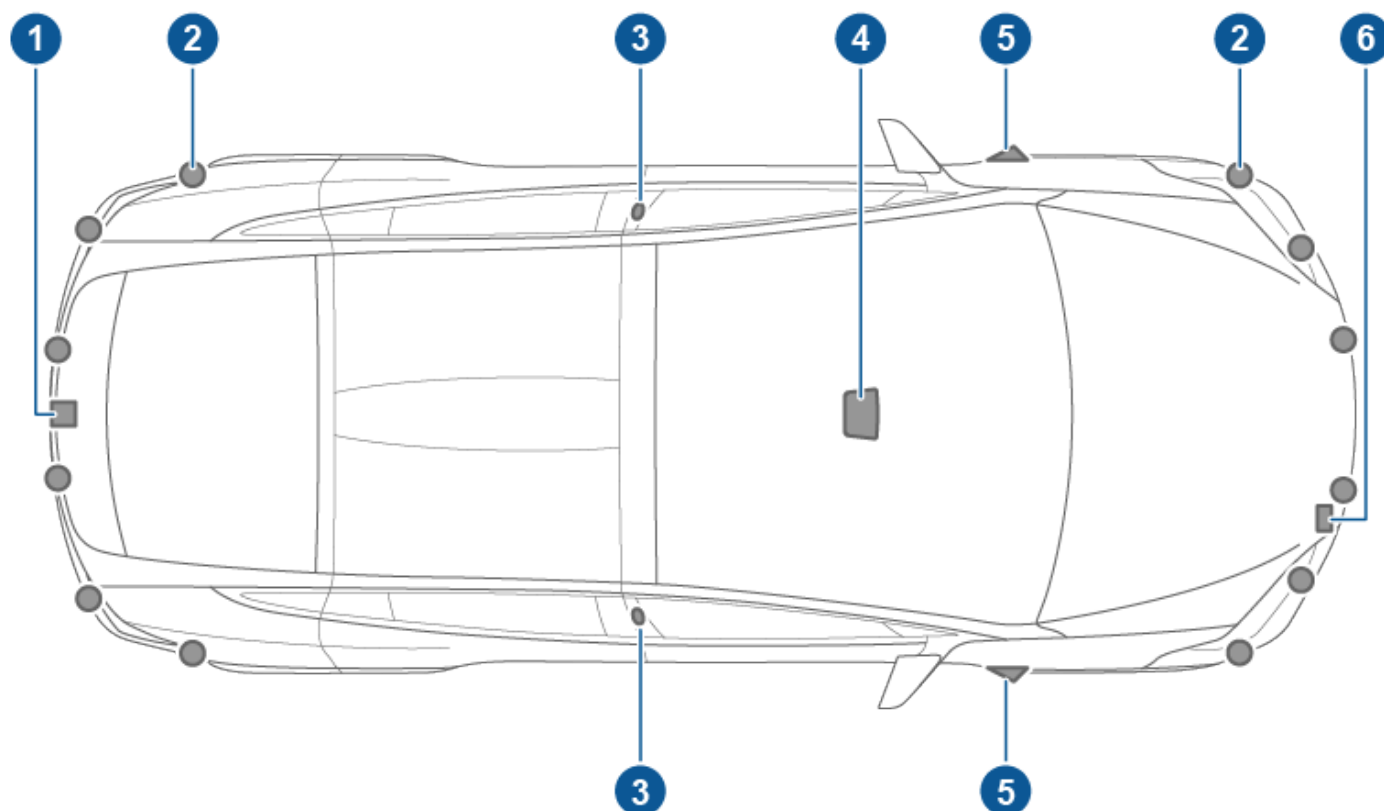
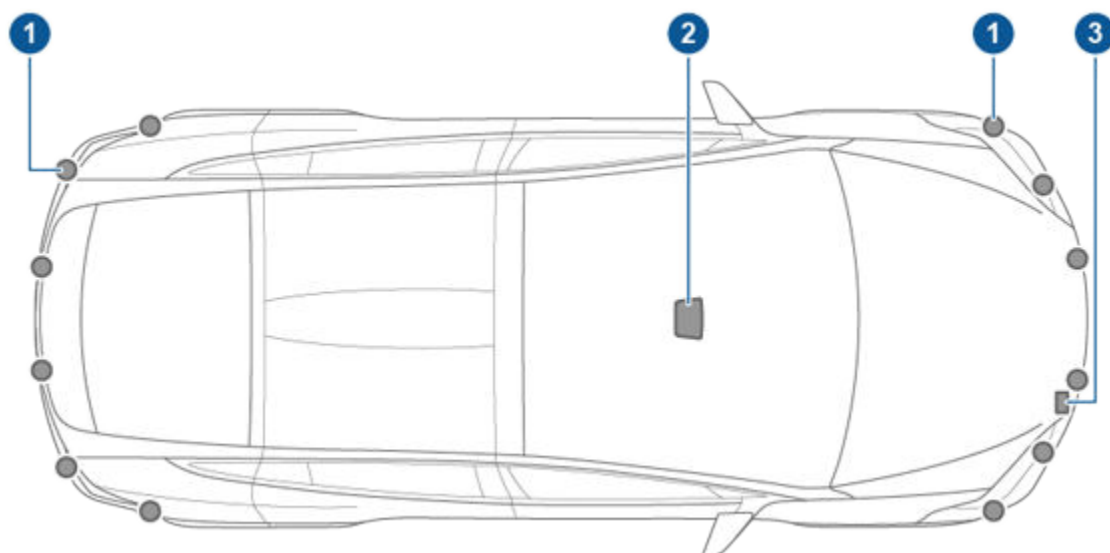
How It Works

Your Model SModel X includes the following components that actively monitor the surrounding area:









1. Ultrasonic sensors are located in the front and rear bumpers.
2. A forward looking camera is mounted on the windshield above the rear view mirror.
3. Radar is mounted in the front grill. Radar is mounted behind the front bumper on the left side of the vehicle. Radar is mounted behind the front bumper on the right side of the vehicle.

1. A camera is mounted above the rear license plate.
2. Ultrasonic sensors are located in the front and rear bumpers.
3. A camera is mounted in each door pillar.
4. Three cameras are mounted to the windshield above the rear view mirror.
5. A camera is mounted to each front fender.



6. Radar (if equipped) is mounted behind the front bumper.

Model S Model X is also equipped with high precision electronically-assisted braking and steering systems.

NOTE: Ensure all cameras and sensors are clean before each drive. See [Cleaning Cameras and Sensors on page 292](#) for more information. Dirty cameras and sensors, as well as environmental conditions such as rain and faded lane markings, can affect Autopilot performance.



Active Safety Features

These Active Safety features, available on all vehicles that are equipped with the components shown above, are designed to increase your safety:

- Lane Assist (see [Lane Assist on page 336](#))
- Collision Avoidance Assist (see [Collision Avoidance Assist on page 340](#))
- Speed Assist (see [Speed Assist on page 344](#))

You can enable/disable some of these features and in some cases, control how they work. To access settings for these features, touch **Controls** > **Autopilot**.

Autopilot Features

NOTE: Depending on market region, vehicle configuration, options purchased, and software version, your vehicle may not be equipped with all features listed below, or a feature may not operate exactly as described.

These Autopilot convenience features are designed to reduce driver workload:

- Traffic-Aware Cruise Control (see [Traffic-Aware Cruise Control on page 299](#))
- Autosteer (see [Autosteer on page 310](#))
- Auto Lane Change (see [Auto Lane Change on page 313](#))
- Autopark (see [Autopark on page 327](#))
- Summon (see [Summon on page 330](#))
- Smart Summon (see [Smart Summon on page 333](#))
- Stop Light and Stop Sign Warning (see [Stop Light and Stop Sign Warning on page 315](#))
- Navigate on Autopilot (see [Navigate on Autopilot on page 316](#))
- Traffic Light and Stop Sign Control (see [Traffic Light and Stop Sign Control on page 320](#))

You can enable/disable some of these features and in some cases, control how they work. To access settings associated with these features, touch **Controls** > **Autopilot**.

Drive to Calibrate Cameras

Model S/Model X must maneuver with precision when Autopilot features are being used. Therefore, before some features can be used for the first time or after some types of service repairs, cameras must complete a self-calibration process. For your convenience, the instrument panel displays a progress indicator.

When calibration is complete, Autopilot features are available for use. Calibration typically completes after driving 20-25 miles (32-40 km), but the distance varies depending on road and environmental conditions. For example, calibration completes quicker when driving on a straight road with multiple lanes (such as a controlled-access highway), with highly-visible lane markings (in the driving lane as well as the adjacent lanes). Contact Tesla only if your Model S/Model X has not completed the calibration process after driving 100 miles (160 km) in the described conditions.

If a camera has shifted from its calibrated position (for example, the camera or windshield was replaced), you must clear the calibration. To do so, touch **Controls** > **Service** > **Camera Calibration** > **Clear Calibration**. When the calibration is cleared, Model S/Model X repeats the calibration process. While this helps re-calibrate the cameras in many cases, **Clear Calibration** may not resolve all camera and sensor concerns.

NOTE: The self-calibration drive process is only applicable to Model S/Model X vehicles built after approximately October 12, 2016.

NOTE: To calibrate, cameras require highly-visible lane markings in both the driving lane and adjacent lanes (at least two lanes over on each side of the vehicle). For best results, drive in the middle lane of a multi-lane highway (ideally with at least five lanes) that has clear lane markings and minimal traffic.

NOTE: If you attempt to use a feature that is not available until the calibration process is complete, the feature is disabled and the instrument panel displays a message.



NOTE: Model S/Model X must repeat the calibration process if the cameras are serviced by Tesla, and in some cases, after a software update.

Limitations

Many factors can impact the performance of Autopilot components, causing them to be unable to function as intended. These include (but are not limited to):

- Poor visibility (due to heavy rain, snow, fog, etc.).
- Bright light (due to oncoming headlights, direct sunlight, etc.).
- Damage or obstructions caused by mud, ice, snow, etc.
- Interference or obstruction by object(s) mounted onto the vehicle (such as a bike rack).
- Obstruction caused by applying excessive paint or adhesive products (such as wraps, stickers, rubber coating, etc.) onto the vehicle.
- Narrow or winding roads.
- A damaged or misaligned body panel.
- Use of gray or aftermarket glass.
- Interference from other equipment that generates ultrasonic waves.
- Extremely hot or cold temperatures.

 **CAUTION:** If a windshield replacement is needed, take your vehicle to Tesla Service. This ensures appropriate handling and mounting of the camera(s). Failure to do so can cause one or more Autopilot features to malfunction.

 **WARNING:** The list above does not represent an exhaustive list of situations that may interfere with proper operation of Autopilot components. Never depend on these components to keep you safe. It is the driver's responsibility to stay alert, drive safely, and be in control of the vehicle at all times.

 **WARNING:** Advanced safety features may not be available during the calibration period.

 **WARNING:** Re-calibrating the cameras or sensors on the touchscreen is not a substitute for checking the physical positioning and condition of these components. Walk around your vehicle and inspect the cameras and sensors for physical damage. Incorrectly calibrated or positioned cameras and sensors may limit or disable the use of safety features. Contact Tesla if you suspect lingering issues.

Cleaning Cameras and Sensors

To ensure the various Autopilot components can provide information that is as accurate as possible, keep them clean and free of obstructions, condensation, or damage (see [Cleaning on page 446](#)).

Condensation can form inside the camera enclosures, especially if you park your vehicle outside in cold or wet conditions. The instrument cluster may display an alert stating that a camera is blocked and that some or all Autopilot features may be temporarily restricted until the camera vision is clear. To proactively dry the condensation, precondition the cabin by setting it to a warm temperature, turning the windshield defroster on, and directing the front air vents toward the door pillars (see [Mobile App on page 406](#)).

 **CAUTION:** Do not wipe an exposed lens with your hands or a cloth in an attempt to remove dirt or debris. The debris can damage the surface of the lens when wiped.

 **CAUTION:** Do not use chemical-based or abrasive cleaners. Doing so can damage surfaces.

 **CAUTION:** Do not clean an ultrasonic sensor or camera lens with a sharp or abrasive object that can scratch or damage its surface.



Full Self-Driving (Supervised)

About Full Self-Driving (Supervised)

When Full Self-Driving (Supervised) (also referred to as Autosteer on City Streets) is engaged, Model S/Model X attempts to drive to your destination by following curves in the road, stopping at and negotiating intersections, making left and right turns, navigating roundabouts, and entering/exiting highways.

Unlike Traffic-Aware Cruise Control, Autosteer, and Navigate on Autopilot, which are intended for use on multi-lane roadways with clear lane markings, Full Self-Driving (Supervised) is meant to work in a variety of driving scenarios. You can use Full Self-Driving (Supervised) on any type of roadway, including residential and city streets.



WARNING: Driver intervention may be required in certain situations, such as on narrow roads with oncoming cars, in construction zones, or while going through complex intersections. For more examples of scenarios in which driver intervention might be required, see [Limitations and Warnings on page 820](#).

Full Self-Driving (Supervised) uses inputs from cameras mounted at the front, rear, left, and right of Model S/Model X to build a model of the area surrounding Model S/Model X (see [About Autopilot on page 286](#)). The Full Self-Driving computer installed in Model S/Model X is designed to use this input, rapidly process neural networks, and make decisions to safely guide you to your destination.

NOTE: As Tesla's Full Self-Driving (Supervised) capabilities evolve, Model S/Model X is upgraded through over-the-air software updates. Download updates as soon as they become available.

NOTE: Full Self-Driving (Supervised) uses Tesla's vision-based system and therefore radar (if equipped) is disabled.

Like other Autopilot features, Full Self-Driving (Supervised) requires a fully attentive driver and will display a series of escalating warnings requiring driver response. **You must keep your hands on the steering wheel/steering yoke while Full Self-Driving (Supervised) is engaged.** While Full Self-Driving (Supervised) is engaged, the cabin camera monitors driver attentiveness (see [Driver Attentiveness on page 296](#)).



WARNING: Full Self-Driving (Supervised) is a hands-on feature that requires you to pay attention to the road at all times. Keep your hands on the steering wheel/steering yoke at all times, be mindful of road conditions and surrounding traffic, pay attention to pedestrians and cyclists, and always be prepared to take immediate action (especially around blind corners, crossing intersections, and in narrow driving situations). Failure to follow these instructions could cause damage, serious injury or death. It is your responsibility to familiarize yourself with the limitations of Full Self-Driving (Supervised) and the situations in which it may not work as expected. For more information, see [Limitations and Warnings on page 297](#).



CAUTION: Use of Full Self-Driving (Supervised) will be suspended if improper usage is detected. For more information, see [Autopilot Suspension on page 297](#).



CAUTION: As Full Self-Driving (Supervised) deployment expands, Tesla will gradually make it available to eligible customers in select countries outside of the United States and Canada. Because every country contains unique infrastructure, driving behaviors, and traffic patterns that Full Self-Driving (Supervised) must adapt to over time, it is essential for drivers using Full Self-Driving (Supervised) in newly eligible countries to be extra attentive and overly cautious. You must be ready to take over safely at any time.

Before Using Full Self-Driving (Supervised)

Before using Full Self-Driving (Supervised), you must:

- Ensure that the cameras on Model S/Model X are unobstructed and calibrated. Full Self-Driving (Supervised) depends on the ability of the cameras to detect traffic lights, stop signs, and road markings.
- Ensure that the latest version of maps has been downloaded to Model S/Model X. Although Full Self-Driving (Supervised) primarily uses visual data received from the vehicle's cameras, greater accuracy is achieved when using the most recent map data. To check which version of maps is currently downloaded, touch **Controls > Software**. You must connect to a Wi-Fi network to receive updated maps (see [Map Updates on page 374](#)).

In addition, you must enable Full Self-Driving (Supervised) before you can use it. To enable Full Self-Driving (Supervised), touch **Controls > Autopilot > Full Self-Driving (Supervised)** and then, after carefully reading and understanding the popup window, touch **Yes**.

NOTE: When Full Self-Driving (Supervised) is enabled, the setting for **Autopilot Activation** is set to **Single Pull** and Traffic-Aware Cruise Control and Autosteer are unavailable.



Customize Full Self-Driving (Supervised) settings by touching **Controls** > **Autopilot**.

- **Full Self-Driving (Supervised):** If desired, change the default setting of **Average** to **Chill** or **Assertive**. **Chill** provides a more relaxed driving style and **Assertive** drives with more urgency.
- **Minimal Lane Changes for the Current Drive:** When selected, Full Self-Driving (Supervised) makes fewer lane changes on the current drive. Model SModel X will still make lane changes as necessary to follow the navigation route.
- **Automatic Set Speed Offset:** When enabled, Model SModel X drives at the speed that Autopilot determines to be the most natural. This considers factors like road type, traffic flow, environmental conditions, the detected speed limit, and the selected Full Self-Driving (Supervised) profile setting.

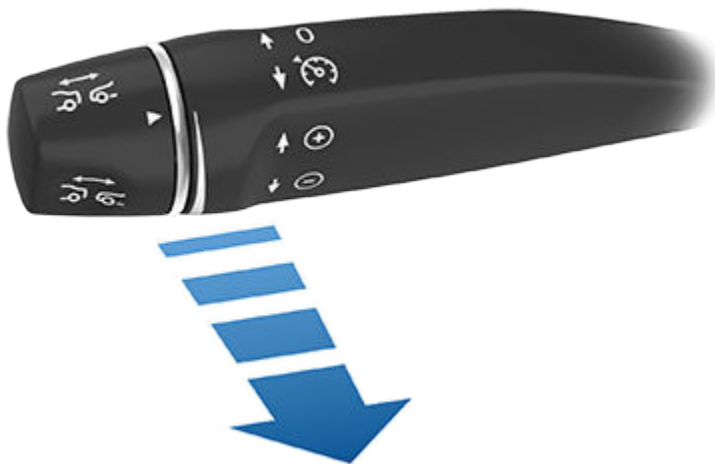


WARNING: You are responsible for the speed of the vehicle at all times, whether Autopilot is engaged or not.

To Use Full Self-Driving (Supervised)

Once Full Self-Driving (Supervised) is enabled, activate it the same way you would Autosteer (see [Autosteer on page 310](#)).

1. Enter a destination. If you do not choose a destination, Model SModel X chooses the most probable driving path or suggests a destination based on your driving.
2. When the instrument cluster displays the gray steering wheelsteering yoke icon, pull the Autopilot stalk toward you.



You can engage Full Self-Driving (Supervised) at any speed less than 85 mph (150 km/h), including when Model SModel X is at a standstill.

The instrument cluster displays the maximum speed in blue. When you engage Full Self-Driving (Supervised), the set cruising speed defaults to the speed limit, plus any offset you've specified. If Autopilot is unable to determine the speed limit, the cruising speed is your current speed, in addition to any specified offset.



To indicate that Full Self-Driving (Supervised) is available but not engaged, the top corner of the touchscreen displays a gray steering wheelsteering yoke icon next to the driving gear.



When Full Self-Driving (Supervised) is engaged, the steering wheelsteering yoke icon is blue and a blue line represents your driving path.

When Full Self-Driving (Supervised) is engaged, the instrument cluster displays a visualization of the environment surrounding Model SModel X, including the roadway and detected objects such as vehicles, pedestrians, curbs, bicyclists, and more. Objects that are highlighted on the visualization represent priorities that Full Self-Driving (Supervised) is actively controlling for at a given time.



NOTE: The Full Self-Driving (Supervised) visualization may not be a holistic representation of the objects, road markings, road signals, and other variables that Full Self-Driving (Supervised) takes into account as it attempts to drive to your destination. While Full Self-Driving (Supervised) is engaged, it uses data from the cameras on Model S/Model X that may not be represented in the visualization (see [About Autopilot on page 286](#)).

NOTE: Full Self-Driving (Supervised) uses Tesla's vision-based system and therefore radar (if equipped) is disabled.



The visualization will also inform you of the system's intended action by displaying a message on the instrument cluster, such as when the vehicle is slowly creeping for visibility to take a turn at an intersection.

NOTE: You can override Full Self-Driving (Supervised) at any time if you are uncomfortable or uncertain about the system's intended course of action. You are driving Model S/Model X at all times.

Canceling Full Self-Driving (Supervised)

To disengage Full Self-Driving (Supervised), do any of the following:

- Press the brake pedal.
- Push the Autopilot stalk away from you once.
- Take over and steer manually.

When you disengage Full Self-Driving (Supervised) by steering manually, Traffic-Aware Cruise Control remains active.

In addition, Full Self-Driving (Supervised) will disengage if any of the following occurs:

- You shift out of Drive.
- A door or trunk is opened.
- There is an Automatic Emergency Braking event (see [Collision Avoidance Assist on page 340](#)).
- The driver's seatbelt is released, and/or the driver gets out of their seat.
- You do not respond to repeated reminders to keep your hands on the wheel and subsequent messages on the instrument cluster.
- Full Self-Driving (Supervised) becomes unavailable. This can happen for a number of reasons (for example, if a camera becomes obscured). If Full Self-Driving (Supervised) disengages, an alert will appear on the instrument cluster to notify you and a chime will sound. If this happens, **take control of steering immediately**.

When driver intervention is required, it is best to safely disengage as soon as possible. It is recommended to practice disengaging from Full Self-Driving (Supervised) in safe environment without other road users so you may become familiar with the process.

While Using Full Self-Driving (Supervised)

Full Self-Driving (Supervised) changes lanes, makes left and right turns, follows on- and off-ramps, and takes forks in the road as necessary to reach the destination.



⚠ WARNING: NEVER make assumptions and predict when and where Full Self-Driving (Supervised) will stop or continue through an intersection or road marking. From a driver's perspective, the behavior of Full Self-Driving (Supervised) may appear inconsistent. Always pay attention to the roadway and be prepared to take immediate action. It is the driver's responsibility to determine whether to stop or continue through an intersection. Never depend on Full Self-Driving (Supervised) to determine when it is safe and/or appropriate to stop or continue through an intersection.

Like Autosteer and Traffic-Aware Cruise Control, Full Self-Driving (Supervised) maintains your speed and following distance from the vehicle ahead of Model S/Model X, if there is one. Full Self-Driving (Supervised) also slows down and stops at traffic lights and stop signs as necessary, and reacts to pedestrians, cyclists, and other vehicles on the road.

For example, if you are driving on a residential street and another vehicle backs out of a driveway ahead of Model S/Model X, Full Self-Driving (Supervised) slows down or stops as appropriate. If the other vehicle stops backing out while partially blocking the driving lane, Full Self-Driving (Supervised) slows down and maneuvers around the other vehicle if the width of the lane allows it.

When the traffic in front of you is slowing down, Full Self-Driving (Supervised) shows blue arrows in the driving lane and slows down to maintain an appropriate following distance from the vehicle ahead of you. When you are driving on the highway, Full Self-Driving (Supervised) displays a message on the instrument cluster to inform you when an action (such as a lane change) is being taken.

⚠ WARNING: In rare cases, Full Self-Driving (Supervised) may not appropriately slow down, come to a stop, or resume control for a stop sign or traffic light. You may assist the system by lightly applying the accelerator, or can override Full Self-Driving (Supervised) at any time.

Once you've arrived at your destination, Full Self-Driving (Supervised) stops Model S/Model X and displays a message indicating that navigation is complete.

Changing Lanes

To tell Full Self-Driving (Supervised) to change lanes while on a multi-lane roadway, engage the right or left turn signal. On city or residential streets, engaging the right or left turn signal tells Full Self-Driving (Supervised) to make a right or left turn, respectively.

Unlike Navigate on Autopilot, Full Self-Driving (Supervised) does not require confirmation before a lane change. To cancel a lane change or turn, cancel the turn signal or intervene with the steering wheel/steering yoke or other vehicle controls.

To be notified by a **Chime**, **Vibration**, or **Both** of upcoming lane changes (in addition to the notification on the instrument cluster), touch **Controls > Autopilot > Full Self-Driving (Supervised)** and then select a **Lane Change Notification**.

Changing the Set Speed

While Full Self-Driving (Supervised) is active, move the Autopilot stalk up to increase, or down to decrease, the set speed until the instrument panel displays your desired cruising speed.

While Full Self-Driving (Supervised) is active, roll the right scroll wheel up to increase, or down to decrease, the set speed.

NOTE: In some cases, your speed is limited by the speed limit, the type of roadway, or the flow of traffic. If this is the case, Full Self-Driving (Supervised) displays a message at the top of the visualization.

Driver Attentiveness

Like other Autopilot features, Full Self-Driving (Supervised) requires driver attentiveness. **Your hands must be on the steering wheel at all times while Full Self-Driving (Supervised) is engaged, and you must monitor your surroundings, the road, and other road users.**

⚠ WARNING: The use of devices designed to circumvent driver attentiveness is a violation of the terms of use for Full Self-Driving (Supervised) and may result in the feature being permanently disabled on your vehicle and a ban on future use of the feature.

Full Self-Driving (Supervised) periodically displays a message reminding the driver to apply slight force to the steering wheel:



Apply slight turning force to steering wheel

If Model S/Model X does not detect slight turning force on the steering wheel, the instrument cluster flashes and eventually chimes repeatedly. Do not use handheld devices while using Full Self-Driving (Supervised). If the cabin camera detects a handheld device while Full Self-Driving (Supervised) is engaged, the instrument cluster displays a message reminding you to keep your hands on the wheel.

Similarly, the cabin camera monitors your continued attentiveness when using Full Self-Driving (Supervised). This system cannot be disabled. The instrument cluster displays a message reminding you to pay attention if you repeatedly look away from the road, obstruct the camera, or prevent the system from identifying your gaze.

If you repeatedly ignore prompts to apply slight force to the steering wheel or to pay attention, Full Self-Driving (Supervised) disables for the rest of the drive and displays the following message requesting you to drive manually. If you don't resume manual steering, Full Self-Driving (Supervised) sounds a continuous chime, turns on the warning flashers, and slows the vehicle to a complete stop.



Autopilot unavailable for current drive. Autopilot Strikeout - Attention warnings ignored.

Autopilot Suspension

Use of Autosteer and Full Self-Driving (Supervised) will be suspended if improper usage is detected.

Use of Autosteer and Full Self-Driving (Supervised) is suspended for a week when you or another driver of your vehicle receives five Autopilot "strikeouts." A strikeout is when the Autopilot system disengages for the remainder of a trip after the driver receives several audio and visual warnings for inattentiveness.

You can see how many strikeouts are remaining before Autopilot access is suspended by touching **Controls > Autopilot**.

A strikeout is forgiven after 7 days, as long as you don't receive another strikeout in that time.

NOTE: If your access to Autosteer and Full Self-Driving (Supervised) is suspended, you can still use Traffic-Aware Cruise Control and all active safety features are still enabled.

There may be occasions where driver intervention is required and you must take over immediately to maintain safe driving. Driver-initiated disengagements do not count as improper usage and are expected from the driver.

Limitations and Warnings



WARNING: Always remember that Full Self-Driving (Supervised) (also known as Autosteer on City Streets) does not make Model S/Model X autonomous and requires a fully attentive driver who is ready to take immediate action at all times.



WARNING: Full Self-Driving (Supervised) is a hands-on feature. Keep your hands on the steering wheel/steering yoke at all times, be mindful of road conditions and surrounding traffic, and always be prepared to take immediate action. Failure to follow these instructions could cause damage, serious injury or death. It is your responsibility to familiarize yourself with the limitations of Full Self-Driving (Supervised) and the situations in which it may not work as expected.



WARNING: Failure to follow all warnings and instructions can result in property damage, serious injury or death.



 **CAUTION:** Full Self-Driving (Supervised) and its associated functions may not operate as intended and there are numerous situations in which driver intervention may be needed. Examples include (but are not limited to):

- Interactions with pedestrians, bicyclists, and other road users.
- Unprotected turns with high-speed cross traffic.
- Multi-lane turns.
- Simultaneous lane changes.
- Narrow roads with oncoming cars or double-parked vehicles.
- Rare objects such as trailers, ramps, cargo, open doors, etc. protruding from vehicles.
- Merges onto high-traffic, high-speed roads.
- Debris in the road.
- Construction zones.
- High curvature roads, particularly at fast driving speeds.

Visibility is critical for Full Self-Driving (Supervised) to operate. Low visibility, such as low light or poor weather conditions (rain, snow, direct sun, fog, etc.) can significantly degrade performance.

 **WARNING:** Model S Model X may quickly and suddenly make unexpected maneuvers or mistakes that require immediate driver intervention.

The list above represents only a fraction of the possible scenarios that can cause Full Self-Driving (Supervised) to make sudden maneuvers and behave unexpectedly. In fact, Model S Model X can suddenly swerve even when driving conditions appear normal and straight-forward. Stay alert and always pay attention to the roadway so you can anticipate the need to take corrective action as early as possible. Remember that this is an early access feature that must be used with extra caution.

 **CAUTION:** As Full Self-Driving (Supervised) deployment expands, Tesla will gradually make it available to eligible customers in select countries outside the United States. Because every country contains unique infrastructure, driving behaviors, and traffic patterns that Full Self-Driving (Supervised) must adapt to over time, it is essential for drivers using Full Self-Driving (Supervised) in newly eligible countries to be extra attentive and overly cautious. You must be ready to take over safely at any time.



Traffic-Aware Cruise Control

NOTE: Traffic-Aware Cruise Control is a BETA feature.

Traffic-Aware Cruise Control determines when there is a vehicle in front of you in the same lane. If the area in front of Model S/Model X is clear, Traffic-Aware Cruise Control maintains a set driving speed. When a vehicle is detected, Traffic-Aware Cruise Control is designed to slow down Model S/Model X as needed to maintain a selected time-based distance from the vehicle in front, up to the set speed. Traffic-Aware Cruise Control does not eliminate the need to watch the road in front of you and to manually apply the brakes when needed.

Traffic-Aware Cruise Control is primarily intended for driving on dry, straight roads, such as highways.



CAUTION: Ensure all cameras and sensors (if equipped) are clean before each drive. Dirty cameras and sensors, as well as environmental conditions such as rain and faded lane markings, can affect Autopilot performance.



WARNING: Traffic-Aware Cruise Control is designed for your driving comfort and convenience and is not a collision warning or avoidance system. It is your responsibility to stay alert, drive safely, and be in control of the vehicle at all times. Never depend on Traffic-Aware Cruise Control to adequately slow down Model S/Model X. Always watch the road in front of you and be prepared to take corrective action at all times. Failure to do so can result in serious injury or death.



WARNING: Although Traffic-Aware Cruise Control is capable of detecting pedestrians and cyclists, never depend on Traffic-Aware Cruise Control to adequately slow Model S/Model X down for them. Always watch the road in front of you and be prepared to take corrective action at all times. Failure to do so can result in serious injury or death.



WARNING: Do not use Traffic-Aware Cruise Control on winding roads with sharp curves, on icy or slippery road surfaces, or when weather conditions (such as heavy rain, snow, fog, etc.) make it inappropriate to drive at a consistent speed. Traffic-Aware Cruise Control does not adapt driving speed based on road and driving conditions.

To Use Traffic-Aware Cruise Control

To initiate Traffic-Aware Cruise Control when no vehicle is detected ahead of you, you must be driving at least 18 mph (30 km/h), unless certain vehicle and environmental conditions are met, in which case, you may be able to initiate it at lower speeds. If a vehicle is detected ahead of you, you can initiate Traffic-Aware Cruise Control at any speed, even when stationary, provided Model S/Model X is at least 5 feet (1.5 m) behind the detected vehicle and certain vehicle and environmental conditions are met.

NOTE: The maximum cruising speed is 90 mph (150 km/h). It is the driver's responsibility to cruise at a safe speed based on road conditions and speed limits.

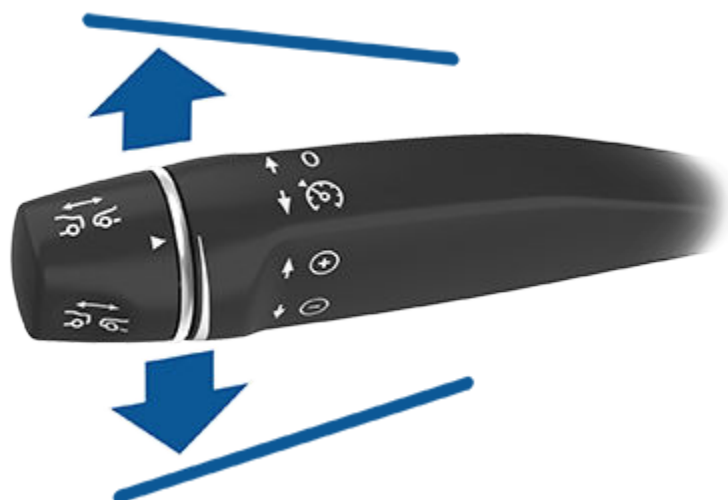


When Traffic-Aware Cruise Control is available but not engaged, the instrument panel displays a gray cruising speed icon. The number shown in gray represents the cruising speed that will be set when you engage Traffic-Aware Cruise Control.

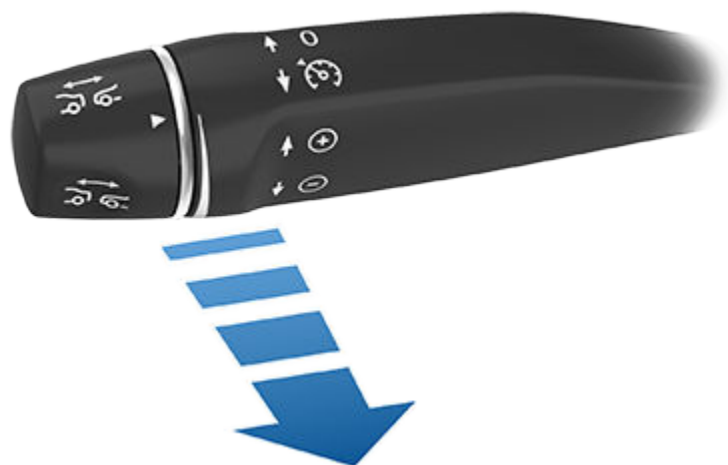


When Traffic-Aware Cruise Control is actively cruising at a set cruising speed, the icon turns blue and displays the set cruising speed.

1. When available, you can engage Traffic-Aware Cruise Control to match the speed limit or your current speed. Choose:
 - To engage Traffic-Aware Cruise Control *at your current driving speed*, move the Autopilot stalk up or down once and release the accelerator pedal to allow Traffic-Aware Cruise Control to maintain the cruising speed.



- To engage Traffic-Aware Cruise Control *at the currently detected speed limit*, pull the Autopilot stalk toward you once and release the accelerator pedal to allow Traffic-Aware Cruise Control to maintain the cruising speed.



NOTE: If **Autopilot Activation** is set to **Single Pull**, moving the Autopilot stalk toward you once activates Autosteer (see [Autosteer on page 310](#)). Touch **Controls** > **Autopilot** > **Autopilot Activation** and choose **Double Pull** to use Traffic-Aware Cruise Control independently of Autosteer when you move the Autosteer stalk toward you.

NOTE: If you choose to engage Traffic-Aware Cruise Control at the currently detected speed limit, you can specify an offset. Touch **Controls** > **Autopilot** > **Set Speed Offset**. You can choose a **Fixed** offset, in which the cruising speed adjusts by a specific number of mph (km/h) on all roads, or a **Percentage** offset, in which the cruising speed is adjusted as a percentage of the road's detected speed limit. If you pull the Autopilot stalk toward you when you are already driving faster than the speed limit, the set speed adjusts to your current driving speed instead of the speed limit. If you move the Autopilot stalk up or down when cruising at the speed limit, your set speed changes to your current driving speed.

A chime sounds to indicate that Traffic-Aware Cruise Control is now active.



WARNING: When you adjust the cruising speed based on the speed limit, the set cruising speed may not change when the speed limit changes.



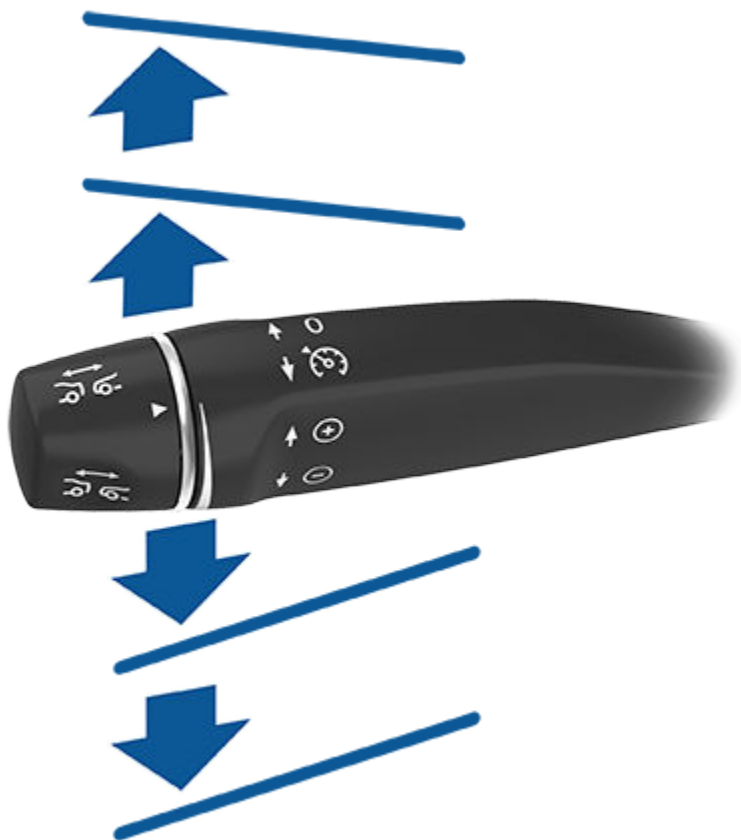
WARNING: Do not rely on Traffic-Aware Cruise Control or Speed Assist to determine an accurate or appropriate cruising speed. It is the driver's responsibility to cruise at a safe speed based on road conditions and applicable speed limits.

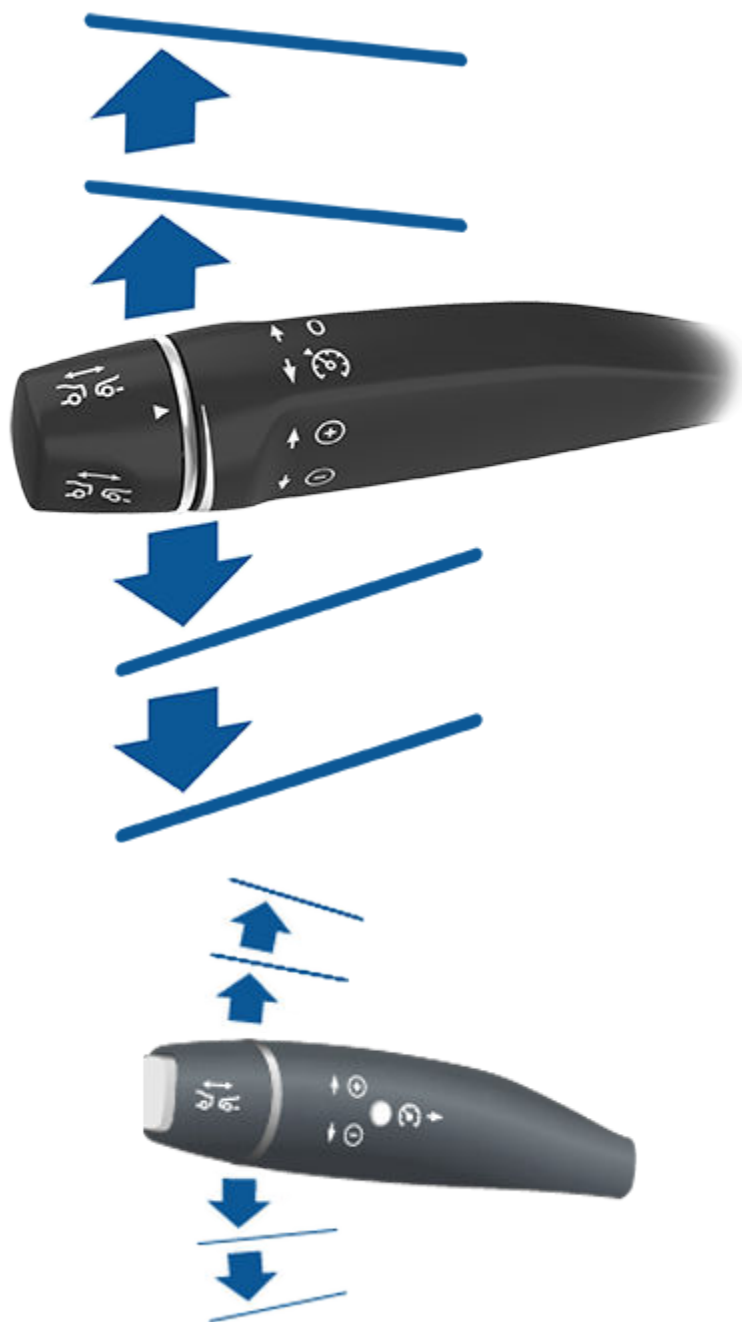
2. To change your speed while using Traffic-Aware Cruise Control, you can use the right scroll wheel or the Autopilot stalk. For details, see [Changing the Cruising Speed on page 301](#).
3. To cancel Traffic-Aware Cruise Control, push the stalk away from you once or press the brake pedal. See [Canceling and Resuming on page 305](#) for more information.



Changing the Cruising Speed

To change the set cruising speed while using Traffic-Aware Cruise Control, move the Autopilot stalk up (increase) or down (decrease) until the instrument panel icon displays your desired cruising speed.





To increase/decrease speed by 1 mph (1 km/h), move the stalk up or down to the first position and release. To increase/decrease speed to the closest 5 mph (5 km/h) increment, move the stalk up/down to the second position and release. For example, if you are traveling at 57 mph and you move the stalk up to the second position and release, the speed increases to 60 mph. You can also increase/decrease speed by holding the stalk in the full up/down position and releasing when the icon on the instrument panel displays your desired cruising speed.

You can also pull and hold the Autopilot stalk towards you for approximately half a second to cruise at the detected speed limit.

NOTE: It may take a few seconds for Model SModel X to reach the new cruising speed, assuming Model SModel X is not cruising behind a vehicle that is driving slower than your set speed.



Cruising at the Set Speed

Traffic-Aware Cruise Control maintains your set cruising speed whenever a vehicle is not detected in front of Model S/Model X. When cruising behind a detected vehicle, Traffic-Aware Cruise Control accelerates and decelerates Model S/Model X as needed to maintain a chosen following distance (see [Adjust the Following Distance on page 304](#)), up to the set speed.

Traffic-Aware Cruise Control also adjusts the cruising speed when entering and exiting curves.

You can manually accelerate at any time when cruising at a set speed, but when you release the accelerator, Traffic-Aware Cruise Control resumes cruising at the set speed.

NOTE: When Traffic-Aware Cruise Control is actively slowing down Model S/Model X to maintain the selected distance from the vehicle ahead, brake lights turn on to alert other road users that you are slowing down. You may notice slight movement of the brake pedal. However, when Traffic-Aware Cruise Control is accelerating Model S/Model X, the accelerator pedal does not move.



WARNING: Traffic-Aware Cruise Control may occasionally cause Model S/Model X to brake when not required or when you are not expecting it. This can be caused by closely following a vehicle ahead, detecting vehicles or objects in adjacent lanes (especially on curves), etc.



WARNING: Due to limitations inherent in the onboard GPS (Global Positioning System), you may experience situations in which Model S/Model X slows down, especially near exits or off-ramps where a curve is detected and/or you are navigating to a destination and not following the route.



WARNING: Traffic-Aware Cruise Control may not detect all objects and, especially when cruising over 50 mph (80 km/h), may not brake/decelerate when a vehicle or object is only partially in the driving lane or when a vehicle you are following moves out of your driving path and a stationary or slow-moving vehicle or object is in front of you. Always pay attention to the road ahead and stay prepared to take immediate corrective action. Depending on Traffic-Aware Cruise Control to avoid a collision can result in serious injury or death. In addition, Traffic-Aware Cruise Control may react to vehicles or objects that either do not exist, or are not in your lane of travel, causing Model S/Model X to slow down unnecessarily or inappropriately.



WARNING: Traffic-Aware Cruise Control may be unable to provide adequate speed control because of limited braking capability and hills. It can also misjudge the distance from a vehicle ahead. Driving downhill can increase driving speed, causing Model S/Model X to exceed your set speed (and potentially the road's speed limit). Never depend on Traffic-Aware Cruise Control to slow down Model S/Model X enough to prevent a collision. Always keep your eyes on the road when driving and be prepared to take corrective action as needed. Depending on Traffic-Aware Cruise Control to reduce your driving speed enough to prevent a collision can result in serious injury or death.

HOLD State

When following a vehicle, Traffic-Aware Cruise Control remains active at low speeds, even when Model S/Model X comes to a full stop. When the vehicle is moving again, Traffic-Aware Cruise Control resumes operating at the set speed. However, under the following circumstances, Traffic-Aware Cruise Control goes into a **HOLD** state, in which case, you need to briefly press the accelerator pedal or pull the Autopilot stalk toward you (see [Canceling and Resuming on page 305](#)) to resume cruising. When the **HOLD** status is active, the instrument panel displays the **HOLD** icon and a message that indicates that you need to resume cruise control. The following circumstances can cause Traffic-Aware Cruise Control to go into the **HOLD** state:

- Model S/Model X has been at a standstill for 5 minutes.
- Model S/Model X detects a pedestrian (the **HOLD** state may clear when the pedestrian is no longer detected).
- Model S/Model X suddenly loses visibility of the vehicle in front of you.
- An obstacle is detected in front of Model S/Model X.

Cruising Near or On Exits

When cruising near an exit on a controlled-access highway and engaging the turn signal toward the off-ramp, Traffic-Aware Cruise Control assumes you are exiting and begins to slow down Model S/Model X. If you do not drive onto the off-ramp, Traffic-Aware Cruise Control resumes cruising at the set speed. In a region with right hand traffic, this occurs only when you engage the right turn signal when driving in the right-most lane within 164 feet (50 meters) of an exit. Likewise in regions with left hand traffic; when engaging the left turn signal when driving in the left-most lane within 164 feet (50 meters) of an exit.

When cruising onto an on-ramp to a controlled-access highway, Traffic-Aware Cruise Control automatically adjusts the set cruising speed to the speed limit of the highway, plus any offset you have specified.



NOTE: The on-board Global Positioning System (GPS) determines if you are driving in a region with right or left hand traffic. In situations where GPS data is unavailable (for example, if there is inadequate signal), engaging the turn signal near an exit does not cause Traffic-Aware Cruise Control to slow down Model S/Model X.

When enabled while on a highway interchange or off-ramp, Traffic-Aware Cruise Control may reduce your set speed in 5 mph (5 km/h) increments – to as slow as 25 mph (40 km/h) – to better match the reported speeds of other Tesla vehicles that have driven at that specific location. To override this and continue cruising at your set speed, tap the accelerator pedal or move the Autopilot stalk. The new set speed is maintained for the duration of the interchange or off-ramp (unless you override it or cancel Traffic-Aware Cruise Control). After the interchange or off-ramp, the set speed may revert or change as necessary based on the new location. For example, if you merged onto a different highway, the set cruising speed reverts to what it was before driving on the interchange.

WARNING: In some cases (such as having insufficient data), Traffic-Aware Cruise Control may not automatically reduce the set speed on the highway interchange or off-ramp. Do not rely on Traffic-Aware Cruise Control to determine an appropriate driving speed. Tesla recommends driving at a speed that is safe for road conditions and within posted speed limits.

Adjust the Following Distance

To adjust the following distance you want to maintain between Model S/Model X and a vehicle traveling ahead of you, rotate the Autopilot stalk. Each setting corresponds to a time-based distance that represents how long it takes for Model S/Model X, from its current location, to reach the location of the rear bumper of the vehicle ahead of you. Your setting is retained until you manually change it.

The closest following distance is 2. The closest following distance is 1.



As you rotate the Autopilot stalk, the instrument panel displays the current setting. Release the stalk when the desired setting is displayed.



- WARNING:** It is the driver's responsibility to determine and maintain a safe following distance at all times. Do not rely on Traffic-Aware Cruise Control to maintain an accurate or appropriate following distance.
- WARNING:** Never depend on Traffic-Aware Cruise Control to adequately slow down Model S/Model X to avoid a collision. Always watch the road in front of you and stay prepared to take immediate corrective action.

Overtake Acceleration

When following a vehicle with Traffic-Aware Cruise Control active, engaging the turn signal (to indicate a move into the passing lane) accelerates Model S/Model X towards the vehicle ahead. By momentarily holding the turn signal stalk up or down, you can quickly accelerate up to your set speed without having to press the accelerator pedal. The turn signal causes acceleration only when all of the following conditions are met:

- Traffic-Aware Cruise Control is operating and detects a vehicle in front of you.
- No obstacles or vehicles are detected in the target lane.
- Model S/Model X is traveling below the set speed, but over 45 mph (72 km/h).

Overtake Acceleration is intended as an aid when passing a vehicle ahead of you. When the turn signal is engaged, Traffic-Aware Cruise Control continues to maintain distance from the vehicle ahead, but allows you to drive slightly closer than your selected distance.

Acceleration cancels when one of the conditions happen:

- You reach your set cruising speed.
- Changing lanes takes too long.
- Model S/Model X gets too close to the vehicle ahead.

OR

- You disengage the turn signal.

NOTE: Overtake Acceleration occurs when you fully engage the turn signal, or you . When you release the turn signal, Model S/Model X stops accelerating (in the same way as when you release the accelerator pedal) and resumes the set speed.

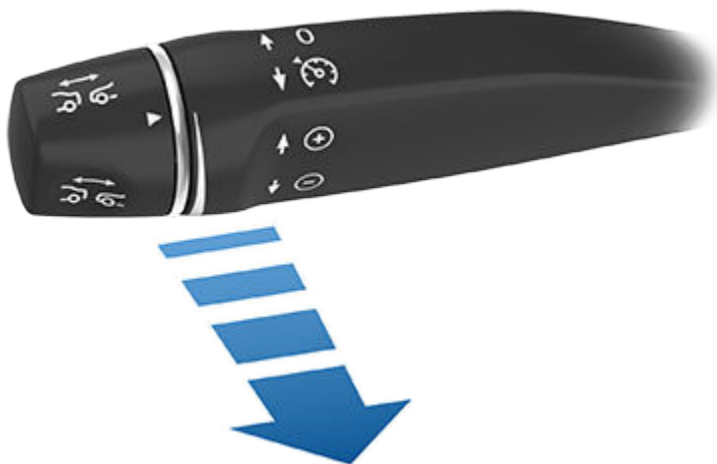
- WARNING:** Overtake Acceleration can cancel for many unforeseen reasons in addition to those listed above (for example, lack of GPS data). Stay alert and never depend on Overtake Acceleration to increase your driving speed.
- WARNING:** Overtake Acceleration increases your driving speed whenever the appropriate turn signal is engaged, and accelerates Model S/Model X closer to the vehicle ahead. Although Traffic-Aware Cruise Control continues to maintain distance from the vehicle ahead, it is important to be aware that your selected following distance is reduced when Overtake Acceleration is active, particularly in cases where it may not be your intention to overtake the vehicle you are following.

Canceling and Resuming

To manually cancel Traffic-Aware Cruise Control, press the brake pedal or briefly push the Autopilot stalk away from you. The cruising speed icon on the instrument panel turns gray to indicate that Traffic-Aware Cruise Control is no longer active.

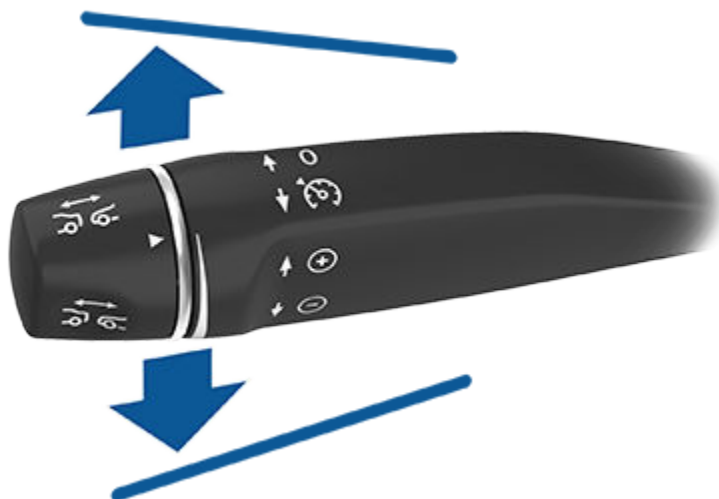


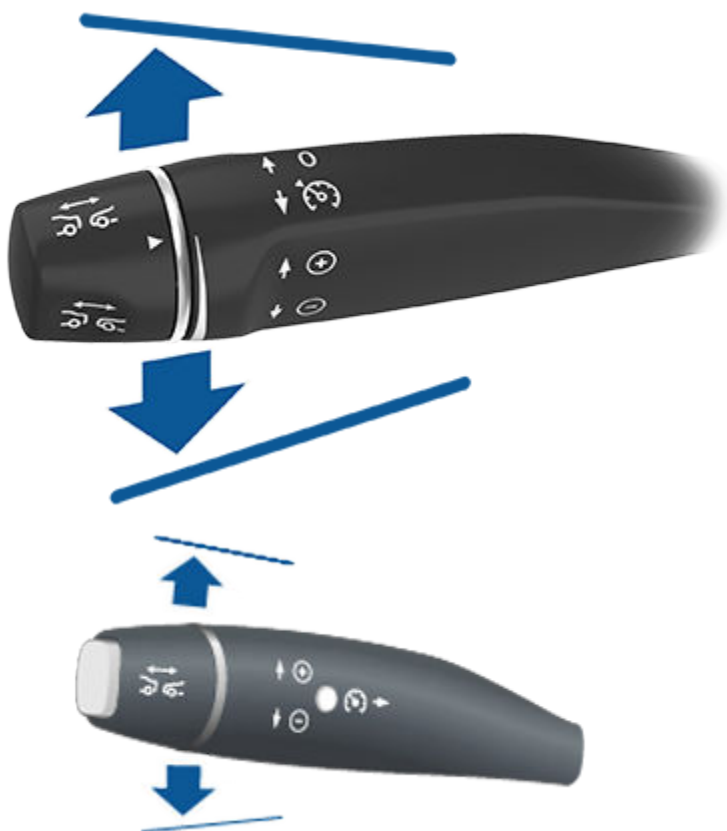
To resume cruising at the previously set speed, briefly pull the Autopilot stalk toward you.





To resume cruising at the current driving speed, move the Autopilot stalk up or down, then release.





NOTE: Depending on date of manufacture, some Model S/Model X vehicles have a button on the end of the Autopilot stalk. Pressing this button when Traffic-Aware Cruise Control is active cancels Traffic-Aware Cruise Control.

NOTE: When Traffic-Aware Cruise Control cancels, Model S/Model X does not coast. Instead, regenerative braking slows down Model S/Model X in the same way as when you move your foot off the accelerator when driving without Traffic-Aware Cruise Control (see [Regenerative Braking on page 233](#)).

WARNING: Traffic-Aware Cruise Control cancels, or may not be available, in the following situations:

- You press the brake pedal.
- Your driving speed exceeds the maximum cruising speed of 90 mph (150 km/h).
- You shift Model S/Model X.
- A door is opened.
- A camera or sensor (if equipped) is obstructed. This could be caused by dirt, mud, ice, snow, fog, etc.
- The traction control setting is manually disabled or is repeatedly engaging to prevent wheels from slipping.
- The wheels are spinning while at a standstill.
- The Traffic-Aware Cruise Control system is failing or requires service.

When Traffic-Aware Cruise Control is unavailable or cancels, Model S/Model X no longer drives consistently at a set speed and no longer maintains a specified distance from the vehicle ahead.

WARNING: Traffic-Aware Cruise Control can cancel unexpectedly at any time for unforeseen reasons. Always watch the road in front of you and stay prepared to take appropriate action. It is the driver's responsibility to be in control of Model S/Model X at all times.



Summary of Cruise Indicators



Traffic-Aware Cruise Control is available but is not actively controlling your speed until you activate it. The number shown in gray is the cruising speed that will be set when you engage Traffic-Aware Cruise Control.



Traffic-Aware Cruise Control is actively cruising and is either maintaining the set speed (no vehicle in front) or is maintaining a chosen following distance from a vehicle ahead (up to the set speed).



Model S Model X has fully stopped but is in a **HOLD** state. If safe, press the accelerator pedal to resume cruising at the set speed.

Limitations

Traffic-Aware Cruise Control is particularly unlikely to operate as intended in the following types of situations:

- The road has sharp curves.
- Visibility is poor (due to heavy rain, snow, fog, etc.).
- Bright light (such as from oncoming headlights or direct sunlight) is interfering with the view of the camera(s).
- A camera or sensor (if equipped) is obstructed (fogged over, dirty, covered by a sticker, etc.).



WARNING: The list above does not represent an exhaustive list of situations that may interfere with proper operation of Traffic-Aware Cruise Control.



Autosteer

NOTE: Autosteer is a BETA feature.

Autosteer builds upon Traffic-Aware Cruise Control (see [Traffic-Aware Cruise Control on page 299](#)), intelligently keeping Model S/Model X in its driving lane when cruising at a set speed. Autosteer also allows you to use the turn signals to move Model S/Model X into an adjacent lane (see [Auto Lane Change on page 313](#)). Autosteer detects lane markings and the presence of vehicles and objects to assist you in steering Model S/Model X.

CAUTION: Ensure all cameras and sensors (if equipped) are clean. Dirty cameras and sensors, as well as environmental conditions such as rain and faded lane markings, affect performance.

WARNING: Autosteer is a hands-on feature. You must keep your hands on the steering wheel/steering yoke at all times.

WARNING: Autosteer is intended for use on controlled-access highways with a fully attentive driver. When using Autosteer, hold the steering wheel/steering yoke and be mindful of road conditions and surrounding traffic. Do not use Autosteer in construction zones, or in areas where bicyclists or pedestrians may be present. Never depend on Autosteer to determine an appropriate driving path. Always be prepared to take immediate action. Failure to follow these instructions could cause damage, serious injury or death.

Operating Autosteer

Before you can operate Autosteer, you must enable it by touching **Controls > Autopilot > Autopilot Features > Autosteer (Beta)**.



To indicate that Autosteer is available (but not actively steering Model S/Model X), the instrument panel displays a gray Autosteer icon.

To initiate Autosteer, pull the Autopilot stalk toward you twice in quick succession.



NOTE: If the setting for **Autopilot Activation** is set to **Single Pull** (touch **Controls > Autopilot > Autopilot Activation**), Autosteer engages when you pull the Autopilot stalk toward you once. If set to **Double Pull**, you must pull the Autopilot stalk toward you twice in quick succession to engage Autosteer.



To indicate that Autosteer is now actively assisting in steering Model S/Model X, the instrument panel displays the Autosteer icon in blue. When Autosteer is able to detect lane markings, it also displays the driving lane in blue.

Autosteer briefly displays a message on the instrument panel reminding you to pay attention to the road and be ready to take over at any time. Have your hands on the steering wheel/steering yoke.

The speed at which you can initiate Autosteer can vary depending on various conditions and whether or not a vehicle is detected ahead of you. When no vehicle is detected ahead of you, you must be driving at least 18 mph (30 km/h), unless certain vehicle and environmental conditions are met, in which case, you may be able to initiate it at lower speeds. When a vehicle is detected ahead of you, you can initiate Autosteer at any speed, even when stationary, provided Model S/Model X is at least 5 feet (150 cm) behind the detected vehicle.

NOTE: The maximum cruising speed is 90 mph (150 km/h). It is the driver's responsibility to cruise at a safe speed based on road conditions and speed limits.

NOTE: When Autosteer is engaged, **Auto High Beam** is automatically enabled and the maximum cruising speed is 85 mph (140 km/h).



WARNING: Never depend on Autopilot features to determine the presence of emergency vehicles. Model S/Model X may not detect lights from emergency vehicles. Keep your eyes on your driving path and always be prepared to take immediate action.

In situations where Autosteer is temporarily unavailable, the Autosteer icon disappears. For example, your driving speed is not within the speed required for Autosteer to operate. Autosteer may also be unavailable if it is not receiving adequate data from the camera(s).

NOTE: In low light conditions (dusk or dark), Autosteer aborts or is unavailable if headlights are set to **Off**. For best results, set headlights to **Auto**.

If unable to detect lane markings, Autosteer may determine the driving lane based on a vehicle you are following. In these situations, the vehicle in front of you is highlighted in blue.

In most cases, Autosteer attempts to center Model S/Model X in the driving lane. However, there may be situations in which Autosteer may steer Model S/Model X in a driving path that is offset from the center of the lane (for example, detection of guard rails).



WARNING: Autosteer is not designed to, and will not, steer Model S/Model X around objects partially in a driving lane and in some cases, may not stop for objects that are completely blocking the driving lane. Always watch the road in front of you and stay prepared to take immediate action. It is the driver's responsibility to be in control of Model S/Model X at all times.

Restricted Speed

On a controlled-access highway, the cruising speed reflects the speed limit, taking into consideration any offset you've specified using Speed Assist. However, if you choose to use Autosteer on residential roads, a road without a center divider, or a road where access is not limited, Autosteer may limit the maximum allowed cruising speed and the instrument panel displays a message indicating that speed is restricted. The restricted speed will be the speed limit of the road plus 5 mph (10 km/h).

In situations where the speed limit cannot be detected when Autosteer is engaged, Autosteer reduces your driving speed and limits the set cruising speed to 45 mph (70 km/h). Although you can manually accelerate to exceed the limited speed, Model S/Model X may not brake for detected obstacles. Autosteer slows down to the limited speed when you release the accelerator pedal. When you leave the road, or disengage Autosteer by using the steering wheel/steering yoke, you can increase your set speed again, if desired.

Hold Steering Wheel/Steering Yoke

Autosteer determines how best to steer assist in steering Model S/Model X. When active, Autosteer requires you to hold the steering wheel/steering yoke. If it does not detect your hands on the steering wheel/steering yoke for a period of time, a flashing light appears along the top of the instrument panel and the following message displays:



Apply slight turning force to steering wheel

Autosteer detects your hands by recognizing slight resistance as the steering wheelsteering yoke turns, or from you manually turning the steering wheelsteering yoke very lightly (without enough force to take over steering). Autosteer also qualifies your hands as being detected if you engage a turn signal use the Autopilot stalk, or use a button or scroll wheel on the steering wheelsteering yoke.

NOTE: When your hands are detected, the message disappears and Autosteer resumes normal operation.

Autosteer requires that you pay attention to your surroundings and remain prepared to take control at any time. If Autosteer still does not detect your hands on the steering wheelsteering yoke, the flashing light on the instrument panel increases in frequency and a chime sounds.

If you repeatedly ignore Autosteer's prompts to apply slight force to the steering wheelsteering yoke, Autosteer disables for the rest of the drive and displays the following message requesting you to drive manually. If you don't resume manual steering, Autosteer sounds a continuous chime, turns on the warning flashers, and slows the vehicle to a complete stop.



Autopilot unavailable for current drive. Autopilot Strikeout - Attention warnings ignored.

For the rest of the drive, you must steer manually. Autosteer is available again on your next drive (after you stop and shift Model SModel X into Park).

Autopilot Suspension

Use of Autosteer and Full Self-Driving (Supervised) will be suspended if improper usage is detected.

Use of Autosteer and Full Self-Driving (Supervised) is suspended for a week when you or another driver of your vehicle receives fivethree Autopilot "strikeouts." A strikeout is when the Autopilot system disengages for the remainder of a trip after the driver receives several audio and visual warnings for inattentiveness.

You can see how many strikeouts are remaining before Autopilot access is suspended by touching **Controls > Autopilot**.

A strikeout is forgiven after 7 days, as long as you don't receive another strikeout in that time.

NOTE: If your access to Autosteer and Full Self-Driving (Supervised) is suspended, you can still use Traffic-Aware Cruise Control and all active safety features are still enabled.

There may be occasions where driver intervention is required and you must take over immediately to maintain safe driving. Driver-initiated disengagements do not count as improper usage and are expected from the driver.

Take Over Immediately

In situations where Autosteer is unable to steer Model SModel X, Autosteer sounds a warning chime and displays the following message on the instrument panel:



Take over immediately

When you see this message, **TAKE OVER STEERING IMMEDIATELY**.



Autosteer is Aborting

In situations where Autosteer is unable to assist in steering Model S/Model X, Autosteer aborts, sounds a warning chime, and displays the following message on the instrument panel:



Autosteer is aborting

Canceling Autosteer

Autosteer cancels when:

- You press the brake pedal.
- You start steering manually.

NOTE: If **Autopilot Activation** is set to **Double Pull** and Autosteer cancels because you started steering manually, Traffic-Aware Cruise Control remains active. If **Autopilot Activation** is set to **Single Pull** and Autosteer cancels because you started steering manually, Traffic-Aware Cruise Control also cancels.

- You apply rotational force to the steering wheel/steering yoke (even a slight amount).

NOTE: If **Autopilot Activation** is set to **Double Pull** and Autosteer cancels because you applied rotational force to the steering wheel/steering yoke, Traffic-Aware Cruise Control remains active. If **Autopilot Activation** is set to **Single Pull** and Autosteer cancels because you started steering manually, Traffic-Aware Cruise Control also cancels.

- You push the Autopilot stalk away from you.
- You exceed the maximum speed at which Autosteer operates – 90 mph (150 km/h).
- You shift.
- A door is opened.
- An Automatic Emergency Braking event occurs (see [Collision Avoidance Assist on page 340](#)).

When Autosteer cancels, it sounds a chime and the Autosteer icon either turns gray to indicate that Autosteer is no longer active, or disappears to indicate that it is not currently available.

NOTE: If Autosteer cancels because you started steering manually/applied rotational force to the steering wheel, Traffic-Aware Cruise Control remains active. Disengage Traffic-Aware Cruise Control as you normally would, by pressing the brake pedal or briefly pushing the Autopilot stalk away from you.

To disable Autosteer so it is no longer available, touch **Controls > Autopilot > Autopilot Features > Autosteer (Beta)**.

Auto Lane Change

When Autosteer is active, engage a turn signal to move Model S/Model X into an adjacent lane (moving the steering wheel/steering yoke would cancel Autosteer).



WARNING: It is the driver's responsibility to determine whether a lane change is safe and appropriate. Auto Lane Change cannot detect oncoming traffic in the target lane, especially fast moving vehicles from the rear. Therefore, before initiating a lane change, always check blind spots, lane markings, and the surrounding roadway to confirm it is safe and appropriate to move into the target lane.



WARNING: Never depend on Auto Lane Change to determine an appropriate driving path. Drive attentively by watching the road and traffic ahead of you, checking the surrounding area, and monitoring the instrument panel for warnings. Always be prepared to take immediate action.



WARNING: Do not use Auto Lane Change on roads where traffic conditions are constantly changing and where bicycles and pedestrians are present.



WARNING: The performance of Auto Lane Change depends on the ability of the camera(s) to recognize lane markings.



WARNING: Do not use Auto Lane Change on winding roads with sharp curves, on icy or slippery roads, or when weather conditions (such as heavy rain, snow, fog, etc.) may be obstructing the view from the camera(s) or sensors (if equipped).



 **WARNING:** Failure to follow all warnings and instructions can result in property damage, serious injury or death.

Operating Auto Lane Change

Auto Lane Change is available whenever Autosteer is active. To change lanes using Auto Lane Change:

1. Perform visual checks to make sure it is safe and appropriate to move into the target lane.
2. Engage the appropriate turn signal, keeping your hands on the steering wheelsteering yoke.
3. If needed, cancel the turn signal once you are in the target lane.

NOTE: Auto Lane Change cancels if the lane change cannot be completed in five seconds.

NOTE: The minimum speed at which Auto Lane Change operates may vary depending on region, adjacent lane speeds, and other factors. Always be ready to manually steer and change lanes as necessary.

Auto Lane Change assists in moving moves Model SModel X into the adjacent lane in the direction indicated by the turn signal, provided the following conditions are met:

- The turn signal is engaged.
- Auto Lane Change detected your hands on the steering wheelsteering yoke.
- Model SModel X does not detect a vehicle in its blind spot, or a vehicle or obstacle up to the center of the target lane.
- Lane markings indicate that a lane change is permitted.
- Midway through the lane change, Model SModel X must detect the target lane's outside lane marking. If this lane marking is not detected, the lane change is aborted and Model SModel X returns to its original driving lane.
- The view of the camera(s) is not obstructed.

When an automatic lane change is in progress, Overtake Acceleration is activated, allowing Model SModel X to accelerate closer to a vehicle in front (see [Overtake Acceleration on page 305](#)).

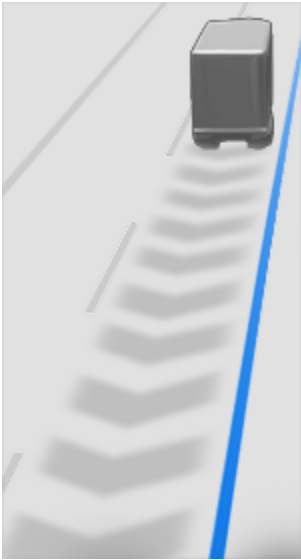
NOTE: Auto Lane Change assists in movingmoves Model SModel X one lane at a time. Moving into an additional lane requires you to engage the turn signal a second time after the first lane change is complete.

When using Auto Lane Change, it is important to monitor its performance by watching the driving path in front of you and the surrounding area. Stay prepared to take over steering at any time. As you are crossing over into the adjacent lane, the instrument panel displays the location in the lane that Model SModel X is moving into.

In situations where Auto Lane Change is unable to operate at optimal performance, or cannot operate due to inadequate data, the instrument panel displays a series of warnings. Therefore, when using Auto Lane Change, always pay attention to the instrument panel and be prepared to manually steer Model SModel X.



Adjacent Lane Speed



When moving significantly faster than vehicles in adjacent lanes, Model S/Model X automatically reduces the driving speed. This is especially helpful in heavy traffic situations or when vehicles are constantly merging into different lanes. When Model S/Model X detects other vehicles driving significantly slower, the instrument panel highlights the adjacent lanes with arrows and detected vehicles in gray, and Model S/Model X reduces the driving speed as appropriate. To temporarily override this feature, press the accelerator pedal.



WARNING: Never depend on Autopilot to determine a safe driving speed; you are responsible for driving safely and according to traffic laws in your market region.

Stop Light and Stop Sign Warning

While Autosteer is in use, Model S/Model X displays a warning on the instrument panel and sounds a chime if it detects that you are likely to run through a red stop light or stop sign. If this happens, **TAKE IMMEDIATE CORRECTIVE ACTION!**

The visual and audible warnings cancel after a few seconds, or when you press the brake pedal, whichever comes first.

Stop Light and Stop Sign Warning provides warnings only. It does not slow down or stop Model S/Model X at red traffic lights, stop signs, road markings, etc. If equipped with Traffic Light and Stop Sign Control, you can enable this feature to automatically stop Model S/Model X at traffic lights and stop signs (see [Traffic Light and Stop Sign Control on page 320](#)).



CAUTION: Stop Light and Stop Sign Warning requires on-board maps to know that a particular stop light or stop sign exists at a location. In some cases, map data is inaccurate or outdated and may not include all stop lights or stop signs. Therefore, Stop Light and Stop Sign Warning may not detect all stop lights and stop signs.



WARNING: The Stop Light and Stop Sign Warning feature does not apply the brakes or decelerate Model S/Model X and may not detect all stop lights and stop signs. Stop Light and Stop Sign Warning is designed for guidance purposes only and is not a substitute for attentive driving and sound judgment. Keep your eyes on the road when driving and never depend on Stop Light and Stop Sign Warning to warn you of a stop light or stop sign.



WARNING: Stop Light and Stop Sign Warning is designed to warn you only when approaching a visible red stop sign, solid red or later portion of a yellow traffic light. It may not warn you of intersections with flashing lights and it does not warn you of yield signs or temporary stop and yield signs (such as those used in construction areas). Additionally, Stop Light and Stop Sign Warning does not warn you of approaching stop lights or stop signs when you are pressing the accelerator pedal or brake pedal (which disables Autosteer).

Limitations

Autosteer and its associated functions are particularly unlikely to operate as intended when:

- Autosteer is unable to accurately determine lane markings. For example, lane markings are excessively worn, have visible previous markings, have been adjusted due to road construction, are changing quickly (lanes branching off, crossing over, or merging), objects or landscape features are casting strong shadows on the lane markings, or the road surface contains pavement seams or other high-contrast lines.



- Visibility is poor (heavy rain, snow, fog, etc.) or weather conditions are interfering with sensor operation.
- A camera(s) or sensor(s) is obstructed, covered, or damaged.
- Driving on hills.
- Approaching a toll booth.
- Driving on a road that has sharp curves or is excessively rough.
- Bright light (such as direct sunlight) is interfering with the view of the camera(s).
- The sensors (if equipped) are affected by other electrical equipment or devices that generate ultrasonic waves.
- A vehicle is detected in your blind spot when you engage the turn signal.
- Model S/Model X is being driven very close to a vehicle in front of it, which is blocking the view of the camera(s).

 **WARNING:** Many unforeseen circumstances can impair the operation of Autosteer. Always keep this in mind and remember that as a result, Autosteer may not steer/assist in steering Model S/Model X appropriately. Always drive attentively and be prepared to take immediate action.

Navigate on Autopilot

NOTE: Navigate on Autopilot is a BETA feature.

When using Autosteer on a controlled-access highway (a main highway on which road users enter and exit using on-ramps and off-ramps), Navigate on Autopilot guides Model S/Model X to off-ramps and interchanges based on your navigation route. Along the highway portion of a navigation route, Navigate on Autopilot also changes lanes to prepare for exits (route-based lane changes) and to minimize the driving time to your destination (speed-based lane changes).

 **WARNING:** Navigate on Autopilot does not make driving autonomous. You must pay attention to the road, keep your hands on the steering wheel/steering yoke at all times, and remain aware of your navigation route.

 **WARNING:** As is the case with normal driving, be extra careful around blind corners, interchanges, and on-ramps and off-ramps – obstacles can appear quickly and at any time.

 **WARNING:** Navigate on Autopilot may not recognize or detect oncoming vehicles, stationary objects, and special-use lanes such as those used exclusively for bikes, carpools, emergency vehicles, etc. Remain alert at all times and be prepared to take immediate action. Failure to do so can cause damage, injury or death.

Enabling and Customizing Navigate on Autopilot

To enable Navigate on Autopilot, touch **Controls > Autopilot > Autopilot Features > Autosteer > Navigate on Autopilot (Beta)**. Then, to customize how you want Navigate on Autopilot to operate, touch **Customize Navigate on Autopilot**:

- **Enable At Start Of Every Trip:** Choose whether or not you want to automatically enable Navigate on Autopilot for every navigation route. When enabled, the Navigate on Autopilot button on the turn-by-turn direction list is already enabled at the start of every trip.
- **Speed Based Lane Changes:** Navigate on Autopilot is designed to perform both route-based and speed-based lane changes. Route-based lane changes are designed to keep you on your navigation route (for example, moving you into an adjacent lane to prepare for an upcoming off-ramp) whereas speed-based lane changes are designed to maintain a driving speed (not to exceed your cruising speed) that allows you to minimize the time it takes to reach your destination (for example, moving into an adjacent lane to pass a vehicle in front of you). Speed-based lane changes are optional. You can use this setting to disable speed-based lane changes or to specify how aggressively you want Navigate on Autopilot to change lanes to achieve the set cruising speed. The **Mild** setting is more conservative about lane changes and may result in a slightly longer driving time whereas **Mad Max** is designed to allow you to reach your destination in the shortest driving time possible, but changes lanes only when safe to do so.
- **Exit Passing Lane:** Choose whether you want Navigate on Autopilot to maneuver out of a passing lane when navigating to a destination.

NOTE: In addition to route-based and speed-based lane changes, Navigate on Autopilot requests a lane change out of a passing lane as a reminder to stay in a slower lane when you are not passing other vehicles. Choose **NO** to disable this and keep Model S/Model X in a passing lane except when needed to stay on the navigation route.



- **Require Lane Change Confirmation:** By default, Navigate on Autopilot requires your confirmation before proceeding with a lane change by pulling the Autopilot stalk toward you or engaging the appropriate turn signal. However, if you want Navigate on Autopilot to change lanes without requiring this confirmation, turn this setting off. When you turn the setting off, you can specify if or how you want to be notified of lane changes (**Off, Chime, Vibrate, or Both**).



WARNING: If you turn off **Require Lane Change Confirmation**, Navigate on Autopilot notifies you of upcoming lane changes and off-ramps, but it remains your responsibility to monitor the environment and maintain control of Model S/Model X at all times. Lane changes can occur quickly and suddenly. Always keep your hands on the wheel and your eyes on the driving path in front of you.

NOTE: The touchscreen displays route-based lane changes at the top of the map's turn-by-turn direction list to notify you that an upcoming lane change is needed to stay on the navigation route.

Operating Navigate on Autopilot

Once enabled, the Navigate on Autopilot button appears on the map's turn-by-turn direction list whenever a navigation route is active and the route includes at least one controlled-access highway. When enabled, the Navigate on Autopilot button is blue and the turn-by-turn direction displays the Autosteer icon next to the maneuvers (such as off-ramps) that Navigate on Autopilot will handle.



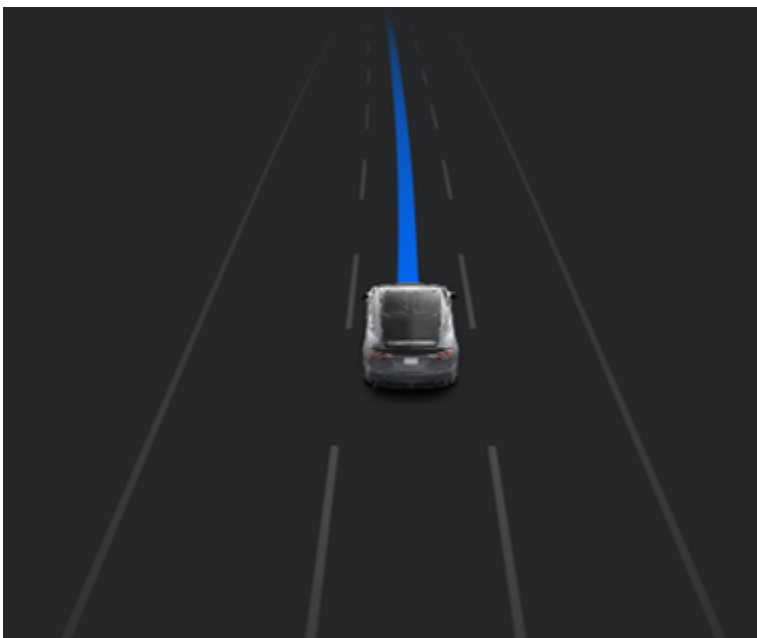
The Navigate on Autopilot icon shows in the turn-by-turn direction list when you are navigating to a destination and Navigate on Autopilot is available but not active.

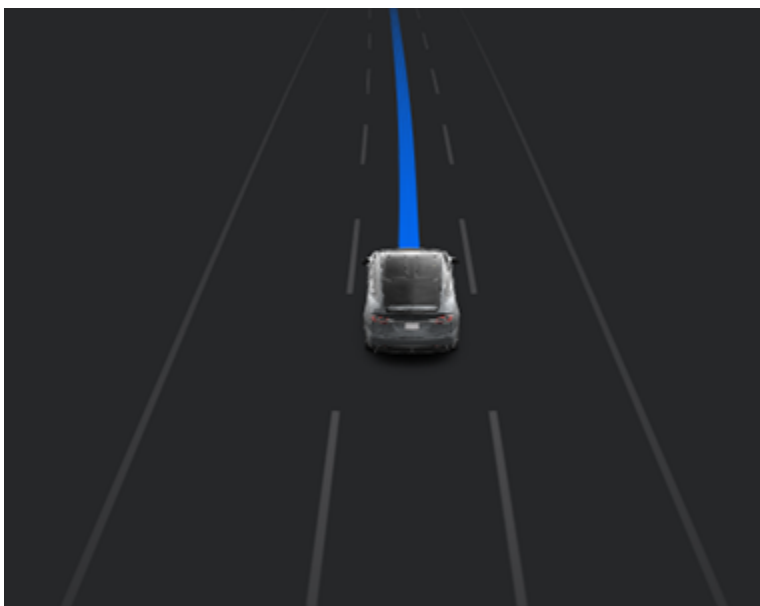


If Navigate on Autopilot is active, the icon is blue. If **Enable at Start of Every Trip** is turned on, the Navigate on Autopilot icon is selected whenever you start navigation. Touch the icon to cancel Navigate on Autopilot and revert to Autosteer. If **Enable At Start Of Every Trip** is turned off, you must touch the **Navigate on Autopilot** button to enable it for each navigation route.

Navigate on Autopilot activates and deactivates as appropriate, based on the type of road you are driving on. For example, if Autosteer is active and Navigate on Autopilot is enabled, Navigate on Autopilot automatically becomes active when you reach a controlled-access highway on your navigation route.

Whenever Navigate on Autopilot is active, the instrument panel displays the driving lane as a single blue line in front of Model S/Model X:





When Navigate on Autopilot is active and you approach an off-ramp or interchange along your navigation route, the appropriate turn signal engages and Autosteer maneuvers Model S Model X onto the off-ramp or interchange.

WARNING: Never depend on Navigate on Autopilot to determine an appropriate lane at an off-ramp. Stay alert and perform visual checks to ensure that the driving lane is safe and appropriate.

When you leave a controlled-access highway (for example, you take an exit or you enter a section of the navigation route that is no longer supported), Navigate on Autopilot reverts to Autosteer— a chime sounds and the instrument panel displays the driving lane lines in blue (instead of the single blue in front of Model S Model X).

NOTE: When determining navigation routes, and maneuvers at interchanges, Navigate on Autopilot considers whether or not you want to use High Occupancy Vehicle (HOV) lanes. Therefore, ensure the **Use HOV Lanes** setting is appropriate for your circumstances (see [Maps and Navigation on page 368](#)). If the setting is off, Navigate on Autopilot never uses a HOV lane, regardless of time of day. If the setting is on, Navigate on Autopilot uses HOV lanes, whenever applicable.

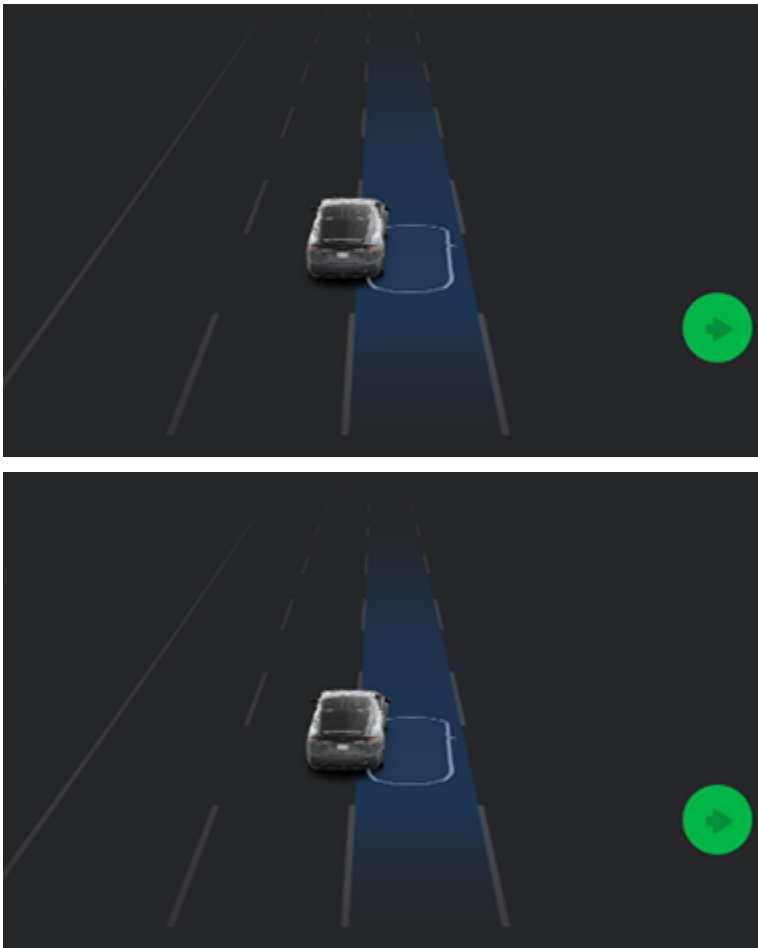
WARNING: When Navigate on Autopilot deactivates, Autosteer remains active. Always be prepared to take appropriate action.

WARNING: Navigate on Autopilot may not always attempt to exit at an off-ramp or change lanes, even when an exit or lane change is determined by the navigation route. Always remain alert and be prepared to manually steer onto an off-ramp, or make a lane change to prepare for, or to exit at, an off-ramp or interchange.

You can cancel Navigate on Autopilot at any time by touching **Navigate on Autopilot** on the map's turn-by-turn direction list (Model S Model X reverts to Autosteer), or by canceling Autosteer entirely (see [Canceling Autosteer on page 313](#)).

Lane Changes

Navigate on Autopilot changes lanes to either prepare Model S Model X for an upcoming off-ramp, to increase your driving speed (not to exceed your set cruising speed), or to move Model S Model X out of a passing lane when you are not actively passing other road users. A message displays at the top of the map's turn-by-turn direction list to notify you when an upcoming lane change is required to stay on your navigation route. The instrument panel displays the upcoming driving path:



When the instrument panel displays a message asking you to confirm the lane change, engage the appropriate turn signal or pull the Autopilot stalk toward you. If you do not confirm the lane change within three seconds, a chime sounds to remind you that Navigate on Autopilot requires your confirmation to change lanes.

If **Require Lane Change Confirmation** is turned **off**, Navigate on Autopilot engages the appropriate turn signal, checks for vehicles and objects, and when appropriate, maneuvers Model S/Model X into the adjacent lane.

If **Require Lane Change Confirmation** is turned **on**, you must engage the appropriate turn signal or pull the Autopilot stalk toward you to confirm that you want Navigate on Autopilot to proceed with the lane change. If you do not confirm the lane change within three seconds, a chime sounds to remind you that Navigate on Autopilot requires your confirmation to change lanes.

NOTE: If you ignore a route-based lane change suggestion (for example, you are driving in the left lane while approaching an off-ramp on the right side of the highway), Navigate on Autopilot is unable to maneuver onto the off-ramp and as a result, you are re-routed to your destination.



WARNING: Navigate on Autopilot may not always attempt to exit at an off-ramp or change lanes, even when an exit or lane change is determined by the navigation route. Always remain alert and be prepared to manually steer onto an off-ramp, or make a lane change to prepare for, or to exit at, an off-ramp or interchange.

Be Ready to Assist

When attempting to change lanes or maneuver Model S/Model X, or when approaching construction zones, Navigate on Autopilot may be unable to determine the appropriate driving lane (for example, complex clover leaves and multi-lane off-ramps) and the instrument panel displays an alert indicating that Navigate on Autopilot is trying to maneuver and may require assistance. When you see the message, be prepared to take immediate action to ensure that it is safe and appropriate to complete the lane change or maneuver.



Traffic Light and Stop Sign Control

NOTE: *Traffic Light and Stop Sign Control is a BETA feature and works best on roads that are frequently driven by Tesla vehicles. Traffic Light and Stop Sign Control attempts to stop at all traffic lights and may also stop at green lights.*

Traffic Light and Stop Sign Control is designed to recognize and respond to traffic lights and stop signs, slowing Model S/Model X to a stop when using Traffic-Aware cruise control or Autosteer. This feature uses the vehicle's forward-facing cameras, in addition to GPS data, and slows the car for all detected traffic lights, including green, blinking yellow, and off lights in addition to stop signs and some road markings. As Model S/Model X approaches an intersection, the instrument cluster displays a notification indicating the intention to slow down. You must confirm that you want to continue or Model S/Model X stops at the red line displayed on the instrument cluster's driving visualization.

 **WARNING: NEVER** make assumptions and predict when and where Traffic Light and Stop Sign Control will stop or continue through an intersection or road marking. From a driver's perspective, the behavior of Traffic Light and Stop Sign Control may appear inconsistent. Always pay attention to the roadway and be prepared to take immediate action. It is the driver's responsibility to determine whether to stop or continue through an intersection. Never depend on Traffic Light and Stop Sign Control to determine when it is safe and/or appropriate to stop or continue through an intersection.

Before Using

Before using Traffic Light and Stop Sign Control, you must:

- Ensure that forward-facing cameras are unobstructed (see [Cleaning a Camera on page 446](#)) and calibrated (see [#unique_484 on page](#)). Traffic Light and Stop Sign Control depends on the ability of the cameras to detect traffic lights, stop signs, and road markings.
- Ensure that the latest version of maps has been downloaded to Model S/Model X. Although Traffic Light and Stop Sign Control primarily uses visual data received from the vehicle's cameras, greater accuracy is achieved when using the most recent map data. To check which version of maps is currently downloaded, touch **Controls** > **Software**. You must connect to a Wi-Fi network to receive updated maps (see [Map Updates on page 374](#)).
- Enable the feature. With the vehicle in Park, touch **Controls** > **Autopilot** > **Traffic Light and Stop Sign Control**. Once enabled, Traffic Light and Stop Sign Control operates whenever Traffic-Aware Cruise Control or Autosteer is active.

How it Works

When Traffic Light and Stop Sign Control is enabled and you are using Autosteer, Traffic-Aware Cruise Control, or Full Self-Driving (Supervised), the instrument cluster displays a popup message to inform you that an upcoming traffic light, stop sign, or road marking has been detected. As it approaches the stop location, **even at an intersection where the traffic light is green**, Model S/Model X slows down and displays a red line to indicate where Model S/Model X will stop. To continue through the intersection—even if the traffic light is green—you must pull the Autopilot stalk toward you or briefly press the accelerator pedal to give the vehicle permission to proceed. When you've confirmed that you want to proceed, the red stop line turns gray and Model S/Model X continues through the intersection and resumes your set cruising speed.

NOTE: If Model S/Model X is approaching a green light and detects that a vehicle in front of you is continuing through the intersection, Model S/Model X continues through the intersection without requiring your confirmation, provided you are not in a turning lane and the vehicle can detect that your hands are on the steering wheel/steering yoke.

NOTE: If, after you pull the Autopilot stalk toward you or briefly press the accelerator pedal to confirm that you want to continue through the intersection, the traffic signal changes before you enter the intersection (for example, the light changes from green to yellow or from yellow to red), Model S/Model X may determine that it is not appropriate to proceed. Therefore, Model S/Model X stops and you must press the accelerator to proceed. At all times, it is your responsibility to ensure the vehicle stops or accelerates appropriately and safely.

 **WARNING:** Traffic Light and Stop Sign Control DOES NOT turn Model S/Model X through an intersection unless Full Self-Driving (Supervised) is engaged. When in a turning lane, Model S/Model X stops at the red stop line. To proceed, pull the Autopilot stalk toward you or briefly press the accelerator pedal—Model S/Model X continues *straight* through the intersection (even when in a turning lane), so you MUST manually steer Model S/Model X through the intersection (which cancels Autosteer).

Traffic Light and Stop Sign Control is designed to operate as described only when the following conditions are met:

- Autosteer, Full Self-Driving (Supervised), or Traffic-Aware Cruise Control is engaged.



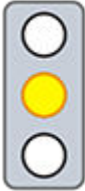
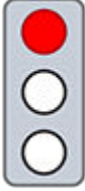
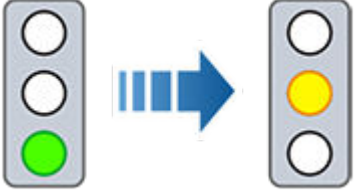
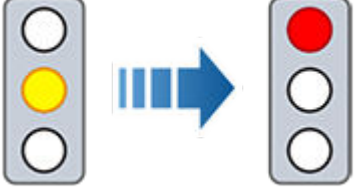
- The cameras can detect an upcoming traffic light, stop sign or road marking (for example, cameras are unobstructed and have a clear line-of-sight to the traffic light, stop sign, or road marking).
- The instrument cluster on Model S Model X is displaying an upcoming traffic light in "bold" format. Model S Model X does not acknowledge traffic lights that the instrument cluster shows as faded. If a traffic light is not directly ahead of the camera (for example, it is located at an angle of the camera's view, or located in an adjacent lane) the instrument cluster displays it as faded and Model S Model X does not slow down and stop for it.

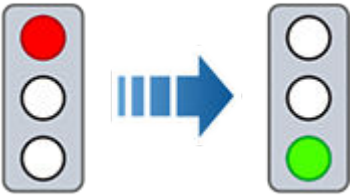
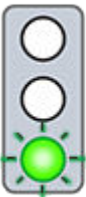
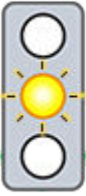
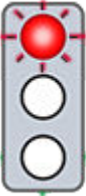
-  **WARNING:** If the instrument cluster is not displaying a red stop line at an upcoming intersection, Model S Model X does not slow down or stop. It is the driver's responsibility to pay attention to upcoming intersections and monitor traffic conditions to determine when and if the vehicle should stop and then to take appropriate action as needed.
-  **WARNING:** Never depend on Traffic Light and Stop Sign Control to determine whether to stop at, or proceed through, an intersection. Drive attentively by watching the road and paying attention to the roadway, upcoming intersections, traffic conditions, crosswalks, and other road users. It is always the driver's responsibility to determine whether to stop or proceed. Be prepared to take immediate action. Failure to do so can result in injury or death.
-  **WARNING:** In some situations, Traffic Light and Stop Sign Control may inaccurately detect a traffic light or stop sign, causing Model S Model X to slow down unexpectedly. Be prepared to take immediate action at all times.
-  **WARNING:** You must pull the Autopilot stalk toward you or briefly press the accelerator pedal to confirm that you want to proceed through an intersection, regardless of the status of the traffic light. If you do not confirm, Model S Model X stops at the red stop line displayed on the instrument cluster, even if stopping may be inappropriate. Stopping at a green light may confuse other drivers and may result in a collision, injury or death. Therefore, always pay attention to upcoming intersections and be prepared to manually brake or accelerate in response to surroundings.
-  **WARNING:** Never assume that your ability to see a traffic light, stop sign, or road marking (especially at a complex intersection, or an intersection in which a traffic light or sign is partially obstructed, etc.) means that Model S Model X can also see it and respond appropriately.
-  **WARNING:** Even the most recent map data does not include all traffic lights and stop signs. Therefore, Traffic Light and Stop Sign Control relies heavily on the ability of the cameras to detect traffic lights, stop signs, road markings, etc. As a result, Model S Model X may ignore an intersection that is blocked from the camera's view (for example, obstructed by a tree or a large vehicle or object, or located near a steep hill or sharp curve).
-  **WARNING:** Traffic Light and Stop Sign Control is not a substitute for attentive driving and sound judgment.



Traffic Lights

When driving with Autosteer or Traffic-Aware Cruise Control engaged, and Traffic Light and Stop Sign Control enabled, Model SModel X is designed to respond as follows when approaching intersections controlled by a traffic light:

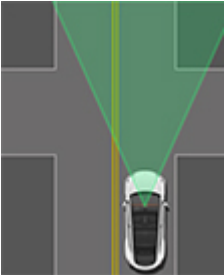
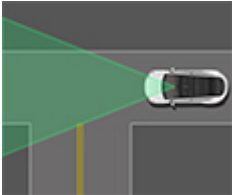
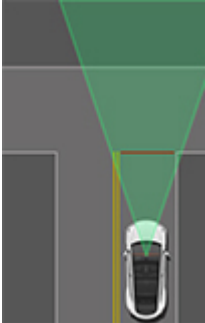
Type of Traffic Light	Vehicle Intended Response
 	At a solid green traffic light, or at a traffic light that is currently off (not illuminated), Model SModel X slows down. If you are following a car in front of you that continues through the intersection, the instrument cluster displays a green stop line and provided your hands are detected on the steering wheelsteering yoke, Model SModel X also continues. If a car is not in front of you, the instrument cluster displays a red stop line and you must confirm that you want to continue through the intersection by pulling the Autopilot stalk toward you or briefly pressing the accelerator pedal. If you don't confirm, Model SModel X stops at the red stop line. NOTE: Model SModel X resumes the set cruising speed when it continues through the intersection, taking into consideration the speed of a vehicle in front of you.
 	Model SModel X slows down and comes to a complete stop at the red stop line displayed on the instrument cluster. When you want to continue through the intersection (for example, the light turns green again, or once Model SModel X has come to a complete stop), you must pull the Autopilot stalk toward you or briefly press the accelerator pedal.
 	Model SModel X slows down and comes to a complete stop at the red stop line displayed on the instrument cluster. When you want to proceed through the intersection (for example, the light turns green again), you must pull the Autopilot stalk toward you or briefly press the accelerator pedal. NOTE: If the traffic light changes <i>after</i> you've confirmed that you want to proceed (for example, a green traffic light turns yellow), Model SModel X may stop instead of continuing, especially if Model SModel X determines that it can safely stop before entering the intersection. NOTE: Model SModel X is not designed to proceed through an intersection when the traffic light is red or if the light turns yellow in situations when there is adequate distance to safely stop before entering the intersection. NOTE: You can take over driving at any time by manually braking to cancel Autosteer or Traffic-Aware Cruise Control.

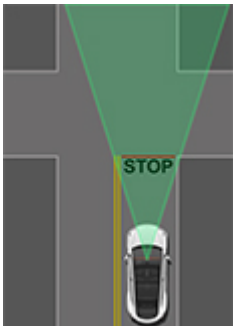
Type of Traffic Light	Vehicle Intended Response
	
 	Model SModel X slows down. To proceed, you must pull the Autopilot stalk toward you or briefly press the accelerator pedal. If you don't, Model SModel X stops at the red stop line displayed on the instrument cluster. NOTE: To prevent Model SModel X from stopping, and to minimize how much it slows down as it approaches, you can confirm that you want to proceed by pulling the Autopilot stalk toward you or briefly pressing the accelerator pedal at any time after the instrument cluster displays the red stop line. Model SModel X resumes your set cruising speed immediately after you confirm (taking into consideration the speed of a vehicle in front of you).  WARNING: Approach attentively and be prepared to press the brake pedal to slow down or stop.
	Model SModel X slows down and comes to a complete stop at the red stop line displayed on the instrument cluster. When you want to proceed through the intersection (for example, traffic laws and conditions indicate it is safe and legal to proceed), you must pull the Autopilot stalk toward you or briefly press the accelerator pedal.



Stop Signs and Road Markings

When driving with Autosteer or Traffic-Aware Cruise Control engaged, and Traffic Light and Stop Sign Control enabled, Model SModel X is designed to respond as follows when approaching intersections controlled by stop signs, stop lines, or road markings:

Type of Intersection	Vehicle Intended Response
 No Traffic Control  Arm of T-junction	Model SModel X assumes the right of way and continues straight without slowing down or stopping.
 End of T-junction	If Model SModel X detects a T-junction based on the map data, Model SModel X slows down and comes to a complete stop at the red stop line displayed on the instrument cluster. When you want to proceed, you must take over steering and acceleration.  WARNING: Model SModel X may not stop at a T-junction that does not have a stop sign or stop line, or if the T-junction is not included in the map data. Drive attentively and be prepared to stop (when necessary and/or appropriate).
 Stop Sign	Model SModel X slows down and comes to a complete stop at the red stop line displayed on the instrument cluster. When you want to proceed through the intersection, you must pull the Autopilot stalk toward you or briefly press the accelerator pedal. NOTE: If you confirm that you want to proceed through an intersection controlled by a stop sign by pulling the Autopilot stalk toward you or briefly pressing the accelerator pedal before Model SModel X has stopped, your confirmation is ignored. Model SModel X is not designed to proceed through a stop sign without stopping. NOTE: Even when using Autosteer, and even if you have engaged a turn signal, you must turn the steering wheelsteering yoke yourself (which cancels Autosteer) to complete a turn at an intersection.

Type of Intersection	Vehicle Intended Response
 Stop Sign and Road Marking  Road Marking	

-  **WARNING:** Model SModel X also slows down and stops at a roundabout. You must take over steering (which cancels Autosteer) and pull the Autopilot stalk toward you or briefly press the accelerator pedal to confirm that you want to continue through the roundabout.
-  **WARNING:** At crosswalks, Model SModel X may slow down and may stop, depending on whether the crosswalk is controlled by a traffic light and whether the cameras detect pedestrians, bicyclists, etc. in the crosswalk. Pay particular attention at crosswalks and be prepared to take over at any time. Failure to do so can result in injury or death.

Limitations

Depending on many different circumstances and environmental conditions, Traffic Light and Stop Sign Control *may or may not* stop at:

- Railroad crossings.
- Keep-out zones.
- Toll booths.
- Crosswalk systems.
- Yield signs or temporary traffic lights and stop signs (such as at construction areas).
- Miscellaneous traffic U-turn lights, bicycle and pedestrian crossing lights, lane availability lights, etc.

In addition, Traffic Light and Stop Sign Control is particularly unlikely to operate as intended, can disengage, or may not operate, when one or more of the following conditions are present:

- Driving through consecutive light-controlled intersections that are very close to each other.
- Visibility is poor (heavy rain, snow, fog, etc.) or weather conditions are interfering with camera or sensor operation.
- Bright light (such as direct sunlight) is interfering with the view of the camera(s).
- A camera is obstructed, covered, damaged, or not properly calibrated.



- Driving on a hill or on a road that has sharp curves on which the cameras are unable to see upcoming traffic lights or stop signs.
- A traffic light, stop sign, or road marking is obstructed (for example, a tree, a large vehicle, etc.).
- Model SModel X is being driven very close to a vehicle in front of it, which is blocking the view of a camera.

 **WARNING:** The limitations listed above are not an exhaustive list of reasons why Model SModel X may not operate as expected. Many unforeseen circumstances can adversely impact the accurate operation of Traffic Light and Stop Sign Control. Using this feature does not reduce or eliminate the need to drive attentively and responsibly. You must be prepared to take appropriate and immediate action at all times.



Autopark

Autopark uses data from the cameras and ultrasonic sensors and GPS to simplify parking on public roads by maneuvering Model S/Model X into parallel and perpendicular parking spaces. See [To Use Autopark on page 327](#).

CAUTION: Ensure all cameras and sensors are clean. Dirty cameras and sensors, as well as environmental conditions such as rain and faded lane markings, can affect Autopilot performance.

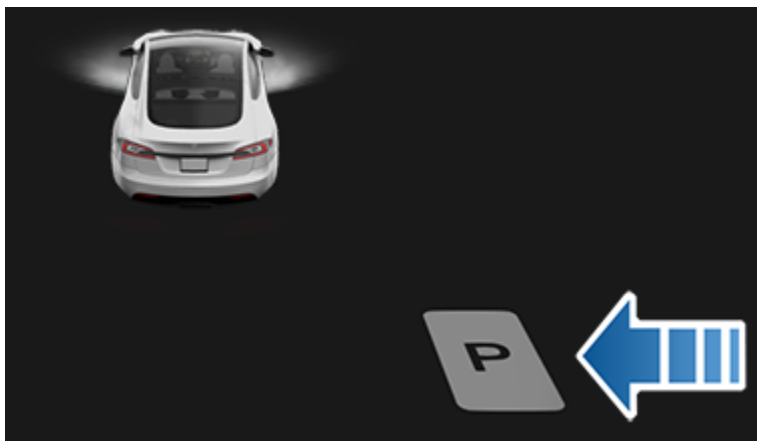
WARNING: Autopark's performance depends on the ability of the cameras and ultrasonic sensors to determine the vehicle's proximity to curbs, objects, and other vehicles.

WARNING: Do not use Autopark if anything, such as a ball hitch, bike rack, or trailer, is attached to the tow hitch. Autopark may not stop for hitches when parking between or in front of other vehicles.

To Use Autopark

When driving, follow these steps to allow Autopark to maneuver Model S/Model X into a parking space:

1. When driving slowly on a public road, monitor the instrument panel to determine when Autopark has detected a parking space. When Autopark detects a potential parking space, the instrument panel displays a parking icon. Autopark detects parallel parking locations when driving below 15 mph (24 km/h) and perpendicular parking locations when driving below 10 mph (16 km/h).





NOTE: The parking icon appears only if the vehicle's position and/or the circumstances of the surrounding area are such that Autopark can determine an appropriate driving path. If Autopark cannot determine an appropriate path (for example, when driving on a narrow street where moving into the parking space causes the front of the vehicle to extend into the adjacent lane), you can either reposition the vehicle, find a different parking space, or park manually.

NOTE: If the Autopark icon does not appear for potential parking spaces when driving at the indicated speed, it is possible that Autopark is calibrating. Autopark requires a calibration process when Model S/Model X is new, or when tires have recently been changed (see [Calibration](#) on page 329).

2. Check to determine if the detected parking space is appropriate and safe. If so, pull forward and stop approximately one car length ahead of the parking space (as you normally would when parallel parking or when backing into a perpendicular parking space).
3. Release the steering wheelsteering yoke, shift Model S/Model X into Reverse, then touch **Start Autopark** on the touchscreen.
4. Release the steering yoke then touch and hold **Autopark** in the drive mode strip on the touchscreen. You can release the button once Autopark engages.
5. When parking is complete, Autopark displays the "Complete" message.

Autopark detects potential perpendicular parking spaces that are at least 9.5 feet (2.9 meters) wide with a vehicle parked on each side. Autopark detects parallel parking spaces that are at least 20 feet (6 meters), but less than 49 feet (15 meters) long. Autopark does not operate on angled parking spaces.

Autopark detects potential perpendicular parking spaces that are at least 7.2 feet (2.2 meters) wide and parallel spaces with a visible vehicle in front of the space and a curb (must be at least 3 feet (1 meter) longer than vehicle length). Autopark does not operate on angled parking spaces.

Autopark detects potential perpendicular parking spaces that are at least 7.2 feet (2.2 meters) wide and parallel spaces with a visible vehicle in front of the space and a curb (must be at least 3 feet (1 meter) longer than vehicle length). Autopark does not operate on angled parking spaces.

NOTE: If you press the brake pedal when Autopark is actively parking Model S/Model X, the parking process pauses until you touch **Resume** on the touchscreen.



-  **WARNING:** Never depend on Autopark to find a parking space that is legal, suitable, and safe. Autopark may not always detect objects in the parking space. Always perform visual checks to confirm that a parking space is appropriate and safe.
-  **WARNING:** When Autopark is actively steering Model S/Model X, the steering wheelsteering yoke moves in accordance with Autopark's adjustments. Do not interfere with the movement of the steering wheelsteering yoke. Doing so cancels Autopark.
-  **WARNING:** During the parking sequence, continually check your surroundings. Be prepared to apply the brakes to avoid vehicles, pedestrians, or objects.
-  **WARNING:** When Autopark is active, monitor the touchscreen and instrument panel to ensure that you are aware of the instructions that Autopark is providing.

Calibration

During a parking sequence, Autopark must maneuver Model S/Model X with a great deal of precision. Therefore, before it can be used, Autopark must complete a calibration process. Calibration can take anywhere from 30 minutes to several days, depending on driving behavior. When Autopark is calibrating, a note displays on the Autopilot settings screen indicating that calibration is in progress. When calibration is complete, this note no longer displays and Autopark is available for use.

NOTE: Autopark repeats the calibration process whenever tires are changed.

To Pause Parking

To pause Autopark, press the brake pedal once. Model S/Model X stops and remains stopped until you touch **Resume** on the touchscreen.

To Cancel Parking

Autopark cancels the parking sequence when you manually move the steering wheelsteering yoke, shift, or touch **Cancel** on the touchscreen. Autopark also cancels parking when:

- The parking sequence exceeds seven moves.
- Model S/Model X detects that the driver is exiting the vehicle.
- A door is opened.
- You press the accelerator pedal.
- You press the brake pedal while Autopark is paused.
- An Automatic Emergency Braking event occurs (see [Collision Avoidance Assist on page 340](#)).

Limitations

Autopark is particularly unlikely to operate as intended in these situations:

- The road is sloped. Autopark is designed to operate on flat roads only.
- Visibility is poor (due to heavy rain, snow, fog, etc.).
- The curb is constructed of material other than stone, or the curb cannot be detected.
- The target parking space is directly adjacent to a wall or pillar (for example, the last parking space of a row in an underground parking structure).
- One or more of the ultrasonic sensors is damaged, dirty, or obstructed (such as by mud, ice, or snow, or by a vehicle bra, excessive paint, or adhesive products such as wraps, stickers, rubber coating, etc.).
- Weather conditions (heavy rain, snow, fog, or extremely hot or cold temperatures) are interfering with sensor operation.
- The sensors are affected by other electrical equipment or devices that generate ultrasonic waves.

-  **WARNING:** Many unforeseen circumstances can impair Autopark's ability to park Model S/Model X. Keep this in mind and remember that as a result, Autopark may not steer Model S/Model X appropriately. Pay attention when parking Model S/Model X and stay prepared to immediately take control.



Summon

Summon allows you to automatically park and retrieve Model S/Model X while you are standing outside the vehicle. Summon moves Model S/Model X forward and reverse up to 39 ft. (12 meters) in, or out of, a parking space.

To move Model S/Model X a longer distance while steering around objects, you can use Smart Summon and your mobile phone. Smart Summon allows your vehicle to find you (or you can send your vehicle to a chosen location). See [Smart Summon on page 333](#).

To move Model S/Model X, your phone must be paired via Bluetooth (see [Pairing a Phone or Bluetooth Device on page 731](#)).

Summon requires that Model S/Model X can detect a valid key nearby.

-  **CAUTION:** Ensure all cameras and sensors (if equipped) are clean. Dirty cameras and sensors, as well as environmental conditions such as rain and faded lane markings, can affect Autopilot performance.
-  **WARNING:** Summon is designed and intended for use only on parking lots and driveways on private property where the surrounding area is familiar and predictable.
-  **WARNING:** Summon is a BETA feature. You must continually monitor the vehicle and its surroundings and stay prepared to take immediate action at any time. It is the driver's responsibility to use Summon safely, responsibly, and as intended.
-  **WARNING:** Summon's performance depends on the ability of the cameras and sensors (if equipped) to determine the vehicle's proximity to objects, people, animals, and other vehicles.

Before Using Summon

Before operating Summon, use the touchscreen to enable it and customize how you want it to work. Touch **Controls** > **Autopilot** > **Customize Summon** and adjust the following settings to suit your preferences:

- **Bumper Clearance:** Set the distance that you want Summon to stop from a detected object (for example, you may want Summon to stop within just a few inches of a garage wall). Note that this distance applies only to objects that Summon detects directly in front of Model S/Model X when moving forward, or directly behind Model S/Model X when reversing.
- **Summon Distance:** Set a maximum distance that Model S/Model X can travel when entering or exiting a parking space.
- **Side Clearance:** Choose an option to specify how much side clearance you want to allow. **Tight** allows Model S/Model X to enter and exit very narrow parking spaces.
 -  **WARNING:** Parking in a narrow space limits the ability of the cameras and sensors (if equipped) to accurately detect the location of obstacles, increasing the risk of damage to Model S/Model X and/or surrounding objects.
- **Require Continuous Press:** By default, Summon requires that you press and hold a button on the mobile app to move Model S/Model X during the parking process. When **Require Continuous Press** is set to **No**, you can press and release the button—you don't need to hold it down to keep the vehicle moving. Also, when **Require Continuous Press** is set to **No**, you can operate Summon using the key fob instead of the mobile app (see [Operating Summon with the Key Fob on page 331](#)) and you can start a parking sequence from inside the vehicle (see [Starting Summon Before Exiting the Vehicle on page 332](#)).
- **Use Auto HomeLink** (if equipped): Set to **ON** if you want to activate HomeLink to open/close a programmed HomeLink device (such as a gate or a garage door) during the parking process when using Summon. If enabled, the device automatically opens and closes when Model S/Model X enters or exits during a Summon session. In a Smart Summon session, the device automatically opens when, at the beginning of a session, Smart Summon detects that Model S/Model X is parked in a garage.
 -  **WARNING:** Always ensure that Model S/Model X is fully in or out of a garage before HomeLink lowers the garage door. Summon and Smart Summon cannot detect where an overhead door will lower.

NOTE: When enabled, the HomeLink device automatically opens and closes when using Summon, and automatically opens as needed when using Smart Summon. To automate HomeLink in other situations (such as normal driving), you must adjust the HomeLink device's main settings by touching the HomeLink icon at the top of the touchscreen (see [HomeLink Universal Transceiver on page 400](#)).

NOTE: The above settings, with the exception of HomeLink, apply only to Summon—not Smart Summon (see [Before Using Smart Summon on page 333](#)). You cannot customize Smart Summon's bumper clearance, distance, and side clearance. And when using Smart Summon, you must always hold down the button on the mobile app to keep Model S/Model X moving. Also, Smart Summon operates with the mobile app only—not the key fob.



NOTE: All settings are retained until you manually change them.

Using Summon to Park and Retrieve your Vehicle

Follow these steps to use Summon to park your Model S/Model X:

- Align Model S/Model X within 39 ft. (12 meters) of the parking space so Model S/Model X can follow a straight path into or out of the space in either Drive or Reverse.
- Ensure Model S/Model X key fob is in close range.
- Pair your phone with Model S/Model X via Bluetooth (see [Pairing a Phone or Bluetooth Device on page 731](#)). After you pair once, your phone automatically connects to Model S/Model X every time. Your phone must be within approximately six meters of the vehicle for Summon to work.
- From outside the vehicle, initiate the parking maneuver by touching **Summon** on the mobile app, then holding down the **Forward** or **Reverse** button.

NOTE: If the **Require Continuous Press** setting is **No**, you do not need to hold down the button, just press and release.

NOTE: You can also initiate the parking maneuver from inside the vehicle (see [Starting Summon Before Exiting the Vehicle on page 332](#)).

Summon shifts Model S/Model X into Drive or Reverse (based on the direction you specified) and drives into or out of the parking space. When parking is complete, or if an obstacle is detected, Summon shifts Model S/Model X into Park. Summon shifts Model S/Model X into Park when:

- Model S/Model X detects an obstacle in its driving path (within the **Bumper Clearance** setting that you specified).
- Summon has moved Model S/Model X the maximum distance of 39 ft. (12 meters).
- You release the **Forward** or **Reverse** button (when Require Continuous Press is turned on).
- You press any button to manually stop Summon.

If you used Summon to park Model S/Model X, you can then use Summon to return Model S/Model X back to its original position (provided Model S/Model X has remained in Park), or to the maximum **Summon Distance** that you have specified (whichever comes first). Simply specify the opposite direction on the mobile app and Summon moves Model S/Model X along the original path, provided no obstructions have been introduced. If an obstacle is detected, Model S/Model X attempts to avoid the obstacle while staying very close to its original path (Summon does not steer around obstacles).

NOTE: To use Summon to move Model S/Model X multiple times in the same direction (not to exceed the maximum of 39 ft. (12 meters)), cancel Summon and then restart the parking process using the same direction.

NOTE: Although Summon can move Model S/Model X a short distance laterally to avoid an obstacle, it does not attempt to steer around an obstacle to return Model S/Model X to its original driving path. Only Smart Summon can steer Model S/Model X around objects.

NOTE: Summon requires that Model S/Model X can detect a valid key nearby.



WARNING: Model S/Model X cannot detect obstacles that are located lower than the bumper, are very narrow, or are hanging from a ceiling (for example, bicycles). In addition, many unforeseen circumstances can impair Summon's ability to move in or out of a parking space and, as a result, Summon may not move Model S/Model X appropriately. Therefore, you must continually monitor the vehicle's movement and its surroundings and remain prepared to stop Model S/Model X at any time.

Operating Summon with the Key Fob

NOTE: Summon may not operate if the battery is low on the key fob.

Follow these steps to park Model S/Model X from outside the vehicle using the key fob:

1. On the touchscreen, ensure that **Require Continuous Press** is disabled (touch **Controls** > **Autopilot** > **Customize Summon** > **Require Continuous Press**).
2. With Model S/Model X in Park, stand within 10 ft. (three meters) and press and hold the top center button on the key fob (Lock/Unlock All button) until the hazard lights blink continuously.



NOTE: The hazard lights flash once as Model S/Model X locks, then within five seconds, Model S/Model X powers on and the hazard lights flash continuously. Do not proceed to the next step until the hazard lights are flashing. If, after five seconds, the hazard lights are not flashing, release the button on the key fob, move closer to Model S/Model X, and try again. If Summon receives no further input within ten seconds, Summon cancels.

3. Press the Front Trunk button on the key fob to move Model S/Model X forward into the parking space, or press the Rear Trunk button to reverse Model S/Model X into the parking space.

Starting Summon Before Exiting the Vehicle

To start a Summon parking sequence before exiting Model S/Model X:

1. On the touchscreen, ensure that **Require Continuous Press** is disabled (touch **Controls > Autopilot > Customize Summon > Require Continuous Press**).
2. Close all doors and trunks.
3. With Model S/Model X powered on and Park engaged, double press the Park button on the drive stalk. The touchscreen displays a popup screen.
4. On the touchscreen, choose the direction of travel.
5. Exit Model S/Model X and close the driver's door.

Summon now moves Model S/Model X according to the direction you specified on the touchscreen.

NOTE: To cancel the parking maneuver before exiting the vehicle, touch **Cancel** on the popup screen.

NOTE: If you do not choose a direction of travel on the touchscreen, Summon does not start a parking maneuver when you exit.

Stopping or Canceling Summon

Stop Model S/Model X at any time while Summon is active by using the mobile app or by pressing any button on the key fob. Summon also cancels when:

- A door handle is engaged or a door is opened.
- You interact with the steering wheel/steering yoke, brake pedal, accelerator pedal, or shift.
- Model S/Model X detects an obstacle.
- Summon has moved Model S/Model X the maximum distance of approximately 39 ft. (12 meters).
- Your phone enters sleep mode or loses connectivity to Model S/Model X.

Limitations

Summon is unlikely to operate as intended in the following types of situations:

- The driving path is sloped. Summon is designed to operate on flat roads only (up to 10% grade).
- A raised concrete edge is detected. Summon does not move Model S/Model X over an edge that is higher than approximately 1 in (2.5 cm).
- One or more of the sensors (if equipped) or cameras is damaged, dirty, or obstructed (such as by mud, ice, or snow, or by a vehicle bra, excessive paint, or adhesive products such as wraps, stickers, rubber coating, etc.).
- Weather conditions (heavy rain, snow, fog, or extremely hot or cold temperatures) are interfering with sensor operation.
- The sensors (if equipped) are affected by other electrical equipment or devices that generate ultrasonic waves.
- Model S/Model X is in Trailer Mode or an accessory is attached.

NOTE: Summon is disabled if Model S/Model X is in Valet mode (see [Valet Mode on page 183](#)).



WARNING: The list above does not represent an exhaustive list of situations that may interfere with proper operation of Summon. It is the driver's responsibility to remain in control of Model S/Model X at all times. Pay close attention whenever Summon is actively moving Model S/Model X and stay prepared to take immediate action. Failure to do so can result in serious property damage, injury or death.



Smart Summon

Smart Summon is designed to allow you to move Model S/Model X to your location (using your phone's GPS as a target destination) or to a location of your choice, maneuvering around and stopping for objects as necessary. Smart Summon works with the Tesla mobile app when your phone is located within approximately 213 ft. (65 meters) of Model S/Model X. Smart Summon works with the Tesla mobile app when your phone is located within approximately 20 ft. (6 meters) of Model S/Model X.

Smart Summon maneuvers Model S/Model X out of parking spaces and around corners. This is useful for moving Model S/Model X out of a tight parking spot, through puddles, or helping you retrieve your car while carrying packages. You must maintain a clear line of sight between you and Model S/Model X and closely monitor the vehicle and its surroundings at all times.

-  **CAUTION:** Ensure all cameras and sensors (if equipped) are clean. Dirty cameras and sensors, as well as environmental conditions such as rain and faded lane markings, can affect Autopilot performance.
-  **WARNING:** Smart Summon is designed and intended for use only on parking lots and driveways located on private property where the surrounding area is familiar and predictable. Do not use Smart Summon on public roads.
-  **WARNING:** Smart Summon must only be used on paved surfaces.
-  **WARNING:** Smart Summon is a BETA feature. You must continually monitor the vehicle and its surroundings and stay prepared to take immediate action at any time. It is the driver's responsibility to use Smart Summon safely, responsibly, and as intended.
-  **WARNING:** Smart Summon may not stop for all objects (especially very low objects such as some curbs, or very high objects such as a shelf) and may not react to all traffic. Smart Summon does not recognize the direction of traffic, does not navigate around empty parking spaces, and may not anticipate crossing traffic.
-  **WARNING:** Smart Summon's performance depends on the sensors (if equipped), the visibility of the cameras, and the availability of an adequate cellular signal and GPS data.
-  **WARNING:** When using Smart Summon, you must maintain a clear line of sight between you and Model S/Model X and stay prepared to stop the vehicle at any time by releasing the button on the mobile app.

Before Using Smart Summon

- Download the latest version of the Tesla mobile app to your phone, and ensure your phone has cellular service and GPS enabled.
- Your phone must be connected to Model S/Model X and located within approximately 213 ft. (65 meters).
- Your phone must be paired to Model S/Model X over Bluetooth (see [Pairing a Phone or Bluetooth Device on page 731](#)) and located within approximately 20 ft. (6 meters).
- The vehicle's cameras must be fully calibrated (see [#unique_484 on page](#)).
- You must have a clear line of sight to Model S/Model X.
- Model S/Model X must be in Park, not charging, and all doors and trunks must be closed.

Using Smart Summon

1. Open the Tesla mobile app, and press **Summon**.
2. Press the **Smart Summon** icon located in the center of the image of your Model S/Model X. It may take several seconds for Smart Summon to start up.

NOTE: You can use Standby Mode to eliminate the delay that occurs when Smart Summon is starting up (see [Standby Mode on page 334](#)).

The mobile app displays a map with a blue circle, which represents the maximum proximity of 213 ft. (65 meters) that you must maintain between your phone and Model S/Model X. The blue dot on the map represents your location, and the red arrow represents the vehicle.

The mobile app displays a map with a blue circle, which represents the maximum proximity of 20 ft. (6 meters) that you must maintain between your phone and Model S/Model X. The blue dot on the map represents your location, and the red arrow represents the vehicle.



3. Position yourself anywhere within the blue circle where you have a clear line of sight to Model S/Model X.
 4. You can now operate Smart Summon using either of these modes:
 - **Come to Me** mode: Press and hold the **Come to Me** button. Model S/Model X moves to your GPS location. As you move, Model S/Model X follows you. When Model S/Model X reaches you, it stops and shifts into park.
 - **Go to Target** mode: Touch the crosshair icon then drag the map to position the pin on a chosen destination. Press and hold the **Go to Target** button. Model S/Model X moves to the destination. When reaching the location, Model S/Model X stops and shifts into Park and the mobile app displays a message indicating that Summon has completed.
- NOTE:** To subsequently change the location, lift your finger, reposition the map, then press and hold **Go to Target** again.
- To stop Model S/Model X at any time, simply release the **Come to Me** or **Go to Target** button.



The map's crosshair icon toggles between **Go to Target** and **Come to Me** modes. When **Come to Me** mode is selected, the icon is blue.

NOTE: The map also has an icon that allows you to display/hide satellite imagery.

Immediately after initiating Smart Summon in either mode, hazard lights briefly flash, mirrors fold, and Model S/Model X shifts into Drive or Reverse. Model S/Model X then slowly moves to within 3 ft. (1 meter) of you (**Come to Me**) or your chosen destination (**Go to Target**), navigating obstacles as needed. As Model S/Model X moves, the corresponding red arrow on the map also moves to show the vehicle's location. As you move, the corresponding blue dot also moves to show your location.

In either mode, Model S/Model X stops moving and shifts into park when:

- You release the button on the mobile app.
- The maximum proximity between your phone and Model S/Model X is exceeded (if moving the vehicle to a destination away from you, you may need to follow the car to maintain this distance).
- The driving path is blocked.
- Model S/Model X has moved the maximum distance of 475 ft. (145 meters) since the start of the Smart Summon session, or has moved 492 ft. (150 meters) away from the location from which the vehicle was last driven manually.

NOTE: If Smart Summon moves Model S/Model X forward 3 ft. and then backwards 2 ft., this is considered 5 ft. of travel.

- Model S/Model X has moved the maximum distance of 65 ft. since the start of the Smart Summon session.

NOTE: If Smart Summon moves Model S/Model X forward 3 meters and then backwards 2 meters, this is considered 5 meters of travel.

NOTE: There is no need to look at the mobile app—just hold down the button while keeping your eye on Model S/Model X and its driving path at all times, remaining ready to release the button to stop the vehicle if needed.

If equipped and Auto HomeLink is enabled for Summon (touch **Controls > Autopilot > Customize Summon > Use Auto HomeLink**), Smart Summon automatically opens a HomeLink device if you start the Smart Summon maneuver when Model S/Model X is located inside a garage. The mobile app informs you that the door has opened.

 **WARNING:** When you release the button to stop Model S/Model X, a slight delay occurs before the vehicle stops. Therefore, it is critical that you pay close attention to the vehicle's driving path at all times and proactively anticipate obstacles that the vehicle may be unable to detect.

 **WARNING:** Use extreme caution when using Smart Summon in environments where movement of obstacles can be unpredictable. For example, where people, children or animals are present.

 **WARNING:** Smart Summon may not stop for all objects (especially very low objects such as some curbs, or very high objects such as a shelf) and may not react to all oncoming or side traffic. Pay attention and be ready to stop Model S/Model X at all times by releasing the button on the mobile app.

Standby Mode

To keep Model S/Model X ready to Summon and reduce the time it takes to warm up, turn on Standby Mode. Touch **Controls > Autopilot > Standby Mode**. When Standby Mode is turned on, you can conserve Battery energy by disabling Standby Mode at these locations:



- **Exclude Home** – Disables Standby Mode at the location you set as Home in your Favorites list.
- **Exclude Work** – Disables Standby Mode at the location you set as Work in your Favorites list.
- **Exclude Favorites** – Disables Standby Mode at any location in your Favorites list.

NOTE: To conserve energy, Smart Summon automatically exits Standby mode from midnight to 6:00 am. During these hours, a delay occurs as Smart Summon starts up.

NOTE: Additional battery power may be consumed while Standby Mode is active.

NOTE: For details on how to designate a location as Home, Work, or Favorites, see [Home, Work, and Favorite Destinations on page 371](#).

Stopping or Canceling Smart Summon

Smart Summon stops Model SModel X whenever you release the button on the mobile app. To resume the Smart Summon session, simply press the **Come to Me** or **Go to Target** button again.



WARNING: Always anticipate when you need to stop Model SModel X. Depending on the quality of the connectivity between the phone and Model SModel X, there may be a slight delay between when you release the button and when the car stops.

Smart Summon cancels, and requires you to restart it, when:

- You press any button on the key fob.
- A door handle is engaged or a door is opened.
- You interact with the steering wheelsteering yoke, brake pedal, accelerator pedal, or shift.
- Model SModel X is blocked by an obstacle.
- Smart Summon has moved Model SModel X the maximum distance. To move further than this distance, you must shift Model SModel X into Drive or Reverse and then re-initiate a Smart Summon session.
- Your phone enters sleep mode or loses connectivity to Model SModel X.

Limitations

Smart Summon is unlikely to operate as intended in the following types of situations:

- GPS data is unavailable due to poor cellular coverage.
- The driving path is sloped. Smart Summon is designed to operate on flat roads only (up to 10% grade).
- A raised concrete edge is detected. Depending on the height of the concrete edge, Smart Summon may not move Model SModel X over it.
- One or more of the sensors (if equipped) or cameras is damaged, dirty, or obstructed (such as by mud, ice, or snow, or by a vehicle bra, excessive paint, or adhesive products such as wraps, stickers, rubber coating, etc.).
- Weather conditions (heavy rain, snow, fog, or extremely hot or cold temperatures) are interfering with sensor (if equipped) or camera operation.
- The sensors (if equipped) are affected by other electrical equipment or devices that generate ultrasonic waves.
- Model SModel X is in Trailer Mode or an accessory is attached.

NOTE: Smart Summon is disabled if Model SModel X is in Valet mode (see [Valet Mode on page 183](#)).



WARNING: The list above does not represent an exhaustive list of situations that may interfere with proper operation of Smart Summon. It is the driver's responsibility to remain in control of Model SModel X at all times. Pay close attention whenever Smart Summon is actively moving Model SModel X and stay prepared to take immediate action. Failure to do so can result in serious property damage, injury or death.

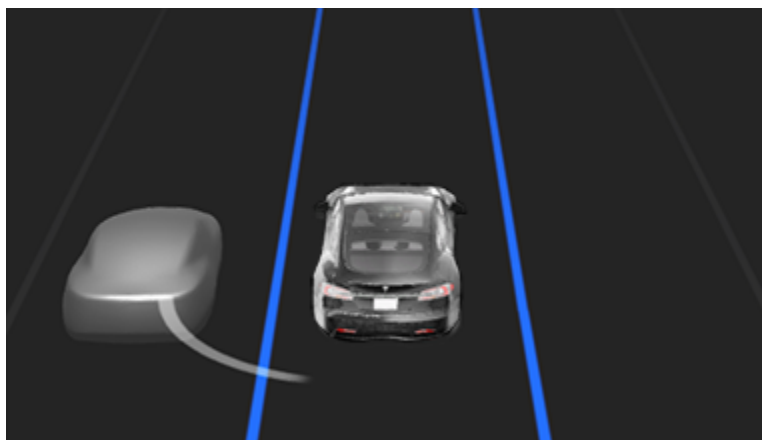
Active Safety Features

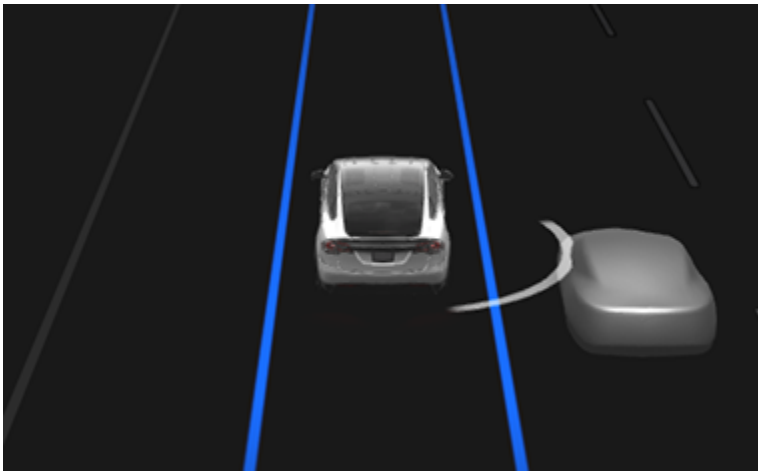


Lane Assist

Model S Model X monitors the markers on the lane you are driving in as well as the surrounding areas for the presence of vehicles or other objects.

When an object is detected in your blind spot or near the side of Model S Model X (such as a vehicle, guard rail, etc.), the instrument panel displays colored lines radiating from the image of your vehicle. The location of the lines correspond to the location of the detected object. The color of the lines (white, yellow, orange, or red) represent the object's proximity to Model S Model X, with white being the farthest and red being the closest and requiring your immediate attention. These colored lines only display when driving between approximately 7 and 85 mph (12 and 140 km/h). When Autosteer is active, these colored lines also display if driving slower than 7 mph (12 km/h). However, the colored lines do not display if Model S Model X is at a standstill (for example, in heavy traffic).





-  **CAUTION:** Ensure all cameras and sensors are clean. Dirty cameras and sensors, as well as environmental conditions such as rain and faded lane markings, can affect Autopilot performance.
-  **WARNING:** Lane Assist features are for guidance purposes only and is not intended to replace your own direct visual checks. Before changing lanes, always use side mirrors and perform the appropriate shoulder checks to visually determine if it is safe and appropriate to change lanes.
-  **WARNING:** Never depend on Lane Assist to inform you if you unintentionally drive outside of the driving lane, or to inform you that there is a vehicle beside you or in your blind spot. Several external factors can reduce the performance of Lane Assist (see [Limitations and Inaccuracies on page 339](#)). It is the driver's responsibility to stay alert and pay attention to the driving lane and other road users. Failure to do so can result in serious injury or death.

Steering Interventions

Lane Assist provides steering interventions if Model S/Model X drifts into (or close to) an adjacent lane in which an object, such as a vehicle, is detected. In these situations, Model S/Model X automatically steers to a safer position in the driving lane. This steering is applied only when Model S/Model X is traveling between 30 and 85 mph (48 and 140 km/h) on major roads with clearly visible lane markings. When a steering intervention is applied, the instrument panel briefly displays a warning message.

Lane Departure Warning

Lane Departure Warning alerts you of undesired lane departures by slightly vibrating the steering wheel/steering yoke if a front wheel passes over a lane marking when the associated turn signal is off. To turn this warning on or off, touch **Controls > Autopilot > Lane Departure Warning**. Lane Departure Warning is active only when driving between approximately 40 and 90 mph (64 and 145 km/h).



Lane Departure Avoidance

Lane Departure Avoidance is designed to warn you if Model SModel X is drifting out of, or nears the edge of, your driving lane.

Lane Departure Avoidance operates when driving between 40 and 90 mph (64 and 145 km/h) on roads with clearly visible lane markings. You can choose if and how you want Lane Departure Warning to operate by touching **Controls > Autopilot > Lane Departure Avoidance** and selecting between these options:

- **OFF:** You are not warned of lane departures or potential collisions with a vehicle in an adjacent lane.
- **WARNING:** If a front wheel passes over a lane marking, the steering wheelsteering yoke vibrates.
- **ASSIST:** Corrective steering is applied to keep Model SModel X in a safe position if Model SModel X drifts into an adjacent lane or near the edge of the road.

When Lane Departure Avoidance is enabled and Traffic-Aware Cruise Control is active, if Model SModel X drifts out of the driving lane when the associated turn signal is off, Lane Assist also checks to see whether your hands are on the steering wheelsteering yoke. If hands are not detected, the instrument panel displays a series of alerts, similar to those that are used when driving with Autosteer. If hands are repeatedly not detected Model SModel X gradually slows down to 15 mph (25 km/h) below the detected speed limit, or below the set cruising speed, and the hazard lights start flashing.

NOTE: Lane Departure Avoidance does not warn you of lane departures, or provide steering interventions, if the associated turn signal is on, which indicates an intentional lane change.

 **WARNING:** Lane Departure Avoidance is intended to help keep you safe, but it does not work in every situation and does not replace the need to remain attentive and in control.

 **WARNING:** Keep your hands on the steering wheelsteering yoke and drive attentively at all times.

 **WARNING:** Steering interventions are minimal and are not designed to move Model SModel X out of its driving lane. Do not rely on steering interventions to avoid side collisions.

Emergency Lane Departure Avoidance

Emergency Lane Departure Avoidance automatically applies steering to avoid a potential collision in situations where:

- Model SModel X is departing a lane and may collide with a vehicle traveling in the same direction in the adjacent lane (regardless of the status of the turn signal).
- Model SModel X is departing a lane into an oncoming lane, the turn signal is off, and an oncoming vehicle is detected.
- Model SModel X is departing the road and the turn signal is off (for example, very close to the edge of the road and a collision may occur).

To turn this feature on or off, touch **Controls > Autopilot > Emergency Lane Departure Avoidance**.

When Emergency Lane Departure Avoidance applies steering, a chime sounds and the instrument panel displays a warning and highlights the lane marking in red.

Emergency Lane Departure Avoidance operates when Model SModel X is traveling between 40 and 90 mph (64 and 145 km/h) on a road with clearly visible lane markings, curbs, etc.

 **WARNING:** Emergency Lane Departure Avoidance is not a substitute for attentive driving and sound judgment. Keep your eyes on the road when driving and never depend on Emergency Lane Departure Avoidance to prevent a collision. Several factors can reduce or impair performance. Depending on Emergency Lane Departure Avoidance to prevent a potential collision can result in serious injury or death.

Blind Spot Camera and Collision Warning Chime

To display the image from the corresponding side repeater camera whenever you engage a turn signal to change lanes, touch **Controls > Autopilot > Blind Spot Camera**.

If you want a chime to sound when a vehicle is in your blind spot and a possible collision is detected, touch **Controls > Autopilot > Blind Spot Collision Warning Chime**.

 **WARNING:** Blind Spot Camera does not eliminate the need to drive attentively and manually perform shoulder checks when changing lanes.



WARNING: Blind Spot Collision Warning Chime cannot detect every collision. It is the driver's responsibility to remain alert and perform the appropriate shoulder checks when changing lanes.

Limitations and Inaccuracies

Lane Assist features cannot always detect lane markings and you may experience unnecessary or invalid warnings in these situations:

- Visibility is poor and lane markings are not clearly visible (due to heavy rain, snow, fog, etc.). The exact detection zone of the ultrasonic sensors varies depending on environmental conditions.
- Bright light (such as from oncoming headlights or direct sunlight) is interfering with the view of the camera(s).
- A vehicle in front of Model S/Model X is blocking the view of the camera(s).
- The windshield is obstructing the view of the camera(s) (fogged over, dirty, covered by a sticker, etc.).
- Lane markings are excessively worn, have visible previous markings, have been adjusted due to road construction, or are changing quickly (for example, lanes branching off, crossing over, or merging).
- The road is narrow or winding.
- Objects or landscape features are casting strong shadows on lane markers.

Lane Assist may not provide warnings, or may apply inappropriate warnings, in these situations:

- One or more of the ultrasonic sensors is damaged, dirty, or obstructed (by mud, ice, or snow, or by a vehicle bra, excessive paint, or adhesive products such as wraps, stickers, rubber coatings, etc.).
- Weather conditions (heavy rain, snow, fog, or extremely hot or cold temperatures) are interfering with sensor operation.
- The sensors are affected by other electrical equipment or devices that generate ultrasonic waves.
- An object that is mounted to Model S/Model X is interfering with and/or obstructing a sensor (such as a bike rack or a bumper sticker).

In addition, Lane Assist may not steer Model S/Model X away from an adjacent vehicle, or may apply unnecessary or inappropriate steering, in these situations:

- You are driving Model S/Model X on sharp corners or on a curve at a relatively high speed.
- Bright light (such as from oncoming headlights or direct sunlight) is interfering with the view of the camera(s).
- You are drifting into another lane but an object (such as a vehicle) is not present.
- A vehicle in another lane cuts in front of you or drifts into your driving lane.
- Model S/Model X is not traveling within the speeds at which the Lane Assist feature is designed to operate.
- One or more of the ultrasonic sensors is damaged, dirty, or obstructed (such as by mud, ice, or snow, or by a vehicle bra, excessive paint, or adhesive products such as wraps, stickers, rubber coating, etc.).
- Weather conditions (heavy rain, snow, fog, or extremely hot or cold temperatures) are interfering with sensor operation.
- The sensors are affected by other electrical equipment or devices that generate ultrasonic waves.
- An object mounted to Model S/Model X (such as a bike rack or a bumper sticker) is interfering with or obstructing a sensor.
- Visibility is poor and lane markings are not clearly visible (due to heavy rain, snow, fog, etc.).
- Lane markings are excessively worn, have visible previous markings, have been adjusted due to road construction or are changing quickly (for example, lanes branching off, crossing over, or merging).



WARNING: The lists above do not represent every possible situation that may interfere with Lane Assist features. There are many reasons why Lane Assist may not operate as intended. To avoid a collision, stay alert and always pay attention to the road so you can anticipate the need to take corrective action as early as possible.



Collision Avoidance Assist

If your Model S/Model X is equipped with Autopilot components (see [About Autopilot on page 286](#)), the following collision avoidance features are designed to increase the safety of you and your passengers:

The following collision avoidance features are designed to increase the safety of you and your passengers:

- **Forward Collision Warning** - provides visual and audible warnings in situations when Model S/Model X detects that there is a high risk of a frontal collision (see [Forward Collision Warning on page 340](#)).
- **Automatic Emergency Braking** - automatically applies braking to reduce the impact of a frontal collision (see [Automatic Emergency Braking on page 342](#)).
- **Obstacle-Aware Acceleration** - reduces acceleration if Model S/Model X detects an object in its immediate driving path (see [Obstacle-Aware Acceleration on page 343](#)).

 **CAUTION:** Ensure all cameras and sensors are clean. Dirty cameras and sensors, as well as environmental conditions such as rain and faded lane markings, can affect performance.

 **WARNING:** Forward Collision Warning is for guidance purposes only and is not a substitute for attentive driving and sound judgment. Keep your eyes on the road when driving and never depend on Forward Collision Warning to warn you of a potential collision. Several factors can reduce or impair performance, causing either unnecessary, invalid, inaccurate, or missed warnings. Depending on Forward Collision Warning to warn you of a potential collision can result in serious injury or death.

 **WARNING:** Automatic Emergency Braking is not designed to prevent all collisions. In certain situations, it can minimize the impact of a frontal collision by attempting to reduce your driving speed. Depending on Automatic Emergency Braking to avoid a collision can result in serious injury or death.

 **WARNING:** Obstacle-Aware Acceleration is not designed to prevent a collision. In certain situations, it can minimize the impact of a collision. Depending on Obstacle-Aware Acceleration to avoid a collision can result in serious injury or death.

Forward Collision Warning

Model S/Model X monitors the area in front of it for the presence of an object such as a vehicle, motorcycle, bicycle, or pedestrian. If a collision is considered likely unless you take immediate corrective action, Forward Collision Warning is designed to sound a chime and highlight the vehicle in front of you in red on the instrument panel. If this happens, **TAKE IMMEDIATE CORRECTIVE ACTION!**





Warnings cancel automatically when the risk of a collision has been reduced (for example, you have decelerated or stopped Model S Model X, or the object in front of your vehicle has moved out of your driving path).

If immediate action is not taken when Model S Model X issues a Forward Collision Warning, Automatic Emergency Braking (if enabled) may automatically apply the brakes if a collision is considered imminent (see [Automatic Emergency Braking on page 342](#)).

By default, Forward Collision Warning is turned on. To turn it off or adjust its sensitivity, touch **Controls > Autopilot > Forward Collision Warning**. Instead of the default warning level of **Medium**, you can turn the warning **Off**, or you can choose to be warned **Late** or **Early**.

NOTE: Your chosen setting for Forward Collision Warning is retained until you manually change it.



-  **WARNING:** The camera(s) and sensors associated with Forward Collision Warning are designed to monitor an approximate area of up to 525 feet (160 meters) in your driving path. The area being monitored by Forward Collision Warning can be adversely affected by road and weather conditions. Use appropriate caution when driving.
-  **WARNING:** Forward Collision Warning is designed only to provide visual and audible alerts. It does not attempt to apply the brakes or decelerate Model SModel X. When seeing and/or hearing a warning, it is the driver's responsibility to take immediate corrective action.
-  **WARNING:** Forward Collision Warning may provide a warning in situations where the likelihood of collision may not exist. Stay alert and always pay attention to the area in front of Model SModel X so you can anticipate whether any action is required.

Forward Collision Warning operates only when driving between approximately 7 mph (10 km/h) and 90 mph (150 km/h) 3 mph (5 km/h) and 90 mph (150 km/h).

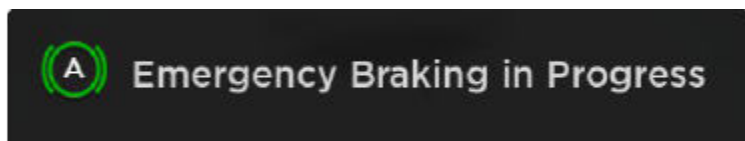
Forward Collision Warning operates only when driving between approximately 7 mph (10 km/h) and 90 mph (150 km/h).

-  **WARNING:** Forward Collision Warning does not provide a warning when the driver is already applying the brake.

Automatic Emergency Braking

Model SModel X is designed to determine the distance from a detected object traveling in front of it. When a frontal collision is considered unavoidable, Automatic Emergency Braking is designed to apply the brakes to reduce the vehicle's speed and therefore, the severity of the impact. The amount of speed that is reduced depends on many factors, including driving speed and environment.

When Automatic Emergency Braking applies the brakes, the instrument panel displays a visual warning and sounds a chime. You may also notice abrupt downward movement of the brake pedal. The brake lights turn on to alert other road users that you are slowing down.



Automatic Emergency Braking operates only when driving between approximately 5 mph (8 km/h) and 90 mph (150 km/h) 3 mph (5 km/h) and 90 mph (150 km/h).

In addition, your vehicle may apply the brakes, regardless of driving speed, to prevent or mitigate a subsequent impact after an initial collision.

Automatic Emergency Braking operates only when driving between approximately 6 mph (10 km/h) and 90 mph (150 km/h).

Automatic Emergency Braking does not apply the brakes, or stops applying the brakes, when:

- You turn the steering wheelsteering yoke sharply.
- You press and release the brake pedal while Automatic Emergency Braking is applying the brakes.
- You accelerate hard while Automatic Emergency Braking is applying the brakes.
- The vehicle, motorcycle, bicycle, or pedestrian is no longer detected ahead.

Automatic Emergency Braking is always enabled when you start Model SModel X. To disable it for your current drive, touch **Controls > Autopilot > Automatic Emergency Braking**. Even if you disable Automatic Emergency Braking, your vehicle may still apply the brakes after detecting an initial collision to reduce further impact.

-  **WARNING:** It is strongly recommended that you do not disable Automatic Emergency Braking. If you disable it, Model SModel X does not automatically apply the brakes in situations where a collision is considered likely.
-  **WARNING:** Automatic Emergency Braking is designed to reduce the severity of an impact. It is not designed to avoid a collision.
-  **WARNING:** Several factors can affect the performance of Automatic Emergency Braking, causing either no braking or inappropriate or untimely braking, such as when a vehicle is partially in the path of travel or there is road debris. It is the driver's responsibility to drive safely and remain in control of the vehicle at all times. Never depend on Automatic Emergency Braking to avoid or reduce the impact of a collision.



-  **WARNING:** Automatic Emergency Braking is designed to reduce the impact of frontal collisions only and does not function when Model SModel X is in Reverse.
-  **WARNING:** Automatic Emergency Braking is not a substitute for maintaining a safe traveling distance between you and the vehicle in front of you.
-  **WARNING:** The brake pedal moves downward abruptly during automatic braking events. Always ensure that the brake pedal can move freely. Do not place material under or on top of the driver's floor mat (including an additional mat) and always ensure that the driver's floor mat is properly secured. Failure to do so can impede the ability of the brake pedal to move freely.

Obstacle-Aware Acceleration

Obstacle-Aware Acceleration is designed to reduce the impact of a collision by reducing motor torque and in some cases applying the brakes, if Model SModel X detects an object in its driving path. The instrument panel displays a visual warning and sounds a chime when the brakes are automatically applied. For example, Model SModel X, while parked in front of a closed garage door with Drive engaged, detects that you have pressed hard on the accelerator pedal. Although Model SModel X still accelerates and hits the garage door, the reduced torque may result in less damage.

Obstacle-Aware Acceleration is designed to operate only when all of these conditions are simultaneously met:

- Drive or Reverse is engaged.
- Model SModel X is stopped or traveling less than 10 mph (16 km/h).
- Model SModel X detects an object in its immediate driving path.

To disable Obstacle-Aware Acceleration, touch **Controls > Autopilot > Obstacle-Aware Acceleration**.

-  **WARNING:** Obstacle-Aware Acceleration is designed to reduce the severity of an impact. It is not designed to avoid a collision.
-  **WARNING:** Obstacle-Aware Acceleration may not limit torque in all situations. Several factors, including environmental conditions, distance from an obstacle, and a driver's actions, can limit, delay, or inhibit Obstacle-Aware Acceleration.
-  **WARNING:** Obstacle-Aware Acceleration may not limit torque when performing a sharp turn, such as into a parking space.
-  **WARNING:** Do not rely on Obstacle-Aware Acceleration to control acceleration or to avoid, or limit, the severity of a collision, and do not attempt to test Obstacle-Aware Acceleration. Doing so can result in serious property damage, injury, or death.
-  **WARNING:** Several factors can affect the performance of Obstacle-Aware Acceleration, causing an inappropriate or untimely reduction in motor torque and/or undesired braking. It is the driver's responsibility to drive safely and remain in control of Model SModel X at all times.

Limitations and Inaccuracies

Collision Avoidance features cannot always detect all objects, vehicles, bikes, or pedestrians, and you may experience unnecessary, inaccurate, invalid, or missed warnings for many reasons, particularly if:

- The road has sharp curves.
- Visibility is poor (due to heavy rain, snow, fog, etc.).
- Bright light (such as from oncoming headlights or direct sunlight) is interfering with the view of the camera(s).
- A camera or sensor is obstructed (dirty, covered, fogged over, covered by a sticker, etc.).
- One or more of the ultrasonic sensors is damaged, dirty, or obstructed (such as by mud, ice, or snow, or by a vehicle bra, excessive paint, or adhesive products such as wraps, stickers, rubber coating, etc.).
- Weather conditions (heavy rain, snow, fog, or extremely hot or cold temperatures) are interfering with sensor operation.
- The sensors are affected by other electrical equipment or devices that generate ultrasonic waves.

-  **WARNING:** The limitations previously described do not represent an exhaustive list of situations that may interfere with proper operation of Collision Avoidance Assist features. These features may fail to provide their intended function for many other reasons. It is the driver's responsibility to avoid collisions by staying alert, paying attention, and taking corrective action as early as possible.

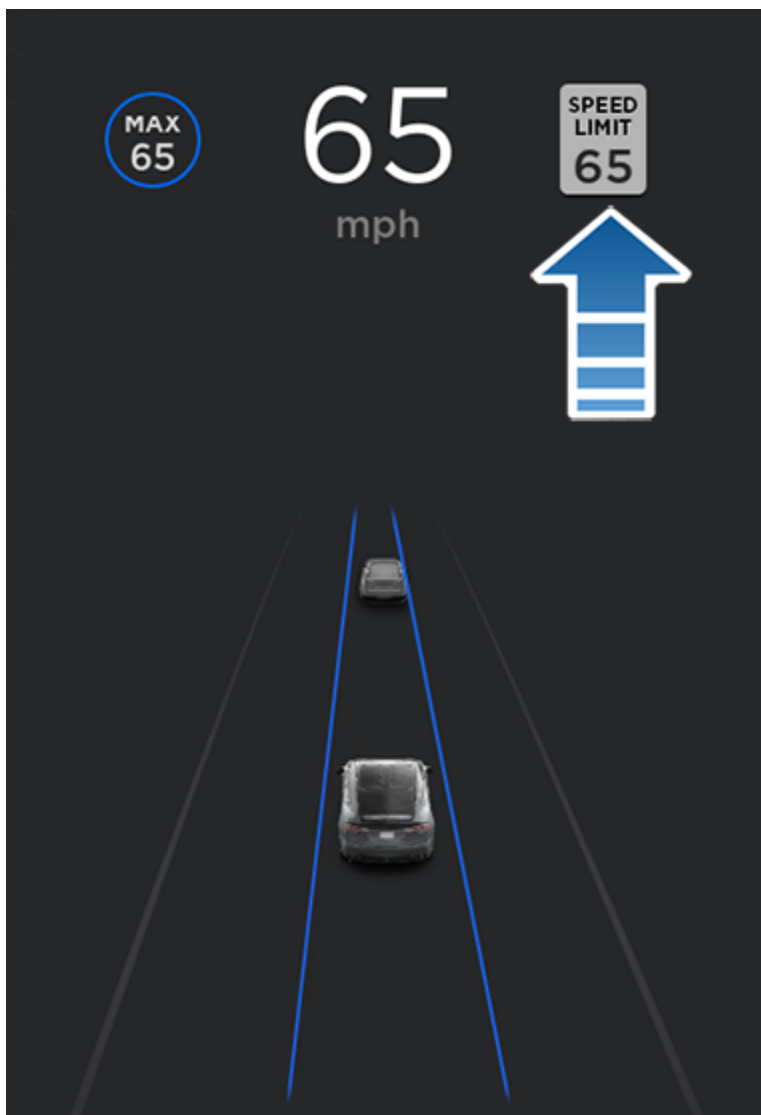


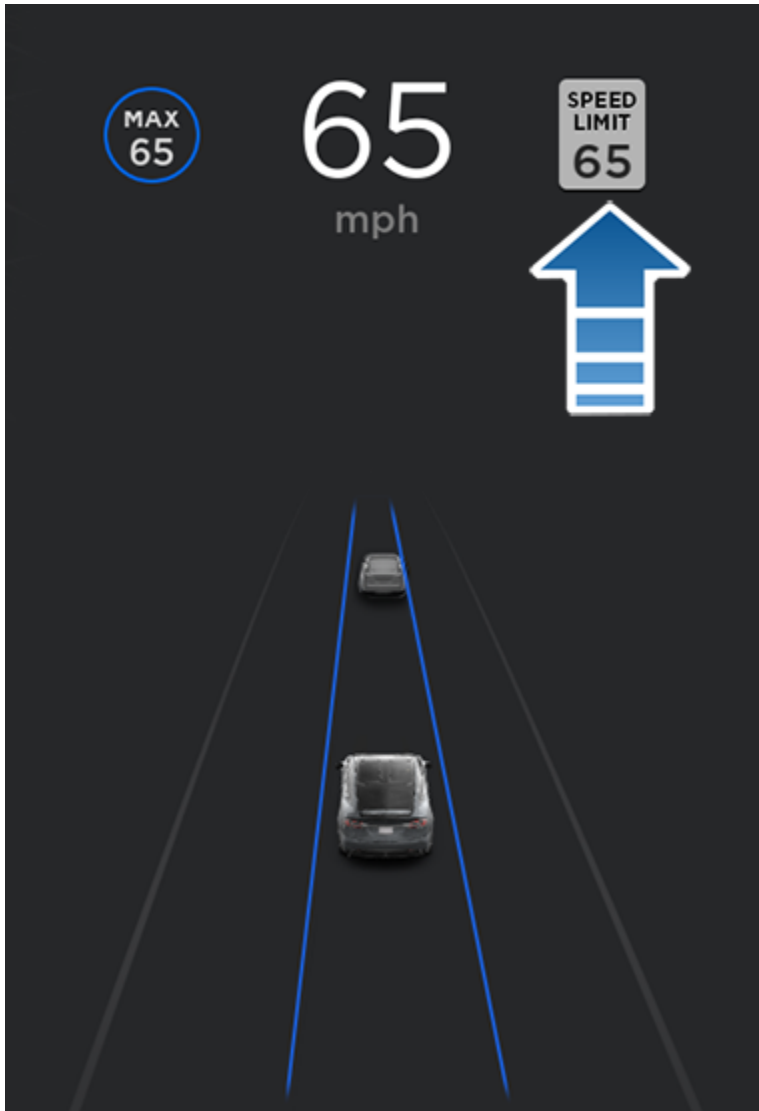
CAUTION: If a fault occurs with a Collision Avoidance Assist feature, Model S/Model X displays an alert. Contact Tesla Service.

Speed Assist

How Speed Assist Works

Model S/Model X displays a speed limit on the instrument panel and you can choose if and how you are warned when you exceed the speed limit. Also, instead of using the detected speed limit, you can base warnings on an arbitrary speed limit that you enter manually.





In situations where Model S/Model X is unable to determine a speed limit, or if Speed Assist is uncertain that an acquired speed limit is accurate, the instrument panel may not display a speed limit sign and warnings do not take effect.

NOTE: Speed limit warnings go away after ten seconds, or when Model S/Model X slows down below the specified limit.



WARNING: Do not rely on Speed Assist to determine the appropriate speed limit or driving speed. Always drive at a safe speed based on traffic and road conditions.

Controlling Speed Assist

To adjust the Speed Limit Warning setting, touch **Controls > Autopilot > Speed Limit Warning**, then choose one of these options:

- **Off** - Speed limit warnings do not display and chimes are not sounded.
- **Display** - Speed limit signs display on the instrument panel and the sign increases in size when you exceed the determined limit.
- **Chime** - In addition to the visual display, a chime is sounded when you exceed the determined speed limit.

You can also specify how the speed limit is determined:

- **Relative** - You can set a speed limit offset (+ or -) if you want to be alerted only when you exceed the offset speed limit by a specified amount. For example, you can increase the offset to +10 mph (10 km/h) if you only want to be warned when you exceed the speed limit by 10 mph (10 km/h).



NOTE: The offset from speed limit also affects the number shown in the gray speed icon on the instrument panel.

- **Absolute** - Manually specify any speed limit between 20 and 140 mph (30 and 240 km/h).

NOTE: Speed Assist is not always accurate. In some situations, the location of a road can be miscalculated and Speed Assist can display a speed for a directly adjacent road that may have a different speed limit. For example, Speed Assist can assume Model S/Model X is on a controlled-access highway when it is actually on a nearby surface street, and vice versa.

NOTE: Your chosen setting is retained until you manually change it.

Limitations and Inaccuracies

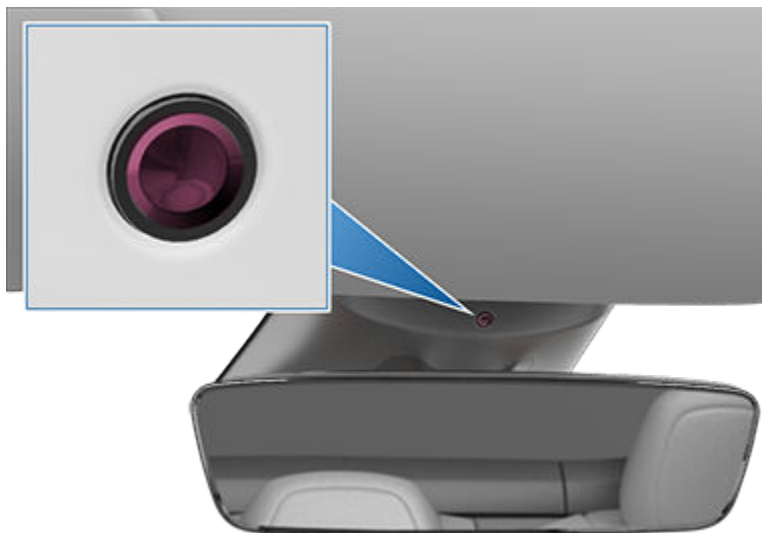
Speed Assist may not be fully functional or may provide inaccurate information in these situations:

- Visibility is poor and speed limit signs are not clearly visible (due to heavy rain, snow, fog, etc.).
- Bright light (such as from oncoming headlights or direct sunlight) is interfering with the view of the camera(s).
- Model S/Model X is being driven very close to a vehicle in front of it which is blocking the view of the camera(s).
- The windshield is obstructing the view of the camera(s) (fogged over, dirty, covered by a sticker, etc.).
- Speed limit signs are concealed by objects.
- The speed limits stored in the map database are incorrect or outdated.
- Model S/Model X is being driven in an area where GPS or map data is not available or where speed limit signs can not be detected.
- Traffic signs do not conform to standard recognizable formats.
- A road or a speed limit has recently changed.

WARNING: The list above does not represent an exhaustive list of situations that may interfere with proper operation of Speed Assist. Speed Assist may fail to provide warnings for many other reasons.

Cabin Camera

Your Model S/Model X may be equipped with a cabin camera located above the rear view mirror.



The cabin camera is not currently active. If used in a future safety feature, Tesla will notify you of its availability through a software update.



By default, images and video from the camera do not leave the vehicle itself and are not transmitted to anyone, including Tesla, unless you enable data sharing. If you enable data sharing and a safety critical event occurs (such as a collision), Model S/Model X shares short cabin camera video clips with Tesla to help us develop future safety enhancements and continuously improve the intelligence of features that rely on the cabin camera. Data may also be shared if diagnostics are required on cabin camera functionality. Cabin camera does not perform facial recognition or any other method of identity verification. To protect your privacy, cabin camera data is not associated with your vehicle identification number.

To adjust your data sharing preferences touch **Controls > Software > Data Sharing > Allow Cabin Camera Analytics**. You can change your data sharing settings at any time.



NOTE: Keep the camera lens clean and free of obstructions. Remove any buildup of dirt or dust by occasionally wiping the camera lens with a clean cloth.



CAUTION: Do not use chemical-based or abrasive cleaners. Doing so can damage the surface of the camera lens.



Using the Touchscreen

Controls

Controls - Overview



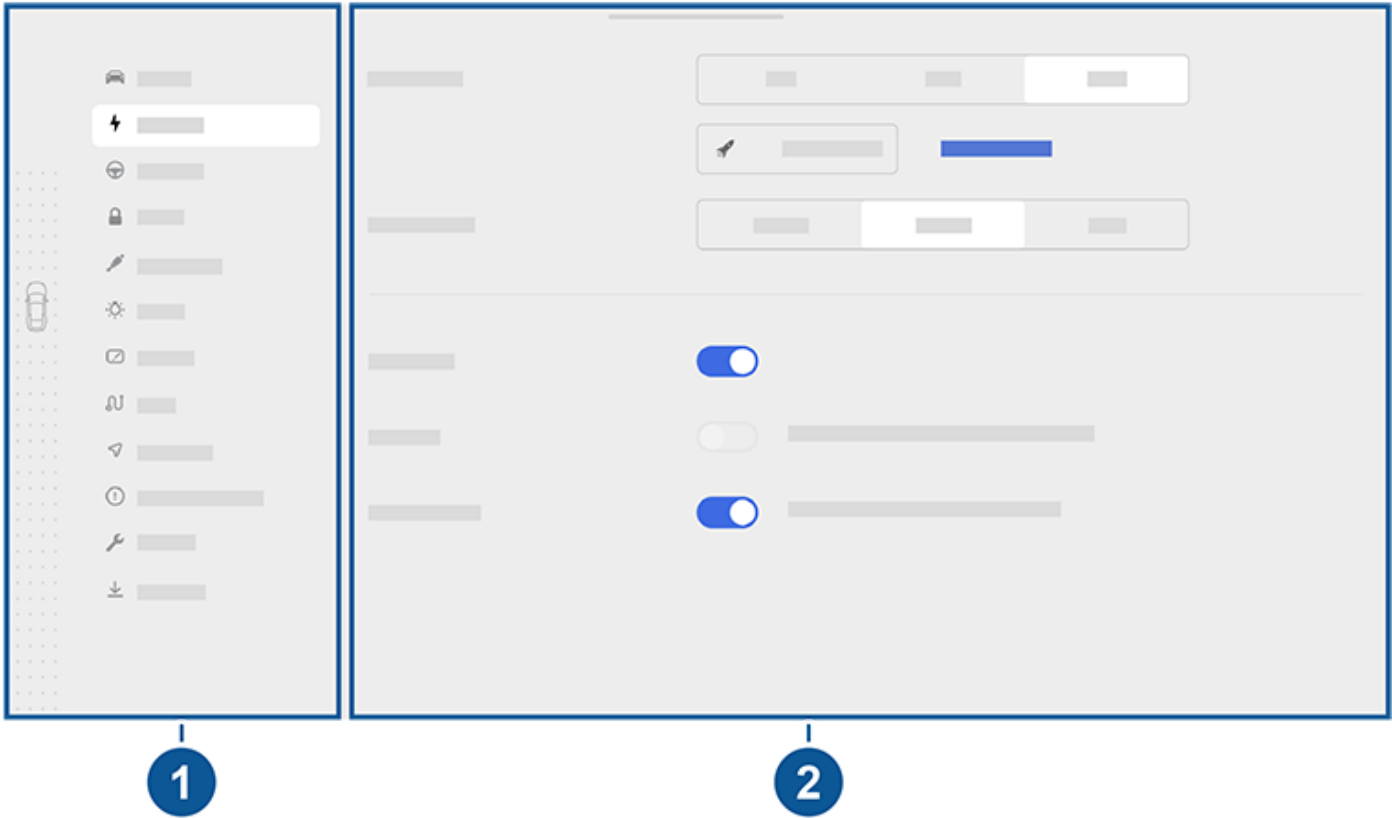
Touch **Controls** on the bottom corner of the touchscreen to control features and customize Model SModel X to suit your preferences. The Controls screen appears over the map. Touch an option on the Controls screen to display the various settings and options associated with the chosen option. Swipe to close.

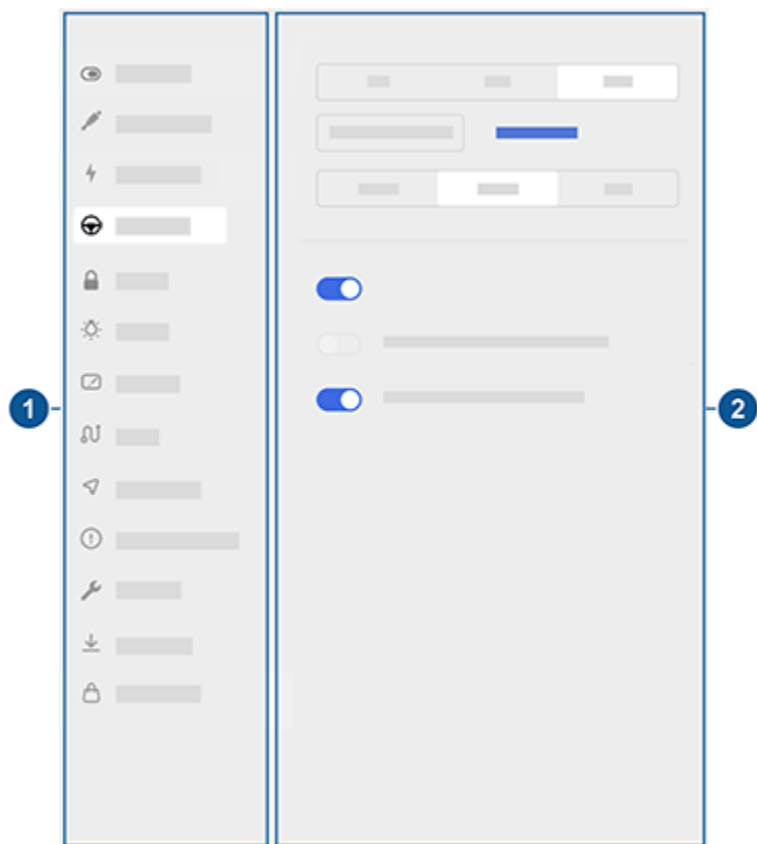
NOTE: You can also access Controls by touching anywhere on the side of the touchscreen closest to the driver and swiping open.



When an information icon displays beside a specific setting, touch it to display a popup that provides helpful details about the associated setting.

NOTE: Many vehicle controls, settings, and preferences (such as climate, media, and navigation) can be adjusted hands-free using voice commands (see [Voice Commands on page 391](#)).





1. List of available settings. When you select an item from this list, its associated settings display on the right side of the screen.
2. Settings area. The options available for the chosen settings display here, and are described next.

Shortcuts and Frequently Used Settings

When you touch **Controls**, the touchscreen displays the following shortcuts and frequently used settings:



1



Your Name

2



3

Frunk
Open



Trunk
Open



4



Mirrors



Steering



Wiper



Window
Lock



Raise
Suspension



Fold
Mirrors



Glovebox



Child
Lock



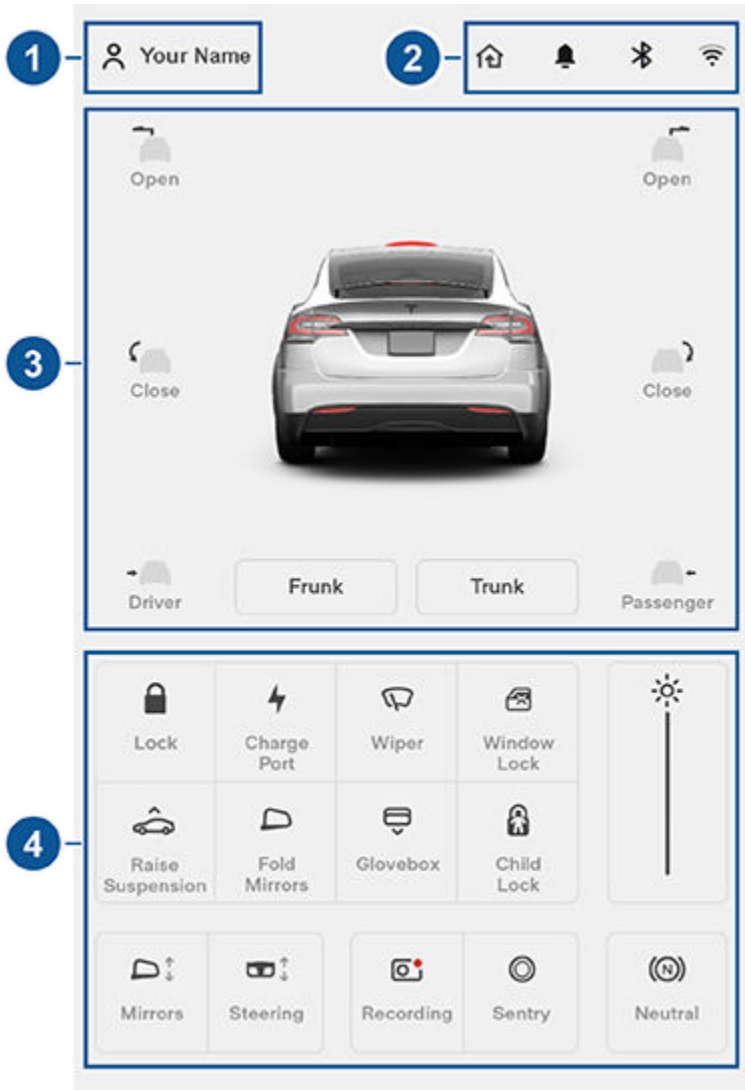
Recording



Sentry



1. Create and access driver profiles (see [Driver Profiles on page 182](#)).
2. Access HomeLink (see [HomeLink Universal Transceiver on page 400](#)), display alerts (see [Troubleshooting Alerts on page 543](#)), and access settings for Bluetooth (see [Pairing a Bluetooth Phone on page 381](#)) and networks (see [Connecting to Wi-Fi on page 403](#)).
3. Quick access to locks, trunks and the charge port (see [Doors on page 31](#), [Front Trunk on page 69](#), [Rear Trunk on page 60](#), and [Opening the Charge Port on page 417](#)).
4. Commonly used controls.



1. Create and access driver profiles (see [Driver Profiles on page 182](#)).
2. Access HomeLink (see [HomeLink Universal Transceiver on page 400](#)), display alerts (see [Troubleshooting Alerts on page 543](#)), and access settings for Bluetooth (see [Pairing a Bluetooth Phone on page 381](#)) and networks (see [Connecting to Wi-Fi on page 403](#)).
3. Quick access to opening and closing doors and trunks (see [Doors on page 31](#), [Front Trunk on page 69](#) and [Rear Trunk on page 60](#)).
4. Commonly used controls.

Pedals & Steering

Acceleration: Adjust the amount of acceleration. (See [Acceleration Modes on page 256](#)[Acceleration Modes on page 254](#)).



Drag Strip Mode: Preconditions the vehicle for improved performance in short distance racing (see [Drag Strip Mode on page 256](#)).

Steering Mode: Adjust the amount of effort required to turn the steering wheelsteering yoke (see [Adjusting Steering Effort on page 186](#)).

Regenerative Braking: When you release the accelerator when driving, regenerative braking slows Model SModel X and feeds any surplus energy back to the Battery. If set to **LOW**, Model SModel X does not slow down as quickly, but also feeds less energy back to the Battery (see [Regenerative Braking on page 233](#)).

NOTE: Regardless of the setting selected, the energy gained by regenerative braking is reduced if the Battery is full, or is extremely cold or hot (in which case, surplus energy is used to heat or cool it).

NOTE: The regenerative braking setting is not available on all vehicles.

Stopping Mode: Choose how you want Model SModel X to behave once regenerative braking has reduced the driving speed to a very low speed, a drive mode is still engaged, and both the accelerator and brake pedals are released. You can adjust this setting only when Model SModel X is in Park.

Auto Shift out of Park: Turn on if you want Model SModel X to automatically choose the initial drive mode (Drive or Reverse). See [Shifting on page 200](#).

Automatic Turn Signals: If set to **Auto Cancel**, turn signals cancel automatically when Model SModel X detects completion of maneuvers such as merges, lane changes, and forks in the roadway (unless you override this by pressing and holding when you engage the turn signal). If set to **Off**, you must cancel turn signals after these types of maneuvers by pressing the turn signal button (see [#unique_45 on page](#)).

Track Mode: when enabled, this mode modifies the vehicle's stability control, traction control, regenerative braking, and cooling system to increase performance and handling while driving on closed circuit courses (see [Track Mode on page 257](#)).

Creep: When on, Model SModel X applies forward torque in Drive and backwards torque in Reverse when you release the brake pedal (similar to a conventional vehicle with an automatic transmission). The torque moves the vehicle slowly on flat roads, but may require you to press the accelerator pedal in some situations (for example, when on a steep hill or driveway). When off, Model SModel X is free rolling when you let your foot off the brake pedal and the motor does not apply torque until the accelerator pedal is pressed. You can adjust this setting only when Model SModel X is in Park.

 **WARNING:** Never rely on Creep to apply enough torque to prevent your vehicle from rolling down a hill. Always apply brakes to remain stopped or the accelerator to proceed up the hill. Failure can result in property damage and/or a collision.

Traction Control: In circumstances where you deliberately want the wheels to spin (for example, Model SModel X is stuck in snow, sand, or mud), you can turn off traction control (see [Traction Control on page 237](#)).

Slip Start: Turn on to allow wheels to spin (see [Traction Control on page 237](#)).

Range Mode: If on, Model SModel X conserves energy by automatically limiting the amount of power that the climate control system uses to maintain the temperature of the cabin area and limits the amount of energy being used to heat or cool the Battery. In addition, Range Mode turns off signature lights (only in market regions where daytime running lights are not required). When turned on in an All-Wheel Drive vehicle, torque distribution between the motors is optimized to maximize range.

Trailer Mode: Enable Trailer Mode before towing a trailer (see [Towing and Accessories on page 269](#)).

Seats

Adjust the seats: Adjust the second row seats by touching the forward and backward buttons.

Easy Entry (if equipped): When enabled, you can move a second row monopost seat all the way forward or backward by touching the forward/backward button once. When off, you must hold the button to move the second row seats fully forward/backward (see [Accessing Third Row Seats \(if equipped\) - Monopost Seating on page 101](#)).

Suspension

Adjust the settings associated with the air suspension system. You can adjust the **Ride Height** (helpful for increasing ground clearance on steep driveways, etc.) and you can optimize ride and handling by adjusting settings for **Adaptive Suspension Damping**. See [Air Suspension on page 385](#). See [Air Suspension on page 389](#). See [Air Suspension on page 387](#).



NOTE: To raise the suspension to **High**, you can also touch the **Raise Suspension** shortcut on the main Controls screen, instead of displaying all Suspension settings.

Charging

View charging status and adjust settings related to charging Model S/Model X (see [Charging Instructions on page 417](#)).

Autopilot

Customize how some of the Autopilot features operate to provide a safer and more convenient driving experience. See [About Autopilot on page 286](#) for an overview of Autopilot components and features.

- **Cruise Follow Distance:** Adjust the following distance you want to maintain between Model S/Model X and a vehicle traveling ahead of you when using Traffic-Aware Cruise Control see [Adjust the Following Distance on page 304](#)).
- **Autosteer (Beta):** Turn on the feature that provides automatic steering in addition to Traffic-Aware Cruise Control (see [Autosteer on page 310](#)).
- **Autosteer Activation:** Choose whether you want Autosteer to activate when you **Single Click** the right scroll button on the steering wheel/steering yoke. If you choose **Double Click**, a single press activates Traffic-Aware Cruise Control and you must press the scroll button twice in quick succession to activate Autosteer.

NOTE: To use Traffic-Aware Cruise Control independently of Autosteer, set your preferences to **Double Click**.

- **Navigate on Autopilot (Beta):** Navigate on Autopilot automatically exits at off-ramps and interchanges based on your navigation route and can also make lane changes designed to prepare for exits and minimize the driving time to your destination. Touch **Customize Navigate on Autopilot** to specify how you want Navigate on Autopilot to operate, such as whether you want it to automatically enable at the start of every trip, how you want it to perform lane changes, etc. (see [Navigate on Autopilot on page 316](#)).
- **Traffic Light and Stop Sign Control (Beta):** Turn on if you want Model S/Model X to automatically stop at traffic lights and stop signs when using Traffic-Aware Cruise Control or Autosteer (see [Traffic Light and Stop Sign Control on page 320](#)).
- **Full Self-Driving Visualization Preview** (if equipped): Display more details about the roadway and its surroundings, such as road markings, stop lights, objects (such as trash cans and poles), etc.
- **Summon (Beta):** Automatically park and retrieve Model S/Model X from outside the vehicle (see [Summon on page 330](#)).

Customize Summon: Determine the bumper clearance, distance, amount of side clearance, and whether Summon requires continuous press to operate (the ability to disable continuous press is not available in all market regions).

Standby Mode: Use Standby Mode to eliminate the delay that occurs when Smart Summon (if equipped) is starting up.

- **Set Speed:** When you engage Traffic-Aware Cruise Control or Autosteer, choose whether you want the initial cruising speed set to the **Speed Limit** or your **Current Speed** (see [Traffic-Aware Cruise Control on page 299](#)).
- **Offset:** When set to cruise at the speed limit, you can choose a **Fixed** offset, in which the speed is adjusted by a specific number of mph (km/h) on all roads, or a **Percentage** offset, in which the speed adjustment varies depending on the detected speed limit of the road.
- **Blind Spot Camera:** When **ON**, the touchscreen displays the view from the corresponding side repeater camera whenever you engage a turn signal to change lanes. See [Blind Spot Camera and Collision Warning Chime on page 338](#).
- **Blind Spot Collision Warning Chime:** Choose if you want a chime to sound when a vehicle is in your blind spot and a possible collision is detected (see [Blind Spot Camera and Collision Warning Chime on page 338](#)).
- **Speed Limit Warning:** Choose the type of warnings, if any, you receive if driving speed exceeds the detected speed limit (see [Speed Assist on page 344](#)).
- **Speed Limit:** Choose if you want **Speed Limit Warning** to use a relative or an absolute speed limit (see [Speed Assist on page 344](#)). If you choose a relative speed limit, you can specify an **Offset** to be alerted only when you exceed the speed limit by the specified offset amount.
- **Lane Departure Avoidance:** Choose if and how you want the steering wheel/steering yoke to respond if a front wheel passes over a lane marking when the associated turn signal is off (see [Lane Assist on page 336](#)).
- **Forward Collision Warning:** Choose if and when Model S/Model X displays visual and audible warnings in situations when there is a high risk of a frontal collision (see [Collision Avoidance Assist on page 340](#)).



- **Emergency Lane Departure Avoidance:** When enabled, Model S Model X attempts to prevent a potential collision with an object in an adjacent lane by steering the vehicle back into your driving lane in emergency situations (see [Emergency Lane Departure Avoidance on page 338](#)).
- **Automatic Emergency Braking:** Choose if you want Model S Model X to automatically apply braking when a frontal collision is imminent (see [Collision Avoidance Assist on page 340](#)).
- **Obstacle-Aware Acceleration:** Choose if you want acceleration to be automatically reduced in situations where Model S Model X is stopped (or moving slowly) and you accelerate toward a detected obstacle (see [Obstacle-Aware Acceleration on page 343](#)).
- **Traffic-Aware Cruise Control Chime:** If on, a chime sounds when you engage or cancel Traffic-Aware Cruise Control.
- **Green Traffic Light Chime** (if equipped): If on, a chime sounds when you are waiting at a red traffic light and the light turns green. If you are not actively using Traffic-Aware Cruise Control and are waiting at a red light with a car in front of you, the chime sounds when the car advances ahead of you.

LocksVehicle

Keys: You can see all the keys used for Model S Model X and their associated driver profiles. You can add, delete, and change the driver profile associated with each key (see [Driver Profiles on page 182](#)).

Window Lock: Locks the rear window switches.

Child Lock: If on, safety locks prevent the rear doors from being opened from inside the vehicle.

Walk-Away Door Lock: If on, doors automatically lock when you walk away from the vehicle carrying your key fob or phone key (see [Walk-Away Door Lock on page 41](#) [Walk-Away Door Lock on page 55](#)).

Driver Door Unlock Mode: Driver Door Unlock Mode will only unlock the driver's door when first unlocking the vehicle.

Unlock on Park: If on, doors automatically unlock when you engage Park (see [Unlock on Park on page 42](#)).

Car Left Open Notification: Choose whether you want Model S Model X to send a notification to your Tesla mobile app if your car remains open for over approximately 10 minutes after you have left:

- **Off:** You are not notified if you leave Model S Model X open.
- **Doors:** You are notified only if a door or trunk is left open.
- **Doors & Windows:** In addition to being notified if a door or trunk is left open, you are notified if Model S Model X is locked and a window is left open.

Touch **Exclude Home** to disable the notification when Model S Model X is parked at the location you set as Home in your Favorites list (see [Home, Work, and Favorite Destinations on page 371](#)).

Falcon Door Height: If set to **AUTO**, falcon wing doors open fully, taking into consideration any remembered location-based heights, and assuming an obstacle is not detected. If set to **LOW**, falcon wing doors open partially, further protecting occupants and the vehicle's interior from inclement weather conditions.

Automatic Doors: If on, the driver's door opens whenever you approach Model X and the key is detected. The driver's door also opens when you double-click the key and the passenger door opens with a subsequent double-click. If not enabled, the door (or doors) unlock, but you'll need to open the driver's door manually.

Close All With Key Fob: If on, a single-click of the key fob's lock/unlock button closes and locks all doors (and the rear trunk). If off, you must triple-click the button.

Auto-Present Handles: If on, door handles automatically extend as you approach Model S carrying a key fob or phone key. If off, you must press the door handle to extend the handle.

Lock Confirmation Sound: If on, a soft horn sounds whenever Model S Model X locks or unlocks (see [Walk-Away Door Lock on page 41](#) [Walk-Away Door Lock on page 55](#)).

Close Windows on Lock: If on, all windows automatically close when you lock Model S Model X.

NOTE: To use the **Car Left Open Notification**, the mobile access setting must be turned on (**Controls > Safety > Allow Mobile Access**).



NOTE: Notifications are not sent when Model SModel X is in Camp Mode or if Tesla Theater (if equipped) is active.

Mirror Auto-Tilt: See [Mirrors on page 192](#).

Mirror Auto-Fold: See [Mirrors on page 192](#).

Lights

Control interior and exterior lights. See [Lights on page 204](#).

NOTE: You can also control the exterior headlights by touching the high beam headlights button on the left side of the steering wheelsteering yoke and then choosing an option using the touchscreen. See [High Beam Headlights on page 207#unique_44 on page](#) .

Display

Customize characteristics of the touchscreen and instrument panel:

- **Appearance:** Customize the display to be **Dark** or **Light**. When set to **Auto**, the brightness changes automatically based on ambient lighting conditions.
- **Brightness:** Drag the slider to manually control the brightness level. If **Display Mode** is set to **Auto**, the touchscreen further adjusts based on both the ambient lighting conditions and your brightness preference. Model SModel X remembers your chosen brightness preference and adjusts the touchscreen accordingly.

Energy Saving: When toggled on, Model SModel X reduces the amount of energy being consumed when not in use (for newer vehicles, this is automated). See [Getting Maximum Range on page 261](#).

Screen Clean Mode: When enabled, your touchscreen darkens and temporarily disables to facilitate cleaning. Follow the onscreen instructions to exit Screen Clean Mode.

Touchscreen Language: Select the language that the touchscreen displays.

NOTE: Model SModel X must be in Park to change the language. When you change the language, you experience a brief delay as Model SModel X shuts down and restarts the touchscreen.

Voice Recognition Language: Choose the language to be used for voice commands.

Voice Navigation Language: Choose the language that the navigation system uses for spoken instructions.

Lock Rear Display: Lock access to the rear touchscreen.

Time: Choose to display time in either 12 or 24 hour format.

Energy Display: Choose to display remaining energy and charging units as either a percentage of battery energy remaining, or as an estimate of the distance you can drive.

Distance: Choose to display range using miles or kilometers.

Temperature: Choose to display temperature using Fahrenheit or Celsius.

Tire Pressure: Choose to display tire pressures using BAR or PSI.

Trips

View the odometer and view and reset up to two trip meters that summarize how far you have driven (see [Trip Information on page 260](#)).

Navigation

Customize how the navigation system works:

- **Navigation Volume:** Increase or decrease the volume of spoken navigation instructions by touching - or +, respectively. Fully decreasing the volume mutes the instructions. You can also mute navigation instructions when a navigation route is active by touching the volume icon on the turn-by-turn direction list.



NOTE: This volume setting applies only to the navigation system's spoken instructions. It does not change the volume of media player and phone calls.

- **Automatic Navigation:** If enabled and your phone's calendar is synced to Model S/Model X, you are automatically routed to an event if you get into Model S/Model X within two hours of the event's start time (assuming the event on your calendar includes a valid address). When this feature is turned on, Model S/Model X also automatically initiates a navigation route to your specified Home and Work locations on weekdays (see [Automatic Navigation on page 371](#)).
- **Trip Planner:** Use trip planner (if available in your market region) to plan your driving and add stops at superchargers if charging is needed to reach a destination to which you are navigating (see [Trip Planner on page 373](#)).
- **Online Routing:** When selected, Model S/Model X can automatically reroute you to a navigation destination to avoid delays (see [Online Routing on page 373](#)).
- **Avoid Ferries:** When on, navigation routes avoid the use of ferries.
- **Avoid Tolls:** When on, navigation routes avoid the use of tolls.
- **Use HOV Lanes:** When on, navigation routes include the use of High Occupancy Vehicle (HOV) lanes. This is particularly useful when using Navigate on Autopilot, if equipped (see [Navigate on Autopilot on page 316](#)). You are responsible for ensuring Model S/Model X is eligible to use HOV lanes.

NOTE: You can also display these navigation settings by touching the settings icon on the map (see [Maps and Navigation on page 368](#)).

Safety

Allow Mobile Access: Allow your Tesla mobile app to access your Model S/Model X (see [Mobile App on page 406](#)).

NOTE: To disable Allow Mobile Access, you must enter your Tesla account credentials.

Parking Brake: Manually apply and release the parking brake (see [Parking Brake on page 235](#)).

Power Off: Manually power off Model S/Model X (see [Powering Off on page 196](#)).

Speed Limit Mode: Speed Limit Mode allows you to limit acceleration and limit the maximum driving speed to a chosen value between 50 and 90 mph (80 and 145 km/h). The first time you use this feature, you must create a 4-digit PIN that you must use to enable and disable Speed Limit Mode. When enabled and the driving speed approaches within approximately 3 mph (5 km/h) of the maximum speed, a chime sounds, the instrument panel displays a message, and Model S/Model X sends a notification to the mobile app. To enable Speed Limit Mode:

1. Ensure Model S/Model X is in Park.
2. Touch **Controls > Safety > Speed Limit Mode** on the touchscreen, or touch **Controls** in your mobile app.
3. Select the maximum driving speed.
4. Drag the slider to the **On** position.
5. Enter the 4-digit PIN that you want to use to enable and disable Speed Limit Mode.

NOTE: If you forget the PIN, you can disable Speed Limit Mode by entering login credentials for your Tesla account.

NOTE: While Speed Limit Mode is enabled, the acceleration setting (**Controls > Pedals & Steering > Acceleration**) automatically sets to **Chill**.

 **WARNING:** Driving downhill can increase driving speed and cause Model S/Model X to exceed your chosen maximum speed.

 **WARNING:** Speed Limit Mode is not a replacement for good judgment, driver training, and the need to closely monitor speed limits and driving conditions. Accidents occur at any speed.

Sentry Mode: When enabled, cameras and sensors remain powered on and ready to record suspicious activity whenever Model S/Model X is locked and in Park. See ([Using Sentry Mode on page 397](#)).

Third Row Easy Entry: If your Model S/Model X is equipped with monopost seats and a third row, a third row ingress button is located on the backrest of each outboard monopost seat in the second row. This button makes it easy for passengers to enter and exit the third row seating positions. Use this setting to choose how you want the button to work (see [Monopost Seats on page 115](#)).



View Live Camera via Mobile App: Enable to see a live video feed of your vehicle's surroundings from the mobile app (see [Using Sentry Mode on page 397](#)).

Dashcam: When enabled, cameras can record and save video footage of the surrounding roadway (see [Using Dashcam on page 396](#)). Customize Dashcam by selecting:

- **Auto:** Dashcam automatically saves a recording to the USB flash drive (if available and installed) in situations where Model S/Model X detects a safety event, such as a collision or airbag deployment.
- **Manual:** You must touch the Dashcam icon to save a recording of the most recent 10 minutes of driving to the USB flash drive.
- **Off:** Dashcam is disabled until you select **Auto** or **Manual**.
- **On Honk:** When you press the horn, Dashcam saves a recording of the most recent 10 minutes of driving to the USB flash drive.

Delete Dashcam Clips: Deletes all Dashcam and Sentry Mode footage, including recent and saved clips.

Format USB Drive: If a USB flash drive is inserted into a front USB port, touch to format the flash drive to allow Model S/Model X to save video recordings using Dashcam, Sentry Mode or Track Mode (see [USB Drive Requirements for Recording Videos on page 80](#) [USB Drive Requirements for Recording Videos on page 88](#)).

Park Assist Chimes: If on, a beep sounds when Model S/Model X approaches an object while parking (see [Park Assist on page 245](#)).

Joe Mode: If on, Joe Mode lowers the volume of your vehicle's chimes, except for turn signals.

NOTE: Joe Mode may not be available at delivery.

Security Alarm: Enable the security alarm (see [Security Settings on page 394](#)).

Tilt/Intrusion: If your vehicle is equipped with the security package, a battery-backed siren sounds in situations where Model S/Model X detects motion inside the cabin, or is moved or tilted (for example, with a tow truck or jack). See [Tilt/Intrusion \(if equipped\) on page 394](#).

Passive Entry: If on, doors automatically unlock and door handles extend (if Auto-Present Handles is on) whenever you approach Model S/Model X carrying a key fob. If off, you must use the key fob to unlock Model S/Model X. See [Using the Key Fob on page 43](#).

NOTE: You must press the brake pedal to power Model S/Model X on before you can change the Passive Entry setting. See [Starting on page 195](#).

NOTE: If Passive Entry is off and you do not press the brake pedal to start Model S/Model X within approximately five minutes, a message displays on the instrument panel and you must use the key fob to lock, then unlock Model S/Model X again before starting the vehicle.

NOTE: When you enable passive entry, it is recommended that you also enable **PIN to Drive** to increase security (see [PIN to Drive on page 394](#)).

PIN to Drive: Increase security by preventing Model S/Model X from being driven until a 4-digit PIN (Personal Identification Number) is entered (see [PIN to Drive on page 394](#)).

Glovebox PIN: For additional security, protect glovebox contents using a 4-digit PIN (see [Glovebox PIN on page 394](#)).

Cabin Overheat Protection: Reduce the temperature of the cabin in extremely hot ambient conditions for a period of up to twelve hours after you exit Model S/Model X (see [Cabin Overheat Protection on page 367](#)). Cabin Overheat Protection stops operating after 12 hours, or when the energy remaining in the Battery drops to 20%, whichever occurs first.

Active Road Noise Reduction: Specify if and how you want Active Road Noise Reduction to operate (see [Active Road Noise Reduction on page 91](#)).

Service

Owner's Manual: View the onscreen Owner's Manual. A new version of the onscreen owner's manual is typically provided with every software update and therefore contains more recent information than those provided by Tesla elsewhere (for example, via the web).



Car Wash Mode: Enable before using a car wash to ensure all doors and windows are closed, and all chimes are turned off. See [Car Wash Mode on page 446](#).

Adjust Headlights: Make adjustments to the level of the headlights .



CAUTION: Headlights should only be adjusted by Tesla Service.

Towing: Prepare Model SModel X to be transported by keeping it in Neutral (with the parking brake disengaged), when you exit. See [Instructions for Transporters on page 503](#)[Instructions for Transporters on page 510](#)[Instructions for Transporters on page 517](#).

Wheel Configuration: Update your vehicle's wheel configuration if you are installing new wheels or swapping them for different ones. This also displays the correct wheel on your vehicle's avatar on the touchscreen.



CAUTION: Changing your vehicle's wheel configuration can impact range estimates, tire pressure warnings, and vehicle visualization. See [Tire Care and Maintenance on page 431](#).



WARNING: Only use Tesla-approved wheels when installing or swapping wheels. Using non Tesla-approved wheels can cause serious damage. Tesla is not liable for damage caused by using wheels not approved by Tesla.

Reset TPMS Sensors: Reset the TPMS sensors after replacing a wheel (see [Resetting the TPMS Sensors on page 437](#)).

Notifications: Display a list of notifications that have recently appeared on your vehicle.

Update Key Fob: Your vehicle must be in Park to update your key fob. See [Using the Key Fob on page 43](#) for more information.

Spoiler Mode (if equipped): The spoiler can change position to provide maximum visibility and the most effective aerodynamics for Model X. To enable, choose **Automatic** (see [Active Spoiler on page 268](#)).

Reset Bluetooth Functionality: (For vehicles manufactured before approximately April 2018) If Bluetooth is taking an exceptionally long time to pair, reset Bluetooth functionality and pair your device again. See [Pairing a Bluetooth Phone on page 381](#).

Camera Calibration: Clear the existing calibration of Autopilot cameras to reset the stored camera positions and angles. Once calibration is cleared, you must drive to calibrate the cameras. See [Drive to Calibrate Cameras on page 291](#) for more information.

Factory Reset: Erase all personal data (saved addresses, music favorites, HomeLink programming, etc.) and restore all settings to their factory defaults. This is useful when transferring ownership of Model SModel X. Before erasing, you must enter the credentials for your Tesla account.

Jack Mode: Disables self-leveling of the air suspension system.



WARNING: The air suspension system causes Model SModel X to self-level, even when powered off. Therefore, when transporting or lifting, you must engage **Jack Mode** to disable self-leveling (see [Instructions for Transporters on page 517](#)[Instructions for Transporters on page 503](#)[Instructions for Transporters on page 510](#)and [Jacking and Lifting on page 462](#)).

Wiper Service Mode: Turn on to provide easy access to wiper blades (see [Wiper Blades and Washer Jets on page 450](#)).

Software

Learn more about your Model SModel X and the status of software updates:

- Get more information about your Model SModel X such as the VIN, vehicle name, and odometer. Touch **Additional vehicle information** to display a list of the various options your vehicle is equipped with.
- View your current software version, map version, and release notes.
- View and install new software updates. Model SModel X must be connected to Wi-Fi to update the software.
- Customize how often you want to receive software updates by touching **Software Update Preferences** (see [Software Update Preferences on page 404](#)).
- **Data Sharing:** Allow sharing cabin camera analytics with Tesla to help improve safety features (see [#unique_49 on page 404](#)).



To further personalize Model SModel X, you can name it. Touch **Controls > Software > Name Your Vehicle** located on the right side of the screen below the image of your Model SModel X. If your Model SModel X has already been named, its name displays instead and you can simply touch the existing name to change it. Enter the new name in the popup, then touch **Save**. The name of your Model SModel X also appears in your Tesla mobile app.

Erasing Personal Data

You can erase all personal data (saved addresses, music favorites, HomeLink programming, etc.) and restore all customized settings to their factory defaults. This is useful when transferring ownership of Model SModel X. Touch **Controls > Service > Factory Reset**. Before erasing, Model SModel X verifies your credentials by prompting you to enter the user name and password associated with your Tesla account.



Climate Controls

Overview of Climate Controls

Climate controls are available at the bottom of the touchscreen. To turn the climate control system on, touch the temperature icon. To turn it off, touch and hold the temperature or touch the temperature icon to display the climate control popup, then touch the power button.

By default, climate control is set to **Auto**, which maintains optimum comfort in all but the most severe weather conditions. When you adjust the cabin temperature in the **Auto** setting, the system automatically adjusts the heating, air conditioning, air distribution, and fan speed to maintain the cabin at your selected temperature. Touch and hold the temperature to customize settings in the climate control screen. You can revert back to **Auto** at any time by touching **Auto**.

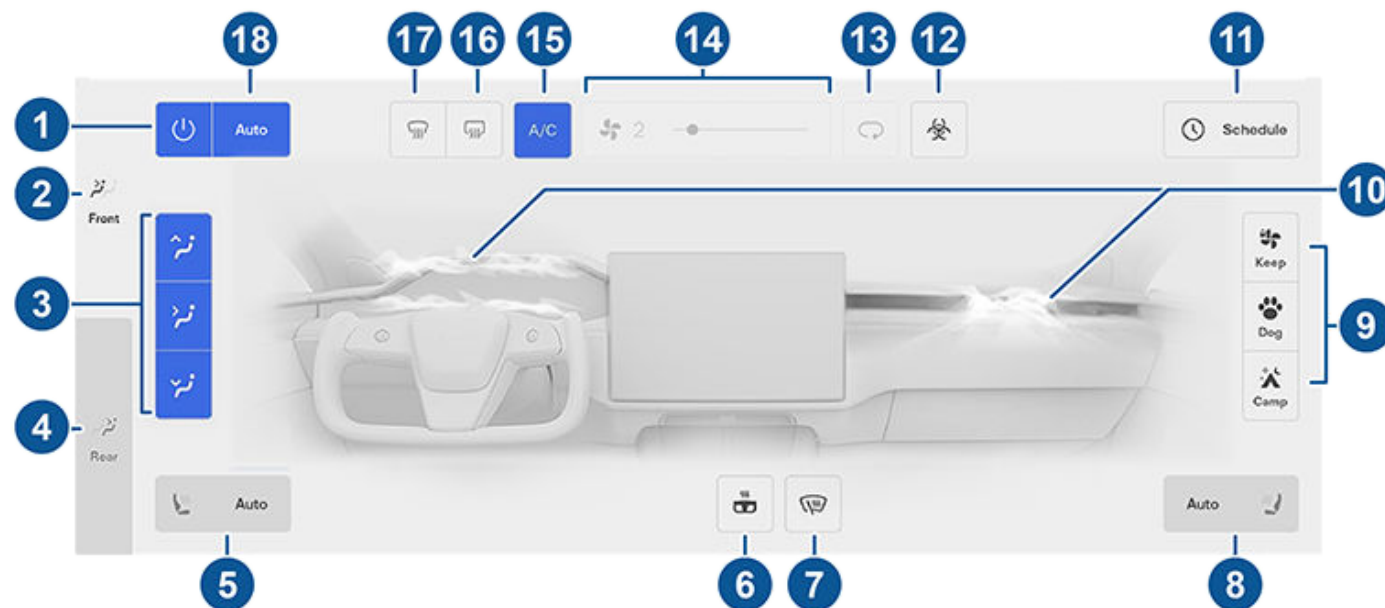
NOTE: The climate control system is powered by the high voltage Battery. Therefore, prolonged use decreases driving range.

WARNING: To avoid burns resulting from prolonged use, individuals who have peripheral neuropathy, or whose capacity to feel pain is limited because of diabetes, age, neurological injury, or some other condition, should exercise caution when using the climate control system and seat heaters.

Adjusting Climate Control Settings

To override the **Auto** setting, touch the temperature, turn off the **Auto** setting, then adjust settings by touching the icons that are no longer grayed out.

NOTE: You can easily adjust your climate preferences, such as turning on the seat heater or changing the cabin temperature, hands-free by using voice commands (see [Voice Commands on page 391](#)).



1. Touch to turn the climate control system on or off.
2. Touch to adjust the climate settings for the front cabin.
3. Choose where air flows into the front cabin (windshield, face-level, or foot-level vents). You can choose more than one location.

NOTE: When air is directed to the foot-level vents, air continues to flow to the windshield vents to assist in defogging. When air is directed to the face-level vents, air does not flow to the windshield.

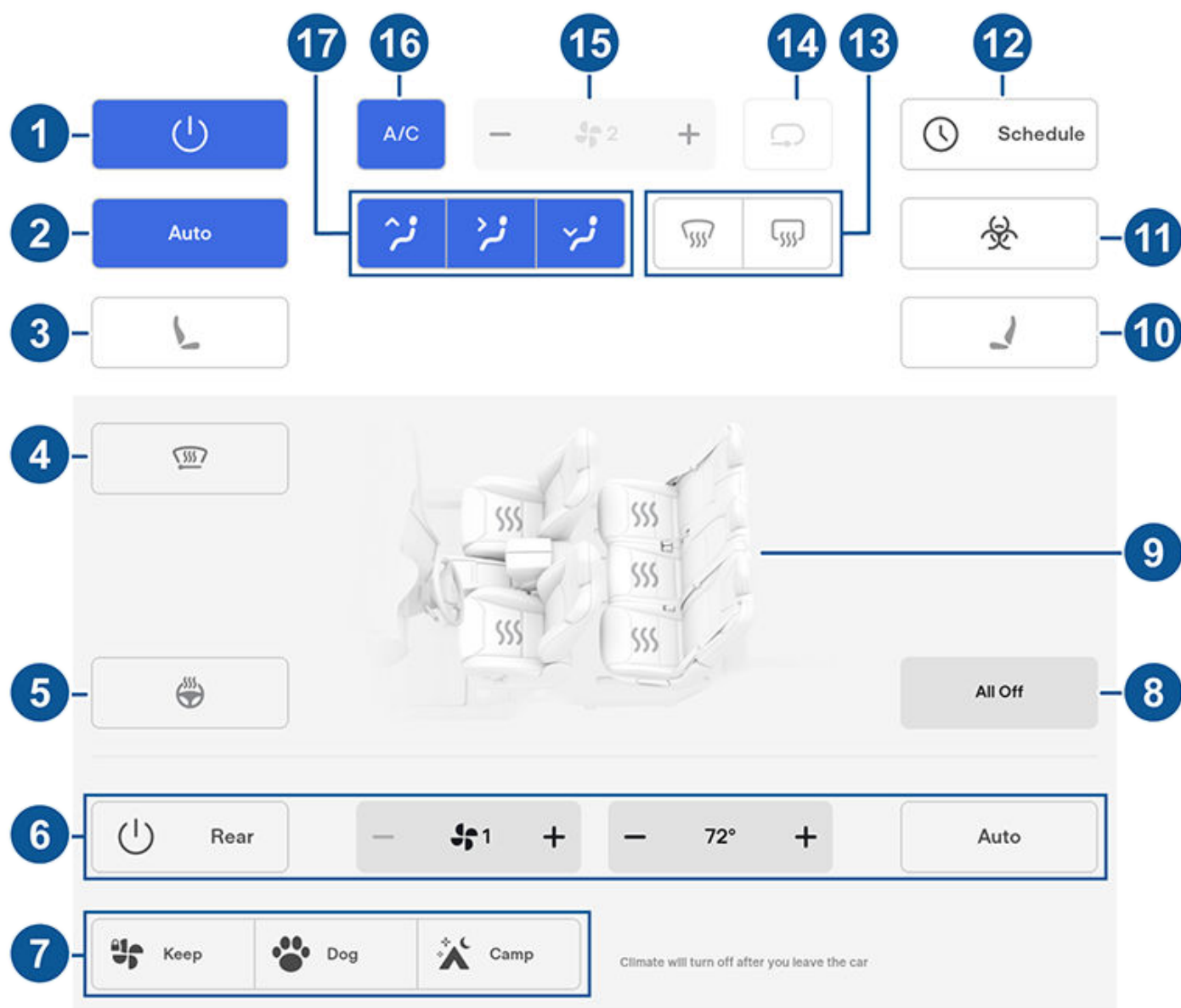
4. Touch to adjust the climate settings for the rear cabin. Passengers seated in the rear cabin can use the rear touchscreen to turn the rear fan on and off, adjust seat heaters, and control how air flows from the rear vents.



5. Touch the driver's side seat icon to adjust seat heaters for the driver. The seat operates at three levels from 3 (highest) to 1 (lowest). The seat icon displays twisting lines that turn red (heating) or blue (cooling) corresponding with the set level. **Auto**, which displays when the climate control system is set to **Auto**, warms or cools the front seats based on cabin temperature.
6. Touch to turn on the heated steering wheelsteering yoke.
7. Touch to turn on the heated wipers. Wipers de-ice for 15 minutes then turn off automatically.
8. Touch the passenger's side seat icon to adjust seat heaters for the front passenger. The seat operates at three levels from 3 (highest) to 1 (lowest). The seat icon displays twisting lines that turn red (heating) or blue (cooling) to corresponding with the set level. **Auto**, which displays when the climate control system is set to **Auto**, warms or cools the front seats based on cabin temperature.
9. When in Park, these settings display to allow you to keep the climate control system operating, even when you leave Model SModel X (see [Keep Climate On, Dog, and Camp on page 366](#)).
10. Touch to adjust how air flows from the front vents. See [Adjusting the Front and Rear Vents on page 364](#).
11. When Model SModel X is in Park, touch **Schedule** to set a recurring daily time when you want Model SModel X to be ready to drive by preconditioning the Battery and cabin climate and/or charging during off-peak hours (see [Scheduled Charging and Scheduled Departure on page 425](#)).
12. If your Model SModel X is equipped with the medical-grade HEPA (High Efficiency Particulate Air) filter, this filter ensures the best quality air inside the cabin whenever the climate control system is on and outside air is entering the cabin (recirculate is off). The HEPA filter is extremely effective at removing particles, including pollution, allergens, bacteria, pollen, mold spores, and viruses. Both the HEPA filter and the secondary filtration system also contain activated carbon to remove a broad spectrum of odors and gases. When you engage Bioweapon Defense Mode, the positive pressure inside the cabin minimizes the amount of outside air that can enter the vehicle.
NOTE: Some gases, such as carbon monoxide, are not effectively removed by activated carbon.
13. Touch to control the flow of air inside the cabin. Air can be drawn into Model SModel X from outside or air can be recirculated inside the cabin.
14. Use the slider to adjust the fan speed.
NOTE: Adjusting the fan speed may change the selected setting for how air is drawn into Model SModel X in order to increase or reduce air flow.
15. Touch to turn the air conditioning system on or off. Turning it off reduces cooling, but saves energy.
NOTE: Because Model SModel X runs much quieter than a gasoline-powered vehicle, you may notice the sound of the air conditioning compressor as it is operating. To minimize noise, reduce the fan speed.
16. Touch to warm up the rear windshield. When operating, the icon turns red. After 15 minutes, the rear window defroster automatically turns off. The exterior side mirrors are also heated whenever the rear window defroster is operating.
17. The windshield defroster distributes air flow to the windshield. Touch once to *defog* the windshield (the icon turns blue) (the icon turns yellow). Touch a second time to *defrost* the windshield (the icon turns red and the heating and fan operate at maximum levels). Touch a third time to turn off and restore the air distribution, heating, and fan to their previous settings. In cold ambient temperatures, the exterior side mirrors are also heated whenever the windshield defroster is operating. See [Cold Weather Best Practices on page 284](#) for more information on preparing for cold weather.
18. Touch **Auto** to turn the Auto setting on or off.

Adjusting Climate Controls

NOTE: You can easily adjust your climate preferences, such as turning on the seat heater or changing the cabin temperature, hands-free by using voice commands (see [Voice Commands on page 391](#)).



1. Touch to turn the climate control system on or off.
2. Touch **Auto** to turn the Auto setting on or off.
3. Touch the driver's side seat icon to adjust seat heaters for the driver. The seat operates at three levels from 3 (highest) to 1 (lowest).
4. Touch to turn the heater on for the heated wipers (if equipped). Wipers de-ice for 15 minutes then turn off automatically.
5. Touch to turn the heater on or off for the steering wheel.
6. Touch to adjust the climate settings for the rear cabin. Passengers seated in the rear cabin can use the rear touchscreen to turn the rear fan on and off, adjust seat heaters, and control how air flows from the rear vents.
7. When in Park, these settings display to allow you to keep the climate control system operating, even when you leave Model S/Model X (see [Keep Climate On, Dog, and Camp on page 366](#)).
8. Touch to turn all seat heaters off.
9. Touch to adjust seat heaters for front and rear seats.
10. Touch the passenger's side seat icon to adjust seat heaters for the front passenger. The seat operates at three levels from 3 (highest) to 1 (lowest).



11. If your Model SModel X is equipped with the medical-grade HEPA (High Efficiency Particulate Air) filter, this filter ensures the best quality air inside the cabin whenever the climate control system is on and outside air is entering the cabin (recirculate is off). The HEPA filter is extremely effective at removing particles, including pollution, allergens, bacteria, pollen, mold spores, and viruses. Both the HEPA filter and the secondary filtration system also contain activated carbon to remove a broad spectrum of odors and gases. When you engage Bioweapon Defense Mode, the positive pressure inside the cabin minimizes the amount of outside air that can enter the vehicle.

NOTE: Some gases, such as carbon monoxide, are not effectively removed by activated carbon.

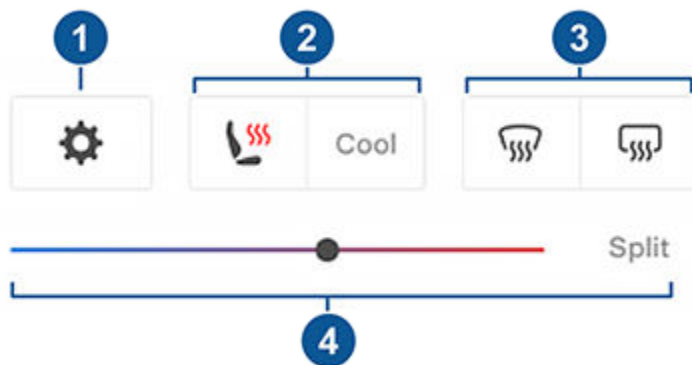
12. When Model SModel X is in Park, touch **Schedule** to set a recurring daily time when you want Model SModel X to be ready to drive by preconditioning the Battery and cabin climate and/or charging during off-peak hours (see [Scheduled Charging and Scheduled Departure on page 425](#)).
13. Touch to turn on the front or rear window defrosters.
14. Touch to control the flow of air inside the cabin. Air can be drawn into Model SModel X from outside or air can be recirculated inside the cabin.
15. Use the slider to adjust the fan speed.

NOTE: Adjusting the fan speed may change the selected setting for how air is drawn into Model SModel X in order to increase or reduce air flow.

16. Touch to turn the air conditioning system on or off. Turning it off reduces cooling, but saves energy.
- NOTE:** Because Model SModel X runs much quieter than a gasoline-powered vehicle, you may notice the sound of the air conditioning compressor as it is operating. To minimize noise, reduce the fan speed.
17. Choose where air flows into the front cabin (windshield, face-level, or foot-level vents). You can choose more than one location.
- NOTE:** When air is directed to the foot-level vents, air continues to flow to the windshield vents to assist in defogging. When air is directed to the face-level vents, air does not flow to the windshield.

Climate Popup

Touch the temperature arrows on the bottom of the touchscreen to display a popup for easy access to some of the most common climate controls:

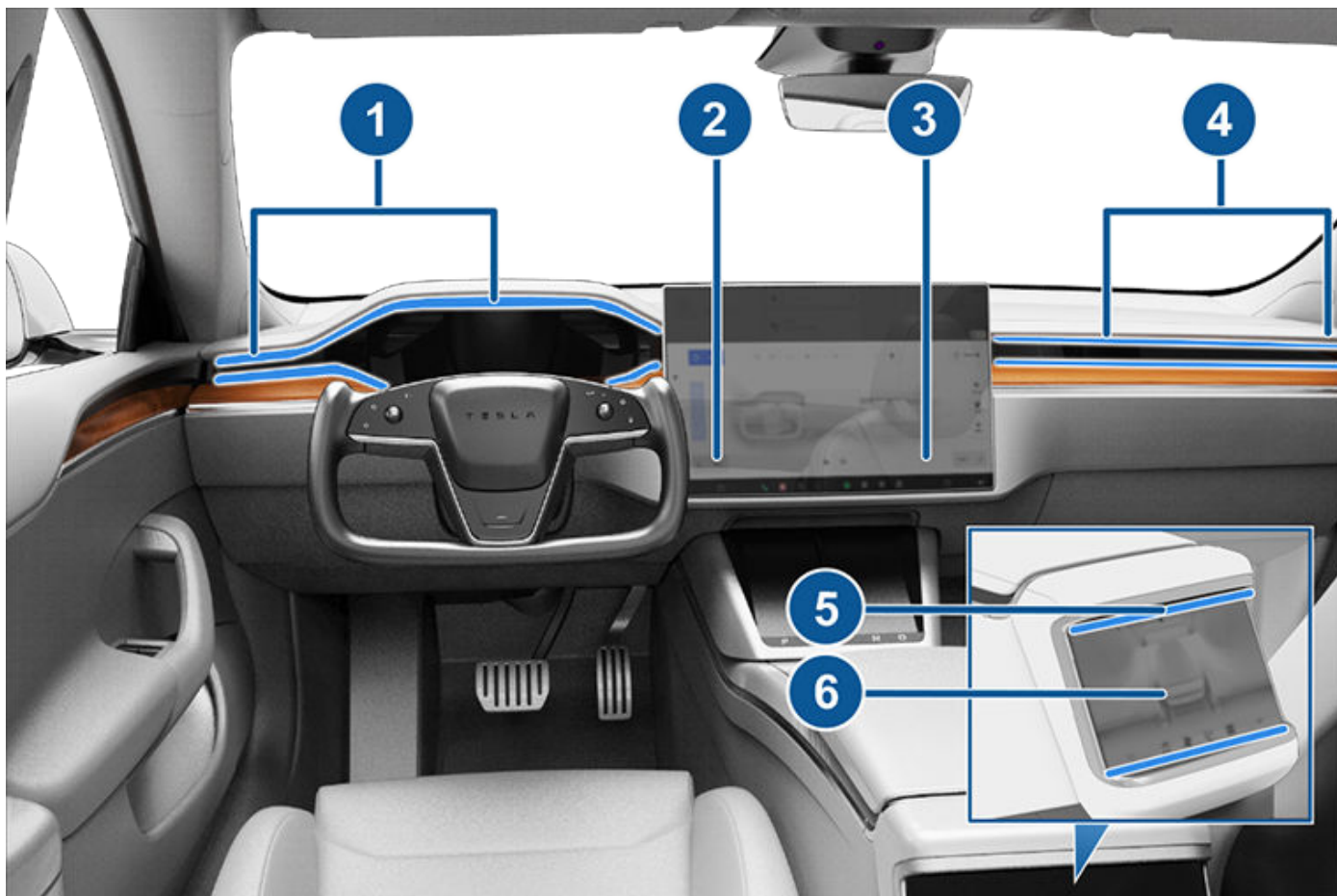


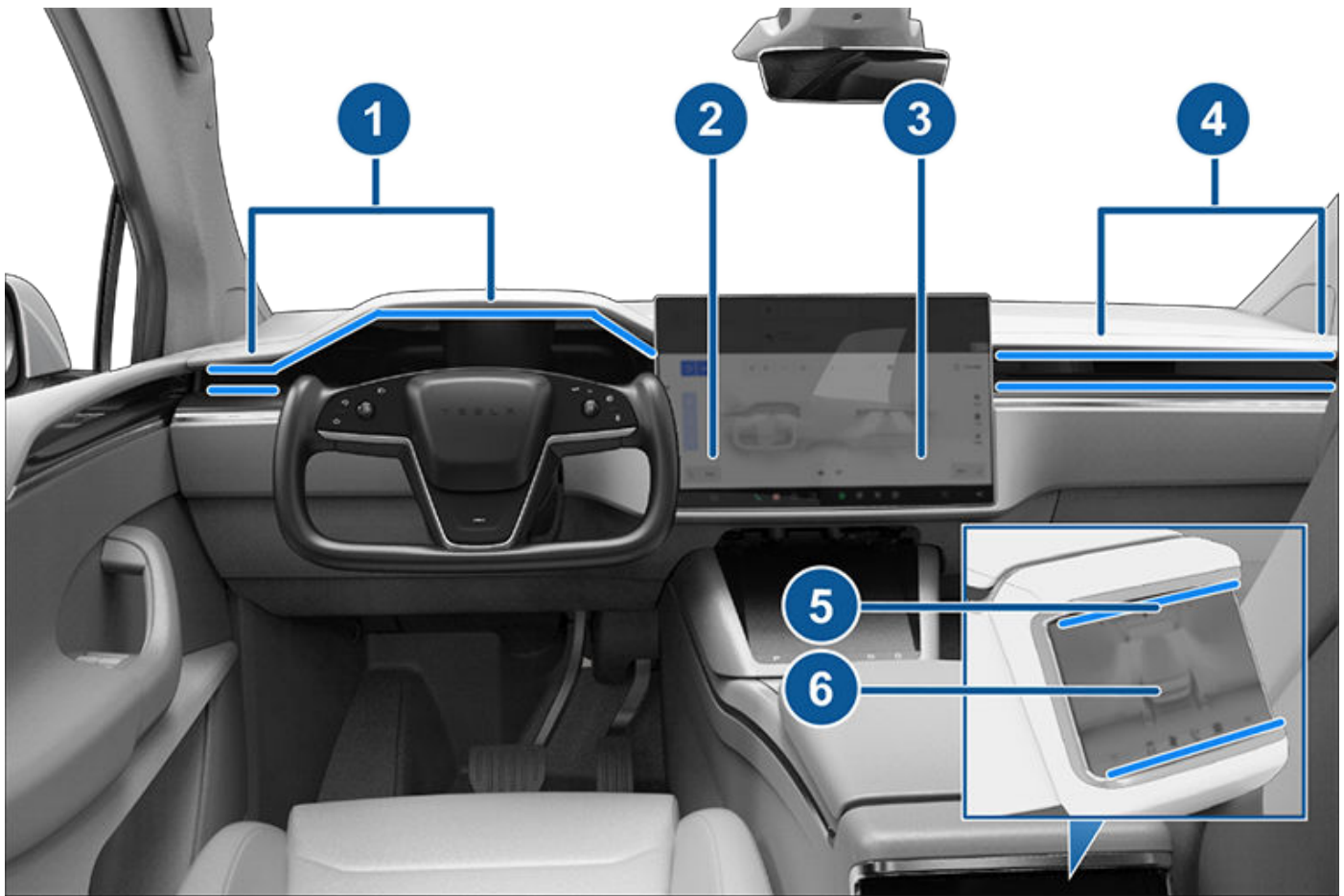
1. Touch to access the main climate controls screen.
2. Enable or disable heated or cooling seats (if equipped).
3. Enable or disable the front or rear windshield defrosters.
4. Modify the cabin temperature by dragging along the slider. You can also enable temperature splitting which allows the driver and front passenger to customize their own climate preferences. The front passenger can touch the temperature icon on the bottom of the touchscreen or the main climate controls screen to adjust. Touch **Split** again to disable climate splitting.



Adjusting the Front and Rear Vents

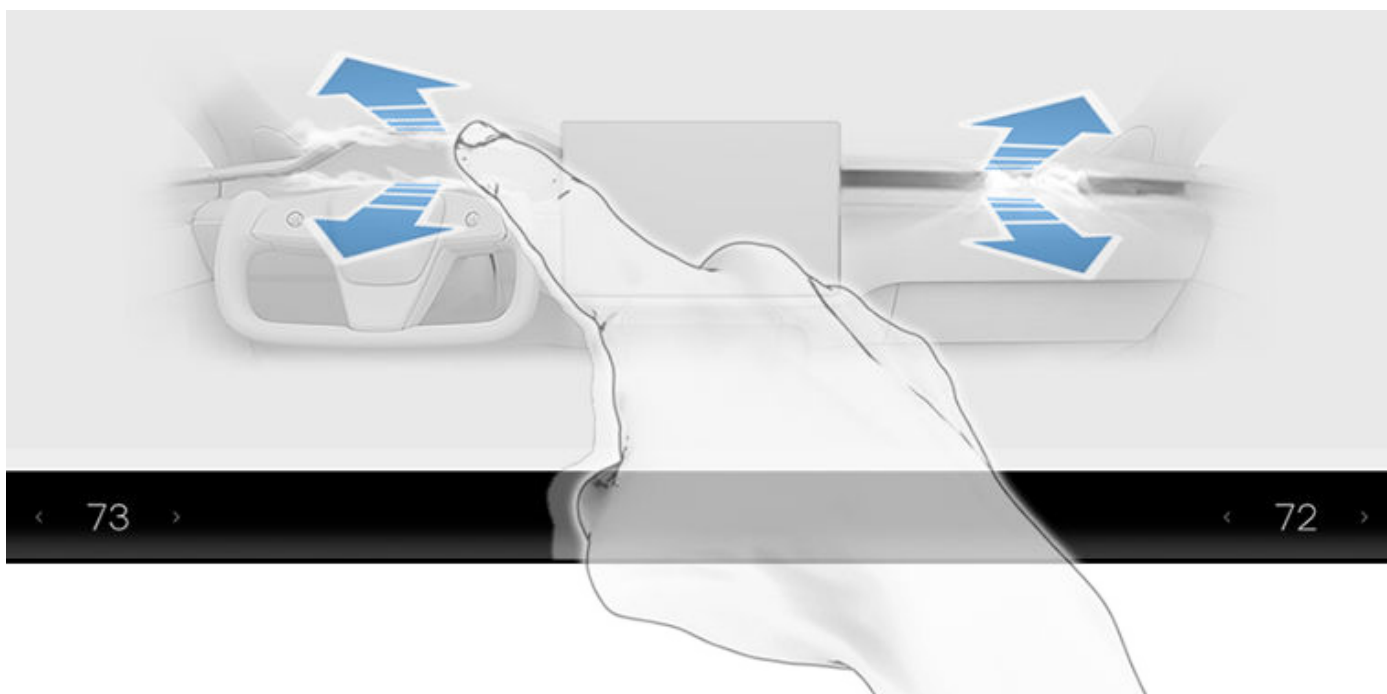
Model SModel X has a unique horizontal face-level vent that spans the width of the dashboard. It also has vents at the top and bottom of the rear console.





1. Driver vents
2. Driver controls
3. Passenger controls
4. Passenger vents
5. Rear vents
6. Rear controls

Using the touchscreens, you can pinpoint exactly where you want to direct the air flowing from this vent when heating or cooling the cabin. When the face-level vent is on you can adjust the direction of the air flow from each vent. To adjust the direction of the air flow, touch the radiating air waves from the corresponding vent on the touchscreen. The air flows in a single stream when centered or splits into mirrored air streams when air is directed outward or inward from the center of the vent.



NOTE: When you split a vent into two separate air flows, the air flow in each direction is not as strong as when all air is flowing in a single direction.

NOTE: Outside air is drawn into Model S/Model X through the grill in front of the windshield. Keep the grill clear of obstructions, such as leaves and snow.

Keep Climate On, Dog, and Camp

The **Keep Climate On**, **Dog**, and **Camp** settings allow you to keep the climate control system running when in Park, even after you've left Model S/Model X or choose to stay inside the vehicle. These settings are useful when it is important to maintain the cabin temperature in hot or cold weather conditions. For example, when leaving groceries in Model S/Model X on hot days, you may want to use Keep Climate On to prevent spoilage.

Dog is designed to maintain a comfortable cabin temperature for your pet while you actively and frequently monitor this temperature using the mobile app (which requires both your phone and the vehicle to have cellular connectivity). When in Dog, the touchscreen displays the current cabin temperature to inform people passing by that your pet is safe. This setting is not intended for people, and should only be used for short periods of time while you stay in close proximity should you need to return to the vehicle in situations where the temperature can no longer be maintained.

Camp allows you to power electronics through the USB ports and low voltage outlet in addition to maintaining the cabin temperature. The touchscreen remains on so you can play music, browse the internet, play games in the arcade, or watch shows in Tesla Theater. You can also control media and climate settings from a paired phone. Camp is ideal for remaining inside your vehicle, such as camping or staying with a child. While active, Sentry Mode and the vehicle alarm system are disabled.

To operate Keep Climate On, Dog, or Camp:

1. Make sure the Battery's charge level is at least 20%.
2. Engage Park. The **Keep Climate On**, **Dog**, and **Camp** settings are available only when Model S/Model X is in Park.
3. If necessary, adjust the climate settings.
4. On the climate controls screen, touch **Keep Climate On**, **Dog**, or **Camp**.

The climate control system attempts to maintain your climate settings until you shift out of Park or manually turn it off. Avoid using Keep Climate On, Dog, or Camp when the battery charge is low. If the Battery's charge level drops below 20%, the Tesla mobile app attempts to repeatedly send you notifications reminding you to check on anything that you have left in Model S/Model X.



NOTE: Software updates cannot be performed when Keep Climate On, Dog, or Camp is active.

NOTE: The intrusion sensor (if equipped) automatically disables when Keep Climate On, Dog, or Camp is active. However, you can override this behavior and keep the intrusion sensor enabled. To do so, touch **Controls > Safety > Tilt/Intrusion** after enabling Keep Climate On, Dog, or Camp. However, note that keeping the intrusion sensor enabled while Keep Climate On, Dog, or Camp is active can trigger an alarm event as a result of air movement inside the cabin.



WARNING: Never leave a child unattended in your vehicle.



WARNING: Check local laws for any restrictions on leaving pets unattended in your vehicle.



WARNING: You are responsible for the safety of your dog or pet. Never leave them in Model SModel X for long periods of time. Constantly monitor the vehicle temperature and their well-being. Make sure you have sufficient cellular coverage on your phone and time to return to the vehicle, if necessary.



WARNING: In the unlikely even that your climate control system needs service or is not working as expected, avoid using Keep Climate On, Dog, and Camp. Never rely on your vehicle to protect something irreplaceable.



WARNING: You can adjust and monitor the climate control system remotely using the mobile app. However, if you use the mobile app to turn off the climate control system, Keep Climate On, Dog, and Camp stop operating.

Cabin Air Filter(s)

Model SModel X has one or more air filters to prevent pollen, industrial fallout, road dust and other particles from entering through the vents.

NOTE: Cabin air filter(s) require periodic replacement. See [Service Intervals on page 429](#).

Cabin Overheat Protection

The climate control system can reduce the temperature of the cabin in extremely hot ambient conditions for a period of up to twelve hours after you exit Model SModel X. Touch **Controls > Safety > Cabin Overheat Protection** and choose:

- **OFF:** Disable Cabin Overheat Protection.
- **ON:** The air conditioning operates when the cabin temperature exceeds 105° F (40° C).

NOTE: Cabin Overheat Protection operates until 12 hours has elapsed since you exited Model SModel X, or until the Battery energy drops below 20%, whichever comes first.



WARNING: Never leave children or pets in the vehicle unattended. Due to automatic shut-off or extreme outside conditions, the inside of the vehicle can become dangerously hot, even when Cabin Overheat Protection is enabled.

Climate Control Operating Tips

- When you use the mobile app to turn on the climate control system, it automatically turns off after four hours or if the charge level drops to 20%. To cool or heat the cabin for a longer period, you must turn it on again.
- To conserve energy, turn on Range Mode to limit the power of the climate control system (touch **Controls > Pedals & Steering > Range Mode**). Cabin heating and cooling may be less effective, but you can use seat heaters to provide warmth in colder climates.
- If the climate control system is louder than you prefer, manually reduce the fan speed.
- In addition to cooling the interior, the air conditioning compressor also cools the Battery. Therefore, in hot weather, the air conditioning compressor can turn on even if you turned it off. This is normal because the system's priority is to cool the Battery to ensure it stays within an optimum temperature range to support longevity and optimum performance.
- Even when not in use, you may hear Model SModel X emit a whining noise or the sound of water circulating. These sounds are normal and occur when the internal cooling systems turn on to support various vehicle functions, such as maintaining the low voltage battery and balancing the temperature of the high voltage Battery.
- To ensure the climate control system operates efficiently, close all windows and ensure that the exterior grille in front of the windshield is free of ice, snow, leaves, and other debris.
- In very humid conditions, it is normal for the windshield to fog slightly when you first turn on the air conditioning.
- It is normal for a small pool of water to form under Model SModel X when parked. Extra water produced by the dehumidifying process is drained underneath.



- To reduce the temperature in the cabin in hot weather conditions, the fan may turn on to vent the cabin when the vehicle is parked. This occurs only if the battery's charge level is above 20%.

Maps and Navigation

Map Overview

The touchscreen displays a map at all times (except when Model S/Model X is shifted into Reverse).

Use your finger(s) to interact with the map:

- To move the map in any direction, hold and drag a finger.
- To rotate the map in any direction, hold and turn two fingers.
- To zoom the map in or out, expand or pinch two fingers, respectively.

NOTE: When you rotate or move the map, your current location is no longer tracked. The message "Tracking Disabled" displays briefly next to the map orientation icon and the icon turns gray. To re-enable tracking, touch the map's orientation icon and choose North Up or Heading Up.

NOTE: The map zooms in and out automatically when a navigation route is active.

To change the orientation of the map, toggle between these options:



North Up - North is always at the top of the screen.



Heading Up - The direction you are driving is always at the top of the screen. The map rotates as you change direction. This icon has an integrated compass that indicates the direction you are driving.

NOTE: Touching this icon while navigating to a destination displays the route overview.



The route overview is available when you are navigating to a destination. The route overview also displays when you expand the turn-by-turn direction list (by swiping it downward). When you collapse the turn-by-turn direction list by swiping it upward, the map reverts back to displaying your previously chosen orientation.

Your current location is shown on the map. When you rotate or move the map, your current location is no longer tracked. To re-enable tracking, touch the map's orientation icon to choose North Up or Heading Up. When you touch the map while a navigation route is active, the turn-by-turn direction list displays the next set of directions and the orientation icon disappears. Touch anywhere on the map to re-display it.

Map Display

Touch these icons to customize what the map displays:



Display/hide satellite imagery (if equipped with premium connectivity).



Display/hide traffic conditions (if equipped with premium connectivity). Green lines indicate no traffic; orange lines indicate light traffic; red lines indicate moderate traffic; and pink lines indicate heavy traffic. To ensure traffic is easy to identify along a navigation route, green traffic lines display under the blue route line, whereas orange, red, and pink traffic lines display on top of the blue route line.



Display/hide map details (such as points of interest).

Drop a pin anywhere on the map by pressing and holding your finger on a desired location. When you drop a pin, or touch an existing pin, the chosen location is centered on the map, and a popup screen provides information about the location. From this popup, you can navigate to the location, call the location (if a phone number is available) and add or remove the location from your list of favorite destinations (see [Home, Work, and Favorite Destinations on page 371](#)).



Display/hide all charging locations and a popup list that includes the city and proximity of the corresponding stations on the map. Charging locations include Tesla Superchargers, destination charging sites, third-party fast chargers, and public chargers that you have used previously. See [Charging Locations on page 372](#).

Touch the lightning bolt icons in the popup list to filter by the types of chargers based on max power.

NOTE: In some market regions, third-party fast chargers are also included on the map as dark gray pins when you display chargers.

Navigation Settings



The navigation settings icon displays when you touch ... once you start navigating to a destination.

NOTE: You can also access navigation settings by touching **Controls** > **Navigation**.

Touch the navigation settings icon to customize the navigation system to suit your preferences: (the available settings vary depending on your market region and vehicle configuration):

- Touch **-** or **+** to increase or decrease the volume of spoken navigation instructions. Decreasing all the way to the left, or touching the speaker icon, mutes the instructions. You can also mute/unmute navigation instructions by touching the speaker icon. This volume setting applies only to the navigation system's spoken instructions. Volume for Media Player and Phone is not changed.
- Enable **Automatic Navigation** if you want Model S/Model X to automatically initiate a navigation destination when you get in your vehicle. Destinations are predicted based on commonly driven routes, time of day, and calendar entries (see [Automatic Navigation on page 371](#)).
- Enable **Trip Planner** to add supercharger stops as needed. Supercharging stops are added to navigation routes with the goal of minimizing the amount of time you spend driving and charging (see [Trip Planner on page 373](#)).
- Enable **Online Routing** to be automatically rerouted to avoid heavy traffic (see [Online Routing on page 373](#)).
- Touch **Avoid Ferries** to be automatically routed to avoid ferries.
- Touch **Avoid Tolls** to be automatically routed to avoid tolls.
- Touch **Use HOV Lanes** to include High Occupancy Vehicle (HOV) lanes on navigation routes. This is particularly useful when using Navigate on Autopilot (see [Navigate on Autopilot on page 316](#)).

NOTE: The navigation settings available can vary depending on region and vehicle configuration.

Navigating to a Destination

To navigate to a location, touch the search bar in the corner of the map and enter a destination, send the destination from your phone, or speak a voice command (see [Voice Commands on page 391](#)). You can enter or speak an address, landmark, business, etc. When you touch the search bar, you can also choose from the following types of locations:

- A saved **Home** or **Work** location (see [Home, Work, and Favorite Destinations on page 371](#)).
- A **Charging** destination (see [Charging Locations on page 372](#)).
- A **Recent** destination (the most recent destination is listed at the top).



- A destination you have marked as a **Favorite** (see [Home, Work, and Favorite Destinations on page 371](#)).
- A popular restaurant when you're feeling **Hungry** or a popular destination (such as museums and amusement parks) when you're feeling **Lucky** (see [I'm Feeling Lucky, Hungry on page 371](#)).

NOTE: If a data connection is not available, onboard maps allow you to navigate to any destination, but you must enter the exact and complete address.

NOTE: You can start navigation remotely from your iOS® or Android™ device using the "share" functionality on your device after allowing access to the Tesla mobile app.

When you specify a location, the touchscreen zooms out to provide an overview of the route you need to travel and displays a turn-by-turn direction list. Estimated arrival time, driving time, and mileage displays at the bottom of the direction list. Battery images at the bottom of the list provide a visual representation showing estimates of how much Battery energy will remain when you reach your destination, and how much will remain if you make a round trip back to your current location. Note the following about the turn-by-turn direction list:

- A battery image provides a visual representation of how much Battery energy will remain when you reach your destination. See [Predicting Energy Usage on page 373](#).
- If charging is needed to reach your destination and Trip Planner is enabled (and available in your market region), the navigation route automatically includes Supercharger stops (see [Trip Planner on page 373](#)).
- If you won't have enough energy to reach your destination and there is no Supercharger on the route, an alert tells you that charging is needed to reach your destination.
- Each turn is preceded by the distance to the maneuver.
- To see the bottom of the list, you may need to drag the list upward.
- Touch the top of the list to minimize it.

While navigating, the map tracks your location and displays the current leg of your trip. You can display the entire route at any time by swiping down to expand the turn-by-turn direction list or touching the route overview icon.

If Navigate on Autopilot is enabled, you can turn it on for the navigation route by touching **Navigate on Autopilot** in the turn-by-turn direction list. Navigate on Autopilot is a full self-driving (Beta) feature that automatically changes lanes and steers Model S Model X along a navigation route, exiting controlled-access highways, etc. For details, see [Navigate on Autopilot on page 316](#).



The **Navigate on Autopilot** icon is blue when the feature is active.

To stop navigating, touch **END**, located in the bottom corner of the turn-by-turn direction list.

Adding Stops to a Route

After you have entered a destination, you can edit your route by adding, deleting or reordering stops. Touch the three dots at the bottom of the turn-by-turn direction list to view options to edit your route.



Add Stop allows you to add a stop by searching for a location or adding a Home, Recent or Favorite destination. You can also add a stop by touching any pin on the map and selecting **Add** from the popup.



Edit Stop allows you to set up a complex trip by adding or deleting stops on your route. Drag and drop stops by touching the equal sign to reorder your trip.



Automatic Navigation

NOTE: Automatic Navigation may not be available in all market regions and on all vehicle configurations.

Automatic Navigation can predict a destination when you get in your vehicle. When your phone's calendar is synced to Model SModel X, and the calendar includes an event that takes place within two hours of when you get in your vehicle to drive, Automatic Navigation suggests the location of the event (assuming a valid address is associated with the event).

In addition, if you are Home and get in your vehicle on weekdays (Monday to Friday) from 5:00 AM to 11:00 AM, Automatic Navigation can automatically route you to your specified Work location (see [Home, Work, and Favorite Destinations on page 371](#)). Likewise, if you are at work on weekdays from 3:00 PM to 11:00 PM, Automatic Navigation can automatically route you to your specified Home location.

To enable Automatic Navigation, touch **Controls > Navigation > Automatic Navigation**. You must have your phone's calendar synced to Model SModel X and the event must include a uniquely specified and valid address (see [Phone and Calendar on page 381](#)).

NOTE: Navigation instructions that you enter manually, or send to Model SModel X, override routes suggested by Automatic Navigation.

I'm Feeling Lucky, Hungry

NOTE: "I'm Feeling Lucky" and "I'm Feeling Hungry" may not be available in all market regions and on all vehicle configurations.

In addition to navigating to a destination of your choice, Model SModel X can also suggest nearby locations based on whether you are feeling **Hungry** or **Lucky**. In the navigation search bar, touch **Hungry** or **Lucky**. **Hungry** suggests popular restaurants, whereas **Lucky** suggests popular destinations (such as museums and amusement parks). For a new suggestion, go back and touch **Hungry** or **Lucky** again for different results. When you discover a destination that interests you, touch **Navigate** to proceed to the destination.

This feature requires the latest version of Navigation maps. To download, connect Model SModel X to Wi-Fi and touch **Controls > Software** to check if an update is available (see [Map Updates on page 374](#)).

Home, Work, and Favorite Destinations

If you frequently drive to a destination, you may want to add it as a favorite to avoid having to enter the location's name or address each time. When you add a destination as a Favorite, you can easily navigate to it by touching the navigation search bar and then touching **Favorites** and choosing it from your list of favorite destinations.



To add a destination to your Favorites list touch its pin on the map, then touch the star icon on the popup screen that appears. Enter a name (or leave as-is to accept the default name), then touch **Add to Favorites**. The star becomes solid and the destination is included on your Favorites list.

To delete a Recent or Favorite destination, touch it on the destination list and hold it down briefly until the **X** appears. Then touch the **X** to delete it from the list.

Home and **Work** locations also display under the map's search bar. Touch to set an address to the corresponding location. After entering the address, touch **Save as Home** or **Save as Work**. Then simply touch these shortcuts whenever you want to navigate home or to work.

To change or delete the address associated with Home or Work, press and hold its icon and in the popup screen that displays, enter a new address and touch **Save as Home** or **Save as Work**, or touch **Clear Home** or **Clear Work**.

NOTE: Based on your usage patterns, Model SModel X may prompt you to save a location as Home or Work.

NOTE: Once a Home or Work location is saved, Model SModel X may prompt you to navigate to your Work location in the mornings and to your Home location in the evenings and provide an estimated driving time based on current traffic conditions. See [Automatic Navigation on page 371](#).

For security reasons, if you sell Model SModel X, it is recommended that you delete your Home and Work locations. You can delete these individually or you can perform a factory reset to erase all personal data (touch **Controls > Service > Factory Reset**).



Charging Locations

To display charging locations on the map, touch the map's search bar, then touch **Charging**. Charging locations are shown in a list (with the closest charging location at the top of the list) and represented by corresponding pins on the map. Touch a pin to display more information, navigate to it, or mark it as a favorite.

Touch the lightning bolt icons to specify the types of charging locations you want the map to include (by default, the map displays only superchargers):



Touch to include destination chargers.



Touch to include standard superchargers.



Touch to include high-powered superchargers.

NOTE: In some market regions, third-party fast chargers are also included as dark gray pins when you choose to display all charging stations.

The appearance of a charging location's pin reveals status information about the location. Touch the pin to display details.



The Supercharger location is operational and the number displayed on the pin represents the number of available Supercharger stalls.

NOTE: A Supercharger located on your current navigation route is colored black (or white, if the touchscreen is in night mode).



The Supercharger location is experiencing a high volume of users and you may need to wait before charging.



The Supercharger location may be operating at a reduced capacity.



The Supercharger location may be closed.



The Supercharger location has no data available but should be operational.



The location is either a destination charging location, a third-party fast charger, or a public charging station that you have previously used. Touch to display more information such as usage restrictions and available charge current.

NOTE: When the map is zoomed out and more than one destination charging location is available in an area, the pin is round and displays the number of stations. Touch the pin to zoom in. Then you can touch an individual pin for details about a specific location.

Touch a charging location's pin to display a popup from which you can:

- Determine its exact location and approximate distance from your current location.
- View amenities that are available at the charging location, including restrooms, restaurants, lodging, shopping, and Wi-Fi. On a supercharger popup, touch an amenity icon to search the surrounding area for the associated amenity.
- Touch the navigation icon to navigate to the charging location.

NOTE: When navigating to a Supercharger (or third-party fast charger in some regions), Model S/Model X preconditions the Battery to prepare for charging. This ensures you arrive with an optimal Battery temperature, reducing the amount of time it takes to charge. In some circumstances (such as cold weather), it is normal for the motor(s) and components to make noise as it generates heat to warm the Battery (see [Warming the Battery Before Supercharging on page 285](#)).

Predicting Energy Usage

When navigating to a destination, Model S/Model X helps you anticipate your charging needs by calculating the amount of energy that remains when you reach your destination. The calculation is an estimate based on driving style (predicted speed, etc.) and environmental factors (elevation changes, temperature, etc.). When navigating, the map displays this calculation at the bottom of the expanded turn-by-turn direction list (see [Navigating to a Destination on page 369](#)). When the turn-by-turn direction list is compressed, touch the top of the list to expand it.

Throughout your route, Model S/Model X monitors energy usage and updates the calculation. A popup warning displays at the bottom of the turn-by-turn direction list in these situations:

- A yellow warning displays when you have very little energy remaining to reach your destination, requiring you to drive slowly to conserve energy. For tips on conserving energy, see [Getting Maximum Range on page 261](#).
- A red warning displays when you must charge to reach your destination.

To determine if you have enough energy for a round trip, touch the battery icon at the bottom of the turn-by-turn direction list to display an estimated calculation of your round trip energy usage.

Online Routing

Model S/Model X detects real-time traffic conditions and automatically adjusts the estimated driving and arrival times. In situations where traffic conditions will delay your estimated time of arrival and an alternate route is available, the navigation system can reroute you to your destination. You can also specify the minimum number of minutes that must be saved before you are rerouted. To turn this feature on or off, touch the map's settings icon (see [Navigation Settings on page 369](#)), then touch **Online Routing**.

Trip Planner

Trip Planner (if equipped) helps you take longer road trips with confidence. If reaching your destination requires charging, Trip Planner routes you through the appropriate Supercharger locations. Trip Planner selects a route and provides charging times to minimize the amount of time you spend driving and charging. To enable Trip Planner, touch the map's settings icon (see [Navigation Settings on page 369](#)), then touch **Trip Planner**.

When Trip Planner is enabled and charging is required to reach your destination, the turn-by-turn direction list includes Supercharger stops, recommended charging times at each Supercharger, and an estimate of how much energy will be available when you arrive at the Supercharger location.

NOTE: When navigating to a Supercharger or, in some regions, a third-party fast charger using Trip Planner, Model S/Model X may allocate some energy to pre-heat the Battery to arrive at the Supercharger or third-party fast charger with an optimal Battery temperature. This reduces charging time (see [Warming the Battery Before Supercharging on page 285](#)).



To remove Supercharger stops and display directions only, touch **Remove all charging stops** at the bottom of the turn-by-turn direction list. If you remove charging stops, the turn-by-turn direction list may display an alert indicating that charging is needed to reach your destination. To add Supercharger stops back to the turn-by-turn direction list, touch **Add charging stops**.

While charging at a Supercharger, the charging screen displays the remaining charging time needed to drive to your next Supercharger stop, or destination (if no further charging is needed). If you charge for a shorter or longer length of time, charging time at subsequent Supercharger stops is adjusted accordingly.

NOTE: You can also use the mobile app to monitor remaining charging time needed.

NOTE: If a Supercharger on your navigation route experiences an outage, Trip Planner displays a notification and attempts to reroute you to a different Supercharger location.

If Trip Planner estimates that you won't have enough energy for your round trip, and there are no Superchargers available on your route, Trip Planner displays an alert at the top of the turn-by-turn direction list notifying you that charging is needed to reach your destination.

Map Updates

As updated maps become available, they are automatically sent to Model S/Model X over Wi-Fi. To ensure you receive them, periodically connect Model S/Model X to a Wi-Fi network (see [Connecting to Wi-Fi on page 403](#)). The touchscreen displays a message informing you when new maps are installed.



Media

Overview

The Media Player displays on the touchscreen and is used to play various types of media. You can drag Media Player upward to expand it (allowing you to browse), and downward to minimize it so that just the Miniplayer displays. The convenient Miniplayer, which occupies the least amount of space on the touchscreen, displays what's currently playing and provides only the basic functions associated with what's playing. You can also drag Media Player to display on the left or right side of the touchscreen.

Media Player displays content and options associated with the app (or source) you choose from the app launcher, or from the dropdown list that displays when you maximize Media Player:

NOTE: Media apps vary depending on market region. Some apps described may not be available in your market region, or may be replaced by different ones.



Radio: Choose from a list of available radio stations or touch the numeric keypad to directly tune the radio to a specific frequency. Touch the next or previous arrows to move from one frequency to the next (or previous).



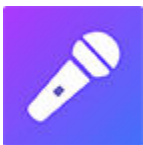
Bluetooth: Play audio from a bluetooth-connected phone or USB device (see [Playing Media from Devices on page 377](#)).



Streaming: Play the audio streaming service available in your market region (for example, Slacker Radio), if equipped.



Spotify: Play audio available on Spotify.



Karaoke: Sing along with various songs (see [Karaoke on page 376](#)).



TuneIn: Play audio available on TuneIn.



Tidal: Play audio available on Tidal.

NOTE: You can show or hide any media app/source. See [Media Settings on page 376](#).

When listening to internet radio or a music streaming service, the options available on the Media Player screen vary depending on what you are listening to. Touch the next (or previous) arrows to play the next (and in some cases previous) available station, episode, or track. You can also play next/previous using the left scroll button on the steering wheelsteering yoke.



Streaming services are available only when a data connection is available (for example, Wi-Fi or Premium Connectivity). For some media services, you can use a default Tesla account. For others, you may need to enter account credentials the first time you use it.

NOTE: Instead of launching a different media app, you can change the source from within the Media Player screen by choosing a source from the dropdown list on the left side.

NOTE: You can use voice commands to adjust media settings and preferences, such as volume control, playing certain songs, or switching the media source (see [Voice Commands on page 391](#)).

Volume Controls

Roll the scroll button on the left side of the steering wheelsteering yoke up or down to increase or decrease volume respectively. The scroll button adjusts the volume for media, voice commands, and phone calls.

You can also adjust the volume by touching the arrows associated with the speaker icon on the bottom corner of the touchscreen.

To mute the volume, press the left scroll button. Press again to unmute.

NOTE: Pressing the left scroll button during a phone call mutes both the sound and your microphone.

NOTE: If you're playing media and you receive a phone call, or the navigation system is speaking directions, the volume of what you are listening to is temporarily muted.

Media Settings

NOTE: The settings available vary depending on market region. Also, a setting may not be applicable to all audio sources.



When displaying an audio source screen, press the settings icon located in the search bar to access audio settings.

You can adjust these settings:

- **Tone:** Drag the sliders to adjust the subwoofer and any of the five frequency bands (Bass, Bass/Mid, Mid, Mid/Treble, and Treble). If equipped with premium audio, you can adjust the level of sound immersion to make your music experience more engaging by dragging the immersive sound slider according to your preferences.
- **Balance:** Drag the center circle to the location in Model SModel X where you want to focus the sound.
- **Options:** Set preferences for optional features. For example, you can turn **DJ Commentary**, **Explicit Content**, and **Allow Mobile Control** on or off.
- **Sources:** Displays all available media sources and allows you to choose whether you want to show or hide each source. You may want to hide media sources that you never use. Once hidden, the media source does not appear on the drop down list in Media Player, nor will it appear in the app tray when you touch the App Launcher. You can re-display a hidden media source at any time by returning to this settings screen.

Searching Audio Content



Touch Media Player's magnifying glass icon to search for a particular song, album, artist, podcast, or station. You can also use voice commands to search hands-free (see [Voice Commands on page 391](#)). If available, touch **HD®** to play high definition versions of the selected frequency.

Caraoke

In addition to various streaming services, your vehicle is equipped with Caraoke. To access Caraoke, navigate to Media Player and select the drop down menu to change the media source to Caraoke. Or add Caraoke as an app in the app launcher. You can browse through various songs and select the song you want to sing. Touch the microphone icon to enable or disable the song's main vocals. Disabling the microphone leaves only the song's instrumentals and background vocals. Touch the lyrics icon (located next to the microphone icon) to enable or disable the song's lyrics.



NOTE: Depending on vehicle configuration and market region, Caraoke may not be available on your vehicle.



WARNING: Never read Caraoke lyrics while driving. You must always pay attention to the road and traffic conditions. When driving, the Caraoke lyrics are intended only for use by a passenger.

Recents and Favorites

For most source content, recents and favorites display at the top for easy access.



To add a currently playing station, podcast, or audio file to your Favorites list, touch the **Favorites** icon on Media Player.



To remove an item as a favorite, touch the highlighted **Favorites** icon. You can also remove multiple favorites by expanding Media Player to show all favorites for the applicable type of source content. Then press and hold any favorite. An **X** appears on all favorites and you can then touch the **X** to remove them from your Favorites list.



Your recently played selections are updated continuously so you don't need to remove them.

NOTE: Selections you play on FM radio are not included in the Recents list.

Playing Media from Devices

You can play audio files from a Bluetooth-connected device (like a phone) or a USB-connected flash drive. When you connect a Bluetooth or USB device, Media Player includes the device as a media source.

USB Connected Flash Drives

Insert a flash drive into a front USB port (see [USB Ports on page 86](#) [USB Ports on page 79](#)). Touch **Media Player > USB**, and then touch the name of the folder that contains the song you want to play. After you display the contents of a folder on the USB connected flash drive, you can touch any song in the list to play it. Or use the previous and next arrows in Media Player to scroll through your songs. You can also scroll to next/previous songs using the left scroll button on the steering wheelsteering yoke.

NOTE: To play media from a USB connection, Model SModel X recognizes flash drives only. To play media from other types of devices (such as an iPod), you must connect the device using Bluetooth.

NOTE: Media Player supports USB flash drives with exFAT formatting (NTFS is not currently supported).

NOTE: Use a USB port located at the front of the center console. The USB connections at the rear of the console are for charging only.

Bluetooth Connected Devices

If you have a Bluetooth-capable device such as a phone that is paired and connected to Model SModel X (see [Pairing a Bluetooth Phone on page 381](#)), you can play audio files stored on it. Choose Media Player's **Phone** source, touch the name of your Bluetooth-connected device, then touch **CONNECT**.

Your Bluetooth device begins playing the audio file that is currently active on your device. If no audio file is playing, use your device to choose the audio file you want to listen to. When the chosen file begins to play, you can then use Media Player's next and previous icons (or use the left scroll button on the steering wheelsteering yoke) to play other tracks.

NOTE: To play media from a Bluetooth-connected device, ensure that access to the device's media is turned on (see [Pairing a Bluetooth Phone on page 381](#)).



Entertainment

Overview

NOTE: Entertainment options vary by market region.

The touchscreen displays the Entertainment screen when you choose any of the following apps:



Theater: Play various video streaming services (such as Netflix, YouTube, Hulu, etc.) while parked.



Arcade: Want to game? Depending on the game, you may need to use the steering wheelsteering yoke buttons or a USB controller to play arcade games.



Toybox: Play in the Toybox while parked.



Browser: Access the web browser.

WARNING: Use entertainment features only when Model SModel X is parked. Always pay attention to road and traffic conditions when driving. Using these features while driving is illegal and very dangerous.

NOTE: Many entertainment features can be easily accessed hands-free using voice commands (see [Voice Commands on page 391](#)).

Toybox

Select This...	To Do This...
007 (air suspension vehicles only)	You are no longer a "Driver", you're a "Diver"! Touch Controls > Suspension to change your depth.
Boombox	Joy to the world! If Model SModel X is equipped with a Pedestrian Warning System, delight pedestrians with a variety of sounds from your vehicle's external speaker while in Park. See Boombox on page 379 for more details. NOTE: Check local laws before use in public spaces.
Emissions Testing Mode	Holiday fun can come in surprising ways. Select your preferred fart style and target seat. For those lucky vehicles equipped with a Pedestrian Warning System, you can choose to broadcast externally when in Park. Use your turn signal or press the left scroll wheel when you're ready to "release" your prank.
Light Show	Park outside, turn the volume up, roll down your windows, then enjoy the show.
Light Show	Park outside, turn the volume up, roll down your windows, then enjoy the show.



Ludicrous Speed (P100D vehicles only)	Press and hold the Ludicrous setting (open the Controls drawer and touch Controls > Driving > Acceleration > Ludicrous) for approximately five seconds. Touch Yes, bring it on! if you want to go fast. To display power and acceleration readings on the instrument panel, press either scroll button briefly until the available options are displayed. Then, roll the scroll button to highlight Readout then press the scroll button again.
Mars	The map shows your Model SModel X as a rover on the Martian landscape, and the About Your Tesla box displays SpaceX's interplanetary spaceship.
Rainbow Charge Port	When Model SModel X is locked and charging, press the button on the mobile connector ten times in quick succession. Neat, huh?
Rainbow Road	Need more cowbell? Visit Rainbow Road by pulling the Autopilot stalk toward you four times in quick succession while Autosteer is enabled.
Romance Mode	You can't roast chestnuts by an open fire in your car, but you can still cozy up with your loved ones by this virtual fireplace. While in Park, access Romance Mode from your Toybox. Queue the music and get your romance on!
Sketchpad	Channel your inner Picasso. Show us what you got! Touch Publish to submit your artistic compositions to Tesla for critiquing.
TRAX	It's never too late to follow your dream of becoming a world-famous DJ. With TRAX, you can turn your vehicle into your own personal music studio. While in Park, choose from an array of instruments and unique sounds to create the next hit song. Access TRAX through your Toybox on the touchscreen and get jamming. Microphone and headset not included (depending on vehicle configuration and market region, this may not be available on your vehicle).
The Answer to the Ultimate Question of Life, The Universe, and Everything	Rename your car to 42 (touch Controls > Software and touch the vehicle's name). Notice the new name of your Model SModel X.

Boombox

Boombox, an app in Toybox, uses the Pedestrian Warning System (PWS) speaker to play media externally when Model SModel X is parked, when you press the horn, or when you use Summon to move Model SModel X. When Boombox is enabled, you can control external volume only when playing current media. You can customize sounds by plugging in a specifically-formatted USB drive.

NOTE: Check local laws before using Boombox in public places.

1. Play current media

- Available in Park only.
- Internal and external volume control.
- If Camp Mode is enabled in Climate Controls, you can exit the car and control the volume with the mobile app.

2. Megaphone When toggled on, you can project a modulated voice through the external speaker of Model SModel X.

- Available in Park only.
- External volume control.

3. Horn sound

- Available in Park only.
- Settings can be adjusted only when in Park.
- Selecting from a USB drive plays the first five seconds.

4. Summon sound

- Preview is only available in Park.
- Some sounds are only available if you are logged into a specific music streaming service and have internet connectivity.
- Plays when using [Summon on page 330](#) or [Smart Summon on page 333](#).



Formatting a USB drive for Boombox

You can add up to five custom Boombox sounds.

1. Using a computer, format a USB drive to exFAT, MS-DOS FAT (for Mac), ext3, or ext4 (NTFS is currently not supported) and upload audio files to a folder named **Boombox**.
 - Supported file types: .wav and .mp3.
 - You can add as many files as you want to the folder, but you can only select from the first five, as listed alphabetically.
 - File names, of any length, can only contain these characters: a-z, A-Z, 0-9, (. - _).
 - The drive should only contain one folder; it cannot be shared with Dashcam.
2. Plug the USB drive into a front USB port.
3. Choose sounds from your USB drive by selecting them in the **Boombox** dropdown menus.

Car Colorizer

Change the color of your Model SModel X on the touchscreen by navigating to Toybox or **Controls > Software**. Touch the color swatch next to the vehicle name and customize the paint, tone, and more.



Phone and Calendar

Bluetooth® Compatibility



You can use your Bluetooth-capable phone hands-free in Model S/Model X provided your phone is within operating range. Although Bluetooth typically supports wireless communication over distances of up to approximately 30 feet (nine meters), performance can vary based on the phone you are using.

Before using your phone with Model S/Model X, you must pair it. Pairing sets up Model S/Model X to work with your Bluetooth-capable phone (see [Pairing a Bluetooth Phone on page 381](#)).

NOTE: Authenticating your phone to use as a key (see [Keys on page 20](#)) does not also allow you to use the phone hands-free, play media from it, etc. You must also pair it as described below.

You can pair up to ten Bluetooth phones. Unless you've specified a specific phone as a **Priority Device** or if the phone specified as **Priority Device** is not within range, Model S/Model X always connects to the last phone that was used (provided it is within range). To connect to a different phone, see [Bluetooth® Compatibility on page 381](#).

NOTE: On many phones, Bluetooth turns off if the phone's battery is low.

NOTE: In addition to phones, you can pair other Bluetooth-enabled devices with Model S/Model X. For example, you can pair an iPod Touch, an iPad, an Android tablet, etc. from which you can play music.

Pairing a Bluetooth Phone

Pairing allows you to use your Bluetooth-capable phone hands-free to make and receive phone calls, access your contact list, recent calls, etc. It also allows you to play media files from your phone. Once a phone is paired, Model S/Model X can connect to it whenever the phone is within range.

To pair a phone, follow these steps while sitting inside Model S/Model X:

1. Ensure both the touchscreen and the phone are powered on.
2. On your phone, enable Bluetooth and ensure it is discoverable.

NOTE: On some phones, this may require you to go to Bluetooth Settings for the remainder of the procedure.

3. Touch the Bluetooth icon located at the top of the **Controls** screen at the top of the touchscreen.
4. On the touchscreen, touch **Add New Device > Start Search**. A list of all available Bluetooth devices within operating distance displays on the Bluetooth settings screen.
5. Choose the phone with which you want to pair. Within a few seconds, the Bluetooth settings screen displays a randomly generated number. Your phone also displays a number.
6. Check that the number displayed on your phone matches the number on the Bluetooth settings screen. Then, on your phone, confirm that you want to pair.
7. If prompted on your phone, specify whether you want to allow Model S/Model X to access your personal information, such as calendar, contacts and media files.

When paired, Model S/Model X automatically connects to the phone, and the Bluetooth settings screen displays the Bluetooth symbol next to the phone's name to indicate that the connection is active.

You can display the Bluetooth settings screen at any time and change the settings associated with a connected device. For example, you can designate a connected phone as the **Priority Device**. This is useful in situations where you have connected more than one phone, and both phones are frequently used in Model S/Model X at the same time. Model S/Model X automatically attempts to connect to the priority device before others. If a priority device is not specified, or is not within range, Model S/Model X connects to the most recently used phone (if applicable).

For vehicles manufactured prior to approximately April 2018: If Bluetooth takes an exceptionally long time to pair, reset Bluetooth functionality by touching **Controls > Service > Reset Bluetooth**. You may need to wait a few minutes. Once reset, try pairing to Model S/Model X again. After you reset Bluetooth functionality, the vehicle may forget any previously paired devices.



Importing Contacts and Recent Calls

Once paired, use the Bluetooth settings screen to specify whether you want to allow access to your phone's calendar, contacts and recent calls. If you allow access, you can use the phone app to make calls and send messages to people in your list of contacts and on your recent calls list (see [Bluetooth® Compatibility on page 381](#)). Before contacts can be imported, you may need to either set your phone to allow syncing, or respond to a popup on your phone to confirm that you want to sync contacts. This varies depending on the type of phone you are using. For details, refer to the documentation provided with your phone.

NOTE: You can turn access to your contacts and recent calls on or off at any time by displaying the Bluetooth settings screen, choosing the phone, and then changing the associated access settings.

Unpairing a Bluetooth Phone

If you want to disconnect your phone and use it again later, simply touch **Disconnect** on the Bluetooth settings screen. If you no longer want to use your phone with Model SModel X, touch **Forget This Device**. Once you forget a device, you must pair it again if you want to use it with Model SModel X (see [Pairing a Bluetooth Phone on page 381](#)).

NOTE: Your phone automatically disconnects when you leave Model SModel X.

NOTE: Unpairing the phone has no effect on using the phone as a key. To forget an authenticated phone, see [Keys on page 20](#) and [Doors on page 43](#).

Connecting to a Paired Phone

Model SModel X automatically connects to a phone that you designated as **Priority Device** on the Bluetooth settings screen. If you have not set a phone as a priority, Model SModel X connects to the last phone to which it was connected, provided it is within operating range and has Bluetooth turned on. If the last phone is not within range, it attempts to connect with the next phone that it has been paired with.

To connect to a different phone, touch the Bluetooth icon at the top of the touchscreen **Controls** screen. The Bluetooth settings screen displays a list of paired phones. Choose the phone you want to connect to, then touch **Connect**. If the phone you want to connect to is not listed, you must pair the phone. See [Pairing a Bluetooth Phone on page 381](#).

When connected, the Bluetooth settings screen displays the Bluetooth symbol next to the phone's name to show that Model SModel X is connected to the phone.

Using the Phone App



When your phone is connected to Model SModel X using Bluetooth, and you have allowed access to information on your phone (see [Importing Contacts and Recent Calls on page 382](#)), you can use the phone app to display and make a hands-free call to anyone listed on your phone.

- **Calls**- Displays recent calls in chronological order with the most recent call listed first.
- **Messages**- Displays message in chronological order with the most recent message listed first. You can view, send, and receive text messages. Instead of typing a text message, touch the microphone button on the right side of the steering wheelsteering yoke to enter text using your voice.
-  **WARNING:** To minimize distraction and ensure the safety of vehicle occupants as well as other road users, do not view or send text messages when the vehicle is in motion. Pay attention to road and traffic conditions at all times when driving.
- **Contacts**- Contacts are listed in alphabetical order and can be sorted by first name or last name. You can also choose a letter on the right side of the list to quickly scroll to the names that begin with the selected character. When you touch a name on your contacts list, the contact's available number(s) displays on the right pane, along with other available information (such as address). Touch the contact's number to make a call.
- **Favorites**- Displays the contacts from your phone that you have identified as Favorites.
- **Calendar**- Displays calendar entries from your phone (see [Calendar on page 383](#)). If an entry includes a phone number or an address, you can make a phone call, or navigate to a destination, by touching the corresponding information in the calendar entry.



Making a Phone Call

You can make a phone call by:

- Speaking a voice command (see [Voice Commands on page 391](#)). Voice commands are a convenient, hands-free way to call or text your contacts.
- Selecting a contact or recent call from the menu on your right scroll button (see [Using Right Steering Wheel Buttons on page 189](#)).
- Touching a phone number shown in a list in the phone app – Contacts, Calls, or Calendar.
- Using the Model S/Model X on-screen dialer in the Phone app's Calls list.

NOTE: If it is safe and legal to do so, you can also initiate a call by dialing the number or selecting the contact directly from your phone.

NOTE: You can also make a phone call by touching a pin on the map and choosing the phone number (if available) on the popup screen.

Receiving a Phone Call

When your phone receives an incoming call, the instrument panel and touchscreen display/touchscreen displays the caller's number or name (if the caller is in your phone's contact list and Model S/Model X has access to your contacts).

Touch one of the options on the touchscreen to **Answer** or **Ignore** the call. Depending on the phone you are using and what speakers you used for your most recent call, your phone may prompt you to choose which speakers you want to use for the incoming call.



WARNING: Stay focused on the road at all times while driving. Using or programming a phone while driving, even with Bluetooth enabled, can result in serious injury or death.



WARNING: Follow all applicable laws regarding the use of phones while driving, including, but not limited to, laws that prohibit texting and require hands-free operation at all times.

In Call Options

When a call is in progress, you can display the call menu on the instrument panel by pressing the top button on the right side of the steering wheel. Then roll the right scroll button and choose an option (see [Using Right Steering Wheel Buttons on page 189](#)). To adjust the call volume, roll the steering wheel's left scroll button during a call.

In Call Options

When a call is in progress, the call menu displays on the touchscreen. Then roll the right scroll button to choose an option. To adjust the call volume, roll the steering wheel/steering yoke's left scroll button during a call.

Calendar



The calendar displays scheduled events from your phone's (iPhone® or Android™) calendar for the current and next day. The calendar is conveniently integrated with the phone app so you can navigate to, or dial into, your next meeting.

Using the calendar requires that:

- The Tesla mobile app is running, you are logged in, and the mobile app's **Calendar Sync** setting is turned on. The mobile app can then periodically (and automatically) send calendar data from your phone to Model S/Model X.

NOTE: To ensure you have access to all of the calendar's features, it is recommended that you use the most recent version of the mobile app.

- Your phone is connected to Model S/Model X via Bluetooth (for privacy reasons, Model S/Model X displays calendar data only from a connected phone). In situations when your vehicle is not connected to a phone, touch **Connect Phone** on the calendar list.
- Mobile access is turned on (**Controls > Safety > Allow Mobile Access**).



- Both your phone and your vehicle have good connectivity.

If a calendar event includes an address, a navigation arrow displays to indicate that you can touch the address to navigate to the event's location. When an event on your calendar takes place within the next hour and has a uniquely specified address, the touchscreen notifies you if there is a better route due to traffic, even when you're not actively using navigation.

If an event has a uniquely specified address and takes place within two hours of you entering your vehicle and preparing to drive, Model S/Model X automatically routes you to the event's address (see [Automatic Navigation on page 371](#)).

Touch an event's information icon to display all notes associated with the event. If the notes include one or more phone numbers, the information icon shows a phone icon and the calendar displays the first phone number found. Touch to initiate a phone call. You can also initiate a phone call by touching any number in an event's notes popup screen (this is especially useful for conference calls). If notes include a web link, you can touch the link to open it in the Web browser.



Air Suspension

NOTE: When Model S Model X starts, you may hear the sound of the compressor as the air suspension system's reservoir fills with air.

Your Model S Model X is equipped with Adaptive Air Suspension that offers superior ride quality and allows you to choose a softer or firmer ride based on your preference. When carrying loads, the system also maintains a level height between the front and rear. You can manually adjust the ride height to suit your circumstances (for example, you can raise Model S Model X when you need extra ground clearance, such as when driving on a steep driveway or ramp, in deep snow, over large speed bumps, parking curbs, etc.).



If a fault is detected that reduces the performance of the adaptive air suspension system, a yellow indicator lights up on the instrument panel. If the problem persists, contact Tesla.



If a fault is detected that disables the adaptive air suspension system, a red indicator lights up on the instrument panel. Contact Tesla.

Adjusting Ride Height



CAUTION: Before adjusting the suspension height, ensure Model S Model X is clear of all obstacles, above and below.

You can manually adjust the ride height by pressing the brake pedal touching **Controls** > **Suspension** on the touchscreen. The ride height settings that are available depend on your driving speed and other conditions (for example, the suspension does not lower if a door is open). The touchscreen also displays the approximate ground clearance for each setting. Drag the slider to choose from these options:

- **Very High** - When set to **Very High**, the suspension automatically lowers to the default ride height* (**StandardMedium** or Low) after driving approximately 100 feet (30 meters) or when driving speed reaches 15 mph (24 km/h). To maintain the **Very High** setting for an unlimited distance until your driving speed reaches the speed threshold, touch **Keep until 15 mph**.
- **High** - When set to **High**, the suspension automatically lowers to the default ride height* (**StandardMedium** or Low) after driving approximately 100 feet (30 meters) or when driving speed reaches 35 mph (56 km/h). To maintain the **High** setting for an unlimited distance until your driving speed reaches the speed threshold, touch **Keep until 35 mph**.

NOTE: You can also raise the suspension to **High** by touching the **Raise Suspension** shortcut on the main Controls window.

- **Standard** - The **Standard** setting ensures optimum comfort and handling under all loading conditions.
- **Medium** - The **Medium** setting ensures optimum comfort and handling under all loading conditions. The suspension automatically lowers to **Low** when driving speed exceeds 55 mph (89 km/h).
- **Low** - Lowering the height can improve aerodynamics, make it easier to load or unload cargo and passengers, and improve handling.
- **Very Low** - This setting takes effect only when you manually choose it. The suspension reverts to the default setting on your next drive.

*If the **Default Ride Height to Low** setting is turned off, the ride height is adjusted between **StandardMedium** and **Low** to balance ride comfort with handling and range. To optimize handling and range, turn on the **Default Ride Height to Low** setting.



CAUTION: Avoid driving aggressively (hard accelerations, sharp turns, etc.) when the suspension is set to **High** or **Very High**. Doing so can cause vibration and increase the possibility of damage.



CAUTION: Acceleration may be reduced when the suspension is set to **High** or **Very High**.

Adaptive Suspension Damping

The settings associated with **Adaptive Suspension Damping** provide real-time adjustments to the suspension system to optimize both ride and handling. Choose from:



- **Comfort** – Provides a gentler ride for a relaxed driving experience.
- **Auto** – Adjusts to a wide range of roads and driving styles, providing a fluid yet well controlled ride.
- **Sport** – Provides a firmer, more controlled ride that increases driver engagement and connection to the road.
- **Advanced** – Can be used to fine tune the suspension by dragging individual sliders that adjust **Ride Comfort** and **Handling**.

Touch **Show Suspension Data** to display detailed information about the dampers for each wheel, including ride height, compression and rebound values, and body accelerations.

Use Comfort Damping in Autopilot – By default, damping automatically sets to the Comfort setting when using Autopilot, and reverts back to your chosen setting when Autopilot is no longer in use. Turn this setting off to disable this feature.

NOTE: Settings for Adaptive Suspension Damping are disabled when Track Mode is engaged. Track Mode automatically optimizes adaptive damping settings to support aggressive driving on a closed circuit driving course (see [Track Mode on page 257](#)).

Real-time Visualization

The image of your Model SModel X on the Suspension screen provides a real-time visualization of the status of the air suspension system. In addition to visually showing changes to the ride height, it displays Compression and Rebound lines that reflect how the suspension system is controlling the dampers for each wheel based on your chosen settings and changing road conditions. Both are controlled simultaneously. Touch **Show Suspension Data** to display detailed information about the dampers for each wheel, including ride height, compression and rebound values, and body accelerations.

NOTE: The instrument panel can also display a real-time visualization of how the suspension system is dynamically adjusting each wheel's damping to account for changing road conditions. To view, hold the respective steering wheelsteering yoke scroll button briefly until the available options are displayed. Roll the scroll button to highlight **Suspension**, then tap the scroll button.

Auto-Raising Locations

Whenever you raise the suspension to **High** or **Very High**, the location is automatically saved. By saving the location, you do not need to manually raise the suspension every time you arrive at a frequently-used location where you have previously raised the suspension. When you return to the saved location, Model SModel X raises the suspension and the instrument panel displays a message indicating that the suspension is being raised.

When saving locations, Model SModel X also saves the **Keep until XX mph** setting (if specified).

NOTE: When returning to a saved location and driving faster than the **High** and **Very High** suspension settings allow, the suspension does not raise until Model SModel X slows down.

NOTE: After leaving a saved location, the suspension automatically lowers. However, it may not lower until Model SModel X meets the speed and distance threshold at which the suspension lowers.

NOTE: If Model SModel X reaches a saved location and the existing suspension setting is already higher than the level that has been saved for that location, the ride height is not adjusted.

To remove an auto-raising location

If you do not want the suspension to automatically raise at a location, touch to deselect **Always raise at this location** in the popup that appears when you arrive at a saved location. Or, when using the **Raise Suspension** shortcut on the main Controls window, touch to deselect **Location Saved**.

Self-Leveling

Model SModel X equipped with air suspension automatically self-levels, even when power is off. To prevent damage when jacking or lifting the vehicle, you must activate **Jack Mode** to disable self-leveling (press the brake pedal and touch **Controls > Service > Jack Mode**). For more details, see [Jack Mode on page 463](#).



Air Suspension

NOTE: When Model S/Model X starts, you may hear the sound of the compressor as the air suspension system's reservoir fills with air.

Air suspension offers a superior ride quality and when carrying loads, the system maintains a level height between the front and rear. You can manually adjust the ride height to suit your circumstances (for example, you can raise Model S/Model X when driving at low speeds when you need extra ground clearance, such as when driving on a steep driveway or ramp, in deep snow, over large speed bumps, parking curbs, etc.).



If a fault is detected that reduces the performance of the air suspension system, a yellow indicator lights up on the instrument panel. If the problem persists, contact Tesla.



If a fault is detected that disables the air suspension system, a red indicator lights up on the instrument panel. Contact Tesla.

Adjusting Ride Height



CAUTION: Before adjusting the suspension height, ensure Model S/Model X is clear of all obstacles, above and below.

You can manually adjust the ride height by pressing the brake pedal touching **Controls > Suspension** on the touchscreen. The ride height settings that are available depend on your driving speed and other conditions (for example, the suspension does not lower if a door is open). The touchscreen also displays the approximate ground clearance for each setting. Drag the slider to choose from these options:

- **Very High.** When set to **Very High**, the suspension automatically lowers to **High** after driving approximately 100 feet (30 meters) or when driving speed reaches 15 mph (24 km/h). To maintain the **Very High** setting for an unlimited distance until your driving speed reaches the speed threshold, touch **Keep until 15 mph**.
- **High.** When set to **High**, the suspension automatically lowers to **Standard** after driving approximately 100 feet (30 meters) or when driving speed reaches 35 mph (56 km/h). To maintain the **High** setting for an unlimited distance until your driving speed reaches the speed threshold, touch **Keep until 35 mph**.
- **Standard.** The **Standard** setting ensures optimum comfort and handling under all loading conditions.
- **Low.** Lowering the height can improve aerodynamics and make it easier to load or unload cargo and passengers.
- **Very Low.** This setting takes effect only when you manually choose it. The suspension reverts to the default setting on your next drive.



CAUTION: Avoid driving aggressively (hard accelerations, sharp turns, etc.) when the suspension is set to **High** or **Very High**. Doing so can cause vibration and increase the possibility of damage.



CAUTION: Acceleration may be reduced when the suspension is set to **High** or **Very High**.

Automatic Lowering

When driving Model S/Model X above typical driveway or parking lot speeds, the suspension automatically lowers ride height to improve aerodynamics and handling. For most average speed driving, the suspension is automatically set to **Standard**. As described above, when you make manual height adjustments, the suspension automatically lowers at increased driving speeds.

You can adjust the speed at which the suspension automatically transitions to the **Low** ride height by touching **Controls > Suspension > Automatic Lowering** on the touchscreen.

NOTE: You can temporarily override the ride height by touching **Controls > Suspension**, and then manually choosing a ride height. Your suspension's automatic lowering setting is restored the next time you drive.



Auto-Raising Locations

Whenever you raise the suspension to **High** or **Very High**, the location is automatically saved. By saving the location, you do not need to manually raise the suspension every time you arrive at a frequently-used location where you have previously raised the suspension. When you return to the saved location, Model SModel X raises the suspension and the instrument panel displays a message indicating that the suspension is being raised.

When saving locations, Model SModel X also saves the **Keep until XX mph** setting (if specified).

NOTE: When returning to a saved location and driving faster than the **High** and **Very High** suspension settings allow, the suspension does not raise until Model SModel X slows down.

NOTE: After leaving a saved location, the suspension automatically lowers. However, it may not lower until Model SModel X meets the speed and distance threshold at which the suspension lowers.

NOTE: If Model SModel X reaches a saved location and the existing suspension setting is already higher than the level that has been saved for that location, the ride height is not adjusted.

To remove an auto-raising location

If you do not want the suspension to automatically raise at a location, touch to deselect **Always raise at this location** in the popup that appears when you arrive at a saved location.

Self-Leveling

Model SModel X equipped with air suspension automatically self-levels, even when power is off. To prevent damage when jacking or lifting the vehicle, you must activate **Jack Mode** to disable self-leveling (press the brake pedal and touch **Controls** > **Service** > **Jack Mode**). For more details, see [Jack Mode on page 463](#).



Air Suspension

NOTE: When Model S/Model X starts, you may hear the sound of the compressor as the air suspension system's reservoir fills with air.

Air suspension offers a superior ride quality and when carrying loads, the system maintains a level height between the front and rear. You can manually adjust the ride height to suit your circumstances (for example, you can raise Model S/Model X when driving at low speeds when you need extra ground clearance, such as when driving on a steep driveway or ramp, in deep snow, over large speed bumps, parking curbs, etc.).



If a fault is detected that reduces the performance of the air suspension system, a yellow indicator lights up on the instrument panel. If the problem persists, contact Tesla.



If a fault is detected that disables the air suspension system, a red indicator lights up on the instrument panel. Contact Tesla.

Adjusting Ride Height



CAUTION: Before adjusting the suspension height, ensure Model S/Model X is clear of all obstacles, above and below.

You can manually adjust the ride height by pressing the brake pedal touching **Controls > Suspension** on the touchscreen. The ride height settings that are available depend on your driving speed and other conditions (for example, the suspension does not lower if a door is open). The touchscreen also displays the approximate ground clearance for each setting. Drag the slider to choose from these options:

- **Very High.** When set to **Very High**, the suspension automatically lowers to **High** when driving speed reaches 22 mph (35 km/h).
- **High.** When set to **High**, the suspension automatically lowers to **Standard** when driving speed reaches 34 mph (55 km/h).
- **Standard.** The **Standard** setting ensures optimum comfort and handling under all loading conditions.
- **Low.** Lowering the height can improve aerodynamics and make it easier to load or unload cargo and passengers.



CAUTION: Avoid driving aggressively (hard accelerations, sharp turns, etc.) when the suspension is set to **High** or **Very High**. Doing so can cause vibration and increase the possibility of damage.



CAUTION: Acceleration may be reduced when the suspension is set to **High** or **Very High**.

Auto-Raising Suspension

Auto-raising suspension saves you from manually having to raise the suspension every time you arrive at a frequently-used location where you have previously raised the suspension. The location is automatically saved whenever you raise the suspension to **High** or **Very High**. When you return to the saved location, Model S/Model X raises the suspension and the instrument panel displays a message indicating that the suspension is being raised.

After leaving a saved location, the suspension automatically lowers. However, it may not lower until Model S/Model X meets the speed threshold at which the suspension lowers.

NOTE: When returning to a saved location and driving faster than the **High** and **Very High** suspension settings allow, the suspension does not raise until Model S/Model X slows down.

NOTE: If Model S/Model X reaches a saved location and the existing suspension setting is already higher than the level that has been saved for that location, the ride height is not adjusted.



To remove an auto-raising location

If you do not want the suspension to automatically raise at a location, touch the **X** in the auto-raising status message that displays at a saved location. By doing so, the suspension does not automatically raise at the location.

Self-Leveling

Model S Model X equipped with air suspension automatically self-levels, even when power is off. To prevent damage when jacking or lifting the vehicle, you must activate **Jack Mode** to disable self-leveling (press the brake pedal and touch **Controls** > **Service** > **Jack Mode**). For more details, see [Jack Mode on page 463](#).



Voice Commands

Use voice commands to easily control settings and preferences without using the touchscreen. You can ask Model S or Model X to do just about anything, such as adjusting climate controls and media preferences. Available commands include most features that are managed by the touchscreen except driving-related commands, for example shifting drive modes.

Voice commands are designed to understand natural requests. You can use voice commands to:

- Adjust climate preferences.
- Tweak the windshield wiper speed and frequency.
- Control various aspects of your vehicle.
- Navigate to a location.
- Call a contact.
- Interact with apps and settings.

To initiate a voice command, fully press the microphone button on the right side of the steering wheel. When you hear a chime, make your request and the vehicle responds.



Examples of Voice Commands

Here is a list of example voice commands. This is not an exhaustive list. Tesla is constantly working to improve voice commands.

NOTE: To choose the language you want to use for voice commands, touch **Controls > Display > Voice Recognition Language**.

Climate Controls

Adjust your climate preferences using voice commands:

- "Make it cooler".
- "Make it warmer".
- "Turn on/off the driver's seat heater".
- "Cool down the passenger".
- "Direct airflow to my face".
- "Sync climate".
- "Increase/decrease the fan speed".



- "Turn on recirculate".

Windshield Wipers

Update the windshield wiper speed and frequency based on changing road and weather conditions:

- "Speed up the wipers".
- "Increase/decrease windshield wiper speed by...".
- "Turn on/off the wipers".
- "Spray the windshield".

Vehicle Controls

You can also modify various controls in your vehicle using voice commands:

- "Sentry Mode on/off".
- "Keep my car safe".
- "Lock/unlock the doors".
- "Turn on Dog Mode".
- "Fold/unfold the mirrors".
- "Open/close charge port".
- "Start/stop charging".
- "Show me the tire pressures".
- "Open the glovebox".

Navigation

To search for, or navigate to, a location, say:

- "Where is [location]"?
- "Drive to [location]".
- "Navigate to [location]"
- "Show nearby Superchargers".
- "I'm feeling hungry/lucky" (see [I'm Feeling Lucky, Hungry on page 371](#)).

If you have defined a navigation address for your home or work locations, you can use a voice command to navigate there by saying "Navigate home" or "Take me to work".

Contacts

To call or text a contact on your Bluetooth-connected phone (see [Phone and Calendar on page 381](#)), say:

- "Call [contact name/phone number]".
- "Re-dial [contact name/phone number]".
- "Text [contact name/phone number]".

Media

To listen to and adjust your media preferences, say:

- "Listen to [song name]".
- "Listen to [song name] by [artist name]".
- "Lower/raise the volume".



- "Skip to next".
- "Pause/play song".
- "Change the radio to..."
- "Change the source to [media source]"

To improve voice command recognition accuracy, provide multiple cues in your command, such as artist and song.

Apps and Settings

Easily navigate through your apps and settings using voice commands:

- "Open [Toybox/browser/theater/phone]"
- "Search for..."
- "The screen is too bright"
- "Show me the Owner's Manual"

Some apps and settings are only accessible while in Park.

You can also file a bug report by saying "report", "feedback", or "bug report".

For a complete list of voice commands, go to <https://www.tesla.com/support/voice-commands>.

NOTE: Tesla is continuously improving the ability of Model S/Model X to recognize voice commands. To support these ongoing quality improvements, Tesla captures short voice recordings anonymously. To protect your privacy, these short recordings are not associated with your personal information or with your vehicle's identification number. Tesla assures that it is not possible to search any system for a recording associated with a specific customer or vehicle.



Security Settings

About the Security System

If Model S/Model X does not detect a key nearby and a locked door or trunk is opened, an alarm sounds. The headlights and turn signals also flash. To deactivate the alarm, press any button on the key fob.

To manually enable or disable the alarm system, touch **Controls > Safety > Security Alarm**. When enabled, Model S/Model X activates its alarm one minute after you exit, the doors lock, and a recognized key is no longer detected.

A battery-backed siren (if equipped) sounds in situations where a locked door or trunk is opened and Model S/Model X does not detect a key nearby. If you also want this siren to sound in situations where the vehicle detects motion inside the cabin, enable **Tilt/Intrusion** (see [Tilt/Intrusion \(if equipped\) on page 394](#)).

NOTE: If Model S/Model X is in Sentry Mode (see [Using Sentry Mode on page 397](#)), you must disable Sentry Mode before you can disable the Security alarm or the Tilt/Intrusion alarm.

Tilt/Intrusion (if equipped)

The **Security Alarm** must be on to enable **Tilt/Intrusion**.

Tilt/Intrusion sounds the alarm in your vehicle if Model S/Model X detects motion inside the cabin, or is moved or tilted (for example, with a tow truck or jack). To enable, touch **Controls > Safety > Tilt/Intrusion**.

The intrusion sensor automatically disables in situations where the climate control system is operating when you leave your vehicle. To override, you can manually turn the Tilt/Intrusion Sensor on again after choosing Keep Climate On, Dog, or Camp Mode.

NOTE: If you plan to leave something that moves inside your locked vehicle, remember to turn off **Tilt/Intrusion**. If this setting is on, any motion detected inside Model S/Model X activates the intrusion alarm.

Enhanced Anti-Theft Upgrade (if equipped)

If your vehicle is equipped with the Enhanced Anti-Theft upgrade, the horn sounds in situations where a locked door or trunk is opened and Model S/Model X does not detect a key nearby. If **Tilt/Intrusion** is on, the horn also sounds if Model S/Model X detects motion inside the cabin or if the vehicle is moved or tilted (for example, with a tow truck or jack). To turn the Tilt/Intrusion detection system on or off, touch **Controls > Safety > Tilt/Intrusion**.

PIN to Drive

To increase security, you can prevent Model S/Model X from being driven until a 4-digit PIN (Personal Identification Number) is entered. To enable this setting, touch **Controls > Safety > PIN to Drive** and follow the on-screen prompts to create a driving PIN.

When enabled, in addition to entering the 4-digit driving PIN to drive, you must also use it to enter Valet mode for the first time and create the 4-digit valet PIN to enter and exit Valet mode. In Valet mode, Model S/Model X can be driven without the need for the valet to enter a driving PIN. The **PIN to Drive** setting is disabled whenever Valet mode is active.

If you forget your driving PIN, touch the link to enter your Tesla login credentials on the PIN to Drive popup, then follow the on-screen prompts.

NOTE: In the unlikely event that your touchscreen is unresponsive, you may be unable to enter the PIN. In this case, first try to restart the touchscreen (see [Restarting the Touchscreen on page 197](#)). If the touchscreen is still unresponsive, you can still bypass PIN to Drive by turning on Keyless Driving in the Tesla mobile app.

Glovebox PIN

For additional security, you can protect the contents in your glovebox with a 4-digit PIN. To enable this setting, touch **Controls > Safety > Glovebox PIN** and follow the on-screen prompts. When enabled, you are prompted to enter the PIN to open the glovebox. To disable this setting, select the toggle to disable and then enter the PIN.

If you forget your glovebox PIN, reset it by entering your Tesla login credentials, then follow the on-screen prompts.



NOTE: When you open the glovebox with **Glovebox PIN** while Valet mode is enabled, Valet mode disables after the glovebox opens.



Dashcam and Sentry Mode

NOTE: Depending on market region, vehicle configuration, options purchased, and software version, your vehicle may not be equipped with Dashcam or Sentry Mode or the features may not operate exactly as described. **Please note it is your sole responsibility to consult and comply with all local regulations and property restrictions regarding the use of cameras.**

In addition to supporting Autopilot, the exterior cameras can record and store video footage of the vehicle's surroundings on a USB flash drive. This can be convenient in situations where you want a video recording of a particular incident. If set to AUTO, Dashcam saves video recordings of collisions when driving. On the other hand, if enabled, Sentry Mode is the alarm system that monitors the environment around your vehicle when it is locked and in Park. After an incident is detected, Sentry Mode responds according to the level of threat detected.

NOTE: For saving Sentry Mode and Dashcam footage, Tesla recommends using the USB port located in the glovebox. Doing so increases security and minimizes power consumption.

NOTE: Dashcam and Sentry Mode will not record video when Dashcam is OFF.

NOTE: To protect your privacy, video recordings are saved locally to onboard memory or the USB flash drive. Recordings are not sent to Tesla.

Using Dashcam

Dashcam records footage of your vehicle's surroundings only when Model S/Model X is powered on (see [Starting and Powering Off on page 195](#)). Dashcam does not record video when your vehicle is powered off. Use Dashcam to record driving incidents, such as a collision.

Dashcam requires a properly formatted USB flash drive, inserted into a front USB port (preferably in the glovebox) in order to store and retrieve footage (see [USB Drive Requirements for Recording Videos on page 80](#)/[USB Drive Requirements for Recording Videos on page 88](#)).

Enable Dashcam by going to **Controls** > **Safety** > **Dashcam** and choose:

- **Auto:** Dashcam automatically saves a recording to the USB flash drive in situations where Model S/Model X detects a safety event, such as a collision or airbag deployment. When **Auto** is selected, detection can vary and is subject to your vehicle's power, sleep, and Autopilot state.

NOTE: Several factors determine whether or not Dashcam automatically saves a recording of a safety event (for example, amount of force, whether or not airbags deployed, etc.). Do not rely on Dashcam to automatically record video of all safety events.

- **Manual:** You must touch the Dashcam icon to save a recording of the most recent 10 minutes of driving to the USB flash drive.
- **On Honk:** When you press the horn, Dashcam saves a recording of the most recent 10 minutes of driving to the USB flash drive.

Once enabled, you can manually save clips by touching:



The Dashcam icon in the app launcher while the vehicle is in Drive (you can add the Dashcam app to My Apps at the bottom of the touchscreen for easy access, see [Customizing My Apps on page 19](#)). The touchscreen displays a message confirming if the footage is saved. When Model S/Model X is in Park, touching the Dashcam icon brings up the Viewer.



The Dashcam icon at the top of the touchscreen on the **Controls** screen.

The Dashcam controls are:



RECORDING: Shows that Dashcam is recording. To save video footage, touch the icon. To pause recording, press and hold the icon.



PAUSED: Shows that Dashcam is paused. To resume recording, touch the icon. To avoid losing video footage, pause Dashcam before removing the flash drive.



SAVED: Shows that footage is saved. You can also save dashcam clips by touching the Dashcam icon in the app launcher while Driving.

To view Dashcam footage, see [Viewing Video Recordings on page 399](#).

Using Sentry Mode

When Sentry Mode is turned on, the cameras and sensors remain powered on and ready to record suspicious activity around your vehicle when Model S/Model X is locked and in Park.

To store and retrieve Sentry Mode footage, ensure that Dashcam is on and a properly formatted USB flash drive is inserted into a front USB port (preferably in the glovebox) (see [Using Dashcam on page 396](#)).

If you want Sentry Mode to automatically turn on every time you leave your vehicle, touch **Controls > Sentry Mode > On**. There are three additional settings for customization:

- **Exclude Home:** Sentry Mode does not operate at the location you set as Home in your favorites list (see [Home, Work, and Favorite Destinations on page 371](#)), but operates at any other parking location.

NOTE: To set up your Home location, touch **Navigate** and hold down **Home**, then enter your address. Touch **Save as Home**.

- **Exclude Work:** Sentry Mode does not operate at the location you set as Work in your Favorites list, but operates at any other parking location. Set your Work location the same way you set your Home location.
- **Exclude Favorites:** Sentry Mode does not operate at any location in your Favorites list, but activates at any other parking location.

NOTE: To recognize a location listed as Home, Work, or a Favorite, Model S/Model X must be parked within 32 feet (10 meters) of the saved location.

NOTE: Sentry Mode will not record video when Dashcam is OFF.



To manually turn Sentry Mode on or off, touch the Sentry Mode icon at the top of your touchscreen.

To manually turn Sentry Mode on or off, touch **Controls > Sentry**.

Manually turning Sentry Mode on or off using the touchscreen or the mobile app overrides your Home, Work, or Favorite exclusion preferences until the next time you drive.

Alternatively, you can use voice commands or the Tesla mobile app. To enable Sentry Mode using voice commands, say "Keep Tesla safe," "Keep my car safe," "Sentry on," or "Enable Sentry" (see [Voice Commands on page 391](#)).

Sentry Mode requires your Battery to be at least 20% charged. If the Battery falls below 20%, Sentry Mode turns off and the mobile app sends you a notification. Power consumption may increase when Sentry Mode is active.

NOTE: Software updates cannot be installed when Sentry Mode is turned on.



CAUTION: Do not rely on Sentry Mode to protect Model S/Model X from all possible security threats. While it may help deter some threats, no security system can prevent all attacks.



To view Sentry Mode footage, see [Viewing Video Recordings on page 399](#).

Standby, Alert, and Alarm States

While in Sentry Mode, Model S/Model X may shift through three states as a response to its surroundings—Standby, Alert, and Alarm:

- **Standby.** Model S/Model X is automatically “on standby” when you activate Sentry Mode. The cameras constantly monitor the surrounding area for possible security threats.
- **Alert.** If Sentry Mode detects a possible threat, such as someone very close to, or leaning on, Model S/Model X, Sentry Mode switches to the Alert state, where:
 - Headlights briefly flicker.
 - The touchscreen displays a message indicating that cameras are recording.
 - Sentry Mode saves the most recent 10 minutes of footage prior to the triggered event to the USB flash drive (if available and installed).
- **Alarm.** For major threats, Sentry Mode:
 - Activates the security alarm and the audio system generates a loud and unexpected sound.
 - Sends an alert to the mobile app on phones that are paired to Model S/Model X to inform you that the alarm state is triggered.
 - Saves the most recent 10 minutes of footage prior to the triggered event to the USB flash drive (if available and installed).
 - Returns to the Standby state after 30 seconds.
 - For vehicles manufactured after approximately April 2018: Saves up to two minutes of footage to the vehicle's internal storage for safekeeping which can be manually saved to a USB flash drive (if available and installed) using the Dashcam viewer.



CAUTION: Sentry Mode may not activate the security alarm in all situations involving damage to the vehicle. Sentry Mode uses many factors to determine whether to activate the security alarm—all impacts may not be detected and the alarm may not activate in all situations.

NOTE: When the internal storage reaches full capacity, new recordings from Alert and Alarm events overwrite the older recordings.

Sentry Mode – View Live Camera

NOTE: View Live Camera requires premium connectivity. It also requires that version 4.2.1 (or newer) of the Tesla mobile app is installed on a phone that has been paired as a key to Model S/Model X.

When Sentry Mode is enabled, you can use the mobile app to remotely view the area surrounding Model S/Model X as seen through the exterior cameras.

To enable, touch **Controls > Safety > Sentry Mode > View Live Camera via Mobile App** on the Model S/Model X touchscreen. Once enabled, ensure there are no occupants in the vehicle and all doors are closed. Then, on the Tesla mobile app, go to **Safety > Sentry Mode** and touch **View Live Camera** to see a live video feed of your vehicle's surroundings.

In addition, if Model S/Model X is equipped with a pedestrian warning speaker (see [Pedestrian Warning System on page 267](#)), you can press and hold the microphone button on the mobile app to transmit your voice through this speaker.

When **View Live Camera** is actively being used, Model S/Model X may periodically flash its exterior lights and display a message on the touchscreen to notify others that the area surrounding the vehicle is being viewed through the cameras.

View Live Camera is limited to approximately one hour (or 15 minutes for some regions) of cumulative usage per day.

NOTE: Video and audio quality can vary depending on network connectivity.

NOTE: The live camera feed is fully encrypted and cannot be accessed by Tesla.



Viewing Video Recordings

You can view recorded footage on the touchscreen when Model S/Model X is in Park. Touch the Dashcam icon located in the app launcher or the Dashcam icon at the top of the touchscreen on the **Controls** screen. Touch the menu icon in the top corner of the screen. The tabs display a list of all video clips, organized by location and timestamp. Pause, rewind, fast forward, and delete video recordings as needed. You can also navigate to **Controls > Safety > Delete Dashcam Clips** to delete all dashcam and Sentry Mode footage, including recent and saved clips.

NOTE: Dashcam recording pauses when you launch the Viewer.

You can also view video footage by removing and inserting the USB flash drive into a computer and navigating to the TeslaCam or TeslaTrackMode folder.

The TeslaCam folder contains three sub-folders:

- **Recent Clips:** When recording, Dashcam continuously saves footage to Recent Clips in 60-minute cycles. Footage is overwritten every hour unless you manually save it. Four videos are recorded for each clip, one from each camera (front, rear, left, and right).

NOTE: Rear camera recordings are available only on vehicles manufactured after approximately February 2018.

- **Saved Clips:** Contains all recordings that are saved using Dashcam.
- **Sentry Clips:** Contains the last 10 minutes of footage from all Sentry Mode events that triggered an Alert or Alarm state. If storage space on the USB flash drive becomes limited, the oldest Sentry Clips are deleted to provide space for new ones. Once deleted, you cannot retrieve them.

When the USB flash drive runs out of storage space, video footage can no longer be saved. To prevent the flash drive from getting full, regularly move saved videos to another device and delete them from the flash drive.



HomeLink Universal Transceiver

About HomeLink



If your vehicle is equipped with the HomeLink® Universal Transceiver, you can operate up to three Radio Frequency (RF) devices, including garage doors, gates, lights, and security systems.

NOTE: Depending on date of manufacture, market region, and options selected at time of purchase, some vehicles are not equipped with a HomeLink Universal Transceiver.

WARNING: Do not use the HomeLink Universal Transceiver with a device that does not have safety stop and reverse features. Using a device without these safety features increases the risk of injury or death.

Supported Modes

HomeLink supports three different transmit modes, which is how your vehicle and the RF device communicate. Selecting a transmit mode is determined by your RF device's compatibility:

- **Standard Mode:** Use Standard Mode if your RF device is equipped with a remote control that must be used to operate the device (for example, a remote-controlled garage door). This mode is the most commonly used transmit mode for HomeLink devices.
- **D-Mode or UR-Mode:** Use D-Mode or UR-Mode if the RF device does not have a remote control, and the receiver has a "Learn" button (may also be called "Program" or "Smart"). D-Mode and UR-Mode function similarly in that Model S/Model X communicates directly with the device's receiver as opposed to the remote control.

NOTE: D-Mode is used primarily in North America whereas UR-Mode is popular in Europe, the Middle East, and Asia. To determine the mode your device is compatible with, contact HomeLink (www.homelink.com or call 1-800-355-3515).

Each of your devices can be set to a different mode. For example, your garage door can be set to Standard Mode, your front gate can be set to D-Mode, etc. To change a transmit mode, touch the HomeLink icon at the top of the touchscreen **Controls** screen and select the device you want to change. Then, select **Program** and choose the desired mode for your device. Confirm by touching **Set Mode** and follow the onscreen instructions.

For older vehicles, changing the mode for one device changes the mode for all devices, so be careful when changing transmit modes. Devices not compatible with your selected mode may not work. Touch the HomeLink icon at the top of the touchscreen, then touch **Change Transmit Mode**.

NOTE: Check the product information for your HomeLink device to determine which mode is compatible with your device.

Programming HomeLink

To program HomeLink®:

1. Park Model S/Model X so that the front bumper is in front of the device you want to program.



CAUTION: Your device might open or close during programming. Therefore, before programming, make sure that the device is clear of any people or objects.

2. Check that the device's remote control has a healthy battery. Tesla recommends replacing the battery in the device's remote control before Programming HomeLink.
3. Touch the HomeLink icon at the top of the touchscreen **Controls** screen.
4. Touch **Create HomeLink**.
5. Select the mode you wish to use: Standard, D-Mode, or UR-Mode (see [Supported Modes on page 400](#)).
6. On the touchscreen, enter a name for your device, then and touch **Enter** or **Create HomeLink**.
7. Touch **Start** and follow the onscreen instructions.



NOTE: If you see a screen called "Train the receiver" while programming the device, remember that this is a time-sensitive step. After pressing the Learn/Program/Smart button on the device's remote control, you have only approximately 30 seconds to return to your vehicle and press **Continue**, and then press the trained HomeLink device name twice. Consider having an assistant to ensure you can complete this step within 30 seconds.

8. Once your device is programmed, touch **Save** to complete the programming.
9. Ensure HomeLink works as expected. In some cases, you may need to repeat the programming process multiple times before succeeding.

Once programmed, you can operate the device by touching its corresponding HomeLink icon on the touchscreen. HomeLink remembers the location of your programmed devices. When you approach a known location, the HomeLink control on the touchscreen automatically appears. When you drive away, it disappears.

NOTE: For additional assistance or compatibility questions, contact HomeLink (www.homelink.com or call 1-800-355-3515).

Auto Opening and Closing

To operate a HomeLink device without using the touchscreen, you can automate the device to open as you approach, and close as you drive away:

1. Touch the HomeLink icon at the top of the touchscreen **Controls** screen, then choose the device you want to automate.
2. Select the **Auto-open when arriving** checkbox if you want the device to open as you approach.
3. Touch the arrows to specify the distance you want Model S/Model X to be from the device before it opens.
4. Select the **Auto-close when leaving** checkbox if you want the device to close as you drive away.

As you approach (or drive away from) a device that is set to operate automatically, the HomeLink status icon displays a count-down message to let you know when the device automatically opens or closes. In situations where you don't want the device to automatically open or close, touch **Skip Auto-Open** or **Skip Auto-Close** at any time during the count-down message.

NOTE: Do not rely on HomeLink to ensure the device fully closes.

Resetting the Location of the HomeLink Device

If you experience situations in which you sometimes drive up to your HomeLink device and it doesn't open, or the touchscreen does not display a notification as you approach a programmed device, you may need to reset the device's location. To do so, park as close as possible to the HomeLink device (garage door, gate, etc.) and display the HomeLink settings page by touching the HomeLink icon at the top of the touchscreen **Controls** screen. Touch the name of the device you want to reset, then touch **Reset Location**.

Deleting a Device

To delete a HomeLink device, touch the HomeLink icon at the top of the touchscreen **Controls** screen. Touch the name of the device you want to delete, then touch **Delete**.

NOTE: You can also perform a factory reset to erase your HomeLink settings, along with all other personal data (saved addresses, music favorites, imported contacts, etc.). See [Erasing Personal Data on page 359](#) [Service on page 357](#).

NOTE: For security reasons, delete your HomeLink devices if you sell your Model S/Model X.

Troubleshooting HomeLink

Standard Mode

In Standard Mode, Model S/Model X records the RF signal from your HomeLink device's remote control. The touchscreen instructs you to stand in front of the vehicle, point the device's remote control at the front bumper, and press and hold the button until the headlights flash. When the headlights flash, Model S/Model X has learned the remote control and you can touch **Continue** on the touchscreen. If the headlights do not flash:

- Check the batteries in the remote control. It is a good idea to replace the batteries before you start programming.
- Ensure you are standing in front of Model S/Model X with the device's remote control positioned within two inches (five cm) of the Tesla emblem.



- Press and hold the button on your device's remote control until the headlights flash. In some cases you must hold the button on the remote control for up to three minutes.

NOTE: Some HomeLink remote controls require multiple short presses (approximately one second each press) instead of one long duration press. If you are unsuccessful after multiple attempts of using long presses, try repeated presses of one second each.

D-Mode and UR-Mode

In D Mode and UR-Mode, the device's receiver learns Model SModel X. The touchscreen instructs you to press the "Learn" button (may also be called "Program" or "Smart") on the device's receiver. If this does not work, refer to the following guidelines:

- Park Model SModel X with its bumper as close as possible to the garage door, gate, etc. that you are trying to program.
- Make sure you are pressing the receiver's Learn/Program/Smart button. For instructions on how to put the receiver into learning mode, refer to the product details provided with your RF device that you are trying to program.
- If you see a screen called "Train the receiver" while programming the device, remember that this is a time-sensitive step. After pressing the Learn/Program/Smart button on the device's remote control or receiver, you only have approximately 30 seconds to return to your vehicle, press **Continue**, then press the trained HomeLink device name twice. Consider having someone assist you with this step.
- Most devices stay in learning mode for only three to five minutes. Immediately after pressing the device's Learn/Program/Smart button, follow the instructions displayed on the vehicle's touchscreen.

For additional assistance or compatibility questions, contact HomeLink (www.homelink.com or call 1-800-355-3515).



Connecting to Wi-Fi

Wi-Fi is available as a data connection method and is often faster than cellular data networks. Connecting to Wi-Fi is especially useful in areas with limited or no cellular connectivity. To ensure fast, reliable delivery of software and map updates, Tesla recommends leaving Model S/Model X connected to a Wi-Fi network whenever possible (for example, when parked overnight).

To connect to a Wi-Fi network:

1. Touch **Controls** > **Wi-Fi icon** at the top of the touchscreen **Controls** screen. Model S/Model X begins to scan and display detected Wi-Fi networks that are within range.
NOTE: If a known Wi-Fi network does not appear in the list, move Model S/Model X closer to the access point or consider using a range extender.
2. Select the Wi-Fi network you want to use, enter the password (if necessary), then touch **Confirm**.
3. Model S/Model X connects to the Wi-Fi network. Whenever the network is within range, Model S/Model X connects to it automatically.

You can also connect to a hidden network that isn't shown on the list of scanned networks. Just touch **Wi-Fi Settings**, enter the name of the network in the resulting dialog box, select the security setting, then touch **Add Network**.

NOTE: If more than one previously connected network is within range, Model S/Model X connects to the one most recently used.

NOTE: At Tesla Service Centers, Model S/Model X automatically connects to the Tesla Service Wi-Fi network.

Hotspots and Connectivity

You can also use a mobile hotspot or your phone's Internet connection via Wi-Fi tethering (subject to fees and restrictions of your mobile carrier) to access the internet. To remain connected to Wi-Fi when shifting into Drive or Reverse, choose the connection from the Wi-Fi settings screen, then touch **Remain connected in Drive**.



Software Updates

Loading New Software

Tesla updates your vehicle's software wirelessly, constantly providing new features. Tesla recommends you install software updates as soon as they are available on your vehicle. To ensure the fastest and most reliable delivery of software updates, leave Wi-Fi turned on and connected whenever possible. In most cases, your vehicle must be connected to Wi-Fi to start an update (see [Connecting to Wi-Fi on page 403](#)).

Software updates are not performed when the following features are active:

- Smart Preconditioning,
- Keep Climate On, Dog Mode, or Camp Mode
- Sentry Mode

NOTE: On an as-needed basis, Tesla also sends software updates using a cellular connection.

 **WARNING:** Do not attempt to use the vehicle while the software is being updated. Vehicle functions, including some safety systems, may be limited or disabled when a software update is in progress and you could damage the vehicle.

When a software update is available, a yellow clock icon appears at the top of the touchscreen **Controls** screen. There are three ways you can install software updates:

- Touch the yellow clock icon to display the scheduling screen, which prompts you to select a time to install the update (**Set For This Time**) or install it now (**Install Now**). Once scheduled, the yellow clock icon changes to a white clock icon until the update begins. At any time before the update begins, you can touch this clock icon to reschedule the update.
- Touch **Controls > Software** to determine if an update is available for your vehicle. If available, touch **Software Update Available** to navigate to the scheduling screen, as mentioned above.
- Start updates using the Tesla mobile app.

NOTE: Some software updates can take up to three hours to complete. Model S Model X must be in Park while the software is being updated. To ensure the fastest and most reliable delivery of software updates, leave the Wi-Fi turned on and connected whenever possible (see [Connecting to Wi-Fi on page 403](#)).

The yellow clock icon becomes a green download icon when a software update is downloading. If a yellow download icon displays, a software update is available but your vehicle is not connected to Wi-Fi. Connect your vehicle to Wi-Fi to start the download.

Software Update Preferences

You can choose how quickly and often you receive software updates. To change your preference, touch **Controls > Software > Software Update Preferences** and choose either of these options:

- **Standard:** Receive software updates using the normal rollout timeframe for your region and vehicle configuration. When a software release is made available it has generally been running on other customer vehicles for a period of time.
- **Advanced:** Receive the latest software updates for your region and vehicle configuration as soon as they are available. Tesla determines how, when, and where to send updates to vehicles based on various factors unique to each release. Keep in mind that although you receive updates as soon as they are available for your specific vehicle, you may not be in the first Tesla group of Tesla owners to receive the update. Choosing Advanced does not enroll your vehicle in Tesla's early access program.

NOTE: Tesla does not update software upon request for those wanting to receive the latest features and improvements. Selecting **Advanced** and consistently connecting to Wi-Fi (see [Connecting to Wi-Fi on page 403](#)) is the best way to receive the latest software updates.

NOTE: The software update screen persists until you install the update. You must install a software update as soon it becomes available. Any harm resulting from failure to install a software update is not covered by the vehicle's warranty. Failure or refusal to install updates can cause some vehicle features to become inaccessible, digital media devices to become incompatible, and can limit Tesla's ability to diagnose and service your vehicle.

NOTE: Reverting to a previous software version is not possible.



If the touchscreen displays a message indicating that a software update was not successfully completed, contact Tesla.

Charging

If Model S/Model X is charging when the software update begins, charging stops. Charging resumes automatically when the software update is complete. If you are driving Model S/Model X at the scheduled update time, the update is canceled and must be rescheduled.

Viewing Release Notes

When a software update is complete, read the release notes displayed on the touchscreen to learn about changes or new features. To display release notes about the current version of your vehicle's software at any time, touch **Controls > Software > Release Notes**.

Tesla strongly recommends reading all release notes. They may contain important safety information or operating instructions for your Model S/Model X.



Mobile App

The Tesla mobile app allows you to communicate with Model SModel X remotely using your iPhone® or Android™ phone.

NOTE: The information below may not represent an exhaustive list of the functions available on the Tesla mobile app. To ensure access to new and improved features, download updated versions of the mobile app as they become available.

To Use the Mobile App

To set up the Tesla mobile app to communicate with your Model SModel X:

1. Download the Tesla mobile app to your phone.
2. Log in to the Tesla mobile app by entering your Tesla account credentials.
3. Enable mobile access to your Model SModel X by touching **Controls > Safety > Mobile Access** (see [Controls on page 348](#)).

Your phone and vehicle must both be actively connected to cellular service to allow the mobile app to communicate with your vehicle. Tesla recommends that you always have a functional physical key readily available if parking in an area with limited or absent cellular service, such as an indoor parking garage.

NOTE: In the event that you require lockout assistance from Tesla due to a non-warranty issue, such as having limited cellular connectivity and having no secondary key available, your expenses are not covered under the Roadside Assistance policy.

NOTE: Tesla does not support the use of third party applications to contact Model SModel X.

Overview

The Tesla mobile app's home screen allows you to:

- See the name of your vehicle (if you have one).
- View your vehicle's estimated range.
- See which drive mode the vehicle is in (Park, Reverse, Neutral, Drive).
- Lock or unlock your vehicle.
- Enable maximum defrost to warm your vehicle in cold conditions.
- Check your vehicle's charging information and open or close the charge port.
- Open the front trunk.
- View your vehicle's odometer, VIN, and current firmware version.

Media settings appear on the mobile app to pause, play, rewind, fast forward, and adjust the volume of the media currently playing in the vehicle.

For supported video sources, send videos to Tesla Theater by sharing the link through the mobile app. Navigate to the movie, show, or video you want to play on your phone and touch the share button. Share the video with the Tesla app and it appears on the touchscreen if Model SModel X is in Park.

Profile

In the Profile tab located at the top corner of your phone's screen (shown as an avatar icon), you can:

- Switch to a different vehicle associated with your Tesla account, if you have access to more than one.
- Navigate the Tesla Shop.
- Access the Tesla inbox.
- Manage your account information and view your order history.
- View and customize notifications you receive under the Settings tab, such as Calendar sync, when your security alarm has been triggered, charging updates, and new software updates. You can start updates from afar and check its progress.



Phone Key

Set up your phone as the key (as described in [Phone Key on page 20](#)). Once authenticated, your phone's Bluetooth signal is detected as you approach your vehicle and the doors unlock when you press a door handle. Likewise, when you exit and walk away with the phone, doors automatically lock (provided the **Walk-Away Door Lock** feature is turned on, as described in [Walk-Away Door Lock on page 41](#)). You must be near your vehicle and have a key card ready to set up your phone as a phone key.

NOTE: Always carry a key card or key fob as a backup key, in case your phone loses power or you misplace your phone.

Controls

The Controls tab allows you to do the following:

- Open the front or rear trunk.
- Lock or unlock Model S/Model X from afar.
- Open or close the charge port.
- Flash the lights or honk the horn to find where Model S/Model X is parked.
- Enable Keyless Driving.

NOTE: Keyless Driving can be used when you do not have your key or to bypass PIN to Drive in cases where you forgot your PIN or your touchscreen is unresponsive (see [PIN to Drive on page 394](#)).

- Open and close your garage door if your vehicle has a programmed HomeLink connection, if available (see [HomeLink Universal Transceiver on page 400](#)).

Climate

You can check the interior temperature and heat or cool the cabin before driving (even if it's in a garage), control the seat heaters, and defrost the windshield:

- Enable or disable **Defrost Car** defrost which helps melt snow, ice, and frost on the windshield, windows, and mirrors.
- Customizing climate controls allows you to precondition the cabin to your desired temperature and turn on or off the steering wheel/steering yoke and seat heaters.
- Vent or close the sunroof. Vent the windows.

Using the mobile app to precondition Model S/Model X also warms the Battery as needed. The mobile app will notify you once your vehicle has reached the desired preconditioning temperature.

NOTE: In extremely cold weather or icy conditions, it is possible that your charge port latch may freeze in place. In cases where you cannot remove or insert the charge cable, or the vehicle is not Supercharging due to the latch being frozen in place, use your Tesla mobile app to precondition your vehicle on **HI** for approximately 30-45 minutes (you must use your mobile app to precondition the vehicle; setting your climate to **HI** using the touchscreen is not effective). This can help thaw ice on the charge port latch so the charge cable can be removed or inserted.

NOTE: In extremely cold weather or icy conditions, it is possible that your charge port latch may freeze in place. In cases where you cannot remove or insert the charge cable, or the vehicle is not Supercharging due to the latch being frozen in place, use your Tesla mobile app to enable **Defrost Car** for approximately 30-45 minutes. This can help thaw ice on the charge port latch so the charge cable can be removed or inserted.

Location

Locate Model S/Model X with directions, or track its movement across a map.

Summon

You can park or retrieve Model S/Model X using Summon (see [Summon on page 330](#)) or Smart Summon (see [Smart Summon on page 333](#)).

Security

The Security tab allows you to do the following:



- Pair your phone to the vehicle (see [Phone Key on page 20](#)).
- Enable or disable Sentry Mode (see [Using Sentry Mode on page 397](#)).
- Enable or disable Valet Mode (see [Valet Mode on page 183](#)).
- Enable or disable Speed Limit Mode and receive notifications when the vehicle's driving speed is within approximately 3 mph (5 km/h) of your selected maximum speed (see [Safety on page 356](#)).

Upgrades

View and purchase the latest upgrades available for your vehicle, such as full self-driving.

Service

See [Schedule Service on page 429](#) for information on how to schedule service through the mobile app.

Roadside

View roadside resources and request roadside assistance (where applicable). For more information on Roadside Assistance, see [Contacting Tesla Roadside Assistance on page 502](#).

Granting Access to a Second Driver

Add and remove access permission for an additional driver from the Tesla mobile app.

NOTE: Tesla mobile app version 4.3.1 or higher is required. Additional drivers can either use a previously registered Tesla Account or use the app to create a new Tesla Account.

To add an additional driver, in the Tesla mobile app from the vehicle home screen, go to **Security > Add Driver** and follow the onscreen instructions.

NOTE: The additional driver has access to all app features except purchasing upgrades.

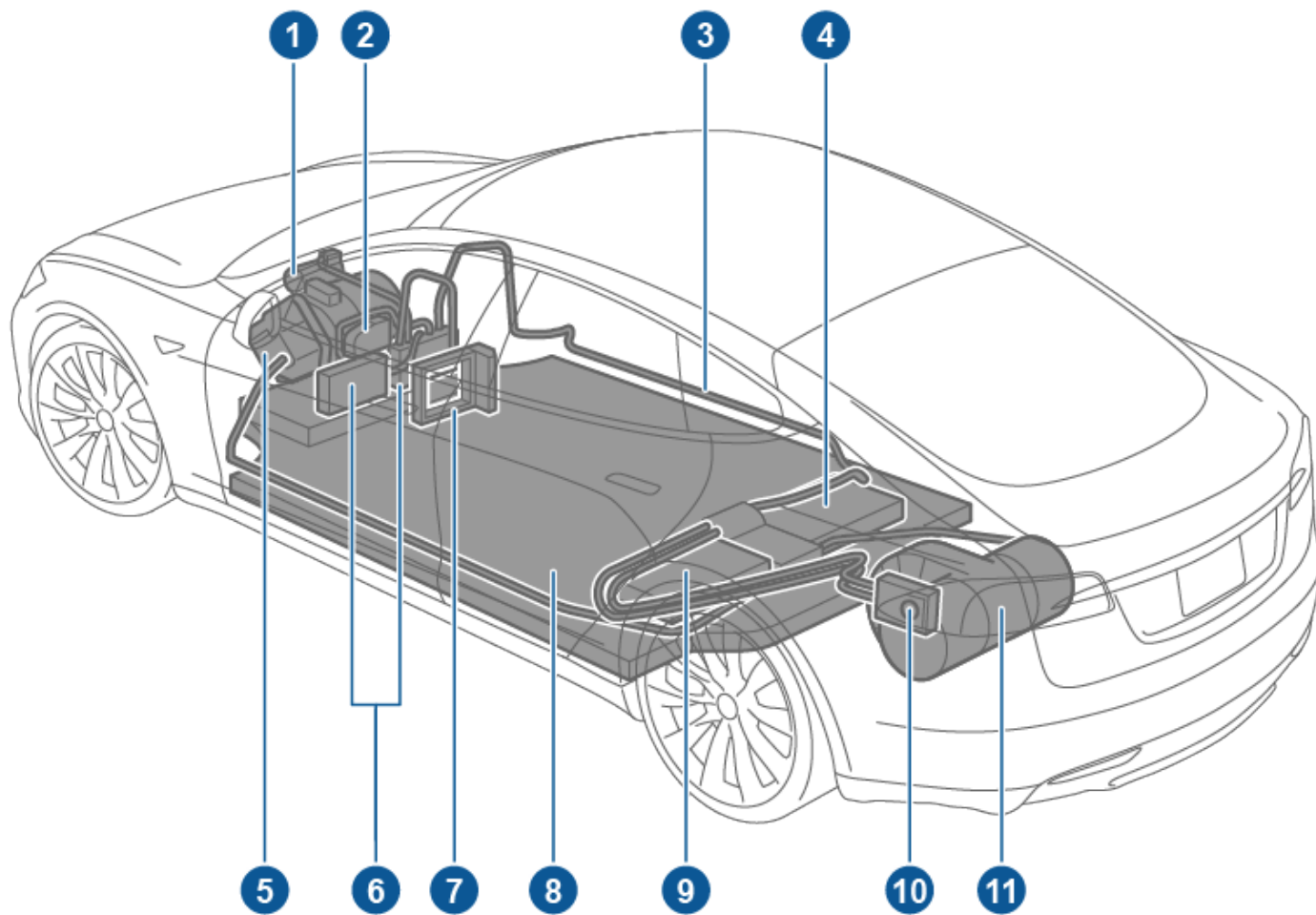
To remove access, use the mobile app and go to **Security > Manage Drivers** and follow the onscreen instructions.



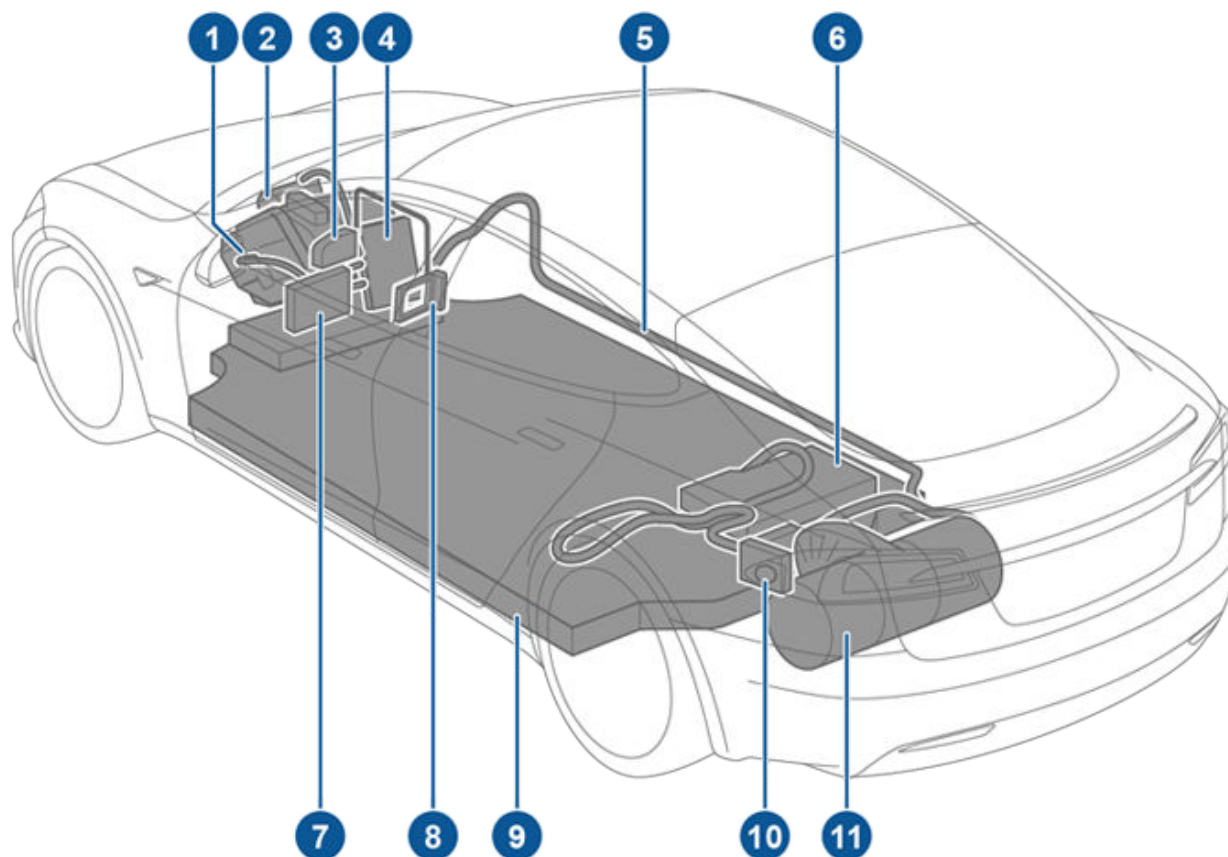
Charging

Electric Vehicle Components

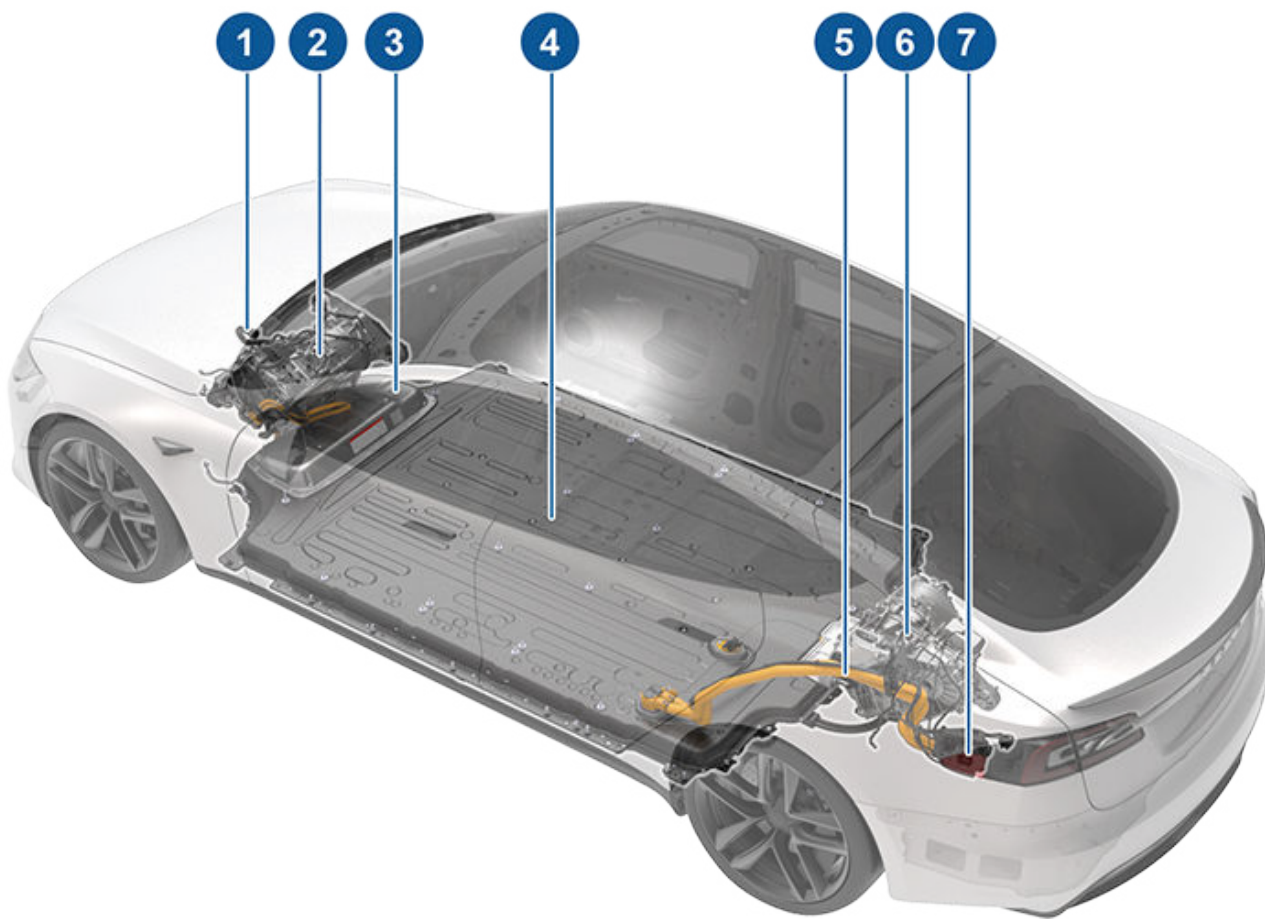
High Voltage Components



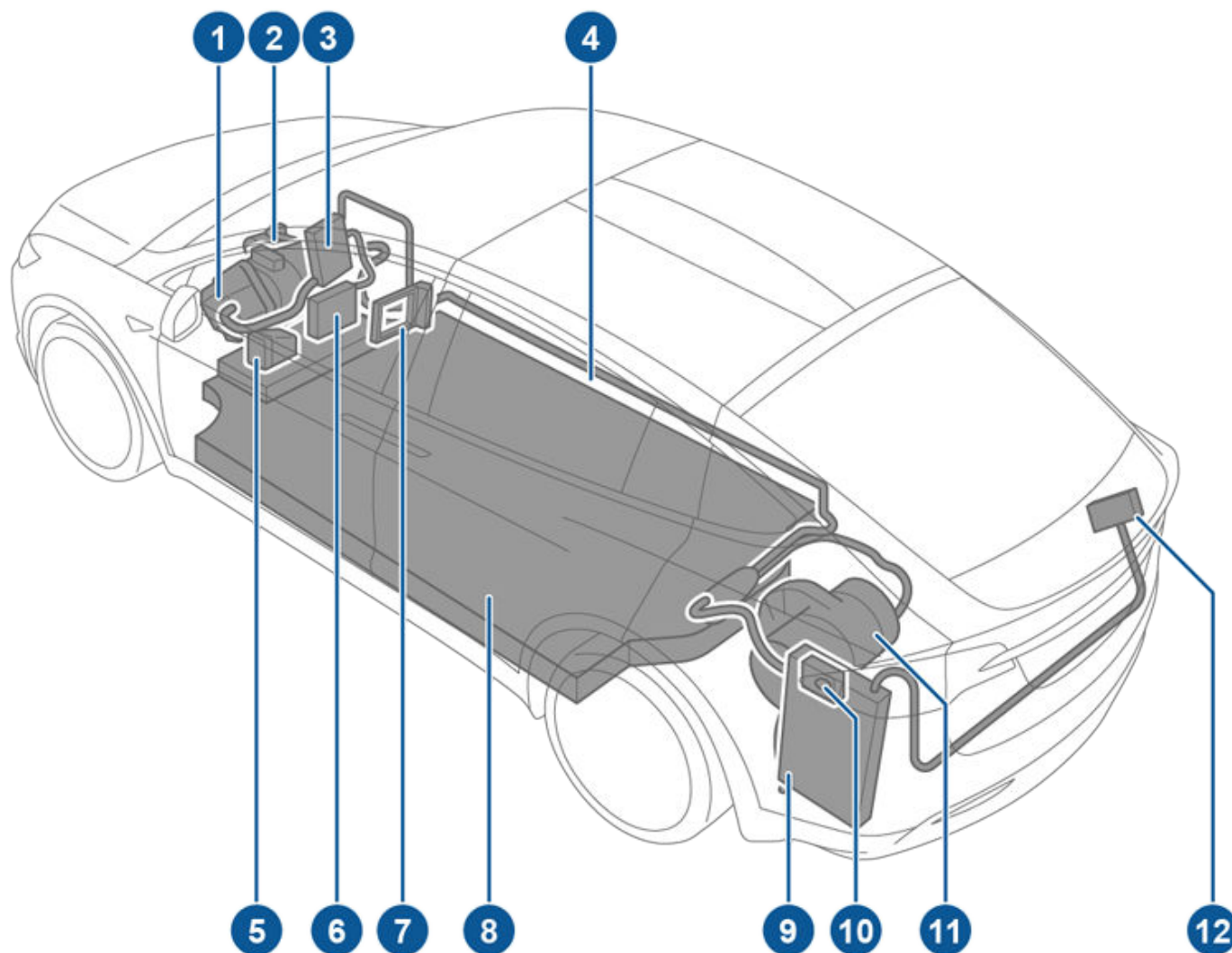
1. Air Conditioning Compressor
2. Battery Coolant Heater
3. High Voltage Cabling (colored orange)
4. On-board Master Charger
5. Front Motor (All-Wheel Drive vehicles only)
6. DC-DC Converter and Junction Box
7. Cabin Heater
8. High Voltage Battery
9. OPTIONAL: On-board Slave Charger
10. Charge Port
11. Rear Motor



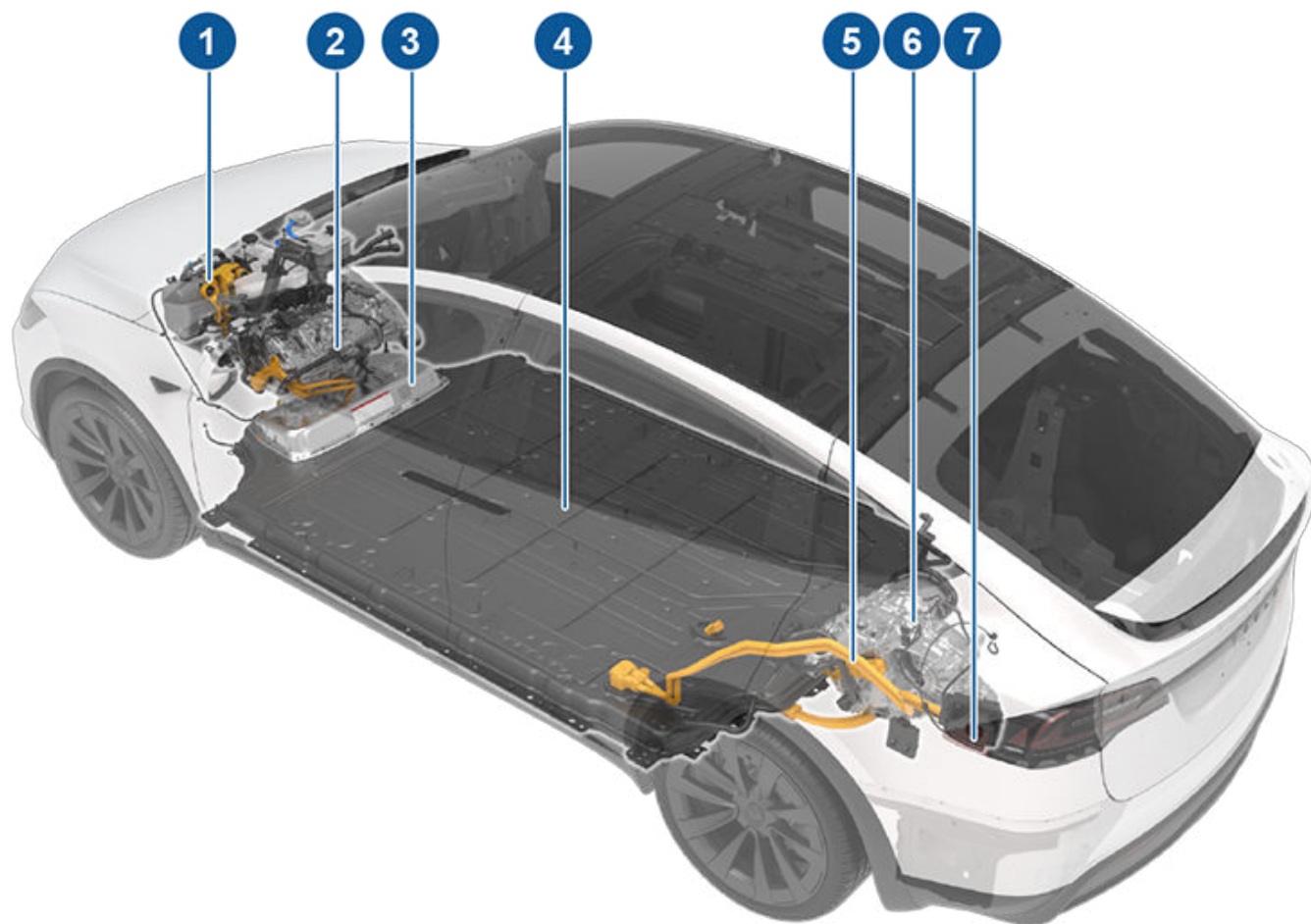
1. Front Motor (All-Wheel Drive vehicles only)
2. Air Conditioning Compressor
3. Battery Coolant Heater
4. Forward Junction Box
5. High Voltage Busbars
6. On-board Charger
7. DC-DC Converter
8. Cabin Heater
9. High Voltage Battery
10. Charge Port
11. Rear Motor



1. Heat Pump Assembly
2. Front Drive Unit
3. High Voltage Battery Service Panel
4. High Voltage Battery
5. High Voltage Busbars
6. Rear Drive Unit
7. Charge Port



1. Front Motor
2. Air Conditioning Compressor
3. Forward Junction Box
4. High Voltage Cabling
5. Battery Coolant Heater
6. DC-DC Converter
7. Cabin Heater
8. High Voltage Battery
9. On-board Charger
10. Charge Port
11. Rear Motor
12. HV Cable to Rear HVAC Assembly



1. Heat Pump Assembly
2. Front Drive Unit
3. High Voltage Battery Service Panel
4. High Voltage Battery
5. High Voltage Busbars
6. Rear Drive Unit
7. Charge Port

NOTE: Plaid version not shown.

-  **WARNING:** The high voltage system has no user serviceable parts. Do not disassemble, remove or replace high voltage components, cables or connectors. High voltage cables are typically colored orange for easy identification.
-  **WARNING:** Read and follow all instructions provided on the labels that are attached to Model SModel X. These labels are there for your safety.
-  **WARNING:** In the unlikely event that a fire occurs, immediately contact your local fire emergency responders.

Charging Equipment

Charging equipment designed specifically to charge your Model SModel X is available from Tesla. A Tesla Wall Connector, which installs in your parking space, is the fastest way to charge Model SModel X in daily use.



In most market regions, Model S/Model X is equipped with a Mobile Connector and the adapter(s) needed to plug into the most commonly used power outlets. When using the Mobile Connector, first plug the Mobile Connector into the power outlet, attach an adapter (if needed), and then plug in Model S/Model X. For more information about your Mobile Connector, see the Mobile Connector Owner's Manual (available on the touchscreen). Additional adapters can be purchased from Tesla.

Tesla offers adapters (for example, J1772, CHAdeMO, and Combined Charging System (CCS)) to allow you to plug into the most commonly used public charging stations in your region. Open the charge port door using the touchscreen (see [Charging Instructions on page 417](#)), plug the adapter into the charging port on Model S/Model X, and then connect the station's charging connector to the adapter. For information on the charging equipment available for your region, go to www.tesla.com, choose your region, and then view the available charging options.

More details on public charging station adapters is available at <https://www.tesla.com/chademo>.



High Voltage Battery Information

About the High Voltage Battery

Model S Model X has one of the most sophisticated battery systems in the world. The most important way to preserve the high voltage Battery is to **LEAVE YOUR VEHICLE PLUGGED IN** when you are not using it. This is particularly important if you are not planning to drive Model S Model X for several weeks.

NOTE: When left idle and unplugged, your vehicle periodically uses energy from the Battery for system tests and recharging the low voltage battery when necessary.

There is no advantage to waiting until the Battery's level is low before charging. In fact, the Battery performs best when charged regularly.

NOTE: If you allow the Battery to discharge to 0%, other components may become damaged or require replacement (for example, the low voltage battery). In these cases, you are responsible for repair and/or transporting expenses. Discharge-related expenses are not covered by the warranty or under the Roadside Assistance policy.

The peak charging rate of the Battery may decrease slightly after a large number of DC Fast Charging sessions, such as those at Superchargers. To ensure maximum driving range and Battery safety, the Battery charge rate is decreased when the Battery is too cold, when the Battery's charge is nearly full, and when the Battery conditions change with usage and age. These changes in the condition of the Battery are driven by battery physics and may increase the total Supercharging duration by a few minutes over time. You can minimize the amount of charge time by using Trip Planner to warm the Battery while driving to a Supercharger. See [Trip Planner on page 373](#) for more information.

Battery Care

Never allow the Battery to fully discharge. Even when Model S Model X is not being driven, its Battery discharges very slowly to power the onboard electronics. The Battery can discharge at a rate of approximately 1% per day, though the discharge rate may vary depending on environmental factors (such as cold weather), vehicle configuration, and your selected settings on the touchscreen. Situations can arise in which you must leave Model S Model X unplugged for an extended period of time (for example, at an airport when traveling). In these situations, keep the 1% in mind to ensure that you leave the Battery with a sufficient charge level. For example, over a two week period (14 days), the Battery may discharge by approximately 14%.

Discharging the Battery to 0% may result in damage to vehicle components. To protect against a complete discharge, Model S Model X enters a low-power consumption mode when the displayed charge level drops to approximately 0%. In this mode, the Battery stops supporting the onboard electronics and auxiliary low voltage battery. Once this low-power consumption mode is active, immediately plug in Model S Model X to prevent a jump-start and low voltage battery replacement.

NOTE: If Model S Model X is unresponsive and does not unlock, open, or charge, the low voltage battery may be discharged. In this situation, try jump starting the low voltage battery (see [Instructions for Transporters on page 510](#) [Instructions for Transporters on page 517](#) for instructions on how to jump start the battery). If the vehicle is still unresponsive, contact Tesla.

Temperature Limits

For better long-term performance, avoid exposing Model S Model X to ambient temperatures above 140° F (60° C) or below -22° F (-30° C) for more than 24 hours at a time.

Energy Saving Feature

Model S Model X has an energy-saving feature that reduces the amount of energy being consumed by the displays when Model S Model X is not in use. On newer vehicles, this feature is automated to provide an optimal level of energy saving. However, on older vehicles, you can control the amount of energy being consumed by the displays by touching **Controls > Display > Energy Saving**. For more information on maximizing range and saving energy, see [Getting Maximum Range on page 261](#).

Battery Warnings and Cautions



WARNING: The Battery has no parts that an owner or a non-Tesla authorized service technician can service. Under no circumstances should you open or tamper with the Battery. Always contact Tesla to arrange for Battery servicing.



-  **CAUTION:** If the Battery's charge level falls to 0%, you must plug it in. If you leave it unplugged for an extended period, it may not be possible to charge or use Model S/Model X without jump starting or replacing the low voltage battery. Leaving Model S/Model X unplugged for an extended period can also result in permanent Battery damage. If you are unable to charge Model S/Model X after attempting to jump start the low voltage battery, contact Tesla immediately.
-  **CAUTION:** The Battery requires no owner maintenance. Do not remove the coolant filler cap and do not add fluid. If the instrument panel warns you that the fluid level is low, contact Tesla immediately.
-  **CAUTION:** Do not use the Battery as a stationary power source. Doing so voids the warranty.



Charging Instructions

Opening the Charge Port

The charge port is located on the left side of Model S/Model X, behind a door that is part of the rear tail light assembly. Park Model S/Model X to ensure that the charge cable easily reaches the charge port.

With Model S/Model X unlocked (or a recognized key is within range) and in Park, press and release the button on the Tesla charge cable to open the charge port door.

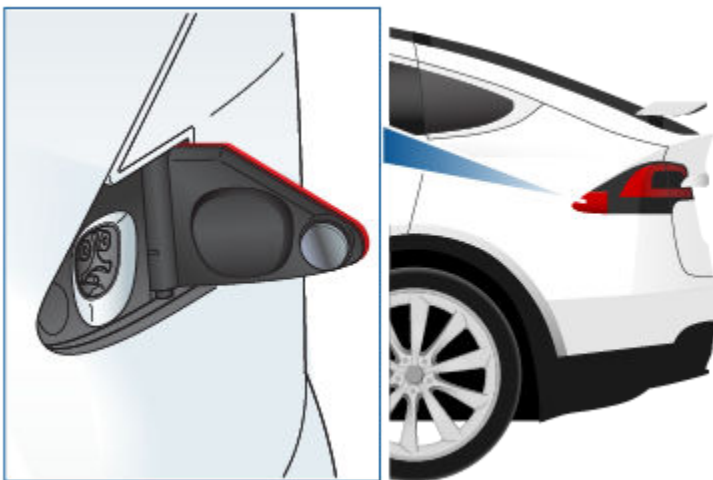
NOTE: If the charge cable is close to the charge port door, you can press the button on the charge cable to open the charge port door even when Model S is locked or a recognized key is not within range.



You can also open the charge port door using any of these methods:

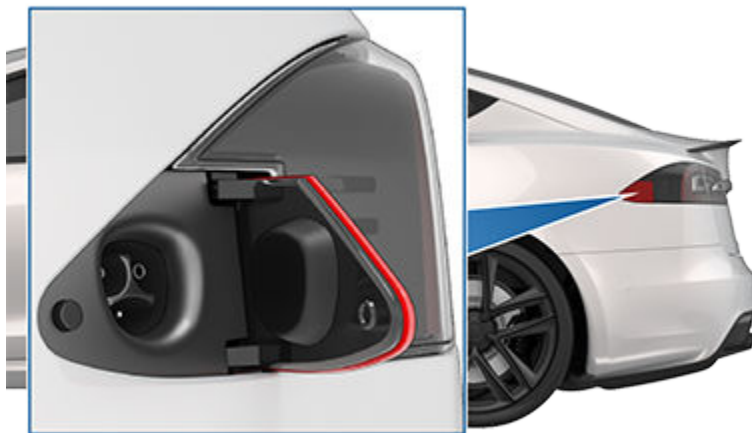
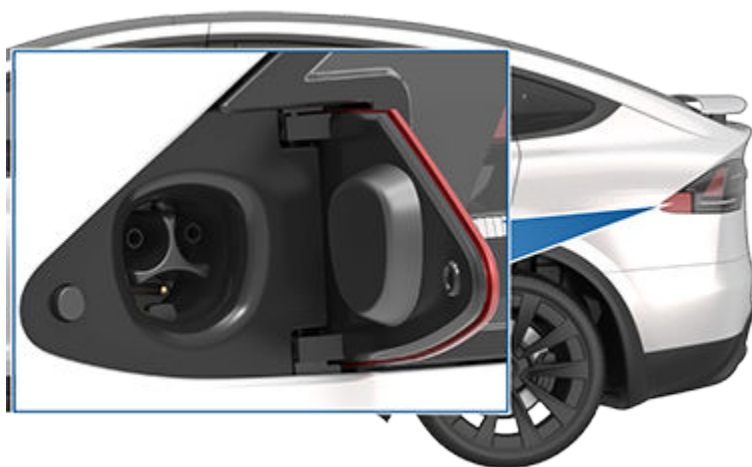
- On the touchscreen, touch **Controls** and touch the Charge Port icon (lightning bolt).
- On the touchscreen, navigate to **Controls > Charging > Open Charge Port**.
- Press the charge port door when Model S/Model X is unlocked or a recognized key is nearby.
- On the key fob, hold down the rear trunk button for 1-2 seconds.
- Use voice commands to open the charge port door (see [Voice Commands on page 391](#)). You can also use voice commands to close the charge port door, and begin or stop charging.

NOTE: The following image is provided for demonstration purposes only. Depending on market region and date of manufacture, your charge port may be slightly different.

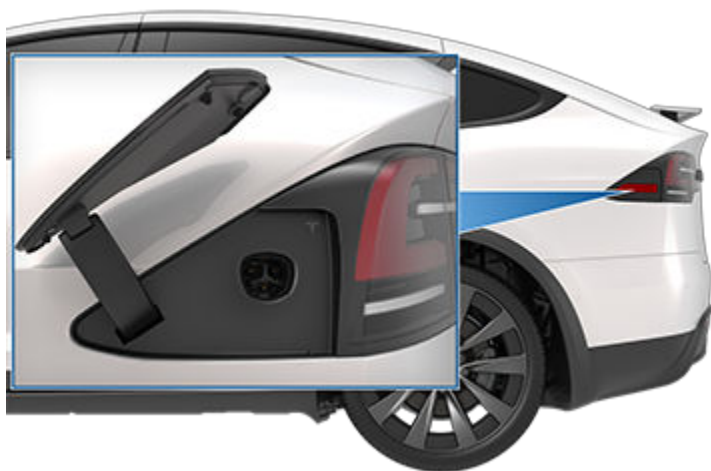




Charge port manufactured until approximately February 2022.



Charge port manufactured after approximately February 2022.



NOTE: The charge port lights up white when you open the charge port door. If you do not insert a charge cable into the charge port within a few minutes after opening the charge port door, the charge port door closes. If this happens, use the touchscreen to open the charge port door again.

NOTE: In extremely cold weather or icy conditions, it is possible that your charge port latch may freeze in place. In cases where you cannot remove or insert the charge cable, or the vehicle is not Supercharging due to the latch being frozen in place, use your Tesla mobile app to precondition your vehicle on **HI** for approximately 30-45 minutes (you must use your mobile app to precondition the vehicle; setting your climate to **HI** using the touchscreen is not effective). This can help thaw ice on the charge port latch so the charge cable can be removed or inserted.

 **CAUTION:** Do not try to force the charge port door open.

Plugging In

If desired, use the touchscreen to change the charge limit and the charging current (see [Charge Settings on page 424](#)).

To charge at a public charging station, plug the appropriate adapter into the vehicle's charging port, and then connect the station's charging connector to the adapter. The most commonly used adapter(s) for each market region are provided. Depending on the charging equipment you are using, you may need to start and stop charging using a control on the charging equipment.

If you are using the Mobile Connector, plug into the power outlet before plugging in Model S/Model X.

Align the connector to the charge port and insert fully. When the connector is properly inserted, charging begins automatically after Model S/Model X:

- Engages a latch that holds the connector in place;
- Shifts into Park (if it was in any other drive mode);



Owners Manual

- Heats or cools the Battery, if needed. If the Battery requires heating or cooling, you may notice a delay before charging begins.

NOTE: Whenever Model S/Model X is plugged in but not actively charging, it draws energy from the wall outlet instead of using energy stored in the Battery. For example, if you are sitting in Model S/Model X and using the touchscreen while parked and plugged in, Model S/Model X draws energy from the wall outlet instead of the Battery.

CAUTION: The connector end of the charge cable can damage the paint if you drop it onto Model S/Model X.

Charge Port Light

- **WHITE (OR LIGHT BLUE):** The charge port door is open. Model S/Model X is ready to charge and the connector is not inserted, or the charge port latch is unlocked and the connector is ready to be removed.
- **BLUE:** Model S/Model X detects that a connector has been plugged in.
- **BLINKING BLUE:** Model S/Model X is communicating with the connector. Either Model S/Model X is preparing to charge, or a charging session is scheduled to begin at a specified future time.
- **BLINKING GREEN:** Charging is in progress. As Model S/Model X approaches a full charge, the frequency of the blinking slows.
- **SOLID GREEN:** Charging is complete.
- **SOLID AMBER:** The connector is not fully plugged in. Realign the connector to the charge port and insert fully.
- **BLINKING AMBER:** Model S/Model X is charging at a reduced current (AC charging only).
- **RED:** A fault is detected and charging has stopped. Check the instrument panel or touchscreen for an alert.

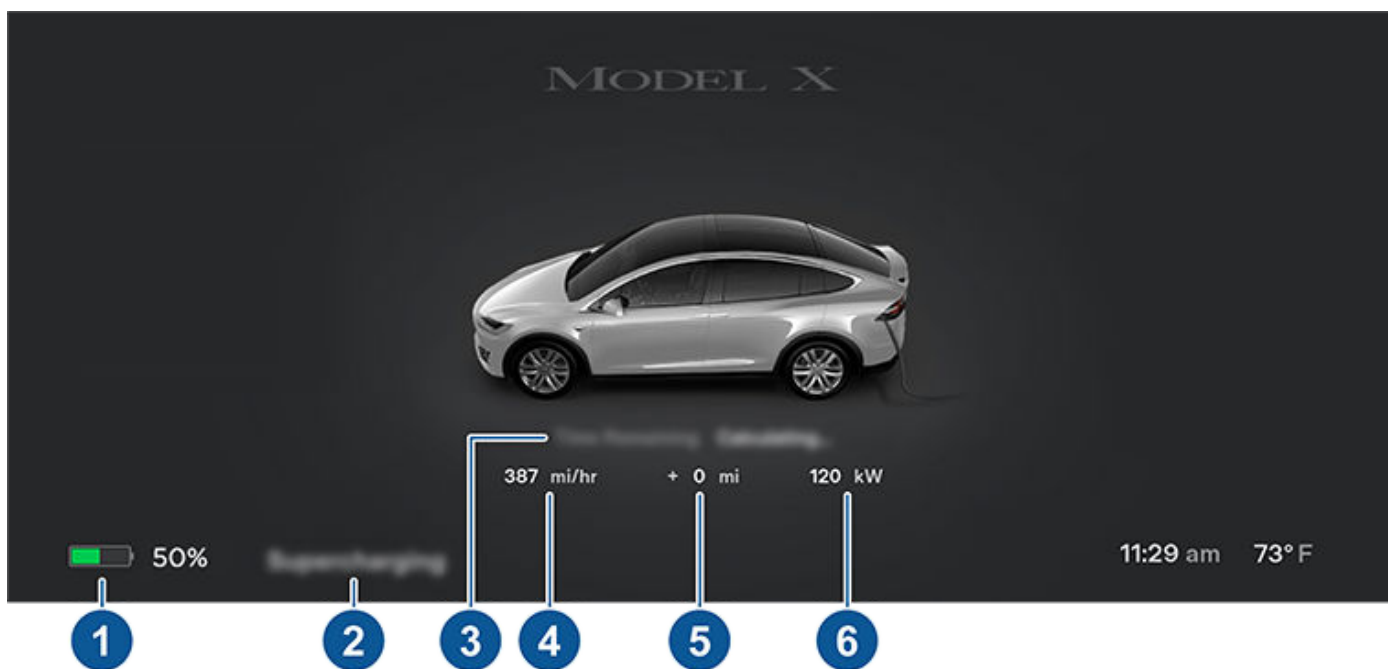
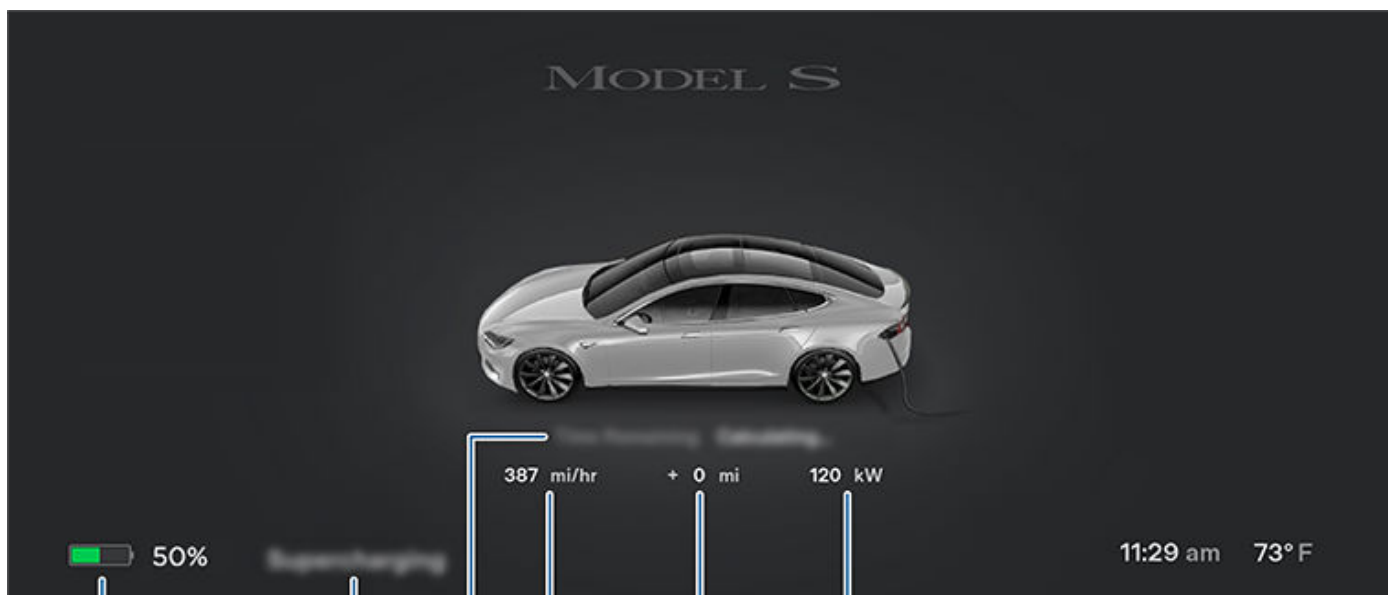
Charging Status

Charging status displays on the instrument panel when the charge port door is open.





1. **Time remaining:** The estimated time remaining to charge to your set limit (see [Charge Settings](#) on page 424).
NOTE: When charging to 100%, the vehicle may continue to charge with low power when charging is displayed as complete. This is expected operation. Because the added energy beyond this point is low, it is usually not beneficial to continue charging.
2. **Charging:** The current power of the charger.
3. **Charging rate:** The maximum current available from the attached charge cable.
4. **Range gained:** Estimated increase in driving distance achieved in the charging session.
5. **Driving distance:** Displays the total estimated driving distance or energy percentage (depending on your display setting) available.
NOTE: To change how energy units are displayed, touch **Controls** > **Display** > **Energy Display**.
6. **Charge status:** Charge status messages (such as Supercharging, Scheduled Charging) display here (see [Scheduled Charging and Scheduled Departure](#) on page 425).



1. **Driving distance:** Displays the total estimated driving distance or energy percentage (depending on your display setting) available.

NOTE: To change how energy units are displayed, touch **Controls > Display > Energy Display**.

2. **Charge status:** Charge status messages (such as Supercharging, Scheduled Charging) display here (see [Scheduled Charging and Scheduled Departure on page 425](#)).
3. **Time remaining:** The estimated time remaining to charge to your set limit (see [Charge Settings on page 424](#)).

NOTE: When charging to 100%, the vehicle may continue to charge with low power when charging is displayed as complete. This is expected operation. Because the added energy beyond this point is low, it is usually not beneficial to continue charging.

4. **Charging rate:** The maximum current available from the attached charge cable.
5. **Range gained:** Estimated increase in driving distance achieved in the charging session.



6. **Charging:** The current power of the charger.

During Charging

During charging, the charge port light pulses green, and the instrument panel touchscreen displays real-time charging status. The frequency at which the green charge port light pulses slows down as the charge level approaches full. When charging is complete, the light stops pulsing and is solid green.

NOTE: If Model S Model X is locked, the charge port light does not light up.

If the charge port light turns red while charging, a fault is detected. Check the instrument panel or touchscreen for an alert describing the fault. A fault can occur due to something as common as a power outage. If a power outage occurs, charging resumes automatically when power is restored.

NOTE: It is normal to hear sounds during charging. Particularly at high currents, the refrigerant compressor and fan operate as needed to keep the Battery cool.

NOTE: Air conditioning performance is generally not affected by charging. However, in some circumstances (for example, charging at high currents during a particularly warm day), the air coming from the vents may not be as cool as expected and a message displays on the instrument panel. This is normal and ensures that the Battery stays within an optimum temperature range while charging to support longevity and optimum performance.



WARNING: Never spray liquid at a high velocity (for example, a pressure washer) towards the charge port while charging. Doing so can result in serious injury or damage to the vehicle, charging equipment, or property.

Stopping Charging

Stop charging at any time by disconnecting the charge cable or touching **Stop Charging** on the touchscreen.

NOTE: To prevent unauthorized unplugging of the charge cable, the charge cable latch remains locked and Model S Model X must be unlocked or able to recognize your key before you can disconnect the charge cable.

NOTE:

To disconnect the charge cable:

1. Press and hold the button on the connector handle to release the latch.

NOTE: You can also release the latch using the touchscreen or mobile app, or by pressing and holding the rear trunk button on the key fob. If your vehicle is equipped with a motorized charge port, you can also press the button to the left of the charge port to release the latch.

2. Pull the connector from the charge port. The charge port door automatically closes.
3. Push the charge port door closed.

To disconnect the charge cable when using an adapter at a public charge station:

1. Unlock Model S Model X.
2. While holding the public charging handle in one hand and the adapter in the other hand, press and hold the button on the public charging handle and pull both outwards, removing the handle and adapter at the same time.

NOTE: If the charging station handle separates from the adapter, leaving the adapter in Model S Model X, use the touchscreen to unlock the charge port.

3. Press and hold the button on the charging handle again to release the adapter from the public charging handle.

NOTE: If Model S Model X is equipped with a motorized charge port door, it automatically closes shortly after you remove the charge cable.

NOTE: The charge port door automatically closes within approximately 10 seconds of removing the connector from the charge port.



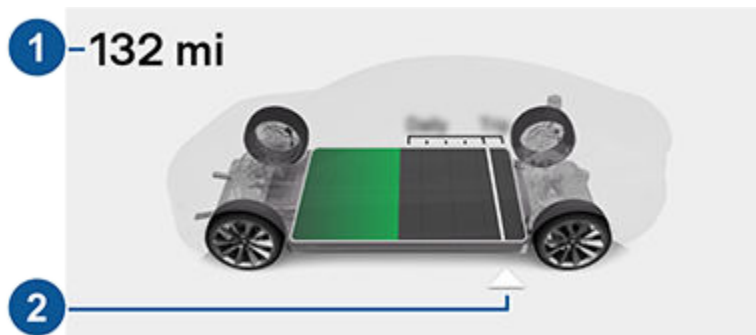
CAUTION: Tesla strongly recommends leaving Model S Model X plugged in when not in use. This maintains the Battery at the optimum level of charge.



Charge Settings

You can access charge settings by touching **Controls > Charging** when Model S/Model X is in Park. While your vehicle is charging, view the charging status on the instrument panel (see [Charging Status on page 420](#)).

When charging, you can also touch the charge icon on the touchscreen to access charge settings.



1. **Driving distance:** Displays the total estimated driving distance available.
2. **Set limit:** Adjust the charge limit by dragging the arrow below the battery to indicate the level of charging you want. The setting you choose applies to immediate and scheduled charging sessions.

NOTE: A portion of the battery image may appear blue. This indicates that a small portion of the energy stored in the battery is not available because the battery is cold. This is normal and no reason for concern. When the battery warms up, the blue portion no longer displays.

You can further adjust charge settings:

- **Open Charge Port, Unlock Charge Port and Stop Charging:** When not charging, touch **Open Charge Port** or **Unlock Charge Port** to open the charge port door or to unlock the charge cable from the charge port. Use **Stop Charging** when you are finished charging.
- **Charge current at this location:** The current automatically sets to the maximum current available from the attached charge cable, unless it was previously reduced to a lower level. If needed, touch **-** or **+** to change the current (for example, you may want to reduce the current if you are concerned about overloading a domestic wiring circuit shared by other equipment). It is not possible to set the charging current to a level that exceeds the maximum available from the attached charge cable. When you change the current, Model S/Model X remembers the location. If you charge at the same location, you do not need to change it again.

NOTE: If Model S/Model X is charging and detects unexpected fluctuations in input power, the charging current is automatically reduced by 25%. For example, a 40 amp current is reduced to 30 amps. This automatic current reduction increases robustness and safety in situations when an external problem exists (for example, a home wiring system, receptacle, adapter or cord is unable to meet its rated current capacity). As a precaution, when Model S/Model X automatically reduces current, it saves the reduced current at the charging location. Although you can manually increase it, Tesla recommends charging at the lower current until the underlying problem is resolved and the charging location can provide consistent power.

- **Schedule:** Depending on the setting you select by touching **Switch to Scheduled Departure/Scheduled Charging**, this displays either a specified departure time for when the vehicle should be charged and preconditioned or a scheduled charging time (see [Scheduled Charging and Scheduled Departure on page 425](#)).
- **Switch to Scheduled Departure/Scheduled Charging:** Toggle between Scheduled Departure and Scheduled Charging by touching **Controls > Charging > Switch to Scheduled Departure/Scheduled Charging**.
- **Supercharging:** Displays supercharger usage fees, the location, the time that charging started, and a cost estimate for the session (see [Supercharger Usage Fees and Idle Fees on page 425](#)).

NOTE: To reduce congestion at high-usage supercharger sites, you may be limited to a maximum charge of 80% when not using Trip Planner (see [Trip Planner on page 373](#)).



Scheduled Charging and Scheduled Departure

With Model S/Model X in Park, touch go to **Controls**

Controls > Charging > Schedule to set a daily time when you want Model S/Model X to be ready to drive. This ensures that charging is complete and/or the cabin climate is comfortably preconditioned by your departure time.

Alternatively, you can switch to **Scheduled Charging** to specify a daily time in which you want Model S/Model X to **start** charging.

NOTE: Only one of these features can be enabled. To enable **Scheduled Charging**, you must first disable **Scheduled Departure**, and vice versa.

Toggle between Scheduled Departure and Scheduled Charging by touching **Controls > Charging > Switch to Scheduled Departure/Scheduled Charging**.

Using Scheduled Charging

With **Scheduled Charging** selected, enable the feature then set a daily time when you want Model S/Model X to start charging.

Using Scheduled Departure

When **Scheduled Departure** is displayed, touch **Schedule** to set a daily time when you want Model S/Model X to be ready to drive. Specify a time, then touch **Settings** to enable either or both of the following departure features:

- **Preconditioning** warms the Battery for improved performance and ensures a comfortable cabin climate at your set departure time.

NOTE: Preconditioning operates only when the Battery's charge level is at least 20%.

- **Off-Peak Charging** automatically charges the Battery during off-peak hours to reduce energy costs. Touch **Change Off-Peak Hours** to customize the time when off-peak utility rates end.

NOTE: Choosing **Off-Peak Charging** can reduce energy costs even in market regions where off-peak utility rates are not applicable. For example, if charging starts as soon as you plug in, charging may complete much sooner. This causes the Battery to cool down to ambient temperatures and requires energy to warm it back up by your departure time. Therefore, even if off-peak utility rates are not applicable to you, it is recommended that you set Off-Peak Hours to the same time as your departure time in order to reduce energy consumption.

NOTE: If Model S/Model X does not have enough time to complete charging during off-peak hours, it continues to charge until it reaches the target battery percentage.

NOTE: If you set a departure time for charging and Model S/Model X is not plugged in, charging is scheduled when you plug it in, provided you plug it in within six hours of the scheduled departure time. If plugged in after six hours, charging may not start until the scheduled time on the next day.

You can also choose to apply **Preconditioning** and **Off-Peak Charging** to weekdays only.

When you've specified your desired settings, touch **Set** and instead of the **Schedule** icon, the touchscreen displays your scheduled departure time.

NOTE: Scheduled Departure settings are also available on the Climate Controls screen.

Supercharger Usage Fees and Idle Fees

When charging at a Tesla supercharger, information about the charging session displays at the bottom of the charging screen. This includes the location, the time that charging started, and a cost estimate for the session. When you stop supercharging, the estimated cost of the session displays until a new supercharging session begins. If free charging is applicable, the estimated cost displays as zero.

NOTE: Estimated cost may not reflect the final cost of the supercharging session. Final pricing for supercharging sessions can be found in your Tesla account.



When charging at a Tesla supercharger, you are subject to idle fees. Idle fees are designed to encourage drivers to move their vehicle from the Supercharger when charging is complete. Idle fees are in effect only when half or more of the Superchargers at a site are occupied. The Tesla mobile app notifies you when charging is almost complete, and again when charging is complete. Additional notifications are sent if idle fees are incurred. Idle fees are waived if you move your vehicle within five minutes of when charging completed.

Log into your Tesla account to view fees and details about Supercharger sessions, track the remaining balance of free credits, set up a payment method, and make payments. Once a payment method is saved, fees are automatically paid from your account.

Manually Releasing Charge Cable

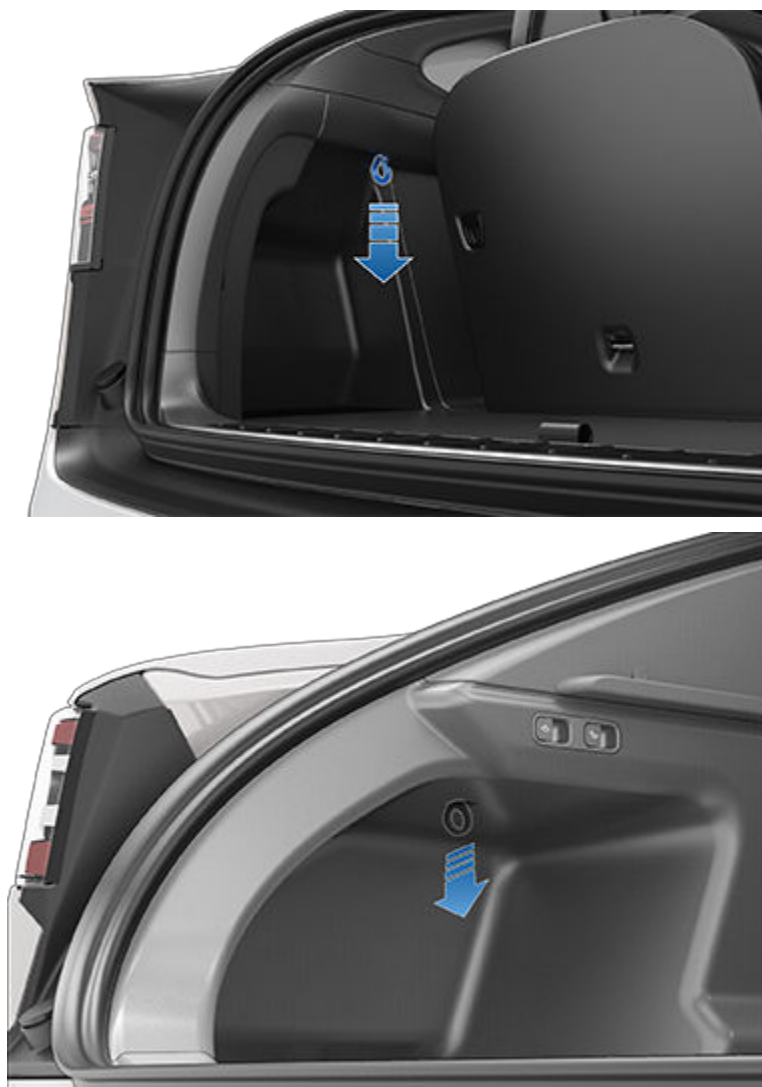
If the usual methods for releasing a charge cable from the charge port (using the charge handle release button, touchscreen, or mobile app) do not work, carefully follow these steps:

1. Ensure that Model S/Model X is not actively charging by displaying the charging screen on the touchscreen. If necessary, touch **Stop Charging**.
2. Open the rear trunk.
3. Pull the charge port's release cable downwards to unlatch the charge cable.



WARNING: Do not pull the release cable while simultaneously attempting to remove the charge cable from the charge port. Always pull the release cable *before* attempting to remove the charge cable. Failure to follow these instructions can result in electric shock and serious injury.





NOTE: The release cable may be recessed within the opening of the trim.

4. Pull the charge cable from the charge port.



CAUTION: Use the release cable **only** in situations where you can not release the charge cable using the usual methods. Continuous use can damage the release cable or charging equipment.



WARNING: Do not perform this procedure when your vehicle is charging, or if any orange high voltage conductors are exposed. Failure to follow these instructions can result in electric shock and serious injury or damage to the vehicle. If you are uncertain as to how to safely perform this procedure, contact your nearest Service Center.

Manually Releasing Charge Cable

If the usual methods for releasing a charge cable from the charge port (using the charge handle release button, touchscreen, or mobile app) do not work, carefully follow these steps:

1. Ensure that Model S/Model X is not actively charging by displaying the charging screen on the touchscreen. If necessary, touch **Stop Charging**.
2. Open the rear trunk.
3. Open the flap on the left side of the trunk side trim.



4. Press and hold the charge port's manual release lever towards the front of the vehicle to unlatch the charge cable.



WARNING: Do not touch or attempt to remove the orange high voltage cover. Failure to follow these instructions can result in electric shock and serious injury.

NOTE: If your vehicle does not have a charge port manual release lever, discontinue this procedure and contact your nearest Service Center.

NOTE: The orientation of the manual release lever may vary depending on market region.



5. Pull the charge cable from the charge port.



6. Close the flap on the left side of the trunk side trim.



CAUTION: The release lever is designed for use only in situations where the charge cable cannot be released from the charge port using the usual methods. Continuous use may result in damage to the release lever or charging equipment.



WARNING: Do not perform this procedure while your vehicle is charging or if any orange high voltage conductors are exposed. Failure to follow these instructions can result in electric shock and serious injury or damage to the vehicle. If you are uncertain as to how to safely perform this procedure, contact your nearest Service Center.



WARNING: Do not attempt to remove the charge cable at the same exact time as you begin to press the release lever towards the front of the vehicle. Always press the release lever towards the front of the vehicle and hold it before you begin to remove the charge cable from the charge port. Failure to follow these instructions can result in electric shock and serious injury.

Maintenance

Maintenance Schedule

Service Intervals

Your vehicle should generally be serviced on an as-needed basis. However, Tesla recommends the following maintenance items and intervals, as applicable to your vehicle, to ensure continued reliability and efficiency of your Model S/Model X.

- Brake fluid health check every 2 years (replace if necessary) or, if the vehicle is used for towing, replace the brake fluid every 2 years.
- A/C desiccant bag replacement every 243 years.
- Cabin air filter replacement every 3 years.
- Cabin air filter replacement every 2 years.
- HEPA filter replacement every 3 years.
- HEPA filter replacement every 3 years.
- Clean and lubricate brake calipers every year or 12,500 miles (20,000 km) if in an area where roads are salted during winter
- Rotate tires every 6,250 miles (10,000 km) or if tread depth difference is 2/32 in (1.5 mm) or greater, whichever comes first

NOTE: The above intervals are based on normal driving behaviors and scenarios. Additionally, the above list should not be considered comprehensive and does not include consumable parts such as windshield wipers, brake pads, etc.

NOTE: Damages or failures caused by maintenance or repairs performed by non-Tesla certified technicians are not covered by the warranty.

Schedule Service

Scheduling a service visit through the mobile app is easy. After touching **Schedule Service**, select the type of service needed and follow the directions in the mobile app. Provide as much detail as possible, such as:

- Photos, sound recordings, or videos.
- Date(s), time(s), and time zone when the issue occurred.
- Country of use and location.
- Approximate speed the vehicle was traveling (if applicable).
- Environmental conditions (rain, snow, cold, etc.).
- Road name and type of road (if applicable).
- Quality of lane markings (if applicable).
- Applicable vehicle settings.
- Identifiable symptoms.

Visit <https://www.tesla.com/support/service-visits> for more information on scheduling service.



Daily Checks

- Check the Battery's charge level, displayed on the instrument panel or mobile app.
- Check the condition and pressure of each tire (see [Tire Care and Maintenance on page 431](#)).
- Check that all exterior lights, horn, turn signals, and wipers and washers are working.
- Check for any unexpected indicator lights or vehicle alerts on the touchscreen or instrument panel.
- Check the operation of the brakes, including the parking brake.
- Check the operation of the seat belts (see [Seat Belts on page 117](#)).
- Look for abnormal fluid deposits underneath Model SModel X that might indicate a leak. It is normal for a small pool of water to form (caused by the air conditioning system's dehumidifying process).
- Look around the exterior of Model SModel X and immediately remove any corrosive substances (such as bird droppings, tree resin, tar spots, dead insects, industrial fallout, etc.) to prevent damage to the paint (see [Cleaning on page 446](#)).

Monthly Checks

- Check windshield washer fluid level and top up if necessary (see [Topping Up Windshield Washer Fluid on page 458](#)).
- Check that the air conditioning system is operating correctly (see [Climate Controls on page 360](#)).

NOTE: In addition to cooling the interior, the air conditioning compressor also cools the Battery. Therefore, in hot weather, the air conditioning compressor can turn on even if you turned it off. This is normal because the system's priority is to cool the Battery to ensure it stays within an optimum temperature range to support longevity and optimum performance. Also, even when not in use, you may hear Model SModel X emit a whining noise or the sound of water circulating. These sounds are normal and occur when the internal cooling systems turn on to support various vehicle functions, such as maintaining the low voltage battery and balancing the temperature of the high voltage Battery.

 **WARNING:** Contact Tesla immediately if you notice any significant or sudden drop in fluid levels or uneven tire wear.

Fluid Replacement Intervals

Your Battery coolant does not need to be replaced for the life of your vehicle under most circumstances. Brake fluid should be checked every 2 years, replacing if necessary**.

*If the vehicle is used for towing, the brake fluid should be replaced every 2 years regardless of the health check.

*If the vehicle is used for towing, the brake fluid should be replaced every 2 years regardless of the health check.

NOTE: Any damage caused by opening the Battery coolant reservoir is excluded from the warranty.

High Voltage Safety

Your Model SModel X has been designed and built with safety as a priority. However, be aware of these precautions to protect yourself from the risk of injury inherent in all high-voltage systems:

- Read and follow all instructions provided on the labels that are attached to Model SModel X. These labels are there for your safety.
- The high voltage system has no user-serviceable parts. Do not disassemble, remove or replace high voltage components, cables or connectors. High voltage cables are colored orange for easy identification.
- If a collision occurs, do not touch any high voltage wiring, connectors, or components connected to the wiring.
- In the unlikely event that a fire occurs, immediately contact your local fire emergency responders.

 **WARNING:** Always disconnect the charge cable before working underneath Model SModel X, even if charging is not in progress.

 **WARNING:** Keep your hands and clothing away from cooling fans. Some fans operate even when Model SModel X is powered off.

 **WARNING:** Some fluids (battery acid, Battery coolant, brake fluid, windshield washer additives, etc.) used in vehicles are poisonous and should not be inhaled, swallowed, or brought into contact with open wounds. For your safety, always read and follow instructions printed on fluid containers.



Tire Care and Maintenance

Displaying Tire Pressures

Display tire pressures on the touchscreen by touching **Controls > Service**. The pressure of each tire displays in the visualization of your Model S/Model X. You can choose whether you want to display tire pressures using Bar or PSI by touching **Controls > Display > Tire Pressure**.

You can display tire pressures on the instrument panel by using the right or left steering wheelsteering yoke buttons to display **Car Status** (see [Using Left Steering Wheel Buttons on page 188](#) or [Using Right Steering Wheel Buttons on page 189](#)). You can also choose whether you want to display tire pressures using Bar or PSI by touching **Controls > Display > Tire Pressure**.

NOTE: You may need to drive briefly before the visualization displays the tire pressure values.

Maintaining Tire Pressures

Keep tires inflated to the pressures shown on the Tire and Loading Information label, even if it differs from the pressure printed on the tire itself. The Tire and Loading Information label is located on the center door pillar and is visible when the front door is open.

If you are towing a trailer, do not use the tire pressures printed on the Tire and Loading Information Label. Instead, refer to the tire pressures published in the towing section (see [Towing and Accessories on page 269](#)).





The Tire Pressure indicator light on the instrument panel alerts you if one or more tires is under- or over-inflated.

The Tire Pressure indicator light does not immediately turn off when you adjust tire pressure. After inflating the tire to the recommended pressure, you must drive over 15 mph (25 km/h) for a short amount of time to activate the Tire Pressure Monitoring System (TPMS), which turns off the Tire Pressure indicator light.

If the indicator light flashes for one minute whenever you power on Model S, a fault with the TPMS is detected (see [TPMS Malfunction on page 438](#)).

NOTE: Your vehicle's tire pressures will drop in cold ambient temperatures. If the TPMS indicator light appears, inflate the tires before driving. The tires will lose one PSI for every 10° F (6° C) drop in outside temperature. Proper tire pressures help protect tires from potholes and improve range when properly inflated.

WARNING: Under-inflation is the most common cause of tire failures and can cause a tire to overheat, resulting in severe tire cracking, tread separation, or blowout, which causes unexpected loss of vehicle control and increased risk of injury. Under-inflation also reduces the vehicle's range and tire tread life.

WARNING: Check tire pressures using an accurate pressure gauge when tires are cold. It takes only about one mile (1.6 km) of driving to warm up the tires sufficiently to affect tire pressures. Parking the vehicle in direct sunlight or in hot weather can also affect tire pressures. If you must check warm tires, expect increased pressures. Do not let air out of warm tires in an attempt to match recommended cold tire pressures. A hot tire at or below the recommended cold tire inflation pressure is dangerously under-inflated.

Checking and Adjusting Tire Pressures

Follow these steps when tires are cold and Model S has been stationary for over three hours:



1. Refer to the Tire and Loading Information label located on the driver's center door pillar for the target tire pressure.
2. Remove the valve cap.
3. Firmly press an accurate tire pressure gauge onto the valve to measure pressure.
4. If required, add or remove air to reach the recommended pressure.
NOTE: You can release air by pressing the metal stem in the center of the valve.
5. Re-check pressure using the accurate tire gauge.
6. Repeat steps 3 and 4 as necessary until the tire pressure is correct.
7. Reinstall the valve cap to prevent dirt from entering. Periodically check the valve for damage and leaks.

Inspecting and Maintaining Tires

Regularly inspect the tread and side walls for any sign of distortion (bulges), foreign objects, cuts or wear.



WARNING: Do not drive Model SModel X if a tire is damaged, excessively worn, or inflated to an incorrect pressure. Check tires regularly for wear, and ensure there are no cuts, bulges or exposure of the ply/cord structure.

Tire Wear

Adequate tread depth is important for proper tire performance. Tires with a tread depth less than $\frac{4}{32}$ " (3 mm) are more likely to hydroplane in wet conditions and should not be used. Tires with a tread depth less than $\frac{5}{32}$ " (4 mm) do not perform well in snow and slush and should not be used when driving in winter conditions.

Model SModel X is originally fitted with tires that have wear indicators molded into the tread pattern. When the tread has been worn down to $\frac{4}{32}$ " (3 mm) $\frac{3}{32}$ " (2 mm), the indicators start to appear at the surface of the tread pattern, producing the effect of a continuous band of rubber across the width of the tire. For optimal performance and safety, Tesla recommends replacing tires before the wear indicators are visible.

Tire Rotation, Balance, and Wheel Alignment

Tesla recommends rotating the tires every 6,250 miles (10,000 km) or if tread depth difference is $\frac{2}{32}$ in (1.5 mm) or greater, whichever comes first.

Model X tires can be rotated side-to-side (left-to-right) but not front-to-back as the front and rear tire size is different.

Unbalanced wheels (sometimes noticeable as vibration through the steering wheelsteering yoke) affect vehicle handling and tire life. Even with regular use, wheels can get out of balance. Therefore, they should be balanced as required.

If tire wear is uneven (on one side of the tire only) or becomes abnormally excessive, check the alignment of wheels.



NOTE: When replacing only two tires, install the new tires on the rear if your vehicle's front and rear tires are the same size.

Punctured Tires

A puncture eventually causes the tire to lose pressure, which is why it is important to check tire pressures frequently. Permanently repair or replace punctured or damaged tires as soon as possible.

Your tubeless tires may not leak when penetrated, provided the object remains in the tire. If, however, you feel a sudden vibration or ride disturbance while driving, or you suspect a tire is damaged, immediately reduce your speed. Drive slowly, while avoiding heavy braking or sharp steering and, when safe to do so, stop the vehicle. Arrange to have Model S Model X transported to a Tesla Service Center, or to a nearby tire repair center.

NOTE: In some cases, you can temporarily repair small tire punctures (under 1/4" (6 mm)) using an optional tire repair kit available from Tesla. This allows you to slowly drive Model S Model X to Tesla or to a nearby tire repair facility.



WARNING: Do not drive with a punctured tire that has not been repaired, even if the puncture has not caused the tire to deflate. A punctured tire can deflate suddenly at any time.

Flat Spots

If Model S Model X is stationary for a long period, tires can form flat spots. When Model S Model X is driven, these flat spots cause a vibration which gradually disappears as the tires warm up and regain their original shape.

To minimize flat spots during storage, inflate tires to the maximum pressure indicated on the tire wall. Then, before driving, release air to adjust tire pressure to the recommended levels.

Improving Tire Mileage

To improve the mileage you get from your tires, maintain tires at the recommended tire pressures, observe speed limits and advisory speeds, and avoid:

- Pulling away quickly, or hard acceleration.
- Fast turns and heavy braking.
- Potholes and objects in the road.
- Hitting curbs when parking.
- Contaminating tires with fluids that can cause damage.

Replacing Tires and Wheels

Tires degrade over time due to the effects of ultraviolet light, extreme temperatures, high loads, and environmental conditions. It is recommended that tires are replaced every six years, or sooner if required, even if tread depth is above the minimum.

Wheel and tires are matched to suit the handling characteristics of the vehicle. Replacement tires must comply with the original specification. If tires other than those specified are used, ensure that the load and speed ratings marked on the tire (see [Understanding Tire Markings on page 494](#)) equal or exceed those of the original specification.

When a tire set becomes worn, replace all four tires at the same time. If there is need to replace a tire early, we recommend replacing the tires in pairs unless the other tires are fairly new (for example, minimal wear relative to the new tire). Place the new tires on the rear if all four tires are of the same size. Always balance the wheel and tire after replacing a tire. Consult with a professional tire retailer and installer for further guidance.

If you replace a wheel, the TPMS (Tire Pressure Monitoring System) sensors need to be reset to ensure they provide accurate warnings when tires are under- or over-inflated (see [Resetting the TPMS Sensors on page 437](#)) (see [Automatic Reset of TPMS Sensors on page 438](#)) (see [Automatic Reset of TPMS Sensors on page 438](#)).

For the specification of the original wheels and tires installed on Model S Model X, see [Wheels and Tires on page 491](#).



WARNING: For your safety, use only tires and wheels that match the original specification. Tires that do not match the original specification can affect the operation of the TPMS.



WARNING: Never exceed the speed rating of your vehicle's tires. The speed rating is shown on the sidewall of your tires (see [Understanding Tire Markings on page 494](#)).



Asymmetric Tires

Model S Model X tires are asymmetric and must be mounted on the wheel with the correct sidewall facing outward. The sidewall of the tire is marked with the word **OUTSIDE**. When new tires are installed, make sure that the tires are correctly mounted on the wheels.



 **WARNING:** Road holding is seriously impaired if the tires are incorrectly installed on the wheels.

Removing and Installing Aero Covers

If your Model S Model X is equipped with aero covers, you must remove them to access the lug nuts.

To remove an aero cover:

1. Grasp the aero cover firmly with both hands.
2. Pull the aero cover toward you to release the retaining clips.

To install an aero cover:

1. Align the aero cover into position so that the notch at the base of the Tesla "T" is aligned with the tire's valve stem.
2. Push firmly around the perimeter of the aero cover until it fully snaps into place.

For Gemini wheels, press on the perimeter of the cover until it aligns with the wheel surface. Press on the Tesla "T" in the center until the cap snaps into place. See [Parts and Accessories on page 465](#) for more information.

 **CAUTION:** To prevent the aero cover from falling off, ensure that it is fully secured before driving.

Removing and Installing Lug Nut Covers

If your Model S Model X is equipped with lug nut covers, you must remove them to access the lug nuts.

To remove a lug nut cover:



1. Insert the curved part of the lug nut cover tool, if equipped (located in the glovebox in some vehicles, or you can use a small allen wrench) into the hole at the base of the Tesla "T".

NOTE: The lug nut cover tool can also be purchased at an auto parts store or through online retailers.



2. Maneuver the lug nut cover tool so that it is fully inserted into the hole in the lug nut cover.
3. Twist the lug nut cover tool so that the curved part is touching the middle of the lug nut cover.
4. Firmly pull the lug nut tool away from the wheel until the lug nut cover is released.



To install the lug nut cover:

1. Align the lug nut cover into position.
2. Push firmly on the lug nut cover until it fully snaps into place.



CAUTION: Make sure the lug nut cover is fully secure before driving to prevent it from falling off.



Wheel Configuration

If you are installing new wheels or swapping them for different ones, update your vehicle's wheel configuration by touching **Controls > Service > Wheel Configuration**. This allows Model S/Model X to learn the new wheels and provide more accurate status updates on your vehicle. Select a wheel from the drop down menu that matches the new wheels you plan to install on Model S/Model X. Selecting new wheels in the wheel configuration also changes the wheels that appear on your vehicle's avatar on the touchscreen.

Ensure you are aware if your vehicle is equipped with staggered wheels, meaning the wheels are different sizes in the front and rear. Check the front and rear tire sizes marked on the tire sidewall to see if they match or are different sizes. If the wheels are staggered, take extra precaution to ensure the new wheels you install are staggered in the same way as the previous wheels.

NOTE: Changing your vehicle's wheel configuration can impact range estimates, tire pressure warning levels, and vehicle visualization.



WARNING: Only use Tesla-approved wheels when installing or swapping wheels. Using non Tesla-approved wheels can cause serious damage. Tesla is not liable for damage caused by using wheels not approved by Tesla.

Tire Pressure Monitoring

Each tire should be checked monthly when cold and inflated to the recommended pressures that are printed on the Tire and Loading Information label located on the driver's door pillar (see [Maintaining Tire Pressures on page 431](#)). If your vehicle has tires of a different size than the size indicated on the vehicle placard or tire inflation pressure label, determine the proper tire inflation pressure for those tires.

As an added safety feature, your vehicle has been equipped with a TPMS that displays a tire pressure telltale (Tire Pressure Warning) on the instrument panel when one or more of your tires is significantly under- or over-inflated. Accordingly, when the Tire Pressure indicator light displays on the instrument panel to alert you about tire pressure, stop and check your tires as soon as possible, and inflate them to the proper pressure (see [Maintaining Tire Pressures on page 431](#)). Driving on a significantly under-inflated tire causes the tire to overheat and can lead to tire failure. Under-inflation also reduces range efficiency and tire tread life, and may affect the vehicle's handling and stopping ability.



If Model S/Model X detects a fault with the TPMS, this indicator flashes for one minute whenever you power on Model S/Model X.

NOTE: Installing accessories that are not approved by Tesla can interfere with the TPMS.



WARNING: The TPMS is not a substitute for proper tire maintenance, including manually checking tire pressures and regularly inspecting the condition of tires. It is the driver's responsibility to maintain correct tire pressure, even if under- or over-inflation has not reached the level for the TPMS to trigger the Tire Pressure Warning on the instrument panel.

Resetting the TPMS Sensors

After replacing one or more wheels (but not after replacing a tire or rotating wheels), the TPMS sensors need to be reset to ensure tire pressure warnings are accurate.

On newer versions of Model S, the TPMS sensors are reset automatically after driving over 15 mph (25 km/h) for longer than 10 minutes. But for older versions, follow these steps:

1. Inflate all tires to their recommended pressures, as indicated on the Tire and Loading Information label located on the door pillar.
2. Get ready to drive for ten minutes, then touching **Controls > Service > Reset TPMS Sensors**.
3. Follow the onscreen instructions.



CAUTION: Selecting the incorrect wheel size may result in false tire pressure warnings. If a tire pressure warning displays, exit the vehicle, close the rear trunk and all doors, wait for the touchscreen to go black, then re-enter the vehicle and ensure that the correct wheel size is selected before touching **Reset TPMS Sensors**.

NOTE: On some older versions of Model S, when changing to 21" wheels, the TPMS may generate false tire pressure warnings. Bring Model S to a Tesla Service Center for further adjustment.



WARNING: Do not reset the TPMS sensors in an attempt to clear tire pressure warnings.

Automatic Reset of TPMS Sensors

After replacing one or more wheels (but not after replacing a tire or rotating wheels), the TPMS sensors are reset to ensure tire pressure warnings are accurate. TPMS sensors reset automatically after driving over 15 mph (25 km/h) for longer than 10 minutes.

NOTE: After replacing a wheel, false tire pressure warnings may display before you've driven 15 mph (25 km/h) for longer than 10 minutes.

Automatic Reset of TPMS Sensors

After replacing one or more wheels (but not after replacing a tire), the TPMS sensors are relearned to ensure tire pressure warnings are accurate. TPMS sensors reset automatically within two minutes of driving over 15 mph (25 km/h).



WARNING: If your Model S/Model X is equipped with aftermarket tires that differ in size from those printed on the Tire and Loading Information Label (see [Vehicle Loading on page 471](#)), it is the driver's responsibility to determine the correct tire pressure. Do not drive on public roads when tires are not inflated to the correct pressure.



WARNING: Do not depend on TPMS sensors to accurately determine pressures and trigger alerts. It is the driver's responsibility to maintain correct tire pressures (see [Maintaining Tire Pressures on page 431](#)). Over or under-inflated tires can result in loss of control or tire damage, which can lead to serious injury.

Replacing a Tire Sensor

If the Tire Pressure warning indicator displays frequently, contact Tesla to determine if a tire sensor needs to be replaced. If a non-Tesla Service Center repairs or replaces a tire, the tire sensor may not work until Tesla performs the setup procedure.

TPMS Malfunction

Model S/Model X has also been equipped with a TPMS malfunction indicator to indicate when the system is not operating properly.



The TPMS malfunction indicator is combined with the tire pressure indicator light. When the system detects a malfunction, the indicator flashes for approximately one minute, then remains continuously lit. This sequence continues upon subsequent vehicle start-ups as long as the malfunction exists. When the TPMS malfunction indicator is on, the system might not be able to detect or signal under- or over-inflated tires as intended.

TPMS malfunctions can occur for a variety of reasons, including installing replacement or alternate tires or wheels that prevent the TPMS from functioning properly. Always check the TPMS malfunction indicator light after replacing one or more tires or wheels on your vehicle to ensure that the replacement tires or wheels allow the TPMS to continue to function properly.

NOTE: If a tire has been replaced or repaired using a different tire sealant than the one available from Tesla, and a low tire pressure is detected, it is possible that the tire sensor has been damaged. Contact Tesla to have the fault repaired as soon as possible.

Seasonal Tire Types

Summer Tires

Your vehicle may be originally equipped with high performance summer tires or all season tires. Tesla recommends using winter tires if driving in cold temperatures or on roads where snow or ice may be present. Contact Tesla for winter tire recommendations.

Your Model S/Model X may be originally equipped with high performance summer tires, all season tires, or winter tires. Summer tires and all season tires are designed for maximum dry and wet road performance but are not designed to perform well in winter conditions. Tesla recommends using winter tires if driving in cold temperatures or on roads where snow or ice may be present. If not equipped with winter tires, contact Tesla for winter tire recommendations.



WARNING: In cold temperatures or on snow or ice, summer tires do not provide adequate traction. Selecting and installing the appropriate tires for winter conditions is important to ensure the safety and optimum performance of your Model S/Model X.



All-Season Tires

Your Model S/Model X may be originally equipped with all-season tires. These tires are designed to provide adequate traction in most conditions year-round, but may not provide the same level of traction as winter tires in snowy or icy conditions. All-season tires can be identified by "ALL SEASON" and/or "M+S" (mud and snow) on the tire sidewall.

Winter Tires

Use winter tires to increase traction in snowy or icy conditions. When installing winter tires, always install a complete set of four tires at the same time. Winter tires must be the same diameter, brand, construction and tread pattern on all four wheels. Contact Tesla for winter tire recommendations.



Winter tires can be identified by a mountain/snowflake symbol on the tire's sidewall.

When driving with winter tires, you may experience more road noise, shorter tread life, and less traction on dry roads.

Driving in Low Temperatures

Tire performance is reduced in low ambient temperatures, resulting in reduced grip and an increased susceptibility to damage from impacts. Performance tires (summer applications) have reduced traction in ambient temperatures below 40° F (5° C), and are not recommended in snow/ice conditions. Performance tires can temporarily harden when cold, causing you to hear rotational noise for the first few miles (kilometers) until the tires warm up.

Using Tire Chains

Tesla has tested and approved the following tire chains to increase traction in snowy conditions. Tire chains should only be installed on the rear tires. The approved tire chains can be purchased from Tesla.

Tire Size	Recommended Chain
20"/22"	KONIG K-SUMMIT K67
Tire Size	Recommended Chain
20"	KONIG K-SUMMIT K67

Do not use tire chains on 22" tires.

Tire Size	Recommended Chain
19"	KONIG K-SUMMIT K45

Do not use tire chains on 21" tires.

When installing tire chains, follow the instructions and warnings provided by the tire chain manufacturer. Mount them evenly and as tight as possible.

When using tire chains:

- Inspect the tire chains for loose fittings and damaged links before each use.
- Set air suspension (if equipped) to Standard/Medium and turn off the **Default Ride Height to Low** setting (see [Air Suspension on page 385](#)[Air Suspension on page 387](#)[Air Suspension on page 389](#)).
- Set air suspension to **Medium** and turn off the **Default Ride Height to Low** setting.
- Avoid heavily loading Model S/Model X (heavy loads can reduce the clearance between the tires and the body).
- Do not drive the vehicle without the chains properly installed.
- Drive slowly. Do not exceed 30 mph (48 km/h).



- Remove the tire chains as soon as conditions allow.

NOTE: Tire chains are prohibited in some jurisdictions. Check local laws before installing tire chains.

 **CAUTION:** Air suspension (if equipped) should remain in the **Medium** ride height setting to avoid damage.

 **CAUTION:** Using non-recommended tire chains, or using tire chains on other sized tires can damage the suspension, body, wheels, and/or brake lines. Damage caused by using non-recommended tire chains, or incorrectly installing tire chains, is not covered by the warranty.

 **CAUTION:** Never deflate your tires to put on tire chains. When re-inflated, the chains might fit too tightly and cause tire damage.

 **CAUTION:** Ensure that the tire chains cannot touch suspension components or brake lines. If you hear the chains making unusual noises that would indicate contact with Model SModel X, stop and investigate immediately.



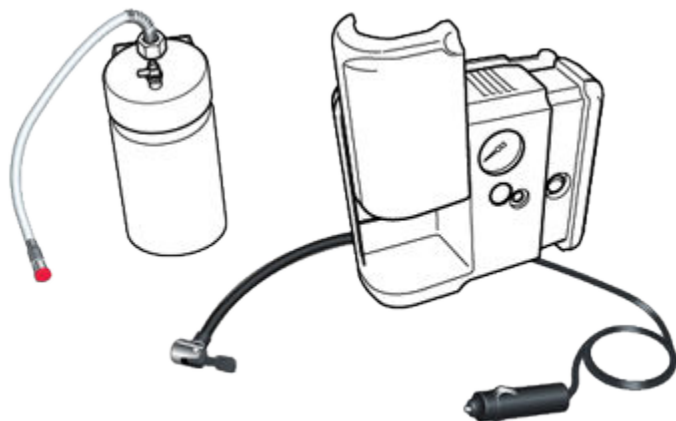
Temporary Tire Repair

Tire Repair Kit

Your Model S/Model X has no spare tire. Depending on the legislations that apply to the region in which you purchased Model S/Model X, a tire repair kit may or may not be included. If a tire repair kit was not provided in Model S/Model X upon delivery, you can purchase one from Tesla.

NOTE: Although Model S/Model X does not have a spare tire, in the event of a flat tire, Roadside Assistance provides towing coverage for up to 50 miles.

The tire repair kit consists of a compressor and a canister of tire sealant (enough to repair one tire). When injected into a tire, the sealant can penetrate a small puncture up to 1/4" (6 mm) to form a temporary repair.



NOTE: For punctures larger than 1/4" (6 mm), severe tread damage, a damaged sidewall, ripped tires or tires that have come off the rim, contact Roadside Assistance.

-  **WARNING:** The tire repair kit is a temporary repair only. You must repair or replace a damaged tire as soon as possible.
-  **WARNING:** Do not exceed 30 mph (48 km/h) when driving with a tire that has been temporarily repaired with sealant.
-  **WARNING:** Follow all directions and warnings on the tire repair kit before starting a repair.
-  **CAUTION:** Do not drive on a deflated tire as this can cause serious damage.

Tire Sealant Canister

The tire sealant provided in the Tesla tire repair kit is approved for use with Model S/Model X and is designed not to damage the TPMS (Tire Pressure Monitoring System) sensors. Therefore, you must replace it only with one of the same type and capacity (see [Replacing the Sealant Canister on page 444](#)). Tire sealant canisters can be purchased from Tesla.

The tire sealant has an expiration date printed on the outside of the canister. If the expiration date has passed, the sealant might not work as expected. Always replace an expired tire sealant canister.

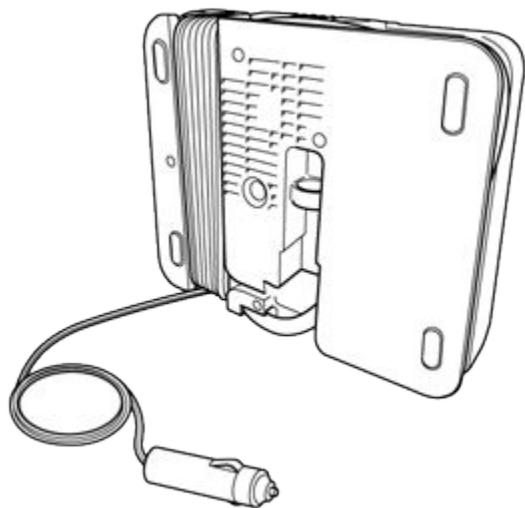
-  **WARNING:** Do not use any tire sealant other than the one available from Tesla. Doing so could cause tire pressure sensors to malfunction.
-  **WARNING:** Always read and follow the safety and handling instructions printed on the sealant canister.
-  **WARNING:** Keep tire sealant out of the reach of children.
-  **WARNING:** Tire sealant can be harmful if it contacts the eyes or if swallowed or inhaled. If the sealant comes into contact with your eyes, immediately flush with water and seek medical attention if irritation persists. If swallowed, do not induce vomiting and seek medical assistance immediately. If inhaled, breathe fresh air. Inhalation can cause drowsiness and dizziness. If breathing is affected, seek medical assistance immediately.

Inflating with Sealant and Air

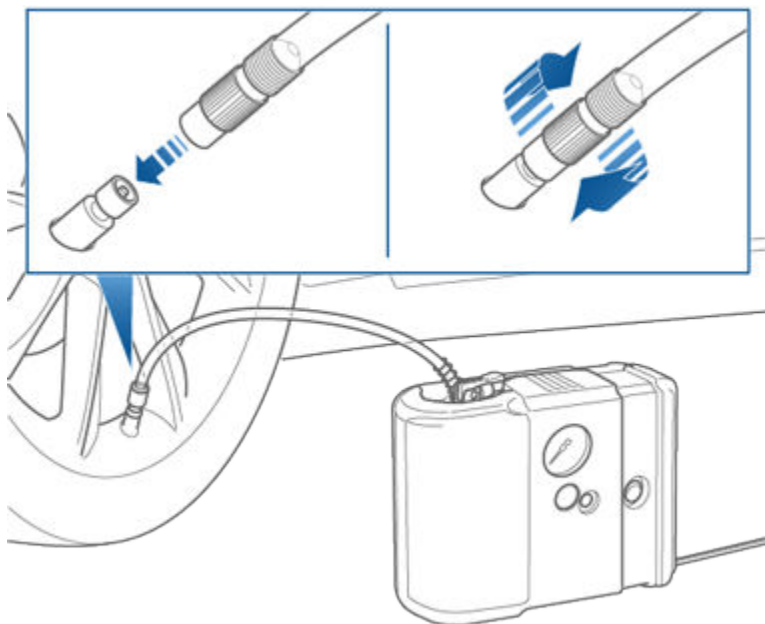
If you have a Tesla tire repair kit, follow these steps to temporarily repair a small tire puncture (less than 1/4" (6 mm)).



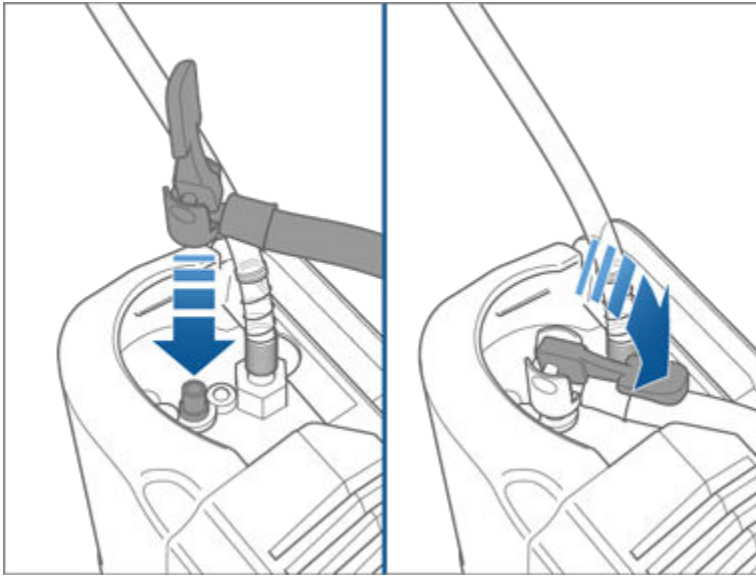
1. Stop Model SModel X in a safe place away from traffic and ask passengers to wait in a safe area.
2. Turn on the hazard warning flashers to alert other road users.
3. If possible, position the wheel with the puncture at the bottom.
4. Detach the power supply connector from the back of the compressor and plug it into the low voltage power socket located on the front of center console.



5. Release the clear plastic hose from the tire compressor.
6. Remove the red cap and screw the end of the hose onto the tire's valve.



7. Attach the sealant kit's black air hose to the sealant valve and press the lever down to secure it in place.

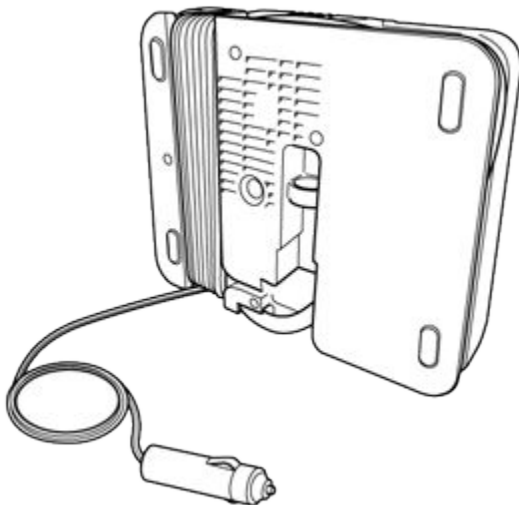


8. Ensure the compressor is lying on a level surface with the pressure gauge facing to the side as shown in Step 5.
9. Turn on the compressor.
10. Inflate the tire to the recommended pressure.
11. Turn off the compressor and disconnect the hose from the tire's valve. Wipe any excess sealant from the tire valve and wheel rim.
12. Immediately drive for 5 miles (8 km) to distribute the sealant around the tire. Do not exceed 30 mph (48 km/h).
13. Stop and check the tire's pressure. If necessary, inflate using the black air hose.
14. Have the tire repaired or replaced as soon as possible.
15. Replace the tire repair sealant canister (see [Replacing the Sealant Canister on page 444](#)).

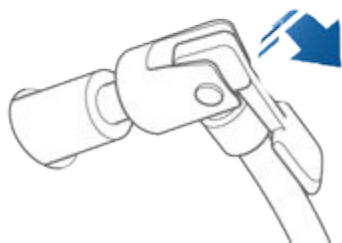
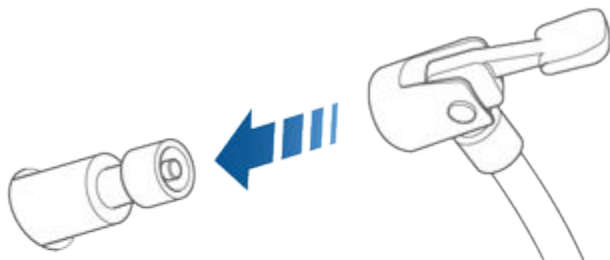
Inflating with Air Only

If you have a Tesla tire repair kit, follow these steps to inflate a tire with air:

1. Detach the power supply connector from the rear of the compressor and plug it into the low voltage power socket located in Model S Model X on the front of center console.

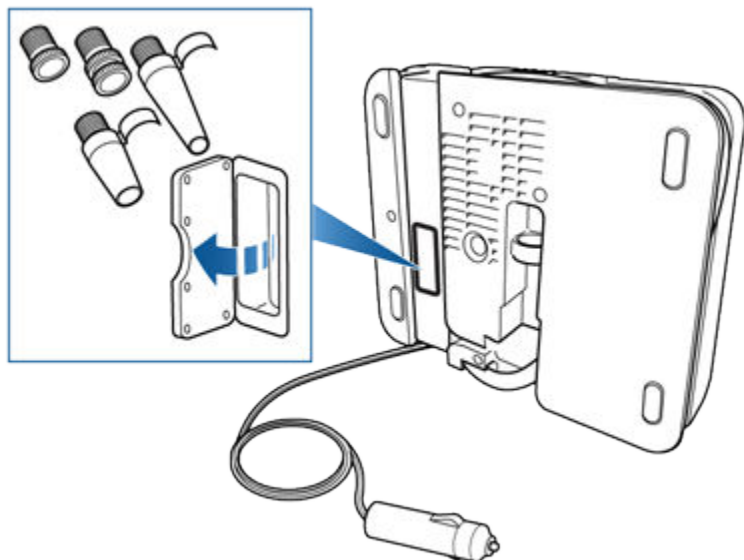


2. Release the black air hose from the compressor.
3. Attach the air hose to the valve and press the lever down to secure it in place.



4. Ensure the compressor is lying on a level surface with the pressure gauge facing to the side where you can read it.
5. To add air, turn on the compressor and inflate until the desired pressure is reached.
6. To release air, turn off the compressor, then press and hold the red button until the desired pressure is reached.

NOTE: For your convenience, the tire repair kit includes a selection of adapters that allow you to inflate other items. These adapters are located in a compartment on the back of the compressor.



CAUTION: To avoid overheating, do not use the compressor continuously for more than eight minutes. Allow the compressor to cool for 15 minutes between uses.

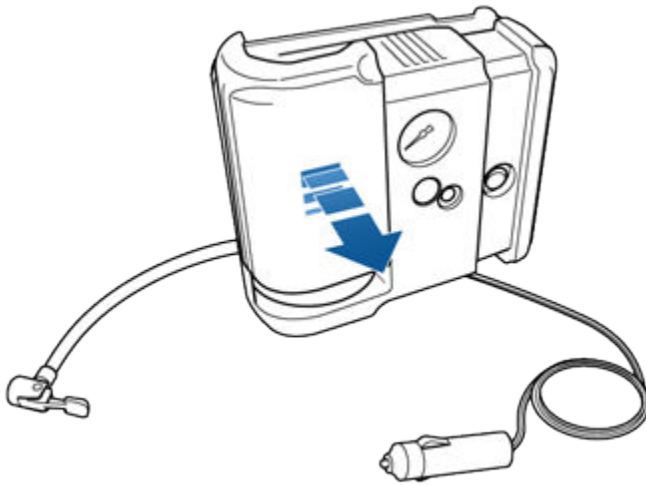
CAUTION: The compressor runs slowly when overheated from excessive use. Turn it off and allow it to cool.

Replacing the Sealant Canister

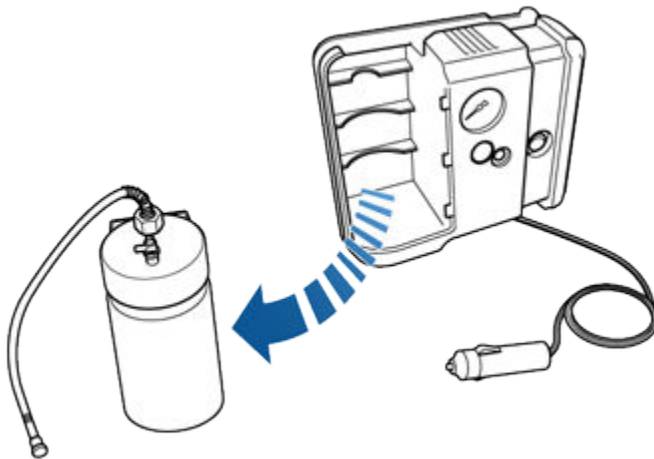
If you have a Tesla tire repair kit, you can purchase additional or replacement canisters of tire sealant from Tesla.

Follow these steps to replace the canister in your Tesla tire repair kit:

1. Unwrap the clear hose from the compressor. This hose is included with the tire repair sealant canister.
2. Remove the canister cover by sliding it upward to release it from the compressor.



3. Remove the canister.



4. Insert the new canister and replace the cover.



Cleaning

Cleaning the Exterior

To prevent damage to the paint, immediately remove corrosive substances (bird droppings, tree resin, dead insects, tar spots, road salt, industrial fallout, etc.). Do not wait until Model S Model X is due for a complete wash. If necessary, use denatured alcohol to remove tar spots and stubborn grease stains, then immediately wash the area with water and a mild, non-detergent soap to remove the alcohol.

Keep the exterior cameras free of dirt, condensation, or obstructions. These substances can cause unclear pictures or Autopilot and safety features to stop working (see [Cleaning a Camera on page 446](#)).

Follow these steps when washing the exterior of Model S Model X:

1. Rinse Thoroughly

Before washing, flush grime and grit from the vehicle using a hose. Flush away accumulations of mud in areas where debris easily collects (such as wheel wells and panel seams). If salt has been used on the highways (such as during winter months), thoroughly rinse all traces of road salt from the underside of the vehicle, wheel wells, and brakes.

2. Hand Wash

Hand wash Model S Model X using a clean soft cloth and cold or lukewarm water containing a mild, high-quality car shampoo.



CAUTION: Some cleaners and car shampoos contain chemicals that can cause damage or discoloration, especially to plastic trim pieces, lamps, or camera lenses. For example, some car cleaning formulas contain hydroxide or other highly alkaline or caustic ingredients that can damage exterior components. Damage or discoloration resulting from cleaning products is not covered by the warranty.

3. Rinse with Clean Water

After washing, rinse with clean water to prevent soap from drying on the surfaces.

4. Dry Thoroughly and Clean Exterior Glass

After washing and rinsing, dry thoroughly with a chamois. If necessary, dry the brakes by going on a short drive and applying the brakes multiple times.

Clean windows and mirrors using an automotive glass cleaner. Do not scrape, or use any abrasive cleaning fluid on glass or mirrored surfaces.

Car Wash Mode

When taking Model S Model X to a car wash, Car Wash Mode closes all windows, locks all doors, and disables windshield wipers, Sentry Mode, walk-away door locking, and parking sensor chimes. To enable, touch **Controls** > **Service** > **Car Wash Mode**. Your vehicle must be stationary and not actively charging.

If using an automatic car wash, **Enable Free Roll** keeps your vehicle in Neutral and activates free roll for the duration of the wash, while preventing Model S Model X from applying the Parking brake if you leave the driver's seat. To enable, press on the brake pedal and touch **Enable Free Roll**; or shift into Neutral.

Car Wash Mode disables if the vehicle's speed exceeds 10 mph (16 km/h) or by touching **Exit** on the touchscreen.

 **CAUTION:** Failure to put Model S Model X in Car Wash Mode may result in damage (for example, to the charge port or windshield wipers). Damage caused by car washes is not covered by the warranty.

Cleaning a Camera

To ensure a clear picture, the camera lens must be clean and free of obstructions. Remove any build-up of dirt or debris by spraying water onto the camera lens with a spray bottle or pressure washer.



CAUTION: Do not attempt to remove dirt or debris by wiping an exposed lens with your hands or a cloth. This debris can damage the surface of the lens when rubbed against it during wiping.

CAUTION: Do not use chemical-based or abrasive cleaners. Doing so can damage the surface of the lens.

Cautions for Exterior Cleaning

CAUTION: Do not wash in direct sunlight.

CAUTION: Do not use windshield treatment fluids. Doing so can interfere with wiper friction and cause a chattering sound.

CAUTION: Do not use hot water, detergents, or highly alkaline or caustic cleaning products, especially those containing hydroxide.

CAUTION: If using a pressure washer, maintain a distance of at least 12" (30 cm) between the nozzle and the surface of Model SModel X. Avoid aiming the water jet directly at parking sensors. Keep the nozzle moving and do not concentrate the water jet on any one area.

CAUTION: Do not aim water hoses directly at windows, door, or hood seals or at electronic modules or exposed cabling.

CAUTION: To avoid corrosive damage that may not be covered by the warranty, rinse away any road salt from the underside of the vehicle, wheel wells, and brakes. After cleaning the vehicle, dry the brakes by going on a short drive and applying the brakes multiple times.

CAUTION: Avoid using tight-napped or rough cloths, such as washing mitts. A high-quality microfiber cleaning cloth is recommended.

CAUTION: If washing in an automatic car wash, use touchless car washes only. These car washes have no parts (brushes, etc.) that touch the surfaces of Model SModel X. Some touchless car washes use caustic solutions that, over time, can cause discoloration of decorative exterior trim. Avoid exposure to soaps and chemicals above pH 13. If unsure, check the product label or ask the staff at the car wash. Damage caused by improper washing is not covered by the warranty.

CAUTION: If washing in an automatic car wash, make sure the vehicle is locked. In addition, avoid using controls on the touchscreen that can result in accidentally opening doors or trunks while the vehicle is being washed. Any damage caused is not covered by the warranty.

CAUTION: Ensure the wipers are off before washing Model SModel X to avoid the risk of damaging the wipers.

CAUTION: Do not use chemical based wheel cleaners or pre-wash products. These can damage the finish on the wheels.

WARNING: Never spray liquid at a high velocity (for example, if using a pressure washer) towards the charge port while Model SModel X is charging. Failure to follow these instructions can result in serious injury or damage to the vehicle, charging equipment, or property.

Cleaning the Interior

Frequently inspect and clean the interior to maintain its appearance and to prevent premature wear. If possible, immediately wipe up spills and remove marks. For general cleaning, wipe interior surfaces using a soft cloth (such as microfiber) dampened with a mixture of warm water and mild non-detergent cleaner (test all cleaners on a concealed area before use). To avoid streaks, dry immediately with a soft lint-free cloth.

Interior Glass

Do not scrape, or use any abrasive cleaning fluid on glass or mirrored surfaces. This can damage the reflective surface of the mirror and the heating elements in the rear window.

Airbags

Do not allow any substance to enter an airbag cover. This could affect correct operation.

Dashboard and Plastic Surfaces

Do not polish the upper surfaces of the dashboard. Polished surfaces are reflective and could interfere with your driving view.

Seats

Wipe spills and chemical residues from interior surfaces as soon as possible using a soft cloth moistened with warm water and non-detergent soap. Wipe gently in a circular motion. Then wipe dry using a soft, lint-free cloth.



Owners Manual

Although seating surfaces are designed to repel stains, Tesla recommends regular cleaning to maintain performance and an as-new appearance. Promptly treat dye transfer from clothing, such as indigo-dyed denim. Avoid contact with harsh chemicals, including certain cosmetics. Never use cleaners containing alcohol or bleach. Spot-test cleaners on an inconspicuous area before applying to visible surfaces.

If equipped with leather seats, note that leather is prone to dye-transfer which can cause discoloration, particularly on light colored leather. White and tan leather is coated with an anti-soiling treatment. Using detergents or commercially available leather cleaners and conditioners is not recommended because they can discolor or dry out the leather.

Vacuum cloth seats as needed to remove any loose dirt.

 **CAUTION:** Aftermarket, non-Tesla seat covers may inhibit the sensitivity of a seat's occupancy sensors and may cause staining or damage.

 **CAUTION:** The front seats are equipped with microphones (see [Active Road Noise Reduction on page 91](#)) that must not be exposed to liquids. To prevent damage to these microphones when cleaning, do not over-saturate the area of the seats where these microphones are located.

Carpets

Avoid over-wetting carpets. For heavily soiled areas, use a diluted upholstery cleaner.

Seat Belts

Extend the belts to wipe. Do not use any type of detergent or chemical cleaning agent. Allow the belts to dry naturally while extended, preferably away from direct sunlight.

Door Seals

Wipe door seals with a damp cloth to remove any debris. Excessive debris on the door seals can cause paint damage when contacting surrounding surfaces. Avoid using alcohol wipes or any chemical products that can potentially deteriorate the coating on the door seals.

Tesla Built-In Rear Facing Child Seats

Vacuum the seats to remove any loose dirt. Wipe the seats with a soft cloth dampened with warm water. You can also use an upholstery cleaner designed for automotive use. Extend the belts to wipe. Allow the belts to dry naturally, preferably away from direct sunlight.

Touchscreen, Rear Touchscreen, and Instrument Panel

Clean the touchscreen and instrument panel using a soft lint-free cloth specifically designed to clean monitors and displays. Do not use cleaners (such as a glass cleaner) or alcohol-based gel products (such as hand sanitizer) and do not use a wet wipe or a dry statically-charged cloth (such as a recently washed microfiber). To wipe the touchscreen without activating buttons and changing settings, you can enable Screen Clean Mode. Touch **Controls > Display > Screen Clean Mode**. The display darkens to make it easy to see dust and smudges. To exit Screen Clean Mode, press and hold **HOLD TO EXIT**.

Chrome and Metal Surfaces

Polish, abrasive cleaners, alcohol-based gel products (such as hand sanitizer), and hard cloths can damage the finish on chrome and metal surfaces.

Cautions for Interior Cleaning

 **CAUTION:** Using solvents (including alcohol), alcohol-based gel products (such as hand sanitizer), bleach, citrus, naphtha, or silicone-based products or additives on interior components can cause damage.

 **CAUTION:** Statically-charged materials can cause damage to the touchscreen or instrument panel.

 **WARNING:** If you notice any damage on an airbag or seat belt, contact Tesla immediately.

 **WARNING:** Do not allow any water, cleaners, or fabric to enter a seat belt mechanism.

 **WARNING:** Exposure to chemical cleaners can be hazardous and can irritate eyes and skin. Read and observe the instructions provided by the manufacturer of the chemical cleaner.



Polishing, Touch Up, and Body Repair

To preserve the cosmetic appearance of the body, you can occasionally treat the paint surfaces with an approved polish containing:

- Very mild abrasive to remove surface contamination without removing or damaging the paint.
- Filling compounds that fill scratches and reduce their visibility.
- Wax to provide a protective coating between the paint and environmental elements.

Regularly inspect the exterior paint for damage. Treat minor chips and scratches using a paint touch-up pen (available for purchase from Tesla). Use the touch-up pen after washing but before polishing or waxing.

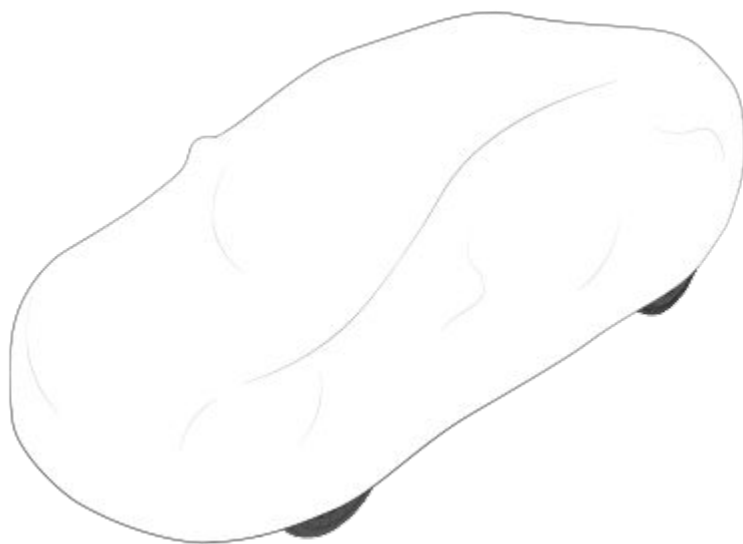
Repair rock chips, fractures or scratches. Refer to <https://www.tesla.com/support/body-shop-support> for more information on repair locations and available services.

CAUTION: Do not use cutting pastes, color restoration compounds, or polishes containing harsh abrasives. These can scour the surface and permanently damage the paint.

CAUTION: Do not use chrome polish or other abrasive cleaners.

Using a Car Cover

To preserve the cosmetic appearance of the body when Model S/Model X is not being used, use a genuine Tesla car cover. Car covers can be purchased from Tesla. See [Parts and Accessories on page 465](#).



CAUTION: Use only a Tesla-approved car cover when Model S/Model X is plugged in. Using a non-Tesla car cover can prevent the Battery from being adequately cooled during charging.

Floor Mats

To extend the life of your carpet and make them easier to clean, use genuine Tesla floor mats (see [Parts and Accessories on page 465](#)). Maintain floor mats by regularly cleaning them and checking that they are properly attached. Replace floor mats if they become excessively worn.

WARNING: To avoid potential interference with a foot pedal, ensure that the driver's floor mat is securely fastened, and never place an additional floor mat on top of it. Floor mats should always rest on top of the vehicle carpeting surface and not on another floor mat or other covering.



Wiper Blades and Washer Jets

Checking and Cleaning Wiper Blades

Periodically clean the edge of the wiper blades and check the rubber for cracks, splits, and roughness. If damaged, replace the blade immediately to prevent damage to the glass and improve visibility.

Contaminants on the windshield, or on the wiper blades, can reduce the effectiveness of the wipers. Contaminants include ice, wax spray from car washes, washer fluid with bug and/or water repellent, bird droppings, tree sap, and other organic substances.

Follow these guidelines for cleaning:

- Clean the windshield and wiper blades using washer fluid, isopropyl (rubbing) alcohol, or non-abrasive glass cleaner approved for use on automotive glass and rubber. Inappropriate products can cause damage or smears, and create glare on the windshield.
- Lift the wiper arm a short distance away from the windshield, just far enough to access the wiper blade. Do not lift a wiper arm beyond its intended position.

If the wipers remain ineffective after cleaning, replace the wiper blades.

Replacing Wiper Blades

For optimum performance, replace the wiper blades at least once a year.

NOTE: Only install replacement blades that are identical to the original blades. Using inappropriate blades can affect the operation of the rain sensor and damage the wiper system and windshield.

NOTE: The wiper washing system is an integrated part of the wiper blades on Model S/Model X.

To replace the wiper blades:

1. Shift into Park and turn off the wipers.
2. Touch **Controls > Service > Wiper Service Mode > ON** to move the wipers to the service position.
3. Lift the wiper arm a short distance away from the windshield, just far enough to access the wiper blade.



CAUTION: Wiper blades do not lock into a lifted position. Do not lift a wiper arm beyond its intended position.

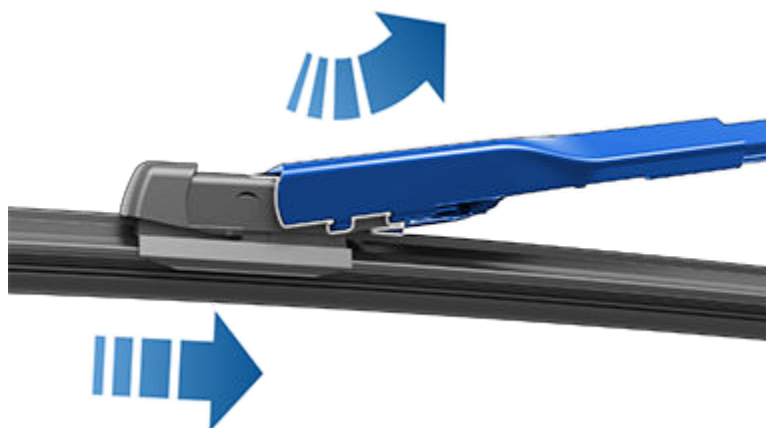
4. Squeeze the two tabs to release the wiper blade from the wiper arm.



CAUTION: The wiper blade is still connected to the washer hose and cannot be removed yet.



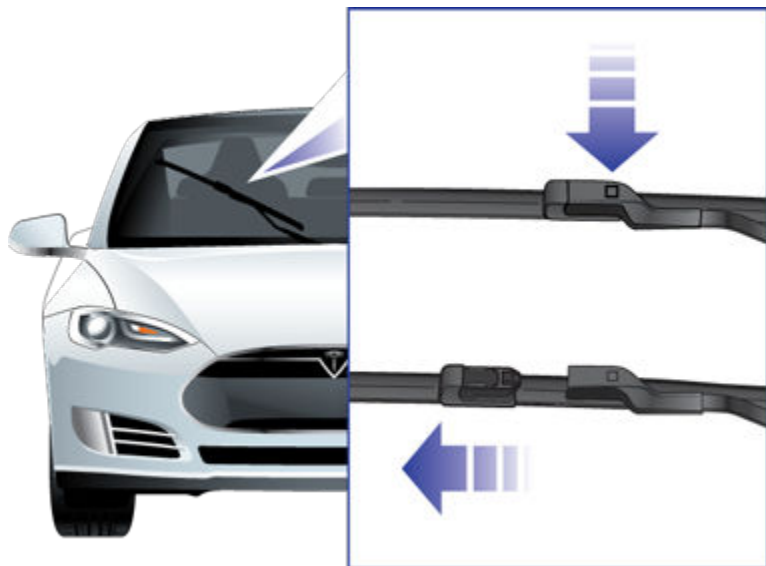
5. Gently slide the wiper blade out and up to release it from the wiper arm.

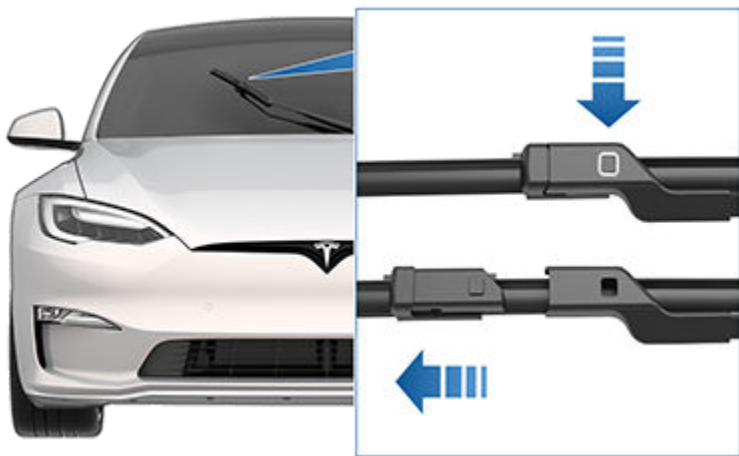
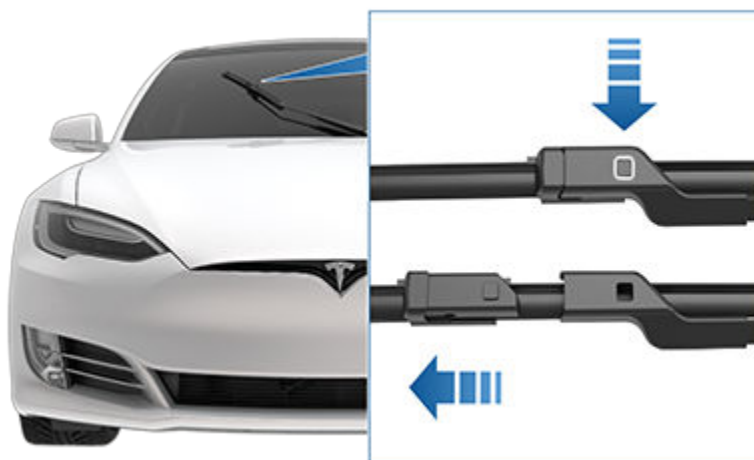


6. Place a towel between the wiper arm and windshield to avoid scratching or cracking the windshield.
7. Disconnect the washer hose from the wiper blade, taking care to avoid spilling any washer fluid.

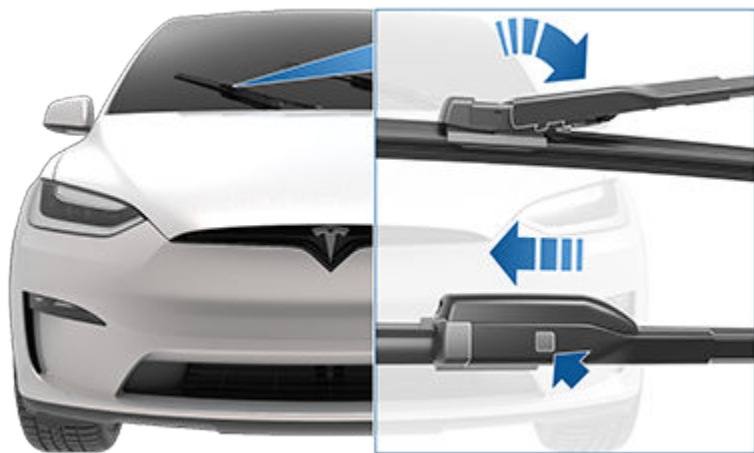


8. Hold the wiper arm and press the locking tab while sliding the blade down the arm.





9. Slide the wiper blade down and into the wiper arm to secure it in place.



10. Fully insert the washer hose onto the nipple of the new wiper blade.

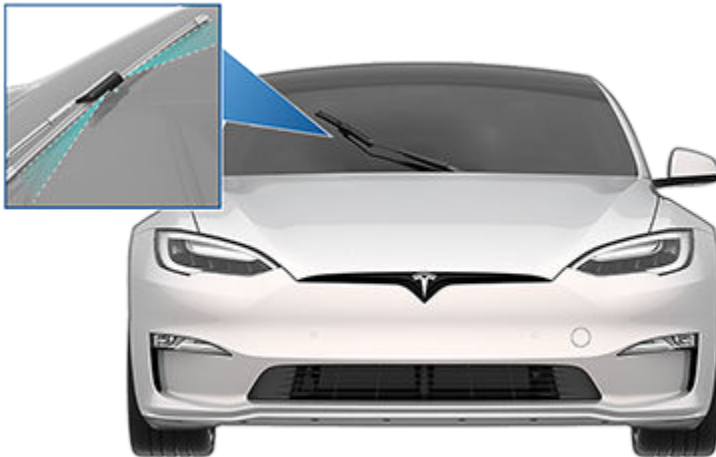
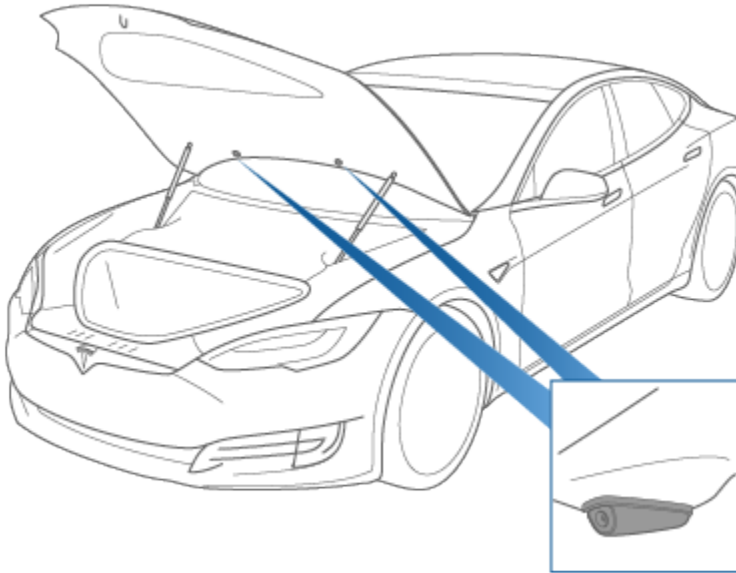
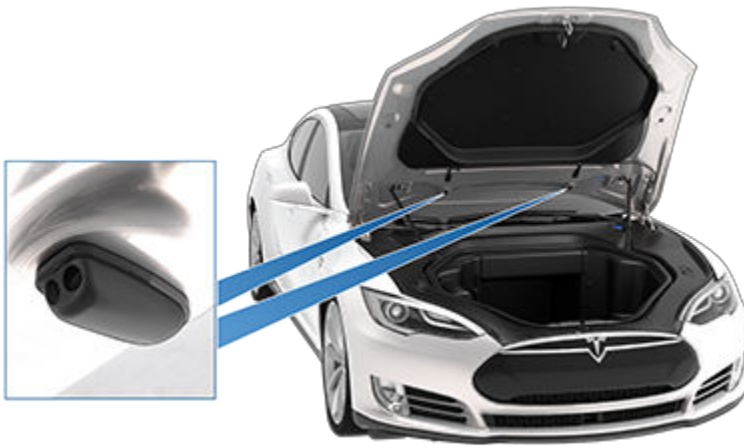
11. Align the new wiper blade on the wiper arm and slide it toward the end of the wiper arm until it locks into place.

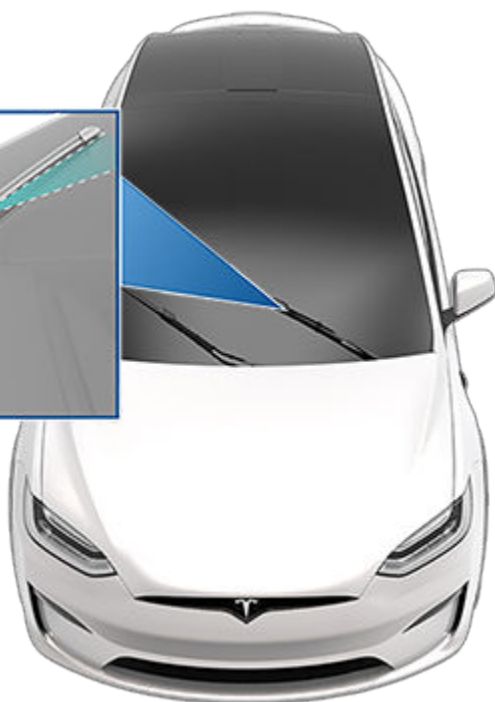
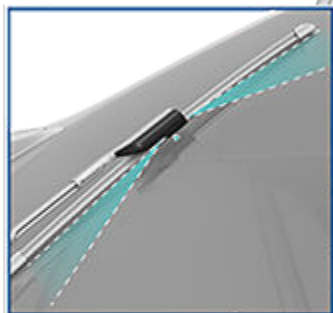
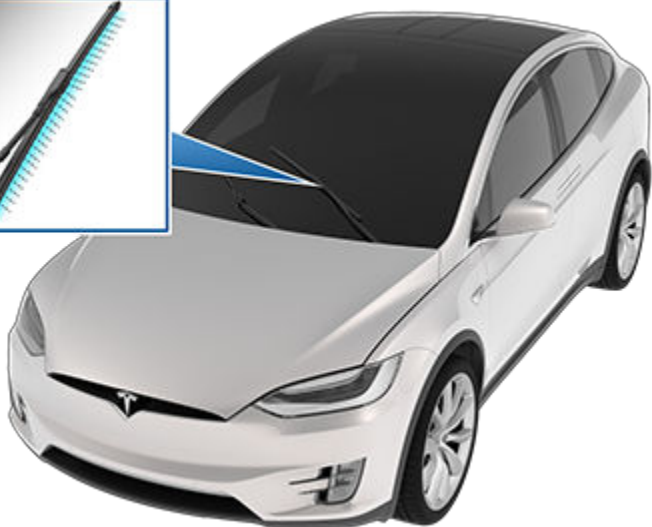
12. Turn Wiper Service Mode off to return the wipers to their normal position.

Cleaning Washer Jets

The position of the windshield washers is set at the factory and should never need adjusting.

If a windshield washer becomes blocked, use a thin strand of wire to clear any blockages from the nozzles.





WARNING: Do not operate the washers while cleaning Model SModel X. Windshield washer fluid can irritate eyes and skin. Read and observe the washer fluid manufacturer's instructions.

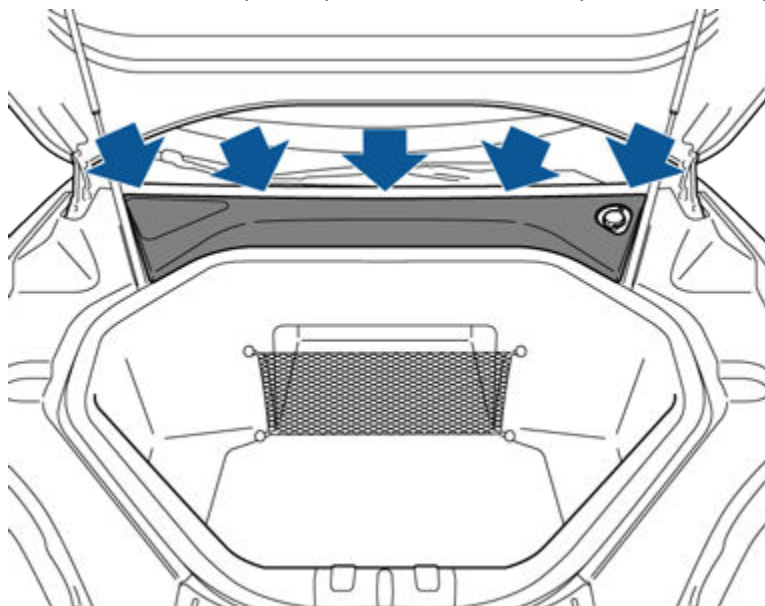


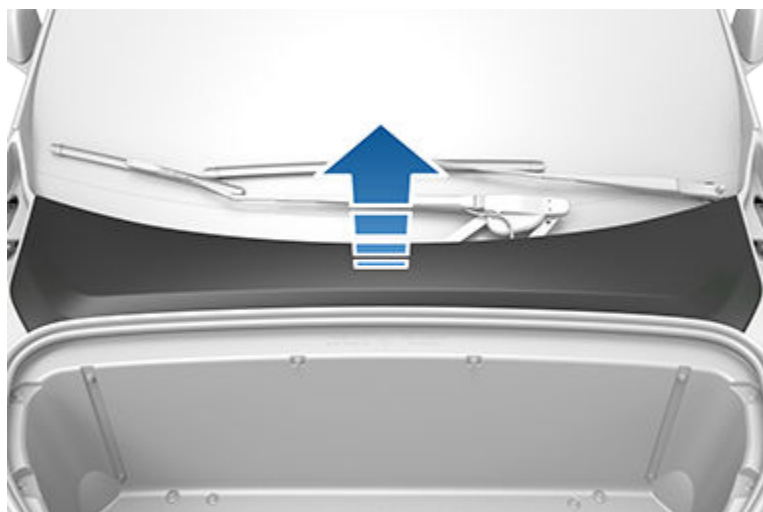
Fluid Reservoirs

Removing the Maintenance Panel

To check fluid levels, remove the maintenance panel:

1. Open the hood.
2. Pull the maintenance panel upward to release the clips that hold it in place.





CAUTION: The maintenance panel protects the front trunk from water. When re-attaching, make sure it is fully seated.

Checking Battery Coolant

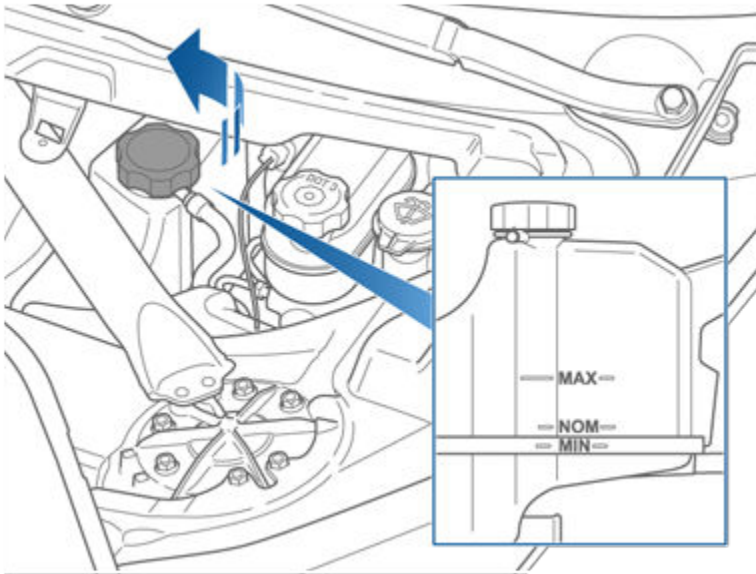
Your Battery coolant should not need to be replaced for the life of your vehicle under most circumstances. However, if the quantity of fluid in the cooling system drops below the recommended level, the instrument panel displays a warning message. Stop driving Model S/Model X as soon as safety permits and contact Tesla.

Fluid Level Check

DO NOT REMOVE THE FILLER CAP AND DO NOT ADD FLUID. Doing so can result in damage not covered by the warranty.

DO NOT REMOVE THE FILLER CAP AND DO NOT ADD FLUID. Doing so can result in damage not covered by the warranty.

On a Rear Wheel Drive Model S, you can check the fluid level visually. BUT DO NOT REMOVE THE FILLER CAP AND DO NOT ADD FLUID. Doing so can result in damage not covered by the warranty. To check the fluid level, park Model S on level ground. When Model S is cool, remove the maintenance panel (see [Removing the Maintenance Panel on page 455](#)). The fluid level can be seen by looking at the outside marks on the side of the reservoir.



The fluid level should be between the **MIN** and the **MAX** marks. If you notice that the fluid level has dropped significantly, contact Tesla before using Model S/Model X.

Do Not Top Up Battery Coolant



WARNING: Battery coolant can be hazardous and can irritate eyes and skin. Under no circumstances should you remove the filler cap and/or add coolant. If the instrument panel warns you that the fluid level is low, contact Tesla immediately.

To maximize the performance and life of the Battery, the cooling system uses a specific mixture of G-48 ethylene-glycol coolant (HOAT). Contact Tesla for more specific information about the coolant.

Checking Brake Fluid



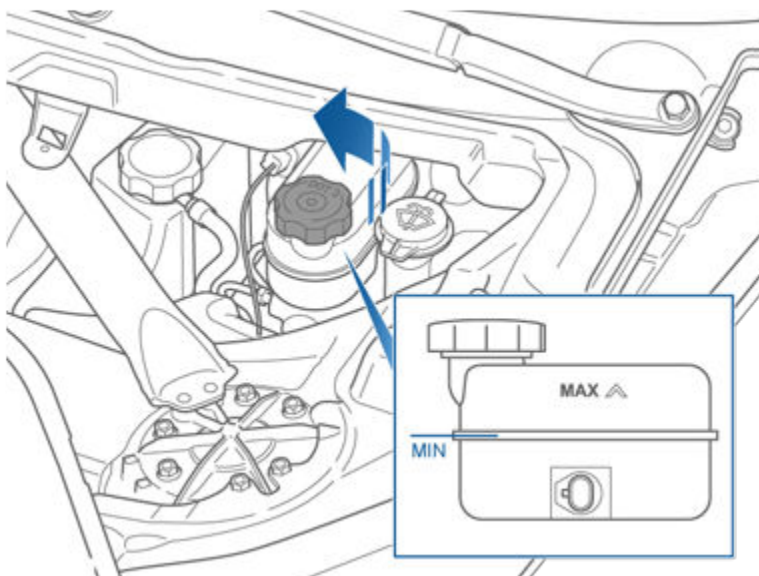
WARNING: Contact Tesla immediately if you notice increased movement of the brake pedal or a significant loss of brake fluid. Driving under these conditions can result in extended stopping distances or complete brake failure.



A red brake indicator on the instrument panel alerts you if the quantity of fluid in the brake reservoir drops below the recommended level. If it displays while driving, stop as soon as safety permits by gently applying the brakes. Do not continue driving. Contact Tesla immediately.

Fluid Level Check

Tesla checks the brake fluid level and health at the regularly scheduled maintenance intervals. To check the fluid level yourself, park Model S/Model X on level ground. When Model S/Model X is cool, remove the maintenance panel (see [Removing the Maintenance Panel on page 455](#)).



Check the fluid level visually by looking at the outside marks on the side of the reservoir without removing the filler cap.

The brake fluid level should always be between the **MIN** and the **MAX** marks.

NOTE: Although brake fluid level drops slightly during normal use as a result of brake pad wear, it should not drop below the MIN mark.

Topping Up the Brake Fluid

Do not top up your brake fluid. The following instructions are provided for information purposes and future reference only:

1. Clean the filler cap before removing it to prevent dirt from entering the reservoir.
2. Unscrew the cap and remove it.
3. Top up the reservoir to the **MAX** mark using the appropriate brake fluid.
4. Replace the filler cap, ensuring it is fully secured.

WARNING: Only use new fluid from a sealed air-tight container. Never use previously used fluid or fluid from a previously opened container—fluid absorbs moisture which decreases braking performance.

WARNING: Brake fluid is highly toxic. Keep containers sealed and out of the reach of children. In the event of accidental consumption, seek medical attention immediately.

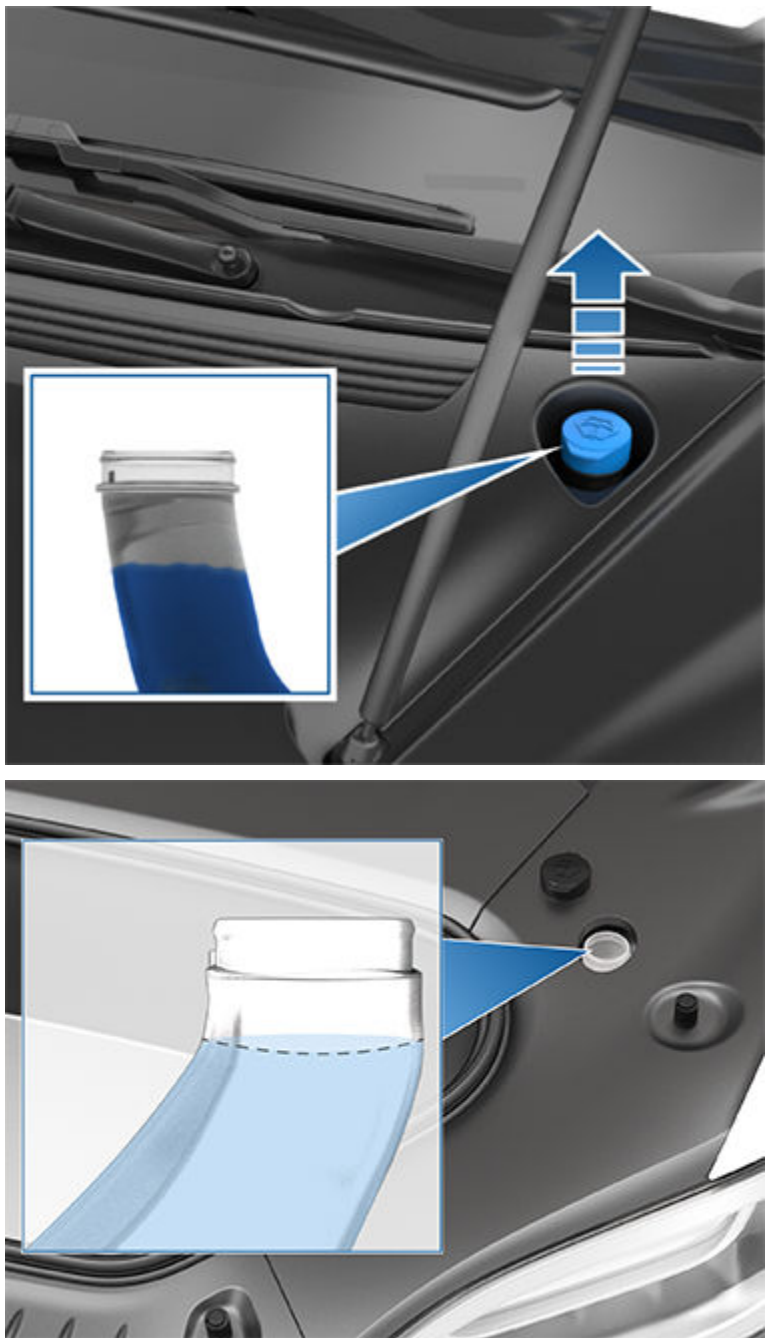
CAUTION: Brake fluid damages painted surfaces. Immediately soak up any spills with an absorbent cloth and wash the area with a mixture of car shampoo and water.

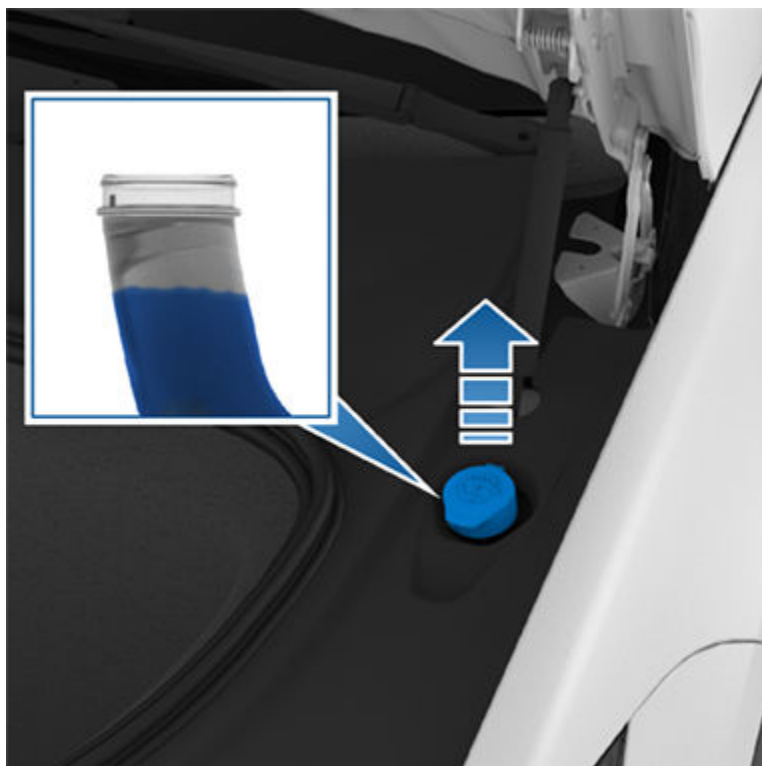
Topping Up Windshield Washer Fluid

The only reservoir into which you can add fluid is the windshield washer fluid reservoir, which is located behind the front trunk. When the level is low, a message displays on the instrument panel.

To top up the washer fluid:

1. Open the hood.
2. Clean around the filler cap before opening it to prevent dirt from entering the reservoir.
3. Open the filler cap.
4. While avoiding spilling, fill the reservoir until the fluid level is visible just below the filler neck.





5. Wipe up any spills immediately and wash the affected area with water.
6. Replace the filler cap.

NOTE: Some national or local regulations restrict the use of Volatile Organic Compounds (VOCs). VOCs are commonly used as antifreeze in washer fluid. Use a washer fluid with limited VOC content only if it provides adequate freeze resistance for all climates in which you drive Model SModel X.

CAUTION: Do not add formulated washer fluids that contain water repellent or bug wash. These fluids can cause streaking, smearing, and squeaking or other noises.



WARNING: In temperatures below 40° F (4° C), use a washer fluid with antifreeze. In cold weather, using a washer fluid without antifreeze can impair visibility through the windshield.



WARNING: Windshield washer fluid can irritate eyes and skin. Read and observe the instructions provided by the washer fluid manufacturer.



Jacking and Lifting

Jacking Procedure

Follow the steps below to lift Model S/Model X. Ensure that any non-Tesla repair facility is aware of these lifting points.

1. Position Model S/Model X centrally between the lift posts.
2. If your Model S/Model X is equipped with air suspension, it automatically self-levels, even when power is off (see [Jack Mode on page 463](#)). Use the touchscreen to set the suspension as follows:
 - Touch **Controls** > **Suspension**.
 - Press the brake pedal, then touch **Very High** to maximize the height of the suspension.
 - Touch **Controls** > **Service** > **Jack Mode** to disable self-leveling.

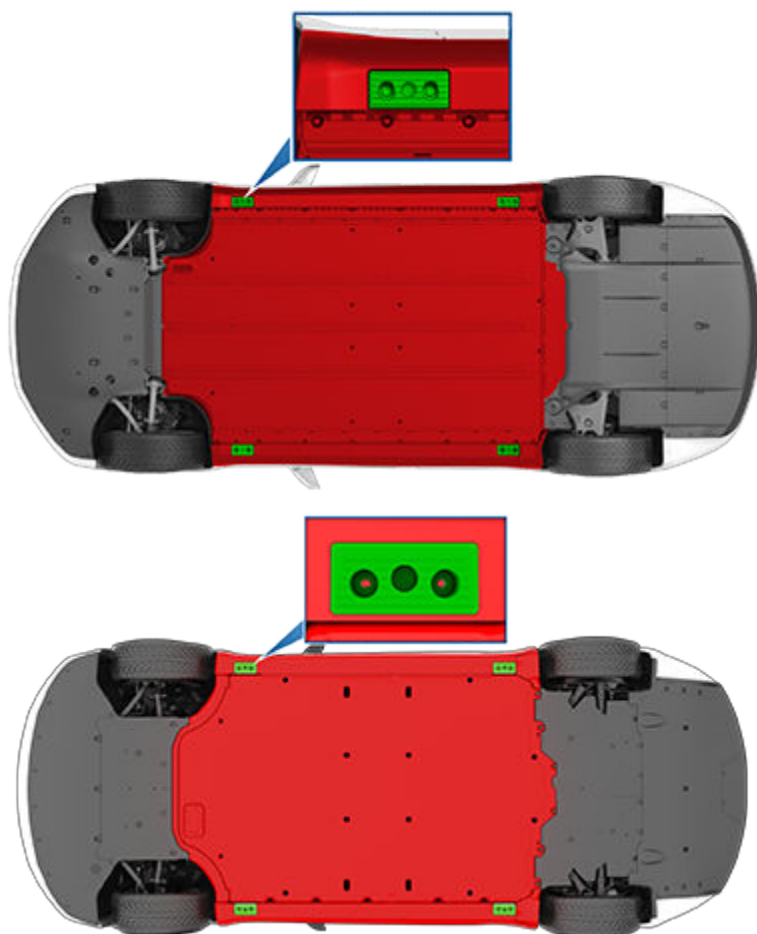


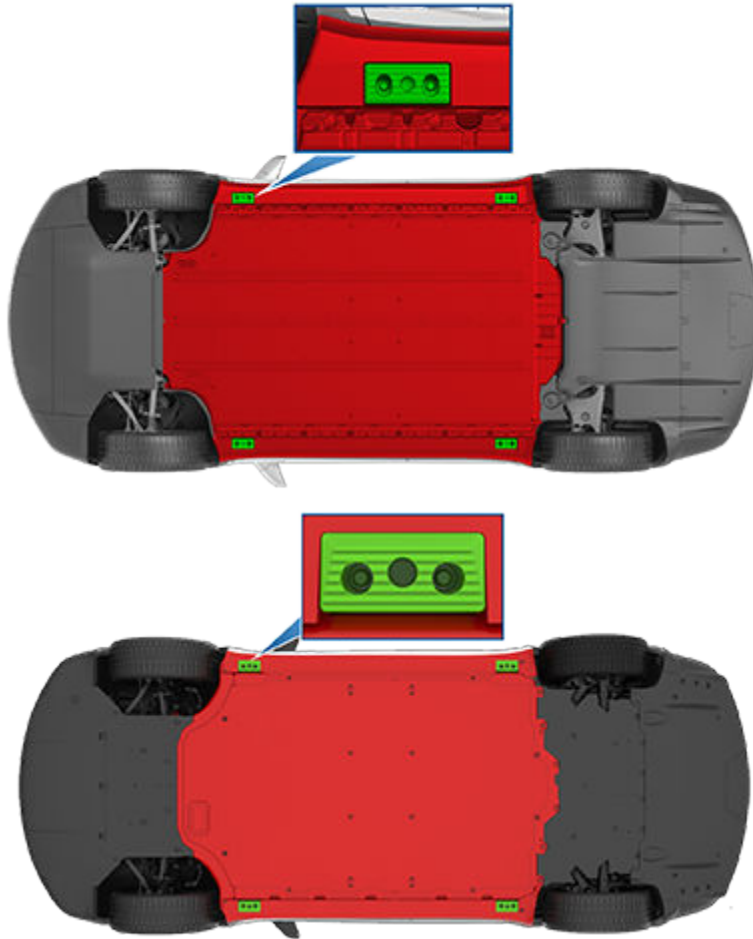
When Jack mode is active, Model S/Model X displays this indicator light on the instrument panel, along with a message telling you that active suspension is disabled.

3. Close the falcon wing doors.
4. Position the lift arm pads under the designated body lift points at the locations shown.



WARNING: DO NOT position the lift arm pads under the Battery or side rails, as shown in red.





5. Adjust the height and position of the lift arm pads to ensure that they are correctly located.
6. With assistance, raise the lift to the desired height, ensuring the lift arm pads remain in their correct positions.
7. Engage any lift safety locks. Follow the lift manufacturer's instructions.

NOTE: Jack mode cancels when Model SModel X is driven over 4 mph (7 km/h).

NOTE: Jack mode may be unexpectedly enabled in situations where an object is supporting the vehicle's weight (for example the bumper of the vehicle is resting on a curb).

- WARNING:** The air suspension system automatically self-levels, even when power is off. You **MUST** disable this system by engaging Jack mode before lifting or jacking. If you do not disable the air suspension, Model SModel X can attempt to self-level, causing serious damage, bodily injury, or death.
- WARNING:** Never raise Model SModel X when the charge cable is connected, even if charging is not in progress.
- WARNING:** Do not work on an incorrectly supported vehicle. Doing so can cause serious damage, bodily injury, or death.
- CAUTION:** DO NOT lift from under the Battery or side rails. Place the lift arm pads under the designated body lift points only. The locations shown are the only approved lifting points for Model SModel X. Lifting at any other points can cause damage. Damage caused by incorrectly lifting Model SModel X is not covered by the warranty.

Jack Mode

If Model SModel X is equipped with air suspension, it automatically self-levels, even when power is off. To prevent damage when jacking or lifting the vehicle, you must activate Jack mode to disable self-leveling. Jack mode prevents the self-leveling that occurs even when Model SModel X is powered off.

Press the brake pedal, then touch **Controls > Service > Jack Mode**.



When Model SModel X is in **Jack Mode** mode, a red air suspension indicator lights up on the instrument panel.



To deactivate, touch **Jack Mode** again.

NOTE: **Jack Mode** automatically cancels when you drive over 4 mph (7 km/h).

NOTE: Model SModel X also sets Jack mode automatically if it detects that the vehicle cannot lower to its target height, or if it detects that an object is supporting the vehicle's weight (for example the bumper of the vehicle is resting on a curb).



Parts and Accessories

Parts, Accessories, and Modifications

Use only genuine Tesla parts and accessories. Tesla performs rigorous testing on parts to ensure their suitability, safety, and reliability. Purchase these parts from Tesla, where they are professionally installed and where you can receive expert advice about modifications to Model SModel X. Accessories are available for purchase from Tesla stores or online at www.tesla.com.

NOTE: Some accessories may not be available in your market region.

Tesla is unable to assess parts manufactured by other distributors and therefore accepts no responsibility if you use non-Tesla parts on Model SModel X.



WARNING: Installing non-approved parts and accessories, or performing non-approved modifications, can affect the performance of Model SModel X and the safety of its occupants. Any damage caused by using or installing non-approved parts, or by performing non-approved modifications, is not covered by the warranty.



WARNING: Tesla does not accept liability for death, personal injury or damage that occurs if you use or install non-approved accessories or make non-approved modifications.

Body Repairs

If your Model SModel X is in a collision, contact Tesla or a Tesla-approved Body Shop to ensure that it is repaired with genuine Tesla parts. Tesla has selected and approved body shops that meet strict requirements for training, equipment, quality, and customer satisfaction.

Some repair shops and insurance companies might suggest using non-original equipment or salvaged parts to save money. However, these parts do not meet Tesla's high standards for quality, fit and corrosion resistance. In addition, non-original equipment and salvaged parts (and any damage or failures they might cause) are not covered by the warranty.

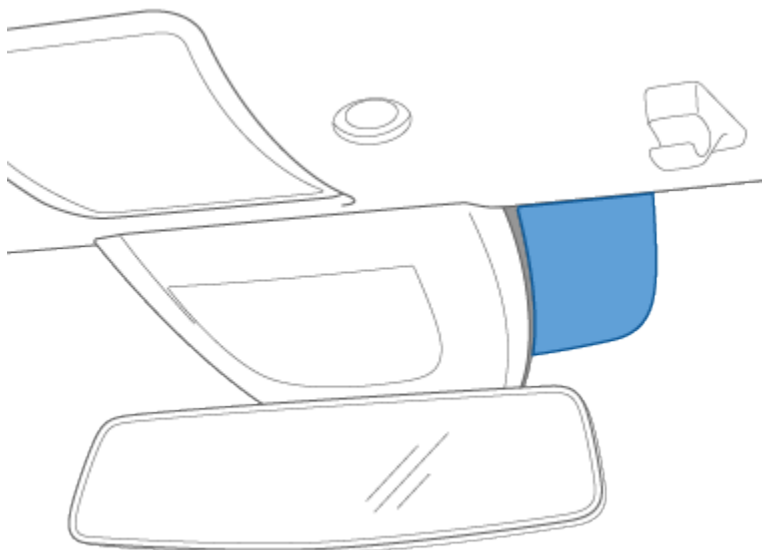
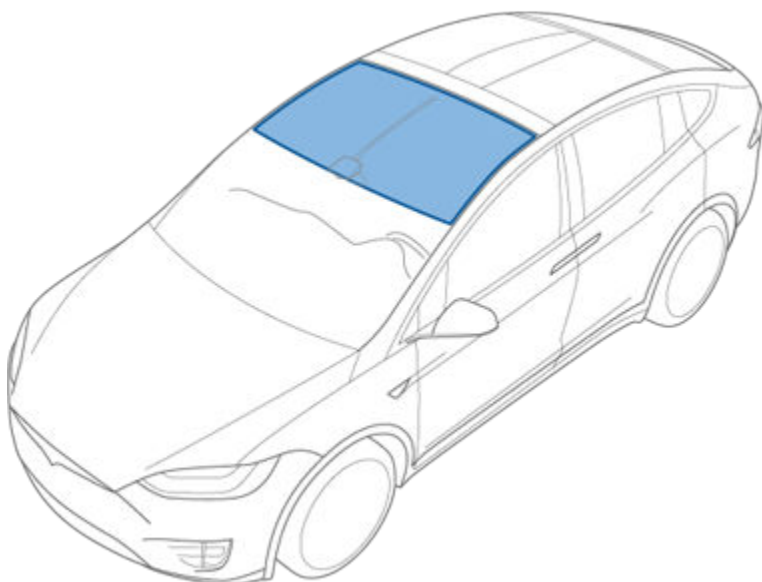
Using RFID Transponders

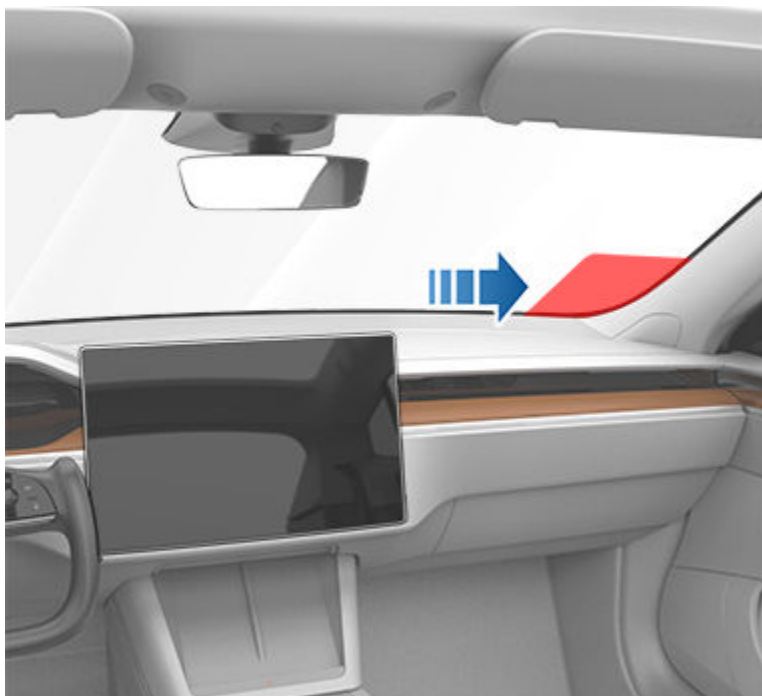
When attaching an RFID transponder (used by many automated toll systems) inside Model SModel X, place the transponder in the topmost area of the windshield as shown. This ensures best results and minimizes any obstruction to your driving view.

When attaching an RFID transponder (used by many automated toll systems) inside Model SModel X, place the transponder on the bottom corner of the passenger side of the windshield as shown. This ensures best results and minimizes any obstruction to your driving view.

Model S has a metallic coating on the windshield that can interfere with signals sent from RFID transponders used by many toll systems. Most Model S vehicles, depending on date of manufacture, include an area in the windshield in which the metallic coating is cut out to accommodate transponders. This area, located on the right side of the rear view mirror, is the best location to mount a transponder. If your vehicle does not include this cut out area, mount the transponder to the rear window.

NOTE: You can also attach a weather-proof transponder to the front license plate or behind the nose cone (for details on how to remove the nose cone, see [Instructions for Transporters on page 503](#)).





Specifications

Identification Labels

Vehicle Identification Number

You can find the VIN at the following locations:

- Touch **Controls** > **Software**.
- Stamped on a plate located at the top of the dashboard. Can be seen by looking through the windshield on the driver's side of the vehicle.



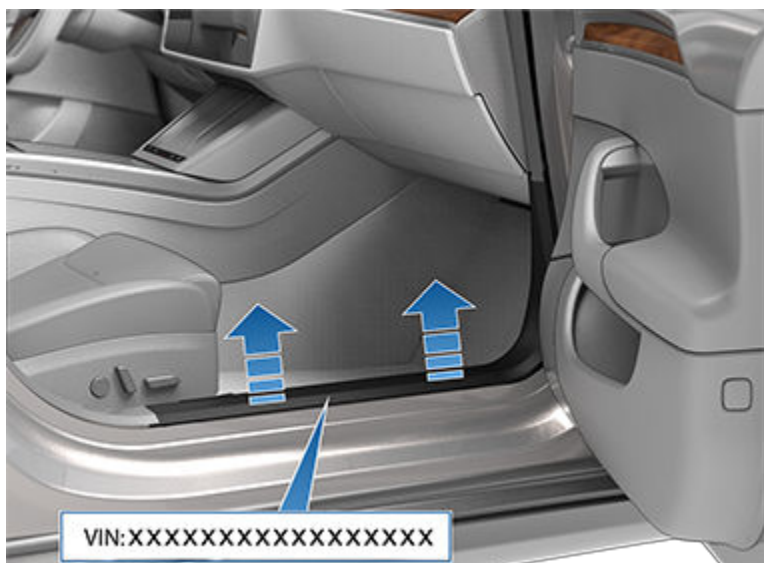
- Printed on the Vehicle Certification label, located on the door pillar. Can be seen when the driver's door is open.



- The VIN is stamped on the chassis and can be seen by removing the sill panel on the front passenger door by gently prying it upward using a flat-bladed tool.



CAUTION: Removing the sill panel to view the VIN is not recommended because damage is likely to occur. The panel is held in place with fragile clips that break easily. Damage caused by removing the sill panel is not covered by the warranty.



- The VIN is stamped on the chassis and can be seen by removing the sill panel on the front passenger door by gently prying it upward using a flat-bladed tool.



CAUTION: Removing the sill panel to view the VIN is not recommended because damage is likely to occur. The panel is held in place with fragile clips that break easily. Damage caused by removing the sill panel is not covered by the warranty.



Vehicle Identification Number

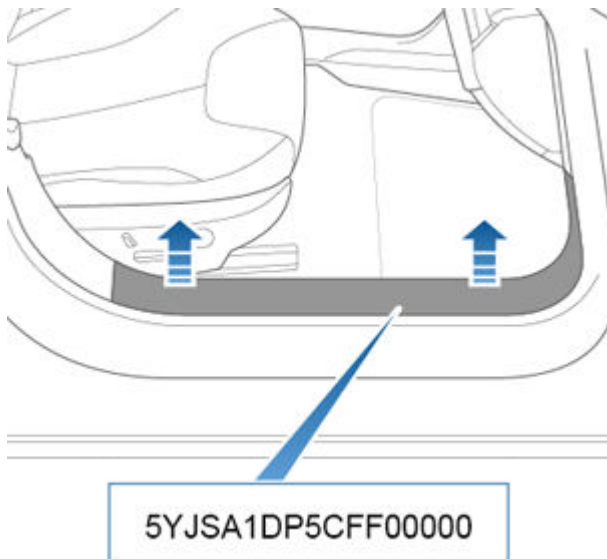
You can find the VIN at the following locations:

- Touch **Controls** > **Software**.
- Stamped on a plate located at the top of the dashboard. Can be seen by looking through the windshield.
- On vehicles manufactured before August 2015, the VIN is stamped on the chassis and can be seen by removing the maintenance panel (see [Removing the Maintenance Panel on page 455](#)).
- On vehicles manufactured as of August 2015, the VIN is stamped on the chassis and can be seen by removing the sill panel on the front passenger door by gently prying it upward using a flat-bladed tool.

NOTE: The VIN was not stamped on the chassis on vehicles manufactured between approximately June 2, 2016 and Feb 28, 2017.



CAUTION: Removing the sill panel to view the VIN is not recommended because damage is likely to occur. The panel is held in place with fragile clips that break easily. Damage caused by removing the sill panel is not covered by the warranty.



- Stamped on the chassis under the sill panel on the rear passenger door. To remove the sill panel, gently pry it upward using a flat-bladed tool.

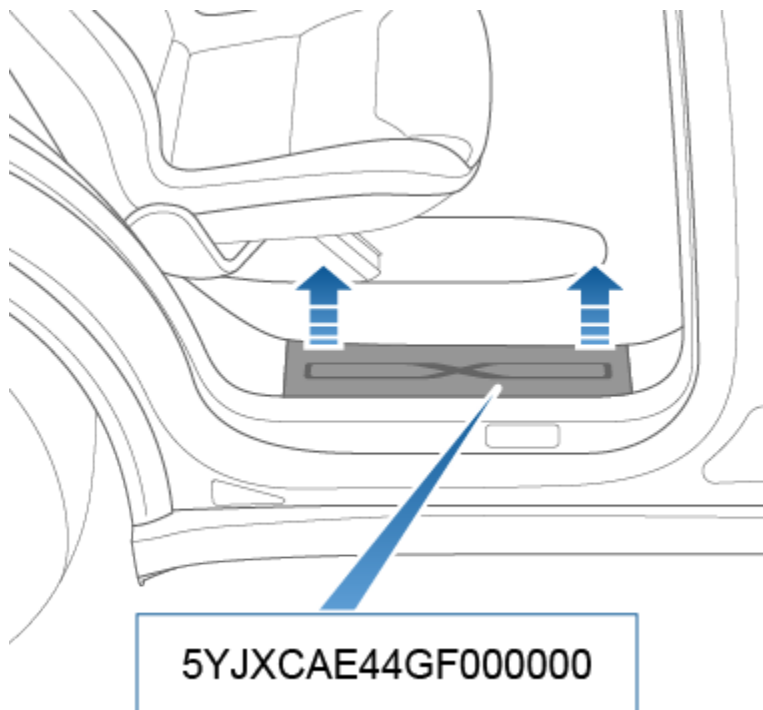
NOTE: The VIN was not stamped on the chassis on vehicles manufactured between approximately June 2, 2016 and Feb 28, 2017.



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CAUTION: Removing the sill panel to view the VIN is not recommended because damage is likely to occur. The panel is held in place with fragile clips that break easily. Damage caused by removing the sill panel is not covered by the warranty.



Emission Control Label

The emission control label is located on the opening face of the liftgate.

NOTE: For vehicles with a model year of 2022 or newer, the emission control label is now located on the inside of the front hood and may not match the label shown.



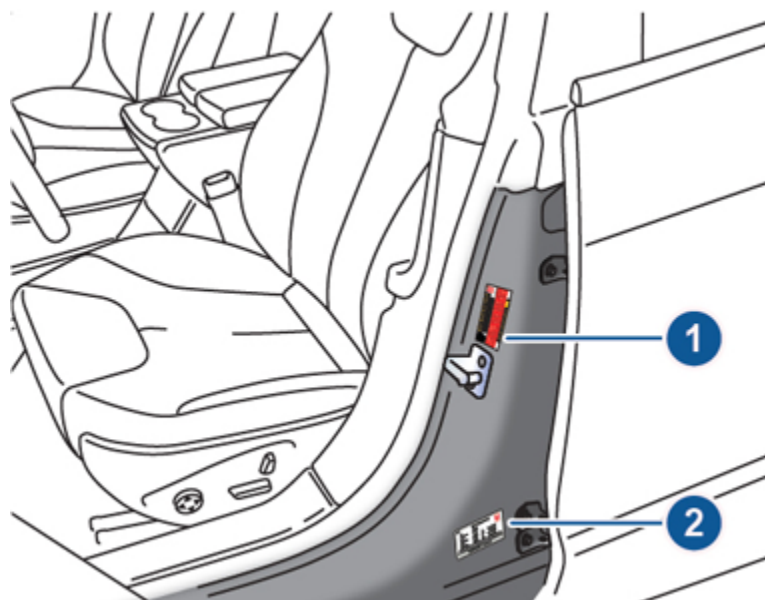


Vehicle Loading

Load Capacity Labeling

It is important to understand how much weight your Model S Model X can safely carry. This weight is called the vehicle capacity weight and includes the weight of all occupants, cargo and any additional equipment added to your Model S Model X since it was manufactured.

Two labels attached to the center door pillar indicate how much weight Model S Model X can safely carry. Labels are visible when the front door is open.



1. Tire and Loading Information Label
2. Vehicle Certification Label

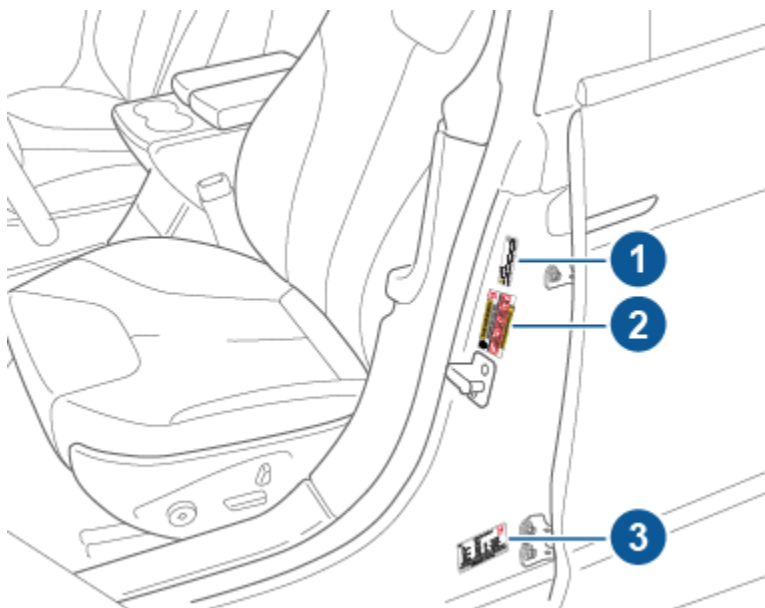


- WARNING:** Overloading Model S/Model X has an adverse effect on braking and handling, which can compromise your safety or cause damage.
- CAUTION:** Never load more than 110 lbs (50 kg) in the front trunk. Doing so can cause damage.
- CAUTION:** Never load more than 300 lbs (136 kg) in the front trunk. Doing so can cause damage.
- CAUTION:** Never load more than 175 lbs (80 kg) in the upper compartment of the rear trunk or more than 175 lbs (80 kg) in the lower compartment. Doing so can cause damage.
- CAUTION:** Never load more than 175 lbs (80 kg) in the upper compartment of the rear trunk or more than 285 lbs (130 kg) in the lower compartment. Doing so can cause damage.
- CAUTION:** Never store large amounts of liquid in Model S/Model X. A significant spill can cause electrical components to malfunction.

Load Capacity Labeling

It is important to understand how much weight your Model X can safely carry. This weight is called the vehicle capacity weight and includes the weight of all occupants, cargo and any additional equipment added to your Model X since it was manufactured.

One or more labels attached to the center door pillar indicate how much weight Model X can safely carry. Labels are visible when the front door is open.





1. Towing label (if equipped)
2. Tire and Loading Information label
3. Vehicle Certification label

NOTE: Towing capability is available only if Model X is equipped with the Towing Package.

-  **WARNING:** Overloading Model X has an adverse effect on braking and handling, which can compromise your safety or cause damage.
-  **CAUTION:** Never load more than 110 lbs (50 kg) in the front trunk. Doing so can cause damage.
-  **CAUTION:** Never load more than 300 lbs (136 kg) in the front trunk. Doing so can cause damage.
-  **CAUTION:** Never load more than 220 lbs (100 kg) on the upper trunk compartment or more than 175 lbs (80 kg) in the lower trunk compartment. Doing so can cause damage.
-  **CAUTION:** Never load more than 175 lbs (80 kg) on the upper trunk compartment or more than 285 lbs (130 kg) in the lower trunk compartment. Doing so can cause damage.
-  **CAUTION:** Never store large amounts of liquid in Model X. A significant spill can cause electrical components to malfunction.

Towing Label

If equipped with the towing package, the Towing Label instructs you to refer to this owner's manual for tire pressures that should be used when towing a trailer. Do not use the tire pressures printed on the Tire and Loading Information Label.

 **IMPORTANT!**
 For towing and high speed driving, please refer to  owner's manual for tire inflation pressure requirements.

Depending on vehicle manufacture date, Model SModel X may or may not have a towing label.



NOTE: Towing capability is available only if Model X is equipped with the Towing Package. Tire pressure information, along with other information related to towing, is located in the topic "Towing a Trailer" in the Driving section of the onscreen Owner's Manual.

Tire and Loading Information Label

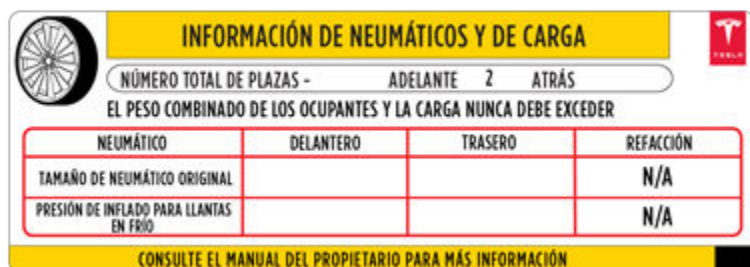
The Tire and Loading Information label provides:

- The maximum number of occupant seating positions.
- The maximum vehicle capacity weight.
- The size of the original tires.
- The cold inflation pressures for the original front and rear tires. These pressures are recommended to optimize ride and handling characteristics.

United States/Canada:



Mexico:



Never change this label, even if you use different tires in the future.

NOTE: If Model SModel X is loaded to its full capacity, double check all tires to ensure they are inflated to their recommended pressure levels.

WARNING: Tire pressures printed on the Tire and Loading Information label DO NOT APPLY to towing. When towing, tire pressures must be increased. For information about the tire pressures required when towing, see [Towing and Accessories on page 269](#).

Vehicle Certification Label

The Vehicle Certification label provides:

- GVWR - Gross Vehicle Weight Rating. The maximum allowable total mass of Model SModel X. This is calculated as the weight of Model SModel X equipped with the heaviest factory selectable options, all passengers, fluids, and cargo.
- GAWR FRT and GAWR RR - Gross Axle Weight Rating for the front and rear axles. The GAWR is the maximum distributed weight that each axle can support.

United States:



MFD BY TESLA, INC.

GVWR	WITH TIRES		
GAWR FRT	WITH TIRES	RIM	COLD TIRE PRESSURE
GAWR RR	WITH TIRES	RIM	COLD TIRE PRESSURE

THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.

Canada:

EC **MFD BY TESLA, INC./FABRIQUÉ PAR TESLA, INC.**

GVWR/PNBV	WITH TIRES/AVEC PNEUS		
GAWR FRT/PNBE AVT	WITH TIRES/AVEC PNEUS	RIM/JANTE	COLD TIRE PRESSURE/PRESSION DES PNEUS À FROID
GAWR FRT/PNBE AVT	WITH TIRES/AVEC PNEUS	RIM/JANTE	COLD TIRE PRESSURE/PRESSION DES PNEUS À FROID

THIS VEHICLE CONFORMS TO ALL APPLICABLE STANDARDS PRESCRIBED UNDER THE CANADIAN MOTOR VEHICLE SAFETY REGULATIONS IN EFFECT ON THE DATE OF MANUFACTURE.
CE VÉHICULE EST CONFORME À TOUTES LES NORMES QUI LUI SONT APPLICABLES EN VERTU DU RÈGLEMENT SUR LA SÉCURITÉ DES VÉHICULES AUTOMOBILES DU CANADA EN VIGUEUR À LA DATE DE SA FABRICATION.

Mexico:

MFD DE TESLA MOTORS, INC.
3500 Deer Creek Rd, Palo Alto, CA, USA 94304



GVWR	CON LLANTAS		
GAWR FRT	CON LLANTAS	RIM	PRESIÓN DE AIRE DE LLANTAS FRÍAS
GAWR RR	CON LLANTAS	RIM	PRESIÓN DE AIRE DE LLANTAS FRÍAS

ESTE VEHÍCULO CUMPLE CON TODOS LOS ESTÁNDARES MEXICANOS Y LOS ESTADOS UNIDOS DE AMÉRICA APPLICABLES CON RESPECTO A LA SEGURIDAD AUTOMOTRIZ, ESTÁNDARES DE PARACHOQUES Y PREVENCIÓN DE ROBOS EN VIGOR EN LA FECHA DE FABRICACIÓN QUE SE MUESTRA ARRIBA.

 **CAUTION:** To prevent damage, never load Model S/Model X so that it is heavier than GVWR or exceeds the individual GAWR weights.

Calculating Load Limits

1. Locate the statement "The combined weight of occupants and cargo should never exceed XXX lbs or XXX kg" on the "Tire and Loading Information" label.
2. Determine the combined weight of all occupants that will ride in the vehicle.
3. Subtract the combined weight of the occupants from XXX lbs or XXX kg (see Step 1).
4. The resulting figure equals the available cargo load capacity. For example, if the "XXX" amount equals 1400 lbs (635 kg) and there will be five 150 lb (68 kg) passengers in the vehicle, the amount of available cargo capacity is 650 lbs (1400 - 750 (5 x 150) = 650 lbs) or 295 kg (635 - 340 (5 x 68) = 295 kg).
5. Determine the combined cargo weight being loaded on the vehicle. That weight must not exceed the available cargo load capacity calculated in Step 4.



Owners Manual

WARNING: Trunks are the preferred places to carry objects. In a collision, or during hard braking and sharp turns, loose items in the cabin could injure occupants.

Example Load Limit Calculations

How much cargo Model S/Model X can carry depends on the number and weight of passengers. The following calculated load limit examples assume passengers weigh 150 lbs (68 kg). If passengers weigh more or less, available cargo weight decreases or increases respectively.

Driver and one passenger

Description	Total
Vehicle capacity weight	954 lbs (433 kg)
Subtract occupant weight (2 x 150 lbs/68 kg)	300 lbs (136 kg)
Available cargo weight	654 lbs (297 kg)

Driver and four passengers

Description	Total
Vehicle capacity weight	954 lbs (433 kg)
Subtract occupant weight (5 x 150 lbs/68 kg)	750 lbs (340 kg)
Available cargo weight	204 lbs (93 kg)

The cargo weight should be distributed between the front and rear trunks.

- CAUTION:** Do not exceed the maximum front trunk load weight of 110 lbs (50 kg).
- CAUTION:** Do not exceed the maximum front trunk load weight of 300 lbs (136 kg).
- CAUTION:** Never load more than 175 lbs (80 kg) on the rear load floor (above the lower trunk compartment) or more than 285 lbs (130 kg) in the lower trunk compartment. Doing so can cause damage.

Towing a Trailer

- WARNING:** Do not use Model S/Model X for towing purposes. Model S/Model X does not support a trailer hitch. Installing one could cause damage and increase the risk of a collision.
- CAUTION:** Using Model S/Model X for towing may void the warranty.

Roof Racks

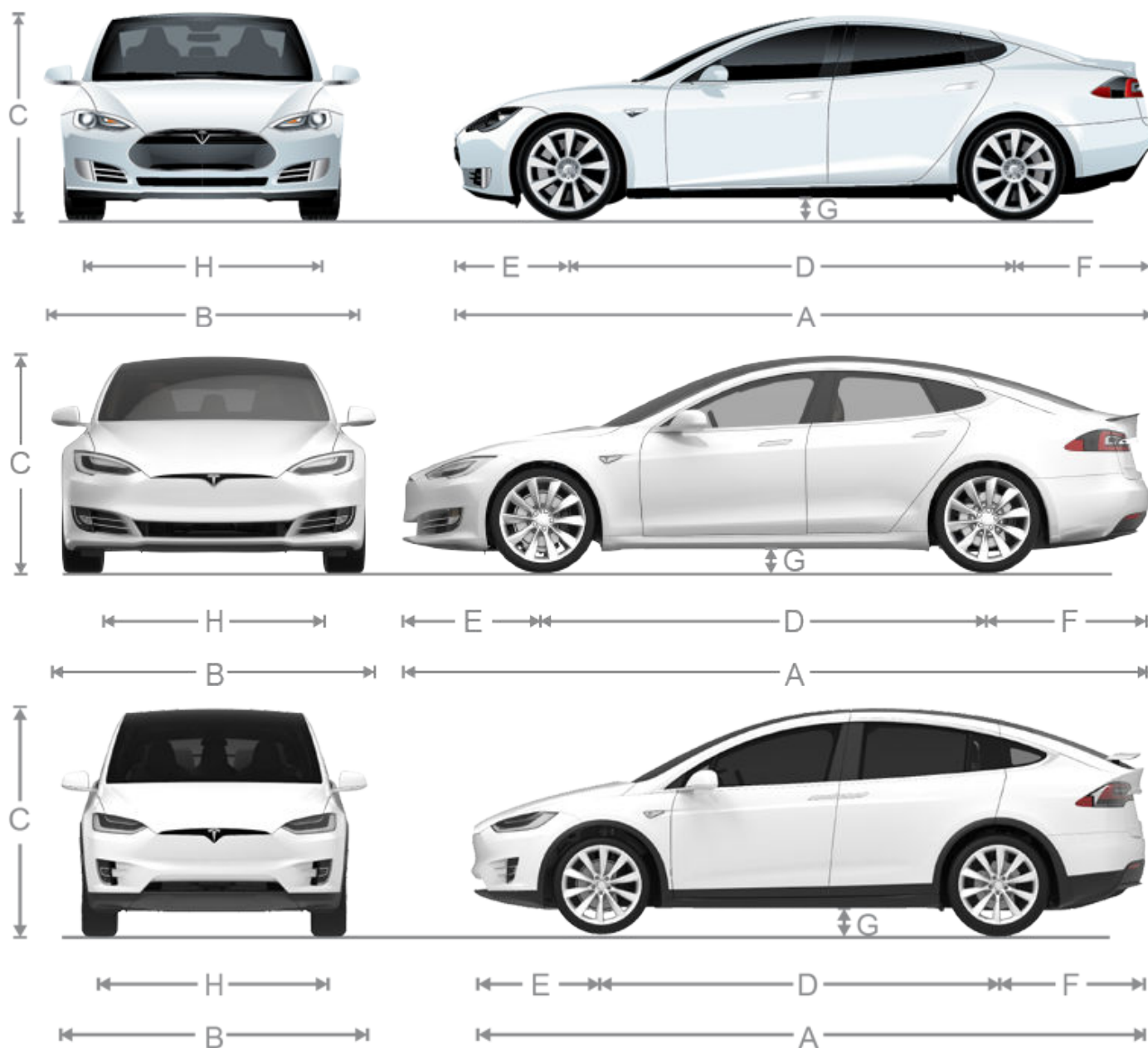
A Model S equipped with a glass roof, or a panoramic sunroof, can carry up to 165 lbs (75 kg) using a Tesla-approved roof rack (see [Parts and Accessories on page 465](#)). A Model S equipped with a solid body color roof is incompatible with roof racks.

- CAUTION:** Do not use roof racks, or place any load, on the roof of a Model S that is equipped with a solid color roof. Doing so can cause significant damage.



Dimensions and Weights

Exterior Dimensions



A	Overall Length	196 in	4,970 mm
B	Overall Width (including mirrors)	86.2 in	2,189 mm
	Overall Width (excluding mirrors)	77.3 in	1,964 mm
C	Overall Height	56.9 in*	1,445 mm*
D	Wheel Base	116.5 in	2,960 mm
E	Overhang - Front	37 in	929 mm
F	Overhang - Rear	42.5 in	1,080 mm
G	Ground Clearance - Coil Suspension (Rear Wheel Drive vehicle)	5.5 in*	139.7 mm*



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G	Ground Clearance - Coil Suspension (All-Wheel Drive vehicle)	5.3 in*	134.6 mm*
G	Ground Clearance - Air Suspension	4.6 - 6.3 in	116.8 - 160 mm
H	Track - Front Track - Rear	65.4 in 66.9 in	1,662 mm 1,700 mm
*Values are approximate. Dimensions can vary depending on a vehicle's options and various other factors.			

A	Overall Length	196 in	4,970 mm
B	Overall Width (including mirrors) Overall Width (excluding mirrors)	86.2 in 77.3 in	2,189 mm 1,964 mm
C	Overall Height	56.9 in*	1,445 mm*
D	Wheel Base	116.5 in	2,960 mm
E	Overhang - Front	36.9 in	929 mm
F	Overhang - Rear	42.55 in	1,081 mm
G	Ground Clearance - Coil Suspension (Rear Wheel Drive vehicle)	5.5 in*	139.7 mm*
G	Ground Clearance - Coil Suspension (All-Wheel Drive vehicle)	5.3 in*	134.6 mm*
G	Ground Clearance - Air Suspension	4.6 - 6.3 in	116.8 - 160 mm
H	Track - Front Track - Rear	65.4 in 66.9 in	1,662 mm 1,700 mm
*Values are approximate. Dimensions can vary depending on a vehicle's options and various other factors.			

A	Overall Length	198.3 in	5,036 mm
B	Overall Width (including mirrors) Overall Width (including folded mirrors) Overall Width (excluding mirrors)	89.4 in 81.6 in 78.7 in	2,271 mm 2,072 mm 1,999 mm
C	Overall Height	66 in*	1,684 mm*
D	Wheel Base	116.7 in	2,965 mm
E	Overhang - Front	38.3 in	974 mm
F	Overhang - Rear	43.2 in	1,097 mm
G	Ground Clearance: Standard, with skis Standard, without skis Very high, with skis Very high, without skis	7 in 7 in 8 in 9 in	171 mm 183 mm 211 mm 223 mm
H	Track - Front Track - Rear	67.1 in 67.3 in	1,705 mm 1,710 mm
*Values are approximate. Dimensions can vary depending on a vehicle's options and various other factors.			



Interior Dimensions

Head Room	Front Rear	38.8 in 35.3 in	986 mm 897 mm
Leg Room	Front Rear	42.7 in 35.4 in	1,085 mm 899 mm
Shoulder Room	Front Rear	57.7 in 55 in	1,466 mm 1,397 mm
Hip Room	Front Rear	55 in 54.7 in	1,397 mm 1,389 mm
Head Room	Front Rear Third	41.7 in 40.9 in 37.1 in	1059 mm 1039 mm 942 mm
Leg Room	Front Rear Third	41.2 in 38.4 in 32.7 in	1046 mm 975 mm 831 mm
Shoulder Room	Front Rear Third	60.7 in 56.8 in 40 in	1542 mm 1442 mm 1016 mm
Hip Room	Front Rear Third	55.6 in 59 in 38.5 in	1412 mm 1498 mm 978 mm

Cargo Volume

Total cargo volume (Rear Wheel Drive vehicles, rear seats not folded)	31.6 cu ft	894.85 L
Total cargo volume (All-Wheel Drive vehicles, rear seats not folded)	28.8 cu ft	815.5 L
Total cargo volume (rear seats not folded)	28.4 cu ft	804.2 L
Rear cargo volume	26.3 cu ft	744.7 L
Rear cargo volume (with seats folded down)	58.1 cu ft	1,645.2 L
Front cargo volume (Rear Wheel Drive vehicles)	5.3 cu ft	150.1 L
Front cargo volume (All-Wheel Drive vehicles)	2.5 cu ft	70.8 L
Front cargo volume	2.1 cu ft	59.5 L



	Front Trunk	Rear*	Total
Seven Seat Vehicles	6.6 cu ft (187 L)	76.5 cu ft (2166 L)**	83.1 cu ft (2353 L)
Six Seat Vehicles	6.6 cu ft (187 L)	70.7 cu ft (2002 L)**	77.3 cu ft (2189 L)
Five Seat Vehicles	6.6 cu ft (187 L)	81.2 cu ft (2299.5 L)**	87.8 cu ft (2486.5 L)
* Maximum cargo volume behind the front row seats. Includes the 12.6 cu ft (357 L) cargo area in the rear trunk (area behind the third row seats, if equipped).			
** Second row seats fully forward and/or folded.			

Weights

Refer to the certification label for mass data (see [#unique_749 on page](#)).

Weights

Refer to the certification label for mass data (see [#unique_749 on page](#)).

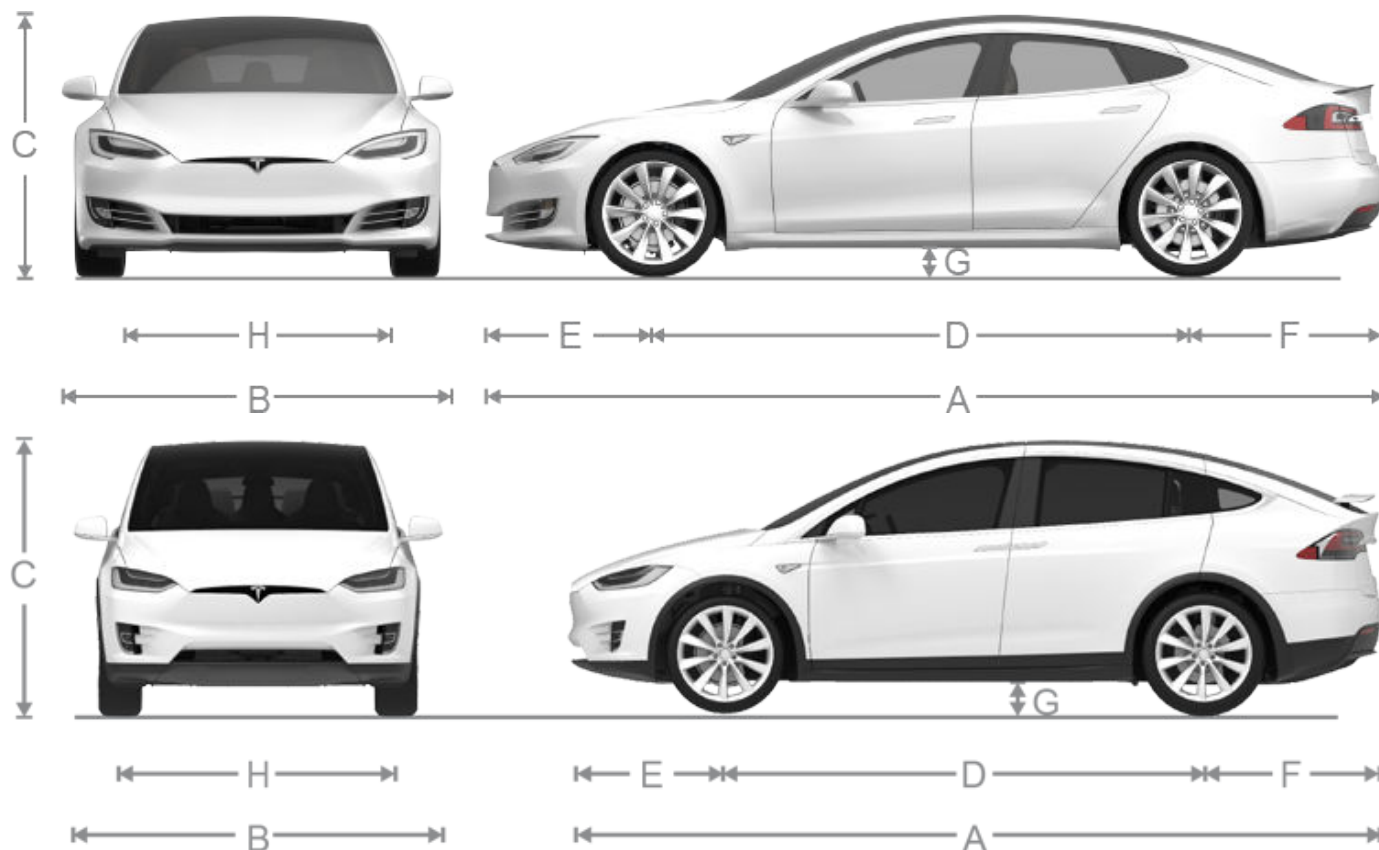
Weights

Refer to the certification label for mass data (see [#unique_749 on page](#)).



Dimensions and Weights

Exterior Dimensions



A	Overall Length	196 in	4,970 mm
B	Overall Width (including mirrors)	86.2 in	2,189 mm
	Overall Width (excluding mirrors)	77.3 in	1,964 mm
C	Overall Height	56.9 in*	1,445 mm*
D	Wheel Base	116.5 in	2,960 mm
E	Overhang - Front	36.9 in	929 mm
F	Overhang - Rear	42.55 in	1,081 mm
G	Ground Clearance - Coil Suspension (Rear Wheel Drive vehicle)	5.5 in*	139.7 mm*
G	Ground Clearance - Coil Suspension (All-Wheel Drive vehicle)	5.3 in*	134.6 mm*
G	Ground Clearance - Air Suspension	4.6 - 6.3 in	116.8 - 160 mm
H	Track - Front	65.4 in	1,662 mm
	Track - Rear	66.9 in	1,700 mm

*Values are approximate. Dimensions can vary depending on a vehicle's options and various other factors.

A	Overall Length	198.9 in	5,052 mm
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Owners Manual

B	Overall Width (including mirrors)	89.4 in	2,271 mm
	Overall Width (including folded mirrors)	81.6 in	2,072 mm
	Overall Width (excluding mirrors)	78.7 in	1,999 mm
C	Overall Height	66 in*	1,684 mm*
D	Wheel Base	116.7 in	2,965 mm
E	Overhang - Front	38.9 in	989 mm
F	Overhang - Rear	43.2 in	1,098 mm
G	Ground Clearance:		
	Standard, with skis	7 in	171 mm
	Standard, without skis	7 in	183 mm
	Very high, with skis	8 in	211 mm
	Very high, without skis	9 in	223 mm
H	Track - Front	67.1 in	1,705 mm
	Track - Rear	67.3 in	1,710 mm
*Values are approximate. Dimensions can vary depending on a vehicle's options and various other factors.			

Interior Dimensions

Head Room	Front Rear	38.8 in 35.3 in	986 mm 897 mm
Leg Room	Front Rear	42.7 in 35.4 in	1,085 mm 899 mm
Shoulder Room	Front Rear	57.7 in 55 in	1,466 mm 1,397 mm
Hip Room	Front Rear	55 in 54.7 in	1,397 mm 1,389 mm
Head Room	Front Rear Third	41.7 in 40.9 in 37.1 in	1059 mm 1039 mm 942 mm
Leg Room	Front Rear Third	41.2 in 38.4 in 32.7 in	1046 mm 975 mm 831 mm



Shoulder Room	Front Rear Third	60.7 in 56.8 in 40 in	1542 mm 1442 mm 1016 mm
Hip Room	Front Rear Third	55.6 in 59 in 38.5 in	1412 mm 1498 mm 978 mm

Cargo Volume

Total cargo volume (Rear Wheel Drive vehicles, rear seats not folded)	31.6 cu ft	894.85 L
Total cargo volume (All-Wheel Drive vehicles, rear seats not folded)	28.8 cu ft	815.5 L
Total cargo volume (rear seats not folded)	28.4 cu ft	804.2 L
Rear cargo volume	26.3 cu ft	744.7 L
Rear cargo volume (with seats folded down)	58.1 cu ft	1,645.2 L
Front cargo volume (Rear Wheel Drive vehicles)	5.3 cu ft	150.1 L
Front cargo volume (All-Wheel Drive vehicles)	2.5 cu ft	70.8 L
Front cargo volume	2.1 cu ft	59.5 L

	Front Trunk	Rear*	Total
Seven Seat Vehicles	6.6 cu ft (187 L)	76.5 cu ft (2166 L)**	83.1 cu ft (2353 L)
Six Seat Vehicles	6.6 cu ft (187 L)	70.7 cu ft (2002 L)**	77.3 cu ft (2189 L)
Five Seat Vehicles	6.6 cu ft (187 L)	81.2 cu ft (2299.5 L)**	87.8 cu ft (2486.5 L)

* Maximum cargo volume behind the front row seats. Includes the 12.6 cu ft (357 L) cargo area in the rear trunk (area behind the third row seats, if equipped).

** Second row seats fully forward and/or folded.

Weights

Refer to the certification label for mass data (see [#unique_749 on page](#)).

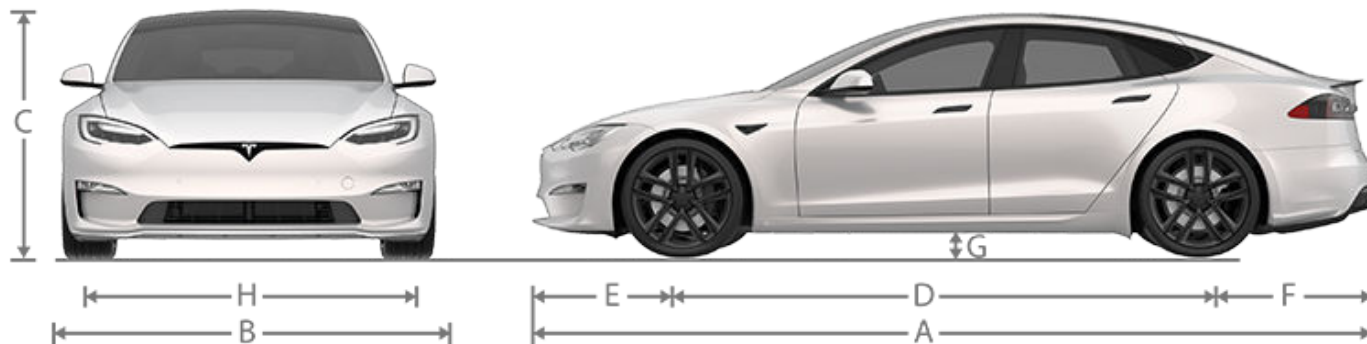
Weights

Refer to the certification label for mass data (see [#unique_749 on page](#)).



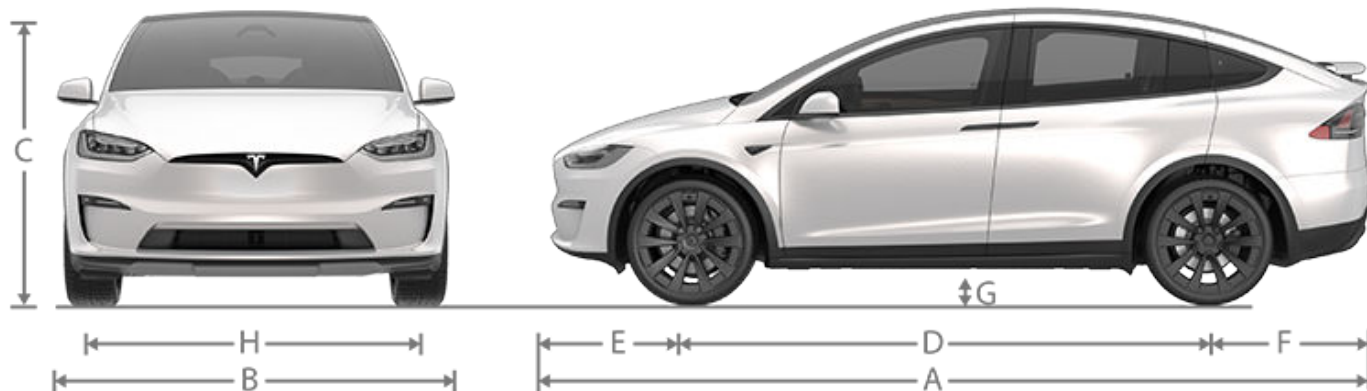
Dimensions and Weights

Exterior Dimensions



Callout	Description	Measurement (in)	Measurement (mm)
A	Overall Length	197.7	5,021
B	Overall Width (including mirrors)	86.2	2,189
	Overall Width (excluding mirrors)	78.2	1,987
C	Overall Height (normal setting)	56.3	1,431
D	Wheel Base	116.5	2,960
E	Overhang - Front	37.8	961
F	Overhang - Rear	43.3	1,100
G	Ground Clearance (lowest setting)	4.6	117
G	Ground Clearance (normal setting)	5.0	126
G	Ground Clearance (highest setting)	6.2	158
H	Track - Front and Rear	66.5	1,690

*Values are approximate. Dimensions can vary depending on a vehicle's options and various other factors.



Callout	Description*	Measurement (in)	Measurement (mm)
A	Overall Length	199.1	5,057



Callout	Description*	Measurement (in)	Measurement (mm)
B	Overall Width (including mirrors)	89.4	2,271
	Overall Width (including folded mirrors)	81.6	2,073
	Overall Width (excluding mirrors)	78.7	1,999
C	Overall Height	66.1	1,680
D	Wheel Base	116.7	2,965
E	Overhang - Front	38.9	988
F	Overhang - Rear	43.5	1,104
G	Ground Clearance (lowest setting)	5.7	146
G	Ground Clearance (normal setting)	6.6	166
G	Ground Clearance (highest setting)	8.1	206
H	Track - Front	67.1	1,705
H	Track - Rear	67.3	1,710
Values are approximate. Dimensions can vary depending on a vehicle's options and various other factors. *Based on 20" wheels with Medium suspension			

Interior Dimensions

Area	Location	Measurement (in)	Measurement (mm)
Head Room	Front	39.7	1,008
	Rear	38.1	968
Leg Room	Front	42.4	1,077
	Rear	35.5	901
Shoulder Room	Front	58.4	1,484
	Rear	55.1	1,399
Hip Room	Front	54.8	1,393
	Rear	50.3	1,278

Area	Row	Measurement (in)	Measurement (mm)
Head Room	First	41.7	1,059
	Second (5/7 seats)	41.0	1,042
	Second (6 seats)	40.9	1,040
	Third	37.1	944
Leg Room	First	41.1	1,046
	Second (5/7 seats)	38.7	983
	Second (6 seats)	39.8	1,012
	Third (6 seats)	32.2	819
	Third (7 seats)	29.8	756
Shoulder Room	First	60.7	1,543



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Area	Row	Measurement (in)	Measurement (mm)
	Second (5/7 seats)	56.9	1,446
	Second (6 seats)	56.8	1,442
	Third	40.7	1,034
Hip Room	First	55.7	1,414
	Second (5/7 seats)	58.9	1,496
	Second (6 seats)	59.0	1,498
	Third	38.7	982

Cargo Volume

Area	Volume (liters)	Volume (cubic feet)
Front trunk	89	3.1
Behind first row, second row folded flat	1,739	61.4
Behind second row	709	25.0
Maximum total cargo volume with driver and front passenger	1,828	64.6
Maximum total cargo volume with driver and 4 passengers	798	28.2

5-Seater Cargo Volumes

Area	Volume (liters)	Volume (cubic ft)
Front trunk	183	6.5
Behind first row, second row folded flat	2,410	85.1
Behind second row	1,050	37.1
Maximum total cargo volume with driver and front passenger	2,593	91.6
Maximum total cargo volume with 5 passengers	1,233	43.5

6-Seater Cargo Volumes

Area	Volume (liters)	Volume (cubic ft)
Front trunk	183	6.5
Behind first row, second row in max cargo position, third row folded flat	2,431	85.8
Behind second row, third row folded flat	935	33
Behind third row	425	15
Maximum total cargo volume with driver and front passenger	2,614	92.3
Maximum total cargo volume with 6 passengers	608	21.5

7-Seater Cargo Volumes

Area	Volume (liters)	Volume (cubic ft)
Front trunk	183	6.5
Behind first row, second row folded flat	2,314	81.7
Behind second row, third row folded flat	957	33.8
Behind third row	425	15
Maximum total cargo volume with driver and front passenger	2,497	88.2



Area	Volume (liters)	Volume (cubic ft)
Maximum total cargo volume with 7 passengers	608	21.5

Weights

Refer to the certification label for mass data (see [#unique_749 on page](#)).

Weights

Refer to the certification label for mass data (see [#unique_749 on page](#)).

Subsystems

Motor(s)

Type	AC induction motor(s), liquid-cooled, with variable frequency drive.
Nominal Voltage	320 Volts
Maximum speed of large motors: – rear motor on all Rear Wheel Drive vehicles – rear motor on Performance All-Wheel Drive vehicles	16,000 rpm
Maximum speed of small motors: – front motor on all All-Wheel Drive vehicles – rear motor on non-Performance All-Wheel Drive vehicles	18,000 rpm
Maximum net power* and motor speed of large motors	Base: 285 kW @ 6,850 rpm Performance: 375 kW @ 5,900 rpm
Maximum net power* and motor speed of small motors	193 kW @ 6100 rpm
Maximum torque of large motors	Base: 440 Nm Performance: 650 Nm
Maximum torque of small motors	330 Nm
*Tested in accordance with ECE R85	

Motor(s)

Type	AC induction motor(s), liquid-cooled, with variable frequency drive
Nominal Voltage	320 volts



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Maximum speed of large motors (rear motor on Performance vehicles)	18300 rpm
Maximum speed of small motors (front motor on all vehicles, rear motor on non-Performance vehicles)	18000 rpm
Maximum net power* and motor speed of large motors	375 kW @ 6,150 rpm
Maximum net power* and motor speed of small motors	193 kW @ 6,100-6,800 rpm
Maximum torque of large motors	660 Nm
Maximum torque of small motors	330 Nm
*Tested in accordance with ECE R85	

Motor Type

Front Motor	AC permanent magnet synchronous motor, liquid-cooled, with variable frequency drive
Rear Motor	AC induction motor, liquid-cooled, with variable frequency drive
Nominal Voltage	320 volts

Motor Type

Motor Type	Model S Model X	Model S Plaid Model X Plaid
Front and rear motor	AC permanent magnet synchronous motor, liquid-cooled, with variable frequency drive	AC permanent magnet synchronous motor, carbon-fiber-wrapped rotor, liquid-cooled, with variable frequency drive (2x motors in the rear)

Transmission

Type	Single speed fixed gear
Overall Final Drive Ratio	Small motor: 9.3:1 Large motor: 9.7:1
Reverse Gear	Reverse direction of motor, limited to 15 mph (24 km/h)

Type	Model S	Model S Plaid
Front transmission	Single speed fixed gear, 7.5:1	Single speed fixed gear, 7.5:1. Enhanced lubrication
Rear transmission	Single speed fixed gear, 9.0:1	Independent single speed fixed gear, 7.5:1. Dry sump lubrication

Type	Specifications
Type	Single speed fixed gear



Type	Specifications
Overall Final Drive Ratio	Small motor: 9.0:1 Large motor: 9.7:1
Reverse Gear	Reverse direction of motor, limited to 15 mph (24 km/h)

Transmission	Model X	Model X Plaid
Type	Single speed fixed gear	Single speed fixed gear
Overall Final Drive Ratio	Front unit motor: 7.5:1 Rear unit motor: 9.0:1	Front unit motor: 7.5:1 Rear unit motor: 7.5:1
Reverse Gear	Reverse direction of motor, limited to 15 mph (24 km/h)	Reverse direction of motor, limited to 15 mph (24 km/h)

Steering

Steering	Specifications
Type	Variable ratio rack and pinion with electronic power steering, speed sensitive
Number of turns lock to lock	2.33
Turning Circle (curb to curb)	40.3 ft/12.3 m

Steering	Specifications
Type	Variable rack and pinion with electronic power steering, speed sensitive
Number of turns lock to lock	2.33
Turning Circle (curb to curb)	40.8 ft (12.4 m)

Brakes

Brakes	Specifications
Type	4-wheel anti-lock braking system (ABS) with Electronic Brake Force Distribution, Integrated Advanced Stability Control and Electronic Accelerator pedal actuated regenerative braking system
Calipers	Front: Four piston, fixed Rear: Single piston, floating
Rotor Diameters (ventilated)	Front: 13.98"/355 mm Rear: 14.37"/365 mm
Front Rotor thickness	New: 1.26"/32 mm Service limit: 1.18"/30 mm
Rear Rotor thickness	New: 1.10"/28 mm Service limit: 1.02"/26 mm
Front Brake Pad Thickness (excluding back plate)	0.346"/8.8 mm



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Brakes	Specifications
Rear Brake Pad Thickness (excluding back plate)	0.354"/9 mm
Parking brake	Electrically actuated parking brake calipers
Brake Disc Friction Pair	Front: .31"/8 mm
	Rear: .28"/7 mm

Brakes	Specifications
Type	4-wheel anti-lock braking system (ABS) with Electronic Brake Force Distribution, Integrated Advanced Stability Control and Electronic Accelerator pedal actuated regenerative braking system
Calipers	Front: Four piston, fixed
	Rear: Single piston, floating
Rotor Diameters (ventilated)	Front: 14.96"/380 mm
	Rear: 14.37"/365 mm
Front Rotor thickness	New: 1.26"/32 mm
	Service limit: 1.18"/30 mm
Rear Rotor thickness	New: 1.10"/28 mm
	Service limit: 1.02"/26 mm
Front Brake Pad Thickness (excluding back plate)	New: 0.41"/10.5 mm (MIN)
	Service limit: 0.09"/ 2.3 mm
Rear Brake Pad Thickness (excluding back plate)	New: 0.33"/8.5 mm (MIN)
	Service limit: 0.11"/ 2.7 mm
Parking brake	Electrically actuated parking brake calipers

Suspension

Suspension	Specifications
Front	Independent, double wishbone, air spring or coil spring/telescopic damper, sway bar
Rear	Independent, multi-link, air spring or coil spring/telescopic damper, sway bar (air suspension vehicles only)

Suspension	Specifications
Front	Independent, virtual pivot double wishbone
Rear	Independent, virtual pivot double wishbone

Suspension	Specifications
Front	Independent, double wishbone, air spring with adaptive damper, stabilizer bar
Rear	Independent, multi-link, air spring with adaptive damper, stabilizer bar

Battery - Low Voltage

Battery - Low Voltage	Specifications
Rating	33 amp hour or higher
Voltage and Polarity	Low voltage negative (-) ground



Battery - Low Voltage	Specifications
Rating	6.9 amp hour
Voltage	15.5V

Battery - High Voltage

Battery - High Voltage	Specifications
Type	Liquid-cooled lithium ion (Li-ion)
Nominal Voltage - 85, 90, and 100 kWh Nominal Voltage - 60, 70, and 75 kWh	350 V DC 300 V DC
Nominal Voltage - 75 and 100 kWh	350 V DC
Temperature Range	Do not expose Model SModel X to ambient temperatures above 140° F (60° C) or below -22° F (-30° C) for more than 24 hours at a time.

Battery - High Voltage	Specifications
Type	Liquid-cooled lithium ion (Li-ion)
Nominal Voltage	350 V DC
Temperature Range	Do not expose Model SModel X to ambient temperatures above 140° F (60° C) or below -22° F (-30° C) for more than 24 hours at a time.

Battery - High Voltage	Specifications
Type	Liquid-cooled lithium ion (Li-ion)
Nominal Voltage	407 V DC
Temperature Range	Do not expose Model SModel X to ambient temperatures above 149° F (65° C) or below -22° F (-30° C) for more than 24 hours at a time.

Wheels and Tires

Wheel Specifications (Factory)

Wheel Type	Location	Size	Offset
19"	Front	8.0J x 19	1.575" (40 mm)
19"	Rear	8.0J x 19	1.575" (40 mm)
19"	Front	8.5J x 19	1.378" (35 mm)
19"	Rear	8.5J x 19	1.378" (35 mm)
21"	Front	8.5J x 21	1.575" (40 mm)
21"	Rear	8.5J x 21	1.575" (40 mm)
21" Performance Plus vehicles	Rear	9.0J x 21	1.575" (40 mm)

Wheel Type	Location	Size	Offset (mm)
19" Cardenio	Front	9.5J x 19	40
	Rear	10.5J x 19	45
21" Arachnid	Front	9.5J x 21	40



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Wheel Type	Location	Size	Offset (mm)
	Rear	10.5J x 21	45

Wheel Type	Size	Offset
20" All Season - Front	9.0J x 20	1.575" (40 mm)
20" All Season - Rear	9.5J x 20	1.378" (35 mm)
20" Summer - Front	9.0J x 22	1.575" (40 mm)
20" Summer - Rear	10.0J x 20	1.378" (35 mm)
22" Summer - Front	9.0J x 22	1.575" (40 mm)
22" Summer - Rear	10.0J x 20	1.378" (35 mm)

Wheel Type	Size	Offset (mm)
20" Cyberstream - Front	9.0J x 20	40
20" Cyberstream - Rear	10.0J x 20	35
22" New Turbine (Gunpowder) - Front	9.0J x 22	40
22" New Turbine (Gunpowder) - Rear	10.0J x 22	35

Lug Nut Torque	129 lb. ft (175 Nm)
Lug Nut Socket Size	21 mm

NOTE: For instructions on how to jack/lift Model S/Model X, see [Jacking and Lifting on page 462](#).

Tire Specifications (Factory)

Tire Type	Location	Size
19" wheels	All	P245/45R19
21" wheels	Front Rear	P245/35R21 P265/35R21*

*On a Performance All-Wheel Drive vehicle, the width of the rear tires may vary depending on date of manufacture. Some vehicles may be equipped with P245/35R21 tires on both front and rear.

Tire pressures vary depending on the type of tires fitted. Refer to the tire pressures printed on the Tire and Loading Information label. This label is located on the center door pillar and is visible when the driver's door is open (see [Maintaining Tire Pressures on page 431](#)).

Winter tires can be purchased from a Tesla service center or may be available for purchase on the Tesla web site.

Tire Type	Location	Size
19" All-Season	Front Rear	255/45R19 104W XL 285/40R19 107W XL
19" Summer	Front Rear	255/45R19 104Y XL 285/40R19 107Y XL



Tire Type	Location	Size
21" Summer	Front Rear	265/35ZR21 101(Y) XL 295/30ZR21 102(Y) XL

Tire pressures vary depending on the type of tires fitted. Refer to the tire pressures printed on the Tire and Loading Information label. This label is located on the center door pillar and is visible when the driver's door is open (see [Maintaining Tire Pressures on page 431](#)).

Winter tires can be purchased from a Tesla service center or may be available for purchase on the Tesla web site.

Tire Type	Size	Load Index / Speed Rating
20" - Continental - Front	265/45R20	108 / V
20" - Continental - Rear	275/45R20	110 / V
22" - Continental, Goodyear, or Pirelli - Front	265/35R22	102 / W
22" - Continental, Goodyear, or Pirelli - Rear	285/35R22	106 / W

Refer to the tire pressures printed on the Tire and Loading Information label. This label is located on the driver's door pillar and is visible when the driver's door is open (see [Maintaining Tire Pressures on page 431](#)).

Winter tires can be purchased from a Tesla service center or may be available for purchase on the Tesla web site.



Understanding Tire Markings

Laws require tire manufacturers to place standardized information on the sidewall of all tires. This information identifies and describes the fundamental characteristics of the tire. It also provides the tire identification number (TIN) for certification of safety standards, and in case of a recall.









1	Tire category. P indicates that the tire is for passenger vehicles.
2	Tire width. This 3-digit number is the width (in millimeters) of the tire from sidewall edge to sidewall edge.
3	Aspect ratio. This 2-digit number is the sidewall height as a percentage of the tread width. So, if the tread width is 205 mm, and the aspect ratio is 50, the sidewall height is 102 mm.
4	Tire construction. R indicates that the tire is of Radial ply construction.
5	Wheel diameter. This 2-digit number is the diameter of the wheel rim in inches.
6	Load index. This 2 or 3-digit number is the weight each tire can support. This number is not always shown.
7	Speed rating. When stated, indicates the maximum speed (in mph) at which the tire can be used for extended periods. Q=99 mph (160 km/h), R=106 mph (170 km/h), S=112 mph (180 km/h), T=118 mph (190 km/h), U=124 mph (200 km/h), H=130 mph (210 km/h), V=149 mph (240 km/h), W=168 mph (270 km/h), Y=186 mph (300 km/h), (Y)=vehicle's top speed (exceeds the "Y" rating).
8	Tire composition and materials. The number of plies in both the tread area and the sidewall area indicates how many layers of rubber coated material make up the structure of the tire. Information is also provided on the type of materials used.
9	Maximum tire load. The maximum load which can be carried by the tire.
10	Maximum permissible inflation pressure. This pressure should not be used for normal driving.



11	U.S. DOT Tire Identification Number (TIN). Begins with the letters DOT and indicates that the tire meets all federal standards. The next 2 digits/letters represent the plant code where it was manufactured, and the last 4 digits represent the week and year of manufacture. For example, the number 1712 is used to represent the 17th week of 2012. The other numbers are marketing codes used at the manufacturer's discretion. This information can be used to contact consumers if a tire defect requires a recall.
12	Treadwear grade. This number indicates the tire's wear rate. The higher the treadwear number is, the longer it should take for the tread to wear down. A tire rated at 400, for example, lasts twice as long as a tire rated at 200.
13	Traction grade. Indicates a tire's ability to stop on wet roads. A higher graded tire should allow you to stop your vehicle in a shorter distance than a tire with a lower grade. Traction is graded from highest to lowest as AA, A, B, and C.
14	Temperature grade. The tire's resistance to heat is grade A, B, or C, with A indicating the greatest resistance. This grading is provided for a correctly inflated tire, which is being used within its speed and loading limits.



Uniform Tire Quality Grading

The following information relates to the tire grading system developed by the National Highway Traffic Safety Administration (NHTSA), which grades tires by tread wear, traction and temperature performance. Tires that have deep tread, and winter tires, are exempt from these marking requirements.

Where applicable, quality grades are found on the tire’s sidewall between the tread shoulder and maximum section width. For example:

- TREADWEAR 180
- TRACTION AA
- TEMPERATURE A

The quality grades are described next.

NOTE: In addition to the marking requirements, passenger car tires must conform to Federal Safety Requirements.

Treadwear

The treadwear grade is a comparative rating based on the wear rate of the tire when tested under controlled conditions on a specified government test course.

For example, a tire graded 150 wears one and a half times better on a government test course than a tire graded 100. The relative performance of tires depends on the actual conditions of their use, however, and can depart significantly from the norm due to variations in driving habits, service practices, road characteristics, and climate.

Traction

The traction grades, from highest to lowest, are: AA, A, B, and C. These grades represent a tire’s ability to stop on wet pavement as measured under controlled conditions on test surfaces of asphalt and concrete. A tire marked C might have poor traction performance.

- **WARNING:** Defective tires are dangerous. Do not drive if a tire is damaged, excessively worn, or is inflated to an incorrect pressure. The safety of the vehicle and occupants can be adversely affected. Check tires regularly for wear and to ensure there are no cuts, bulges or exposure of the ply/cord structure.
- **WARNING:** The traction grade assigned to the tire is based on straight-ahead braking tests, and does not include: acceleration, cornering, hydroplaning or peak traction characteristics.

Temperature

The temperature grades are A (the highest), B, and C, representing the tire’s resistance to the generation of heat and its ability to dissipate heat when tested under controlled conditions on a specified indoor laboratory test wheel. Sustained high temperature can cause the tire to degenerate and reduce tire life, and excessive temperature can lead to sudden tire failure.

The grade C corresponds to the minimum level of performance that all passenger car tires must meet under the Federal Motor Safety Standard No. 109. Grades B and A represent levels of performance on the laboratory test wheel that exceed the minimum requirements.

- **WARNING:** A tire’s temperature grade is established for a tire that is properly inflated and not overloaded. Excessive speed, under-inflation, or excessive loading, either separately or in combination, can cause heat buildup and possible tire failure.

Tire and Loading Glossaries

General Wheel and Tire Terms

Accessory Weight	The combined weight (in excess of those items replaced) of items available as factory installed equipment.
Bead	The inner edge of a tire that is shaped to fit to the rim and form an air tight seal. The bead is constructed of steel wires which are wrapped, or reinforced, by the ply cords.



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Cold Tire Pressure	The air pressure in a tire that has been standing in excess of three hours, or driven for less than one mile.
Curb Weight	The weight of a standard vehicle, including any optional equipment fitted, and with the correct fluid levels.
Gross Vehicle Weight	The maximum permissible weight of a vehicle with driver, passengers, load, luggage, and equipment.
kPa (kilo pascal)	A metric unit used to measure pressure. One kilo pascal equals approximately 0.145 psi.
Maximum Inflation Pressure	The maximum pressure to which the tire should be inflated. This pressure is given on the tire side wall in psi (lbf/in²).  CAUTION: This pressure marked on the tire is the maximum allowed by the tire manufacturer. It is not the pressure Tesla recommends using for Model S/Model X.
Maximum Loaded Vehicle Weight	The sum of curb weight, accessory weight, vehicle capacity weight, and production options weight.
Production Options Weight	The combined weight of options installed which weigh in excess of 3 lb (1.4 kg) more than the standard items that they replaced, and are not already considered in curb or accessory weights.
PSI (lbf/in ²)	Pounds per square inch (the unit used to measure tire pressure).
Recommended Tire Inflation Pressure	Tire inflation pressure, established by Tesla, which is based on the type of tires that are mounted on the vehicle at the factory. This information can be found on the Tire and Loading Information label located on the door pillar.
Rim	The metal support for a tire, or tire and tube, upon which the tire beads are seated.
Vehicle Capacity Weight	The number of seats multiplied by 150 lbs (68 kg) plus the rated amount of load/luggage.

Load Carrying Definitions

Normal occupant weight	68 kilograms (150 lbs) times the number of occupants specified in the second column of the tables for calculating load limits (see Vehicle Loading on page 471).
Occupant distribution	Distribution of occupants in a vehicle.
Passenger car tire	A tire intended for use on passenger cars, multipurpose passenger vehicles, and trucks, that have a gross vehicle weight rating (GVWR) of 10,000 lbs (4536 kg) or less.
Rim diameter	Nominal diameter of the bead seat.
Rim size designation	Rim diameter and width.
Rim type designation	The manufacturing industry's designation for a rim by style or code.
Rim width	Nominal distance between the rim's flanges.
Vehicle maximum load on the tire	Load on an individual tire that is determined by distributing to each axle its share of the maximum loaded vehicle weight and dividing by two.
Vehicle normal load on the tire	Load on an individual tire that is determined by distributing to each axle its share of the curb weight, accessory weight, and normal occupant weight and dividing by two.

Pneumatic Radial Tire Definitions

Bead separation	A breakdown of the bond between components in the bead.
Bias ply tire	A pneumatic tire in which the ply cords that extend to the beads are laid at alternate angles substantially less than 90 degrees to the center line of the tread.
Carcass	The tire structure, except tread and sidewall rubber which, that when inflated, bears the load.
Chunking	The breaking away of pieces of the tread or sidewall.



Cord	The strands forming the plies in the tire.
Cord separation	The parting of cords from adjacent rubber compounds.
Cracking	Any parting within the tread, sidewall, or inner liner of the tire extending to cord material.
Extra load tire	A tire designed to operate at higher loads and higher inflation pressure than the corresponding standard tire.
Groove	The space between two adjacent tread ribs.
Inner liner	The layer(s) forming the inside surface of a tubeless tire that contains the inflating medium within the tire.
Inner liner separation	The parting of the inner liner from cord material in the carcass.
Load rating	The maximum load that a tire is rated to carry for a given inflation pressure.
Maximum load rating	The load rating for a tire at the maximum permissible inflation pressure for that tire.
Measuring rim	The rim on which a tire is fitted for physical dimension requirements.
Open splice	Any parting at any junction of tread, sidewall, or inner liner that extends to the cord material.
Outer diameter	The overall diameter of an inflated new tire.
Overall width	The linear distance between the exteriors of the sidewalls of an inflated tire, including elevations due to labeling, decorations, or protective bands or ribs.
Ply	A layer of rubber-coated parallel cords.
Ply separation	A parting of rubber compound between adjacent plies.
Pneumatic tire	A mechanical device made of rubber, chemicals, fabric and steel or other materials, that, when mounted on an automotive wheel, provides the traction and contains the gas or fluid that sustains the load.
Radial ply tire	A pneumatic tire in which the ply cords that extend to the beads are laid at substantially 90 degrees to the center line of the tread.
Reinforced tire	A tire designed to operate at higher loads and at higher inflation pressures than the corresponding standard tire.
Section width	The linear distance between the exteriors of the sidewalls of an inflated tire, excluding elevations due to labeling, decoration, or protective bands.
Sidewall	The portion of a tire between the tread and bead.
Sidewall separation	The parting of the rubber compound from the cord material in the sidewall.
Snow tire	A tire that attains a traction index equal to or greater than 110, compared to the ASTM E1136-93 (re-approved 2003, incorporated by reference, see §571.5) Standard Reference Test Tire when using the snow traction test as described in ASTM F1805-00 (incorporated by reference, see §571.5), and that is marked with an Alpine Symbol specified in S5.5(i) on at least one sidewall.
Test rim	The rim on which a tire is fitted for testing, and may be any rim listed as appropriate for use with that tire.
Tread	The portion of a tire that comes into contact with the road.
Tread rib	A tread section running around the circumference of a tire.
Tread separation	The pulling away of the tread from the tire carcass.
Tread wear indicators (TWI)	The projections within the principal grooves designed to give a visual indication of the degrees of wear of the tread.
Wheel-holding fixture	The fixture used to hold the wheel and tire assembly securely during testing.



Roadside Assistance

Contacting Tesla Roadside Assistance

Tesla Roadside Assistance is available to you 24 hours a day, 365 days a year, for the duration of your warranty period. Tesla Roadside Assistance is also available to speak with roadside service professionals to answer any questions and explain the proper procedure for transporting your vehicle.

When contacting Tesla Roadside Assistance, please provide:

- The Vehicle Identification Number (VIN). The VIN is displayed when you touch **Controls > Software**. The VIN can also be seen on the upper dashboard by looking through the driver's side of the windshield.
- Your exact location.
- The nature of the problem.

If available in your region, you can also expedite your request, by choosing the Roadside Assistance option in the Tesla mobile app.

NOTE: For a detailed description of Tesla's Roadside Assistance policy, go to the support page on the Tesla web site for your region.

Regional Phone Number(s)

Mexico: [1-800-228-8145](tel:1-800-228-8145)

United States and Canada: [1-877-79TESLA \(1-877-798-3752\)](tel:1-877-79TESLA)

NOTE: The phone number is also available by touching **Controls > Service**.



Instructions for Transporters

When Transporting Model S/Model X

Always transport Model S/Model X with all four tires off the ground. A flatbed truck or comparable transport vehicle is recommended. A wheel lift and dolly can be used only when transporting Model S/Model X for a very short distance to reposition the vehicle for loading onto a flatbed truck or comparable transport vehicle (for example, the vehicle is located in a low-clearance garage) or if otherwise specified by Tesla. When transporting, whether on a flatbed truck or using a wheel lift and dolly, Model S/Model X can face either direction.

Do not transport Model S/Model X using any other method unless specified by Tesla. Follow the steps provided and observe all warnings and cautions. Damage caused by transporting your vehicle is not covered by the warranty.

NOTE: The following illustrations are for demonstration purposes only.





WARNING: Model S Model X is equipped with high voltage components (see [High Voltage Components on page 409](#)). Before transporting Model S Model X as a result of an event (such as a collision) that may have compromised a high voltage component, it is important to assume that these components are energized. Always follow high voltage safety precautions (wearing personal protective equipment, etc.) until emergency response professionals have evaluated the vehicle and can accurately confirm that all high voltage systems are no longer energized. Failure to do so may result in serious injury or death.

Disable Self-Leveling (air suspension vehicles only)

If Model S Model X is equipped with the air suspension system, it automatically self-levels, even when power is off. To prevent damage, you must activate Jack Mode to disable self-leveling:

1. Touch **Controls** > **Suspension** on the touchscreen.
2. Press the brake pedal, then touch **Very High** to maximize height.
3. Touch **Controls** > **Service** > **Jack Mode**.



When Jack mode is active, Model S Model X displays this indicator light on the instrument panel, along with a message telling you that active suspension is disabled.

NOTE: Jack Mode cancels when Model S Model X is driven over 4 mph (7 km/h).

WARNING: Failure to activate Jack Mode on a Model S Model X equipped with the air suspension system can result in the vehicle becoming loose during transport, which may cause significant damage.

Activate Tow Mode

Model S Model X may automatically shift into Park when it detects the driver leaving the vehicle, even if it has previously been shifted into Neutral. To keep Model S Model X in Neutral (which disengages the brake), you must use the touchscreen to activate Tow Mode:

1. Shift into Park.



2. Chock the tires or otherwise ensure Model S/Model X is stable.
3. Press and hold the brake pedal, then on the touchscreen touch **Controls > Service > Tow Mode**.



When Tow Mode is active, Model S/Model X displays this yellow indicator light on the instrument panel, along with a message telling you that Model S/Model X is free-rolling.

To cancel **Tow Mode**, shift Model S/Model X into Park.



CAUTION: If the electrical system is not working, and you therefore cannot release the electric parking brake, attempt to jump start the low voltage battery. For instructions, call Tesla Roadside Assistance. If a situation occurs where you cannot disengage the parking brake, use a self-loading dolly or tire skates. Before doing so, always check the manufacturer's specifications and recommended load capacity.

Pull onto the Flatbed Truck

The method used to pull Model S/Model X onto the truck depends on whether a tow eye is available (provided with your vehicle at time of purchase).

If equipped with a tow eye:

1. Remove the nose cone by inserting a plastic pry tool into the top right corner, and gently prying it toward you. When the clip releases, pull the nose cone toward you, without twisting or bending, to release the three remaining clips.

NOTE: If the nose cone is equipped with a removable slot, which is distinguished by the ridge that sits directly below the slot, remove the slot by prying it from the bottom and around the edge until the entire slot is removed.

Remove the tow eye cover by inserting a small flat screwdriver into the slot located along the top of the cover, then prying gently to release the cover from the top snap. Remove the tow eye cover by inserting a small flat screwdriver into the slot located along the top of the cover, then prying gently to release the cover from the top snap.

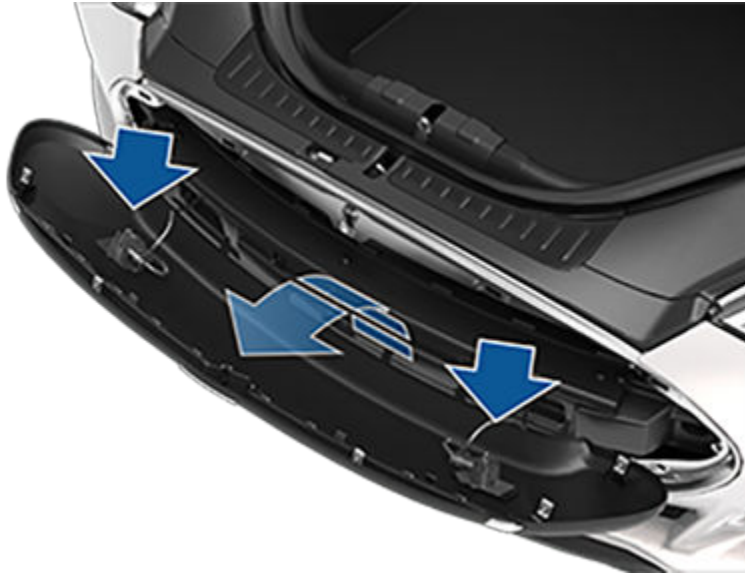


CAUTION: Keep the tow eye cover in a safe place so you can replace it when transporting is complete.





2. If Model S/Model X is equipped with sensors on the nose cone, you also need to disconnect the electrical connectors. To do so, press down on the tab and pull to release.



3. Fully insert the tow eye into the opening, then turn it **counter-clockwise** until securely fastened.





4. Attach the winch cable to the tow eye.



CAUTION: Before pulling, make sure the tow eye is securely tightened.

5. Pull Model SModel X slowly onto the flatbed truck.
6. Shift Model SModel X into Park by pressing the button on the end of the gear selector.

If not equipped with a tow eye:



WARNING: If the vehicle is pulled onto the flatbed truck without a tow eye, all suspension fasteners should be checked for proper torque and all components should be visually inspected for damage prior to driving the vehicle again. If a fastener is loose, or if any damage is found, the affected component(s) should be replaced.

1. Attach the tow straps to the large hole on each of the rearmost lower suspension arms underneath the front of the vehicle.



2. To protect the underbody from any damage, place a protective barrier (such as a piece of wood) between the tow strap and the underbody.
3. Pull Model S/Model X slowly onto the flatbed truck.
4. Shift Model S/Model X into Park by pressing the button on the end of the gear selector.

Secure the Tires

The vehicle's tires must be secured onto the truck using the eight-point tie-down method.

- Ensure any metal parts on the tie-down straps do not contact painted surfaces or the face of the wheels.
- Do not place tie-down straps over body panels or through the wheels.



CAUTION: Attaching tie-down straps to the chassis, suspension or other parts of the vehicle's body may cause damage.



Instructions for Transporters

DO NOT TRANSPORT WITH WHEELS ON THE GROUND

The front motor in Model S Model X generates power when the wheels spin. Always transport Model S Model X with all four tires off the ground. Ensure that the tires are unable to spin at any time during transport.

WARNING: NEVER TRANSPORT YOUR VEHICLE WITH THE TIRES IN A POSITION WHERE THEY CAN SPIN. DOING SO CAN LEAD TO SIGNIFICANT DAMAGE AND OVERHEATING. IN RARE CASES EXTREME OVERHEATING MAY CAUSE THE SURROUNDING COMPONENTS TO IGNITE.



Do not transport Model S Model X using any method that is not specified by Tesla. Adhere to the instructions provided in the following sections and observe all warnings and cautions provided. Damage caused by improper transporting of your vehicle is not covered by the warranty.

NOTE: Tesla is not liable or responsible for reimbursing services not dispatched through Tesla Roadside Assistance.

Approved Methods for Transporting

NOTE: The tires are allowed to rotate slowly (under 3 mph or 5 km/h) and for a very short distance (less than 30 feet or 10 meters) only when Transport Mode is enabled (see [Activate Transport Mode on page 512](#)) while the vehicle is being winched onto a flatbed truck or pulled out of a parking space for repositioning. Exceeding these boundaries can lead to significant damage and overheating that is not covered by the warranty.

A flatbed truck or comparable transport vehicle is the recommended method of transporting Model S Model X. The vehicle can face either direction when using a flatbed.



If Model S/Model X must be transported without a flatbed truck, then wheel lifts and dollies must be used to ensure that all four wheels are off of the ground. This method may only be used for a maximum of 35 miles (55 km), and must not exceed the manufacturer speed rating of the dollies. With this method, Tesla recommends the vehicle facing forward so that the front wheels are lifted and the rear wheels are on dollies.

NOTE: Transporting Model S/Model X with the front wheels on dollies is not recommended, but may be done if an external steering wheel lock is applied and care is taken to prevent the front wheels from spinning. **DO NOT TRANSPORT YOUR VEHICLE IF THERE IS ANY CHANCE OF THE FRONT WHEELS SPINNING.**



CAUTION: Enable Transport Mode (see [Activate Transport Mode on page 512](#)) before winching Model S/Model X onto a flatbed truck (see [Pull onto the Flatbed Truck - With Tow Eye on page 512](#)). If Transport Mode is not available or the touchscreen is not accessible, self-loading dollies or tire skates must be used to load the vehicle into the approved transportation position. Tesla is not responsible for any damage caused by or during the transport of Model S/Model X, including personal property damage or damage caused by using self-loading dollies or tire skates.

WARNING: Model S/Model X is equipped with high voltage components that may be compromised as a result of a collision (see [High Voltage Components on page 409](#)). Before transporting Model S/Model X, it is important to assume these components are energized. Always follow high voltage safety precautions (wearing personal protection equipment, etc.) until emergency response professionals have evaluated the vehicle and can accurately confirm that all high voltage systems are no longer energized. Failure to do so may result in serious injury.

Disable the Self-Leveling Air Suspension System

If Model S/Model X is equipped with the air suspension system, it automatically self-levels, even when power is off. To prevent damage, you must activate Jack Mode to disable self-leveling:

1. Touch **Controls** > **Suspension** on the touchscreen.
2. Press the brake pedal, then touch **Very High** to maximize height.
3. Touch **Controls** > **Service** > **Jack Mode**.



When Jack mode is active, Model SModel X displays this indicator light on the instrument panel, along with a message telling you that active suspension is disabled.

NOTE: Jack Mode cancels when driving speed exceeds 4 mph (7 kph).

WARNING: Failure to activate Jack Mode on a vehicle equipped with the air suspension system can result in the vehicle becoming loose during transport, which may cause significant damage.

Activate Transport Mode

Transport Mode keeps the parking brake disengaged while winching Model SModel X onto a flatbed truck. When active, Transport Mode displays a message indicating that the vehicle will remain free-rolling. The following are required to enable Transport Mode:

- Low voltage power is required. You are unable to use the touchscreen to activate Transport Mode if Model SModel X has no power.
- Model SModel X must detect a key fob. Transport Mode is available only when a key fob is detected.

To activate Transport Mode:

1. Ensure the vehicle is in Park.
2. Chock the tires or otherwise ensure Model SModel X is secure.
3. Press and hold the brake pedal, then on the touchscreen, touch **Controls** > **Service** > **Towing**. The touchscreen displays a message reminding you how to properly transport Model SModel X.
4. Press and hold the **Transport Mode** button until it turns blue. Model SModel X is now free-rolling and can slowly be rolled (no faster than walking speed) or winched.

To cancel Transport Mode, shift Model SModel X into Park.

NOTE: If Model SModel X loses low voltage power after Transport Mode is enabled, Transport Mode cancels.

CAUTION: If the electrical system is not working, and you therefore cannot use the touchscreen to activate Transport Mode, use self-loading dollies or tire skates. Before doing so, always check the manufacturer's specifications and recommended loading capacity.

Pull onto the Flatbed Truck - With Tow Eye

1. Locate the tow eye.
2. Remove the tow eye cover by inserting a small flat screwdriver into the slot located along the top of the cover, then prying gently to release the cover from the top snap.



NOTE: Keep the tow eye cover in a safe place so you can replace it when towing is complete.

3. Fully insert the tow eye into the opening, then turn it counter-clockwise until securely fastened.



4. Attach the winch cable to the tow eye.



CAUTION: Before pulling, make sure the tow eye is securely fastened.

5. Activate Transport Mode by touching **Controls** > **Service** > **Towing**.
6. Pull Model S Model X slowly onto the flatbed truck.



Pull onto the Flatbed Truck - Without Tow Eye



CAUTION: To avoid damage, only pull the vehicle onto a flatbed truck using a properly-installed tow eye. Using the chassis, frame, or suspension components to pull the vehicle can result in damage.



WARNING: If the vehicle is pulled onto the flatbed truck without a tow eye, all suspension fasteners should be checked for proper torque and all components should be visually inspected for damage prior to driving the vehicle again. If a fastener is loose, or if any damage is found, the affected component(s) should be replaced.

It is strongly recommended that you connect the winch to your vehicle's tow eye, as described previously. However, if a situation arises in which the tow eye is not available (lost, misplaced, etc.), the following instructions describe how to attach tow straps.

1. Attach the tow straps to each of the lower suspension arms underneath the front of the vehicle.



2. To protect the underbody from damage, place a protective barrier (such as a piece of wood) between the tow strap and underbody.
3. Activate Transport Mode by touching **Controls > Service > Towing**.
4. Pull Model S/Model X slowly onto the flatbed truck.

Secure the Tires

The vehicle's tires must be secured onto the truck using the eight-point tie-down method.

- Ensure any metal parts on the tie-down straps do not contact painted surfaces or the face of the wheels.
- Do not place tie-down straps over body panels or through the wheels.



CAUTION: Attaching the tie-down straps to the chassis, suspension or other parts of the vehicle's body may cause damage.



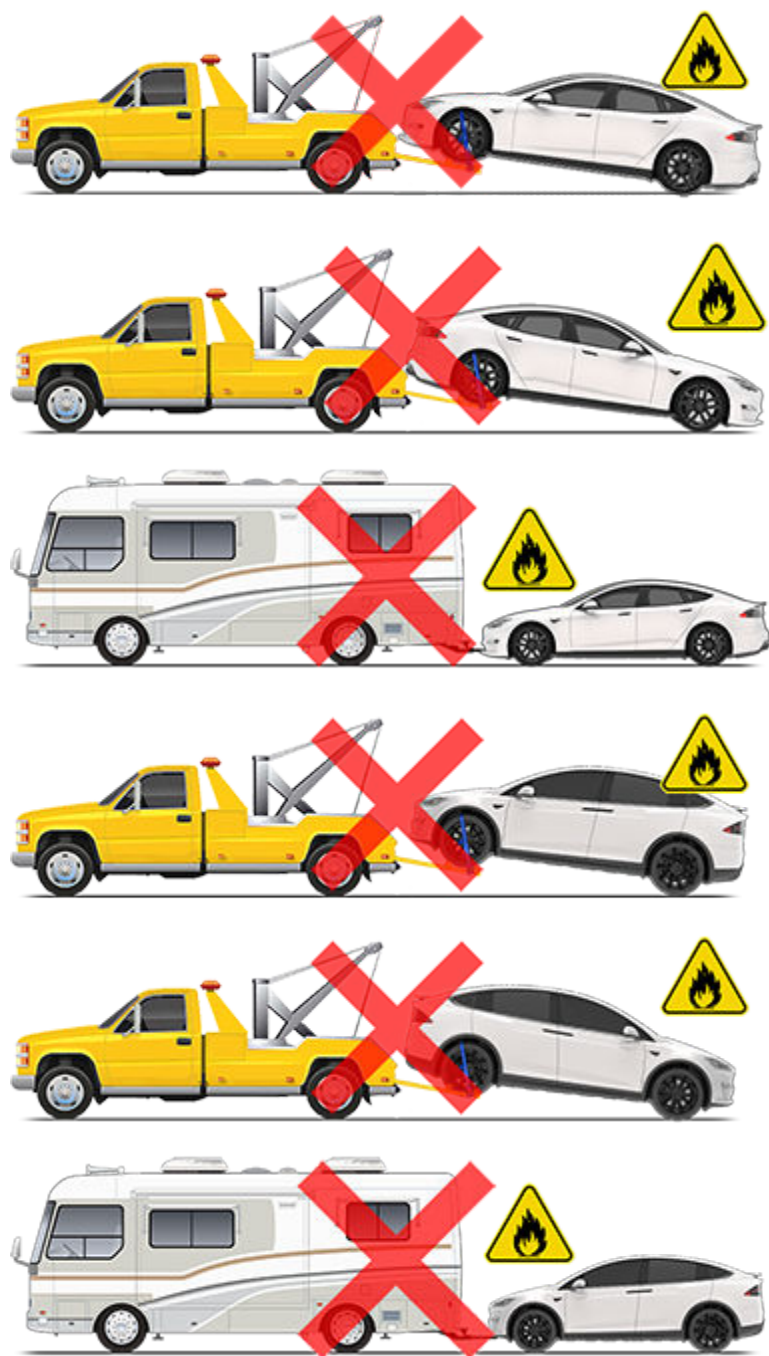


Instructions for Transporters

DO NOT TRANSPORT WITH WHEELS ON THE GROUND

The front and rear motors in Model S/Model X generate power when the wheels spin. Always transport Model S/Model X with all four tires off the ground. Ensure that the tires are unable to spin at any time during transport.

WARNING: NEVER TRANSPORT YOUR VEHICLE WITH THE TIRES IN A POSITION WHERE THEY CAN SPIN. DOING SO CAN LEAD TO SIGNIFICANT DAMAGE AND OVERHEATING. IN RARE CASES EXTREME OVERHEATING MAY CAUSE THE SURROUNDING COMPONENTS TO IGNITE.



Do not transport Model S/Model X using any method that is not specified by Tesla. Adhere to the instructions provided in the following sections and observe all warnings and cautions provided. Damage caused by improper transporting of your vehicle is not covered by the warranty.



NOTE: Tesla is not liable or responsible for reimbursing services not dispatched through Tesla Roadside Assistance.

Approved Methods for Transporting

A flatbed truck or comparable transport vehicle is the recommended method of transporting Model S/Model X. The vehicle can face either direction when using a flatbed.



If Model S/Model X must be transported without a flatbed truck, then wheel lifts and dollies must be used to ensure that all four wheels are off of the ground. This method may only be used for a maximum of 35 miles (55 km), and must not exceed the manufacturer speed rating of the dollies. With this method, Tesla recommends the vehicle faces forward so that the front wheels are lifted and the rear wheels are on dollies.

NOTE: Transporting Model S/Model X with the front wheels on dollies is not recommended, but may be done if an external steering wheel/steering yoke lock is applied and care is taken to prevent the front wheels from spinning.

 **CAUTION:** DO NOT TRANSPORT YOUR VEHICLE IF THERE IS ANY CHANCE OF ANY OF THE WHEELS SPINNING.



 **CAUTION:** Enable Transport Mode (see [Activate Transport Mode on page 519](#)) before winching Model S/Model X onto a flatbed truck. If Transport Mode is not available or the touchscreen is not accessible, self-loading dollies or tire skates must be used to load the vehicle into the approved transportation position. Tesla is not responsible for any damage caused by or during the transport of Model S/Model X, including personal property damage or damage caused by using self-loading dollies or tire skates.

NOTE: Transport Mode is only intended to allow for winching Model S/Model X onto a flatbed truck or repositioning the vehicle out of a parking space. While in Transport Mode, the tires are allowed to rotate slowly (under 3 mph or 5 km/h) and for a very short distance (less than 30 feet or 10 meters). See [Activate Transport Mode on page 519](#). Exceeding these boundaries can lead to significant damage and overheating that is not covered by the warranty.



WARNING: Model SModel X is equipped with high voltage components that may be compromised as a result of a collision (see [High Voltage Components on page 409](#)). Before transporting Model SModel X, it is important to assume these components are energized. Always follow high voltage safety precautions (wearing personal protection equipment, etc.) until emergency response professionals have evaluated the vehicle and can accurately confirm that all high voltage systems are no longer energized. Failure to do so may result in serious injury.

Disable the Self-Leveling Air Suspension System

NOTE: If Model SModel X has no low voltage power, you need an external low voltage power supply to use the touchscreen. See [If Vehicle Has No Power on page 526](#).

Your Model SModel X is equipped with an air suspension system that automatically self-levels the vehicle, even when power is off. To prevent damage, you must activate Jack mode to disable self-leveling:

1. Touch **Controls** > **Suspension** on the touchscreen.
2. Press the brake pedal, and then touch **Very High** to maximize height.
3. Touch **Controls** > **Service** > **Jack Mode**.

NOTE: Jack mode cancels when driving speed exceeds 4 mph (7 km/h).

Activate Transport Mode

Transport Mode keeps the parking brake disengaged while winching Model SModel X onto a flatbed truck. When active, Transport Mode displays a message indicating that the vehicle will remain free-rolling. The following are required to enable Transport Mode:

- Low voltage power. You are unable to use the touchscreen to activate Transport Mode if Model SModel X has no power.
- Model SModel X must detect a key. Transport Mode is available only when a key is detected.

To activate Transport Mode:

1. Ensure the vehicle is in Park.
2. Chock the tires and make sure Model SModel X is secure.
3. Press and hold the brake pedal, and then on the touchscreen, touch **Controls** > **Service** > **Towing**. The touchscreen displays a message reminding you how to properly transport Model SModel X.
4. Press and hold the **Transport Mode** button until it turns blue. Model SModel X is now free-rolling and can slowly be rolled (no faster than walking speed) for short distances or winched.

To cancel Transport Mode, shift Model SModel X into Park.

NOTE: If the electrical system is not working, and you therefore cannot use the touchscreen to activate Transport Mode, use self-loading dollies or tire skates. Before doing so, always check the manufacturer's specifications and recommended loading capacity.

Pull Onto Flatbed Truck From Front (Using Tow Eye)

NOTE: If Model SModel X has no low voltage power, you need an external low voltage power supply to open the hood or use the touchscreen. See [If Vehicle Has No Power on page 526](#).



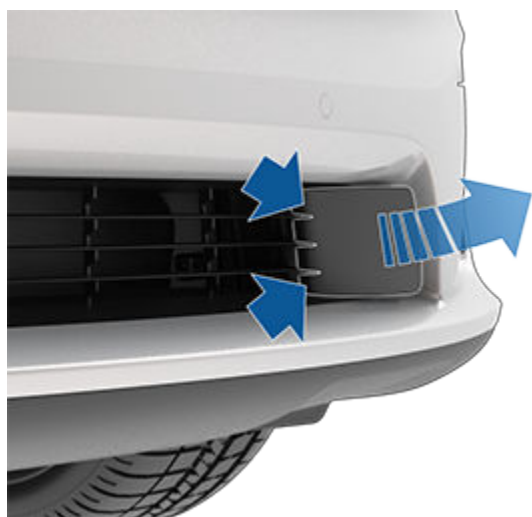
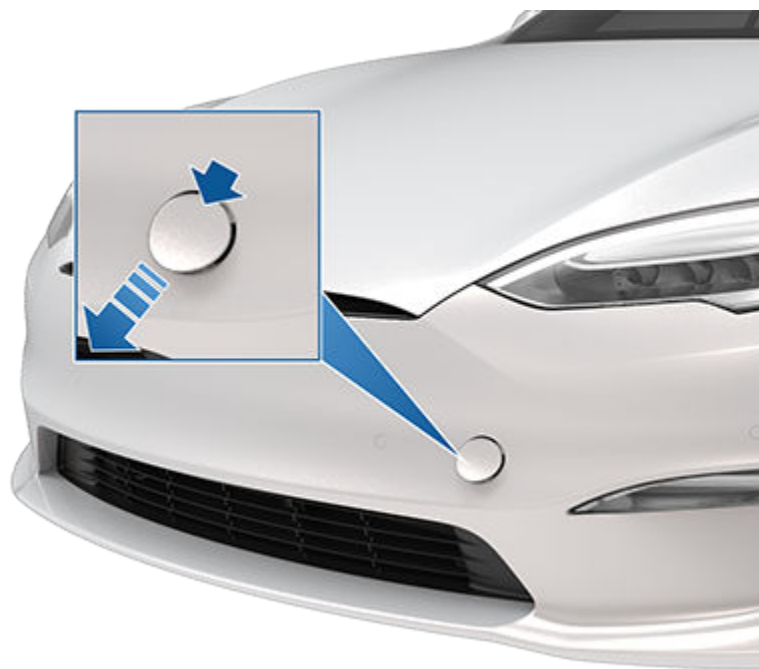
CAUTION: To avoid damage, only pull the vehicle onto a flatbed truck using a properly-installed tow eye. Using the chassis, frame, or suspension components to pull the vehicle can result in damage.

1. Locate the tow eye. The tow eye is located in the front trunk.

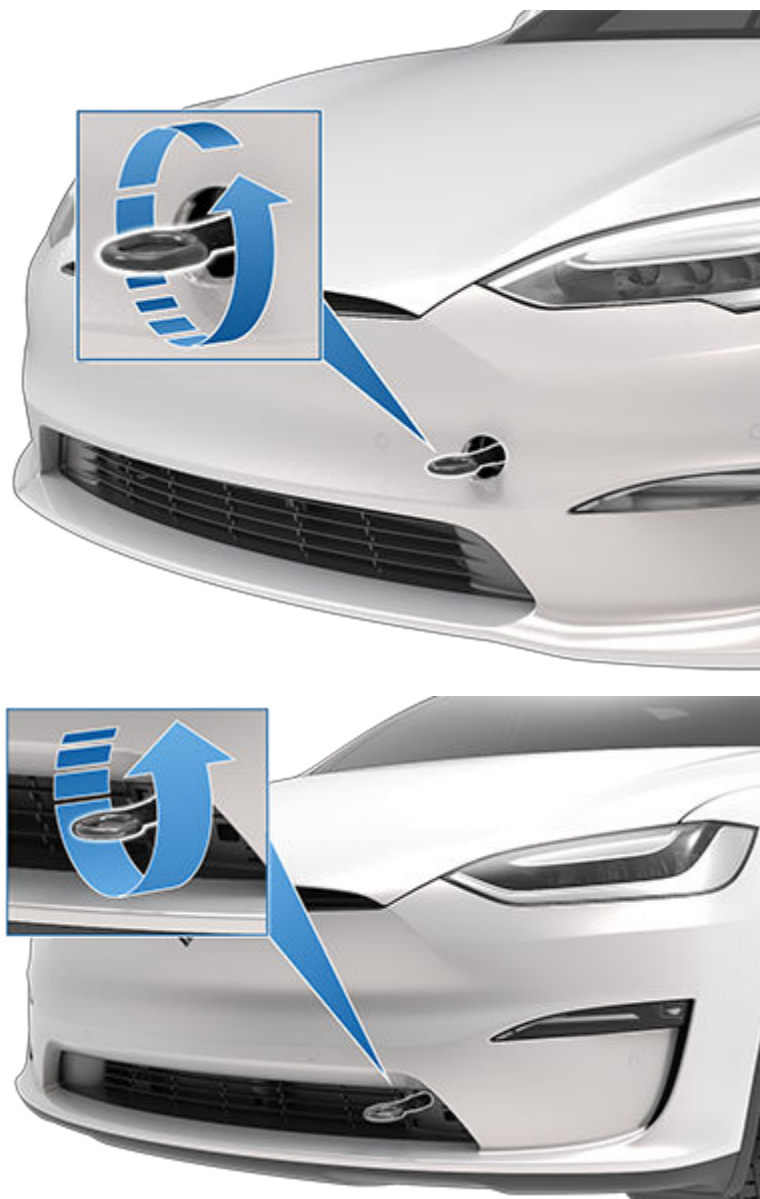


2. Release the front tow eye cover by pressing firmly on its top right perimeter until it pivots inward, then gently pulling the raised section toward you. To remove the tow eye cover, insert a small, flat screwdriver into the top and bottom slots, release the snaps and pull the cover towards you.

NOTE: The front tow eye cover is connected to the vehicle's black negative (-) terminal.



3. Fully insert the tow eye into the opening, then turn it **counter-clockwise** until securely fastened.



4. Attach the winch cable to the tow eye.



CAUTION: Before pulling, make sure the tow eye is securely tightened.

5. Activate Transport Mode.
6. Pull Model S Model X slowly onto the flatbed truck.

Pull Onto Flatbed Truck From Rear (Using Tow Eye)

NOTE: If Model S Model X has no low voltage power, you need an external low voltage power supply to open the hood or use the touchscreen. See [If Vehicle Has No Power on page 526](#).

NOTE: Vehicles equipped with a hitch receiver cannot be pulled from the rear tow eye. Use the tow bar or hitch receiver only to pull the vehicle to a safe location, such as onto a flatbed truck. Do not transport the vehicle with wheels on the ground.

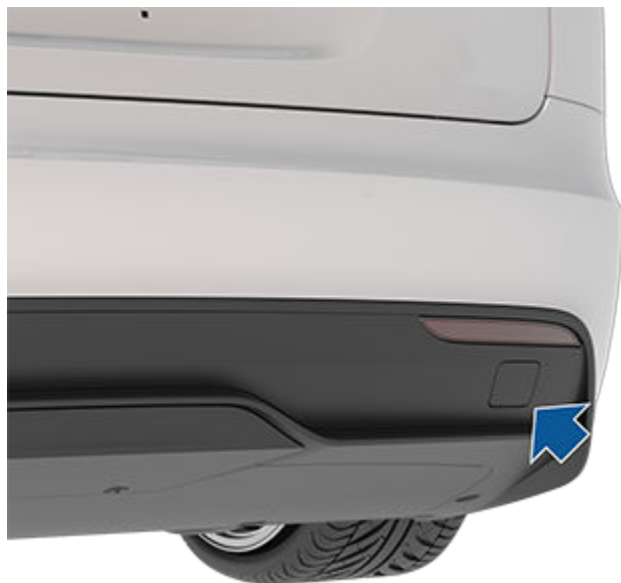


CAUTION: To avoid damage, only pull the vehicle onto a flatbed truck using a properly-installed tow eye. Using the chassis, frame, or suspension components to pull the vehicle can result in damage.

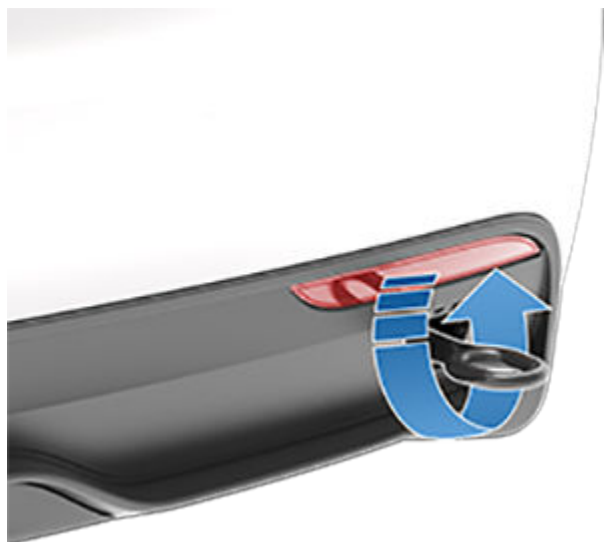
1. Locate the tow eye. The tow eye is located in the front trunk.



2. Release the rear tow eye cover by pressing firmly on its bottom perimeter until it pivots inward, then gently pulling the raised section toward you.



3. Fully insert the tow eye into the opening, then turn it **counter-clockwise** until securely fastened.



4. Attach the winch cable to the tow eye.



CAUTION: Before pulling, make sure the tow eye is securely tightened.

5. Activate Transport Mode.
6. Pull Model S/Model X slowly onto the flatbed truck.

Pull onto the Flatbed Truck From Front (Without Tow Eye)



CAUTION: To avoid damage, only pull the vehicle onto a flatbed truck using a properly-installed tow eye. Using the chassis, frame, or suspension components to pull the vehicle can result in damage.



WARNING: If the vehicle is pulled onto the flatbed truck using this method, all suspension fasteners should be checked for proper torque and all components should be visually inspected for damage prior to driving the vehicle again. If a fastener is loose, or if any damage is found, the affected component(s) should be replaced.

It is strongly recommended that you connect the winch to your vehicle's tow eye, as described previously. However, if a situation arises in which the tow eye is not available (lost, misplaced, etc.), the following instructions describe how to attach tow straps.

1. Attach the tow straps to each of the lower suspension arms underneath the front of the vehicle.



2. To protect the underbody from damage, place a protective barrier (such as a piece of wood) between the tow strap and underbody.
3. Activate Transport Mode.
4. Pull Model S/Model X slowly onto the flatbed truck.



Pull Onto Flatbed Truck From Rear

CAUTION: To avoid damage, only pull the vehicle onto a flatbed truck using a properly-installed tow eye. Using the tow hitch, chassis, frame, or suspension components to pull the vehicle can result in damage.

NOTE: Make sure Transport Mode is activated prior to pulling Model S/Model X onto the flatbed truck.

It is strongly recommended that you connect the winch to your vehicle's tow eye, as described previously. However, if a situation arises in which the vehicle must be pulled from the rear, Tesla recommends attaching the winch to the tow hitch. Refer to the owner's manual for instructions on how to connect the tow hitch.

Secure the Tires

The vehicle's tires must be secured onto the truck using the eight-point tie-down method.

- Ensure any metal parts on the tie-down straps do not contact painted surfaces or the face of the wheels.
- Do not place tie-down straps over body panels or through the wheels.

CAUTION: Attaching the tie-down straps to the chassis, suspension or other parts of the vehicle's body may cause damage.





If Vehicle Has No Power

If Model S/Model X has no low voltage power, perform the following steps to open the hood or jump start the auxiliary low voltage battery.

Jump Starting the Low Voltage Battery

CAUTION: Model S/Model X cannot be used to jump start another vehicle. Doing so can result in damage.

NOTE: If jump starting Model S/Model X using another vehicle, refer to that vehicle manufacturer's instructions. The following instructions assume an external low voltage power supply (such as a portable jump starter) is used.

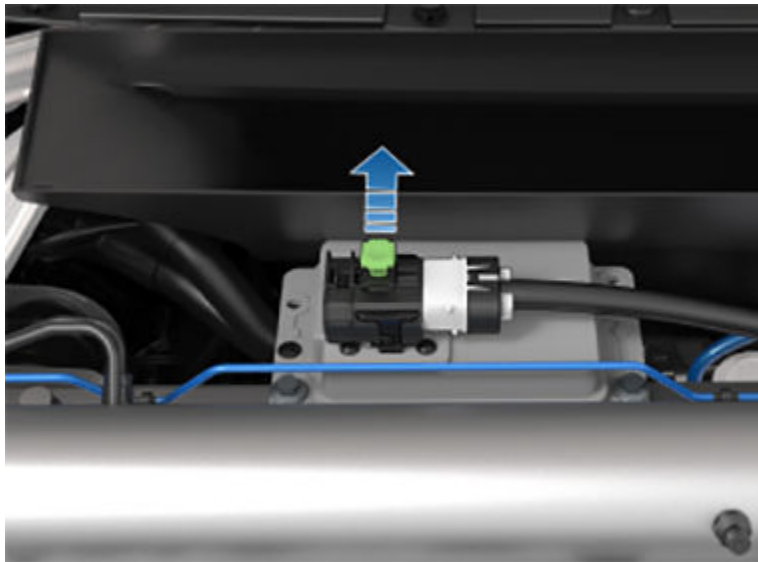
CAUTION: Avoid short circuits when jump starting Model S/Model X. Connecting cables to the wrong jump post, touching leads together, etc., can result in damage to Model S/Model X.

1. Open the hood (see [Opening Hood with No Power on page 75](#)).
2. Remove the maintenance panel by pulling it upwards to release the trim clips that hold it in place.

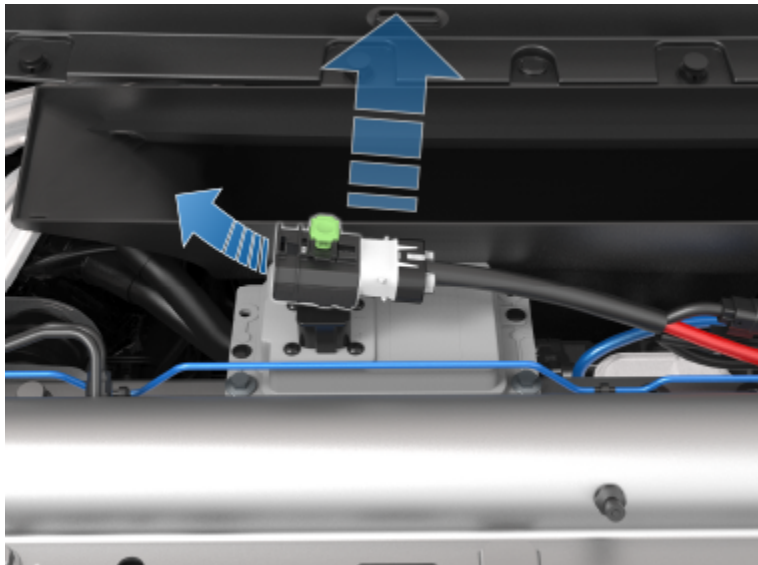


3. On top of the low voltage battery, lift the locking tab that attaches the electrical connector to the connector housing.

NOTE: The appearance of the electrical connector and connector housing may vary, but the procedure remains the same.



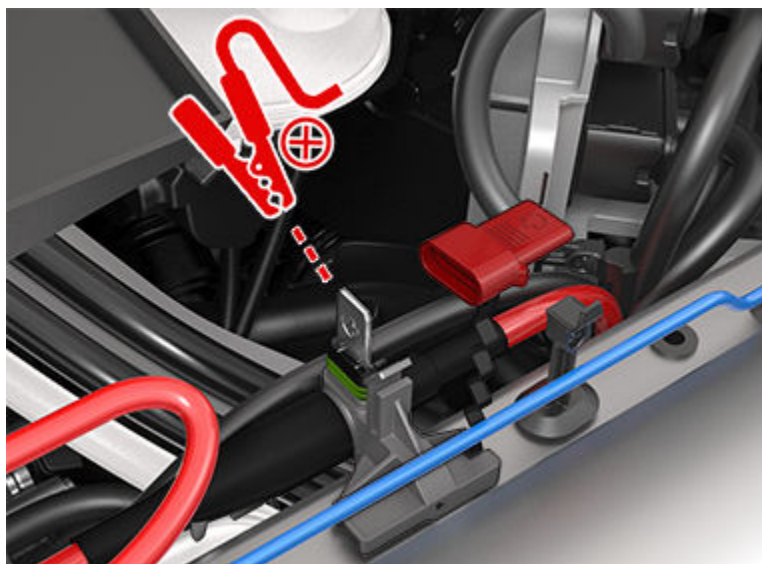
4. On top of the low voltage battery, pull the connector housing to the left. The electrical connector releases from the low voltage battery.



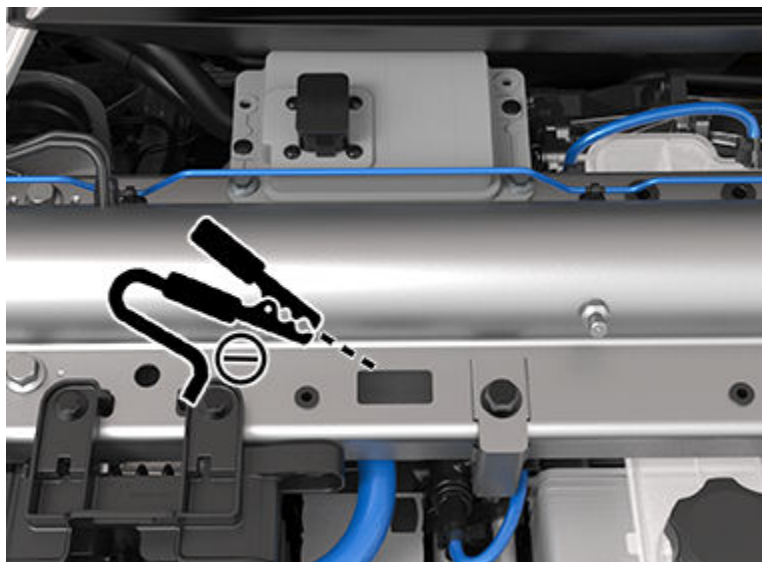
5. Release the cover from the red positive (+) jump post, and then connect the low voltage power supply's red positive (+) cable to the red positive (+) jump post.



CAUTION: To avoid damaging Model S/Model X, do not allow the positive cable to contact other metal components.



6. Connect the low voltage power supply's black negative (-) cable to the vehicle in the location shown.



7. Turn on the external power supply (refer to the manufacturer's instructions). Touch the touchscreen to wake it up.
- NOTE:** It may take several minutes to receive enough power to wake up the touchscreen.
8. When external low voltage power is no longer required, disconnect both cables, beginning with the black negative (-) cable.
9. On top of the low voltage battery, push the connector housing towards the electrical connector so that the electrical connector engages the low voltage battery.
10. On top of the low voltage battery, push down the locking tab that attaches the electrical connector to the connector housing.
11. Replace the maintenance panel by placing it back in its original location and pressing down until it is secure.
12. Close the hood.

Consumer Information



About this Owner Information

Document Applicability

For the latest and greatest information that is customized to your vehicle, view the Owner's Manual on your vehicle's touchscreen by touching **Controls > Service > Owner's Manual**. The information is specific to your vehicle depending on the features you purchased, vehicle configuration, market region and software version. In contrast, owner information that is provided by Tesla elsewhere is updated as necessary and may not contain information unique to your vehicle.

Information about new features is displayed on the touchscreen after a software update, and can be viewed at any time by touching **Controls > Software > Release Notes**. If the content in the Owner's Manual on how to use your vehicle conflicts with information in the Release Notes, the Release Notes take precedence.

Illustrations

The illustrations provided in this document are for demonstration purposes only. Depending on vehicle options, software version and market region, the information displayed on the touchscreen in your vehicle may appear slightly different.

Feature Availability

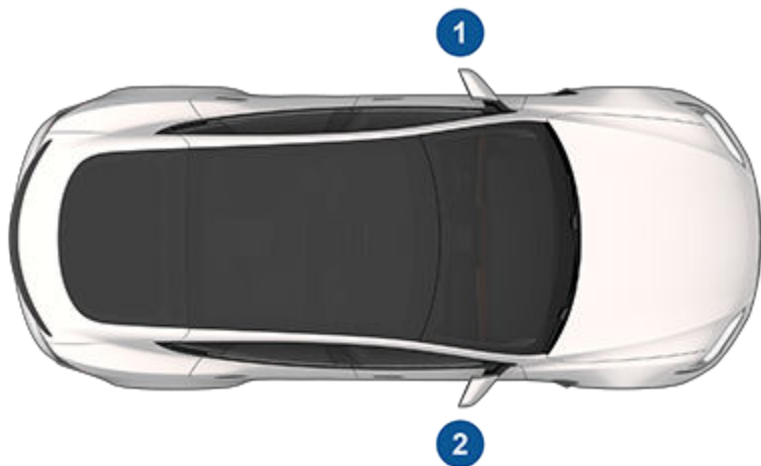
Some features are available only on some vehicle configurations and/or only in specific market regions. Options or features mentioned in the Owner's Manual does not guarantee they are available on your specific vehicle.

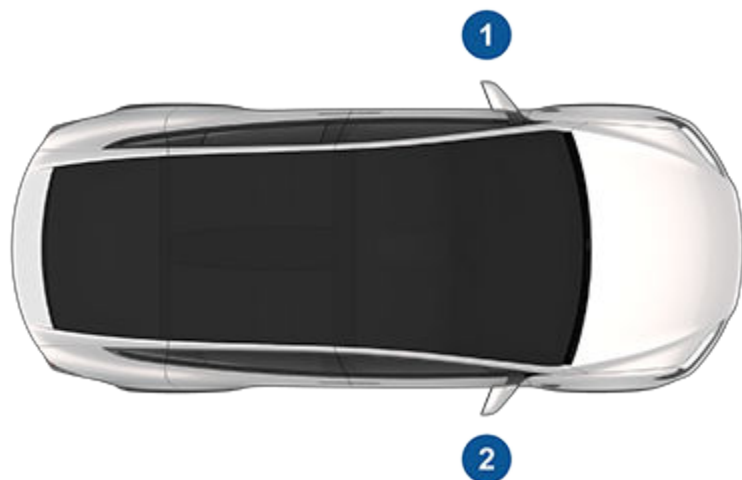
Errors or Inaccuracies

All specifications and descriptions are known to be accurate at time of publishing. However, because continuous improvement is a goal at Tesla, we reserve the right to make product modifications at any time. To communicate any inaccuracies or omissions, or to provide general feedback or suggestions regarding the quality of the Owner's Manual, send an email to ownersmanualfeedback@tesla.com.

Location of Components

Owner information may specify the location of a component as being on the left or right side of the vehicle. As shown, left (1) and right (2) represent the side of the vehicle when sitting inside.





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TESLA ROADSTER

MODEL S

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MODEL 3

MODEL Y

T E S L A



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Disclaimers

Event Data Recorder (EDR)

Model SModel X is equipped with an event data recorder (EDR). The main purpose of an EDR is to record, in certain crash or near crash-like situations, such as an air bag deployment or hitting a road obstacle, data to better understand how the vehicle's systems performed. The EDR is designed to record data related to vehicle dynamics and safety systems for a short period of time, typically 30 seconds or less. The EDR in Model SModel X is designed to record data such as:

- How various systems in your vehicle were operating;
- Whether or not the driver and passenger safety belts were buckled/fastened;
- How far (if at all) the driver was depressing the accelerator and/or brake pedal; and,
- How fast the vehicle was traveling.

The data can help provide a better understanding of the circumstances in which crashes and injuries occur.

NOTE: EDR data is recorded by your vehicle only if a non-trivial crash situation occurs; no data is recorded by the EDR under normal driving conditions and no personal data (for example, name, gender, age, and crash location) is recorded. However, other parties, such as law enforcement, could combine the EDR data with the type of personally identifying data routinely acquired during a crash investigation.

To read data recorded by an EDR, special equipment is required, and access to the vehicle or the EDR is needed. In addition to the vehicle manufacturer, other parties, such as law enforcement, that have the special equipment, can read the information if they have access to the vehicle or the EDR. Tesla may also access the EDR remotely in some crash circumstances.

Vehicle Telematics

Model SModel X is equipped with electronic modules that monitor and record data from various vehicle systems, including the motor, Autopilot components, Battery, braking and electrical systems. The electronic modules record information about various driving and vehicle conditions, including braking, acceleration, trip and other related information regarding your vehicle. These modules also record information about the vehicle's features such as charging events and status, the enabling/disabling of various systems, diagnostic trouble codes, VIN, speed, direction and location.

The data is stored by the vehicle and may be accessed, used and stored by Tesla service technicians during vehicle servicing or periodically transmitted to Tesla wirelessly through the vehicle's telematics system. This data may be used by Tesla for various purposes, including, but not limited to: providing you with Tesla telematics services; troubleshooting; evaluation of your vehicle's quality, functionality and performance; analysis and research by Tesla and its partners for the improvement and design of our vehicles and systems; to defend Tesla; and as otherwise may be required by law. In servicing your vehicle, Tesla can potentially resolve issues remotely simply by reviewing your vehicle's data log.

Tesla's telematics system wirelessly transmits vehicle information to Tesla on a periodic basis. The data is used as previously described and helps ensure the proper maintenance of your vehicle. Additional Model SModel X features may use your vehicle's telematics system and the information provided, including features such as charging reminders, software updates, and remote access to, and control of, various systems of your vehicle.

Tesla does not disclose the data recorded in your vehicle to any third party except when:

- An agreement or consent from the vehicle's owner (or the leasing company for a leased vehicle) is obtained.
- Officially requested by the police or other authorities.
- Used as a defense for Tesla.
- Ordered by a court of law.
- Used for research purposes without disclosing details of the vehicle owner or identification information.
- Disclosed to a Tesla affiliated company, including their successors or assigns, or our information systems and data management providers.

For additional information regarding how Tesla processes data collected from your vehicle, please review Tesla's Privacy Notice at <http://www.tesla.com/about/legal>.



Data Sharing

For quality assurance and to support the continuous improvement of advanced features such as Autopilot, your Model S/Model X may collect analytics, road segment, diagnostic, and vehicle usage data and send to Tesla for analysis. This analysis helps Tesla improve products and services by learning from the experience of billions of miles that Tesla vehicles have driven. Although Tesla shares this data with partners that contribute similar data, the collected information does not identify you personally and can be sent to Tesla only with your explicit consent. In order to protect your privacy, personal information is either not logged at all, is subject to privacy preserving techniques, or is removed from any reports before being sent to Tesla. You have control over what data you share by touching **Controls > Software > Data Sharing**.

For additional information regarding how Tesla processes data collected from your vehicle, please review Tesla's Privacy Notice at <http://www.tesla.com/about/legal>.

NOTE: Although Model S/Model X uses GPS in connection with driving and operation, as discussed in this owner's manual, Tesla does not record or store vehicle-specific GPS information, except the location where a crash occurred. Consequently, Tesla is unable to provide historical information about a vehicle's location (for example, Tesla is unable to tell you where Model S/Model X was parked/traveling at a particular date/time).

Quality Control

You might notice a few miles/km on the odometer when you take delivery of your Model S/Model X. This is a result of a comprehensive testing process that ensures the quality of your Model S/Model X.

The testing process includes extensive inspections during and after production. The final inspection takes place at Tesla and includes a road test conducted by a technician.

California Proposition 65

-  **WARNING:** Operating, servicing and maintaining a passenger vehicle or off-highway motor vehicle can expose you to chemicals including phthalates and lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. To minimize exposure, wear gloves or wash your hands frequently when servicing your vehicle. For more information go to: www.P65Warnings.ca.gov/passenger-vehicle.
-  **WARNING:** Certain components of this vehicle such as airbag modules and seat belt pre-tensioners may contain Perchlorate Material. Special handling may be required for service or vehicle end of life disposal. See www.dtsc.ca.gov/hazardouswaste/perchlorate.
-  **WARNING:** Battery posts, terminals, and related accessories contain lead and lead compounds. Wash hands after handling.



Reporting Safety Defects

Contacting Tesla

For detailed information about your Model S/Model X, go to <http://www.tesla.com> and log on to your Tesla account or sign up to get an account.

If you have any questions or concerns about your Model S/Model X, in the United States, Canada or Puerto Rico, call 1-877-79TESLA (1-877-798-3752) and in Mexico, call 1-800-228-8145.

NOTE: You can also use voice commands to provide feedback to Tesla. Say "'Fold/unfold the mirrors".', "'Open/close charge port".', "'Start/stop charging".', or "'Show me the tire pressures".' (in the English language) followed by brief comments in your language of choice. Model S/Model X takes a snapshot of its systems, including your current location, vehicle diagnostic data, and screen captures of the touchscreen and instrument panel. Tesla periodically reviews these notes and uses them to continue improving Model S/Model X.

Reporting Safety Defects - US

If you believe that Model S/Model X has a defect which could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying Tesla.

If NHTSA receives similar complaints, it may open an investigation. If it finds that a safety defect exists in a group of vehicles, it may order a recall and remedy campaign. However, NHTSA cannot become involved in individual problems between you, your dealer, or Tesla.

To contact NHTSA, you may call the Vehicle Safety Hotline toll-free at 1-888-327-4236 (TTY: 1-800-424-9153); go to www.safercar.gov; or write to: Administrator, National Highway Traffic Safety, 1200 New Jersey Avenue SE., Washington, DC 20590. You can also obtain other information about motor vehicle safety from www.safercar.gov.

Reporting Safety Defects - Canada

If you believe that your Model S/Model X has a defect which could cause a crash or could cause injury or death, you should immediately inform Transport Canada, in addition to notifying Tesla. To contact Transport Canada, call their toll-free number: 1-800-333-0510.

Declarations of Conformity

FCC and IC Certification

Component	Manufacturer	Model	Operating Frequency (MHz)	FCC ID	IC
B Pillar Endpoint	Tesla	1614291	13.56 2400-2483.5 6500-8000	2AEIM-1614291	20098-1614291
Security Controller	Tesla	1614280	2400-2483.5	2AEIM-1614280	20098-1614280
Fascia Endpoint	Tesla	1613851	2400-2483.5 6500-8000	2AEIM-1613851	20098-1613851
Key fob	Tesla	1614283	2400-2483.5 6500-8000	2AEIM-1614283	20098-1614283
TPMS	Tesla	1472547	2400-2483.5	2AEIM-1472547	20098-1472547
Radar (if equipped)	Continental	ARS 4-B	76000-77000	OAYARS4B	4135A-ARS4B
Homelink	Gentex	ADHL5C	286-440MHz	NZLADHL5C	4112A-ADHL5C



Owners Manual

Component	Manufacturer	Model	Operating Frequency (MHz)	FCC ID	IC
CarPC	Tesla	1960000	--	XMR2020AG525RGL YZP-ATC5CPC001	10224A-2020AG525R 7414C-ATC5CPC001
Wireless Charger	Tesla	WC4	127.72 KHz 13.56 2400-2483.5	2AEIM-WC4	20098-WC4
Wireless Charger	Tesla	WC3	127.72KHz	2AEIM-WC3	20098-WC3
BT USB hub	Tesla	1642783	2400-2483.5	2AEIM-1642783	20098-1642783
In-cabin radar*	Tesla	1616631	60000-64000	2AEIM-1616631	20098-1616631

* The in-cabin radar is restricted to factory installation.

The devices listed above comply with Part 15 of the FCC rules and Industry Canada's license-exempt RSS Standard(s) and EU Directive 2014/53/EU.

Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by Tesla could void your authority to operate the equipment.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Radiation Exposure Statement

The products comply with the FCC/IC RF Exposure for Low Power Consumer Wireless Power Transfer. RF exposure limits are set forth for an uncontrolled environment and are safe for intended operation as described in this manual. The farthest RF exposure demonstrated by compliance was at 20cm and farther from the user's body; set the device to low output power if such function is available.

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé.

Déclaration d'exposition aux radiations

Le produit est conforme à l'exposition RF IC pour le transfert de puissance sans fil de consommateurs de faible puissance. La limite d'exposition RF fixée pour un environnement non contrôlé est sans danger pour le fonctionnement prévu tel que décrit dans ce manuel. L'exposition RF supplémentaire que la conformité a été démontrée à 20cm et plus de séparation du corps de l'utilisateur ou de mettre l'appareil à la puissance de sortie inférieure si une telle fonction est disponible.

Mexico

IFT-008-SCFI-2015 / NOM-208-SCFI-2016

Key fob, model: 1614283, IFT #: RLVTE1621-3394

La operación de este equipo está sujeta a las siguientes dos condiciones:

1. Es posible que este equipo o dispositivo no cause interferencia perjudicial.
2. Este equipo debe aceptar cualquier interferencia, incluyendo la que pueda causar su operación no deseada.



Radio Frequency Information

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician to help.



CAUTION: This equipment and its antennas must not be co-located or operated with another antenna or transmitter.

Canada

CAN ICES-003 (B)/NMB-003(B)

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radioexempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé.

Déclaration d'exposition aux radiations

Le produit est conforme à l'exposition RF IC pour le transfert de puissance sans fil de consommateurs de faible puissance. La limite d'exposition RF fixée pour un environnement non contrôlé est sans danger pour le fonctionnement prévu tel que décrit dans ce manuel. L'exposition RF supplémentaire que la conformité a été démontrée à 20cm et plus de séparation du corps de l'utilisateur ou de mettre l'appareil à la puissance de sortie inférieure si une telle fonction est disponible.

Declarations of Conformity

Key and Passive Unlocking System

FCC Certification

Model Number	Mfr	Frequency	Tested For
A-0749G02	Pektron	315 MHz	USA Canada Mexico Taiwan
A-0749G12	Pektron	315 MHz	USA Canada Mexico Taiwan
WC1	Tesla	127.7 KHz	Global



The devices listed above comply with Part 15 of the FCC rules, Industry Canada's license-exempt RSS Standard(s) and EU Directive 2014/53/EU.

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by Tesla could void your authority to operate the equipment.

La Operación de Este Equipo no está Sujeta a las dos following conditions:

1. Es Posible Que Este Equipo o Dispositivo no causar interferencia perjudicial.
2. Este Equipo o Dispositivo debe Aceptar Cualquier interferencia. Incluyendo La Que Pueda causar do Operación no Deseada.

Radiation Exposure Statement

The product complies with the FCC/IC RF Exposure for Low Power Consumer Wireless Power Transfer. The RF exposure limit set forth for an uncontrolled environment and are safe for intended operation as described in this manual. The furthest RF exposure that compliance was demonstrated at 20cm and greater separation from the user body or set the device to lower output power if such function is available.

IC Certification

CAN ICES-3 (B)/NMB-3(B)

The following device is used in vehicles in Canada:

- Key fob Model Number: 002 and A-0749G12 (315 MHz)
- Key fob Manufacturer: Pektron

Per IC 10176A-002, this device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radioexempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1. L'Appareil ne doit pas produire de brouillage, et
2. L'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé.

Déclaration d'exposition aux radiations:

Le produit est conforme à l'exposition RF IC pour le transfert de puissance sans fil de consommateurs de faible puissance. La limite d'exposition RF fixée pour un environnement non contrôlé est sans danger pour le fonctionnement prévu tel que décrit dans ce manuel. L'exposition RF supplémentaire que la conformité a été démontrée à 20cm et plus de séparation du corps de l'utilisateur ou de mettre l'appareil à la puissance de sortie inférieure si une telle fonction est disponible.

IC Certification

La Operación de Este Equipo no está Sujeta a las dos condiciones siguientes:

1. Es Posible Que Este Equipo o Dispositivo no causar interferencia perjudicial.
2. Este Equipo o Dispositivo debe Aceptar Cualquier interferencia. Incluyendo La Que Pueda causar do Operación no Deseada.



MIC Certification

Model Number	Mfr	MHz	Tested For
A-0749G04/A-0749G14	Pektron	315	Japan

CE Certification

Model #	Mfr	MHz	Tested For
A-0749G01 and A-0749G11	Pektron	433	Europe Australia New Zealand Singapore South Korea
A-0749G05 and A-0749G15	Pektron	433	China Hong Kong Korea

The devices listed above comply with CE standards. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by Tesla could void your authority to operate the equipment.

Tire Pressure Monitoring System

FCC IDs: TZSTPMS201, Z9F-201FS43X

IC ID: 11852A-201FS4X

The tire pressure monitoring system (TPMS) complies with Part 15 of the FCC rules and RSS-210 of Innovation, Science and Economic Development Canada. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by Tesla could void your authority to operate the equipment.

HomeLink

This device complies with Part 15 of the FCC rules, RSS-210 Industry Canada, and with EU Directive 2014/53/EU.

Operation is subject to the following conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications to the device not expressly approved by the manufacturer or Tesla could void your authority to operate the equipment.



Radio Frequency Information

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Declarations of Conformity

Key and Passive Unlocking System

FCC Certification

Model Number	Mfr	Frequency	Tested For
Key fob 1048598	Tesla	2.4 GHz	USA Canada Mexico Taiwan
WC1	Tesla	127.7KHz	Global

The devices listed above comply with Part 15 of the FCC rules, Industry Canada's license-exempt RSS Standard(s) and EU Directive 2014/53/EU.

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by Tesla could void your authority to operate the equipment.

La Operación de Este Equipo no está Sujeta a las dos following conditions:

1. Es Posible Que Este Equipo o Dispositivo no causar interferencia perjudicial.
2. Este Equipo o Dispositivo debe Aceptar Cualquier interferencia. Incluyendo La Que Pueda causar do Operación no Deseada.

Radiation Exposure Statement

The product complies with FCC/IC RF Exposure for Low Power Consumer Wireless Power Transfer. The RF exposure limit set forth for an uncontrolled environment is safe for the operations intended, as described in this manual. Compliance was demonstrated at a distance of 20 cm or greater between the human body and the device. If the function is available, the device's output power could be lowered.

IC Certification

The following device is used in vehicles in Canada:

- Key fob Model Number: 1048598 (2.4 GHz)



- Key fob Manufacturer: Tesla

Per IC 20098-1048598, this device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radioexempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1. L'Appareil ne doit pas produire de brouillage, et
2. L'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé.

Déclaration d'exposition aux radiations:

Le produit est conforme à l'exposition RF IC pour le transfert de puissance sans fil de consommateurs de faible puissance. La limite d'exposition RF fixée pour un environnement non contrôlé est sans danger pour le fonctionnement prévu tel que décrit dans ce manuel. L'exposition RF supplémentaire que la conformité a été démontrée à 20cm et plus de séparation du corps de l'utilisateur ou de mettre l'appareil à la puissance de sortie inférieure si une telle fonction est disponible.

IC Certification

La Operación de Este Equipo no está Sujeta a las dos condiciones siguientes:

1. Es Posible Que Este Equipo o Dispositivo no causar interferencia perjudicial.
2. Este Equipo o Dispositivo debe Aceptar Cualquier interferencia. Incluyendo La Que Pueda causar do Operación no Deseada.

Central Body Controller

FCC Certification

Model Number	Mfr	MHz / GHz	Tested For
Central Body Controller 1031503	Tesla	315 / 2.4	USA Canada

Per FCC ID 2AEIM-1031503, the devices listed above comply with Part 15 of the FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by Tesla could void your authority to operate the equipment.

IC Certification

The following device is used in vehicles in Canada:

- Central Body Controller Model Number: 1031503 (315 MHz / 2.4 GHz)
- Central Body Controller Manufacturer: Tesla



Per IC 20098-1031503, this device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Integral Component Only

The Central Body Controller is an integral part of the vehicle that is installed and secured around other interior trim components. The Central Body Controller is designed and intended for use only as an integral component and cannot be sold and/or marketed separately.

Tire Pressure Monitoring System

FCC IDs: TZSTPMS201, Z9F-201FS43X

IC ID: 11852A-201FS4X

The tire pressure monitoring system (TPMS) complies with Part 15 of the FCC rules and RSS-210 of Innovation, Science and Economic Development Canada. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by Tesla could void your authority to operate the equipment.

HomeLink

This device complies with Part 15 of the FCC rules, RSS-210 Industry Canada, and with EU Directive 2014/53/EU.

Operation is subject to the following conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications to the device not expressly approved by the manufacturer or Tesla could void your authority to operate the equipment.

Radio Frequency Information

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



Declarations of Conformity

FCC and IC Certification

Component	Manufacturer	Model	Operating Frequency (MHz)	FCC ID	IC
B Pillar Endpoint	Tesla	1607773	13.56 2400-2483.5 6500-8000	2AEIM-1607773	20098-1607773
Security Controller	Tesla	1614280	2400-2483.5	2AEIM-1614280	20098-1614280
Fascia Endpoint	Tesla	1613851	2400-2483.5 6500-8000	2AEIM-1613851	20098-1613851
Key fob	Tesla	1614285	2400-2483.5 6500-8000	2AEIM-1614285	20098-1614285
TPMS	Tesla	1472547	2400-2483.5	2AEIM-1472547	20098-1472547
Radar (if equipped) (if equipped)	Continental	ARS 4-B	76000-77000	OAYARS4B	4135A-ARS4B
Homelink	Gentex	ADHL5C	286-440	NZLADHL5C	4112A-ADHL5C
CarPC	Tesla	1960000	--	XMR2020AG525RGL YZP-ATC5CPC001	10224A-2020AG525R 7414C-ATC5CPC001
Wireless Charger	Tesla	WC4	127.72 KHz 13.56 2400-2483.5	2AEIM-WC4	20098-WC4
BT USB hub	Tesla	1642783	2400-2483.5	2AEIM-1642783	20098-1642783
In-Cabin Radar*	Tesla	1616631	60000-64000	2AEIM-1616631	20098-1616631
Wireless Charger	Tesla	WC3	127.72 KHz	2AEIM-WC3	20098-WC3

*The in-cabin radar is restricted to factory installation.

The devices listed above comply with Part 15 of the FCC rules and Industry Canada's license-exempt RSS Standard(s) and EU Directive 2014/53/EU.

Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by Tesla could void your authority to operate the equipment.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Radiation Exposure Statement

The products comply with the FCC/IC RF Exposure for Low Power Consumer Wireless Power Transfer. RF exposure limits are set forth for an uncontrolled environment and are safe for intended operation as described in this manual. The farthest RF exposure demonstrated by compliance was at 20cm and farther from the user's body; set the device to low output power if such function is available.



Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé.

Déclaration d'exposition aux radiations

Le produit est conforme à l'exposition RF IC pour le transfert de puissance sans fil de consommateurs de faible puissance. La limite d'exposition RF fixée pour un environnement non contrôlé est sans danger pour le fonctionnement prévu tel que décrit dans ce manuel. L'exposition RF supplémentaire que la conformité a été démontrée à 20cm et plus de séparation du corps de l'utilisateur ou de mettre l'appareil à la puissance de sortie inférieure si une telle fonction est disponible.

Radio Frequency Information

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician to help.

 **CAUTION:** This equipment and its antennas must not be co-located or operated with another antenna or transmitter.

Canada

CAN ICES-3 (B)/NMB-3(B)

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé.

Déclaration d'exposition aux radiations:

Le produit est conforme à l'exposition RF IC pour le transfert de puissance sans fil de consommateurs de faible puissance. La limite d'exposition RF fixée pour un environnement non contrôlé est sans danger pour le fonctionnement prévu tel que décrit dans ce manuel. L'exposition RF supplémentaire que la conformité a été démontrée à 20cm et plus de séparation du corps de l'utilisateur ou de mettre l'appareil à la puissance de sortie inférieure si une telle fonction est disponible.

Mexico

IFT-008-SCFI-2015 / NOM-208-SCFI-2016

La operación de este equipo está sujeta a las siguientes dos condiciones:

1. Es posible que este equipo o dispositivo no cause interferencia perjudicial.
2. Este equipo debe aceptar cualquier interferencia, incluyendo la que pueda causar su operación no deseada.



Troubleshooting Alerts

(APP_w207)

Autosteer temporarily unavailable

Autosteer is currently unavailable. This could be a temporary condition due to external conditions that include:

- Missing or faded lane markers
- Narrow or winding roads
- Poor visibility due to rain, snow, fog, or other weather conditions
- Extremely hot or cold temperatures
- Bright light due to other vehicle headlights, direct sunlight, or other light sources

If the alert is caused by a temporary factor like these, no action or service is typically needed. Continue to your destination. The alert will clear and Autosteer will be available once the condition is no longer present.

Please note that the minimum speed to initiate Autosteer when there is no vehicle detected ahead of you and while driving on a road with visible lane markings is 18 mph (30 km/h), unless certain vehicle and environmental conditions are met. If a vehicle is detected ahead of you:

- You can initiate Autosteer at any speed under 90 mph (150 km/h).
- You can even initiate Autosteer when stationary, provided the other vehicle is at least 5 feet (150 cm) in front of you.

This alert will be present if you have temporarily exceeded 90 mph (150 km/h) with Autosteer active, and Autosteer will not be available for the rest of your current drive.

NOTE: If this alert becomes active while you are driving in Germany, Autosteer should again be available once your vehicle is traveling below 90 mph (150 km/h).

If Autosteer is not available by the time you reach your destination, and remains unavailable during your next planned drive, the problem might be one of these issues:

- Damage or obstruction caused by mud, ice, snow, or other environmental factors
- Obstruction caused by an object mounted on the vehicle, like a bike rack
- Obstructions caused by adding paint or adhesive products like wraps, stickers, or rubber coatings to your vehicle
- A damaged or misaligned bumper

The solution might be as simple as washing your vehicle. If you do not find any obvious obstructions or you find damage to the vehicle, schedule service at your convenience. Your vehicle is OK to drive in the meantime.

For more information, see [Autosteer on page 310](#).

(APP_w218)

Autosteer speed limit exceeded

Take control of steering wheelsteering yoke

Autosteer is unavailable because your vehicle has exceeded the maximum speed limit for this driver assistance feature. Autosteer is only available at speeds up to 90 mph (150 km/h).

Take immediate control of the steering wheelsteering yoke and maintain control until you reach your destination. Your vehicle is OK to drive.

In most cases, Autosteer will not be available for the rest of your current drive. To reset it, you will need to bring the vehicle to a complete stop and shift into Park. When you shift into Drive to travel to your next destination, Autosteer should again be available.

Please note that the minimum speed to initiate Autosteer when there is no vehicle detected ahead of you and while driving on a road with visible lane markings is 18 mph (30 km/h), unless certain vehicle and environmental conditions are met.



If a vehicle is detected ahead of you:

- You can initiate Autosteer at any speed under 90 mph (150 km/h).
- You can even initiate Autosteer when stationary, provided the other vehicle is at least 5 feet (150 cm) in front of you.

NOTE: If this alert becomes active while you are driving in Germany, Autosteer should again be available once your vehicle is traveling below 90 mph (150 km/h).

If Autosteer is not available during your next drive, and remains unavailable throughout subsequent drives, schedule service at your convenience. Your vehicle is OK to drive in the meantime.

For more information, see [Autosteer on page 310](#).

(APP_w221)

Cruise control unavailable

Reduced front radar visibility

Traffic-Aware Cruise Control and Autosteer are unavailable because the radar located in the front bumper area of your vehicle has no or low visibility. Continue to your destination. Your vehicle is OK to drive.

Traffic-Aware Cruise Control and Autosteer will remain unavailable as long as the radar lacks adequate visibility. This could be a temporary obstruction caused by factors like snow, ice, dirt, or mud. If the alert is caused by a temporary factor like these, no action might be needed: the condition might clear during your drive.

If the alert persists throughout your drive, examine the front bumper before your next planned drive and attempt to clear any obstruction.

- See the [About Autopilot on page 286](#) sections "How It Works" and "Cleaning Cameras and Sensors" for more on the radar location and care needed if clearing dirt / debris from that area of the vehicle.
- See [Cleaning on page 446](#) for general cleaning tips and cautions.

Once the radar regains adequate visibility, the alert will clear and both Traffic-Aware Cruise Control and Autosteer should again be available.

If this alert persists throughout subsequent drives but no obstruction is visible on the front bumper where the radar is located, schedule service at your earliest convenience. Your vehicle is OK to drive in the meantime.

(APP_w222)

Cruise control unavailable

Reduced front camera visibility

Traffic-Aware Cruise Control and Autosteer are unavailable because one or more of the front cameras in your vehicle is blocked or blinded by external conditions. Continue to your destination. Your vehicle is OK to drive.

Traffic-Aware Cruise Control and Autosteer will remain unavailable while a front camera lacks adequate visibility. Cameras can be blocked or blinded due to many factors that include:

- Dirt or debris on the camera surface
- Environmental conditions like rain, fog, snow, or dew
- Bright sunlight or glare from another light source
- Condensation (water droplets or mist) on the camera surface

This is often a temporary issue that will clear up when condensation evaporates or a particular environmental condition is no longer present.

If the alert does not clear by the end of your drive, inspect and clean the front camera area at the top center of the windshield before your next planned drive. Check the camera surface for condensation, dirt, or other debris and attempt to clear any obstruction. See the [About Autopilot on page 286](#) sections "How It Works" and "Cleaning Cameras and Sensors" for more on front camera location and tips for careful cleaning.



Although condensation on the inside of the front camera enclosure cannot be wiped clean, you can usually clear it quicker by following these steps:

1. Pre-condition the cabin with the temperature set to High and A/C turned ON.
2. Turn on the front windshield defroster.

Once all front cameras regain adequate visibility, the alert will clear and both Traffic-Aware Cruise Control and Autosteer should again be available.

If this alert persists throughout subsequent drives but no front camera obstruction is visible, schedule service at your earliest convenience. Your vehicle is OK to drive in the meantime.

(APP_w224)

Cruise control unavailable

Continue driving to allow cameras to calibrate

Traffic-Aware Cruise Control and Autosteer are unavailable because the cameras on your vehicle are not fully calibrated. Continue to your destination. Your vehicle is OK to drive.

Traffic-Aware Cruise Control and Autosteer will remain unavailable until camera calibration is complete.

Your vehicle must maneuver with great precision when features like Traffic-Aware Cruise Control and Autosteer are active. Before these features can be used for the first time, the cameras must complete an initial self-calibration. Occasionally, one or more cameras can become uncalibrated.

For your convenience, a calibration progress indicator is displayed on the touchscreen. Calibration typically completes after your vehicle has driven 20-25 miles (32-40 km), but the distance varies depending on road and environmental conditions. For example, driving on a straight road with highly visible lane markings helps the cameras calibrate quicker.

See [Drive to Calibrate Cameras on page 291](#) for more information.

When calibration is complete, Traffic-Aware Cruise Control and Autosteer should be available.

If the alert persists and camera calibration has not completed after your vehicle has driven 100 miles (160 km) or more, or Traffic-Aware Cruise Control and Autosteer remain unavailable despite successful camera calibration, schedule service at your earliest convenience. Your vehicle is OK to drive in the meantime.

(APP_w304)

Camera blocked or blinded

Clean camera or wait for it to regain visibility

One or more of the vehicle cameras is blocked or blinded due to external conditions. When the cameras cannot provide accurate visual information, some or all Autopilot features may be temporarily unavailable.

Cameras can be blocked or blinded due to many factors, including:

- Dirt or debris on the camera surface
- Environmental conditions like rain, fog, snow, or dew
- Bright sunlight or glare from another light source
- Condensation (water droplets or mist) on the camera surface

Continue to your destination. Your vehicle is OK to drive.

This is often a temporary issue that will be resolved when condensation evaporates or a particular environmental condition is no longer present.

If the alert does not clear by the time you reach your destination, check camera surfaces for condensation, dirt, or other debris.

For camera locations, see [About Autopilot on page 286](#).



Clean the cameras as necessary before your next planned drive. For recommended cleaning procedures, see [Cleaning Cameras and Sensors on page 292](#).

If you continue to see this alert after cleaning the cameras, check the inside surfaces of the door pillar camera enclosures for condensation.

Although condensation inside the camera enclosures cannot be wiped clean, you can usually clear it faster by following these steps:

1. Pre-condition the cabin with the temperature set to High and A/C turned ON.
2. Turn on the front windshield defroster.
3. Direct the air vents toward the door pillar cameras.

For more information on clearing condensation from camera enclosures, see [Cleaning Cameras and Sensors on page 292](#).

If the alert does not clear by the end of your next planned drive, despite cleaning the indicated camera(s) and following recommended steps to clear condensation, schedule service at your next convenient opportunity. Your vehicle is OK to drive in the meantime.

(CC_a001)

Unable to charge - Insufficient grounding

Proper wiring or outlet grounding must be verified

What this alert means:

No ground connection detected in the Wall Connector.

What to do:

Have the Wall Connector inspected by an electrician to make sure it is properly grounded. Your electrician should ensure there is proper grounding at your circuit breaker or power distribution box and also ensure that appropriate connections are made to the Wall Connector.

(CC_a002)

Unable to charge - Insufficient grounding

Disconnect and retry or use different equipment

What this alert means:

Ground fault. Current is leaking through an unsafe path. Possible Line to ground or Neutral to ground fault.

What to do:

Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting. If the issue persists, turn OFF the circuit breaker servicing the Wall Connector, wait 10 seconds, turn the circuit breaker ON again, then try reconnecting the Wall Connector to the vehicle. If the issue persists, consult your electrician or contact Tesla.

(CC_a003)

Unable to charge - Wall Connector GFCI tripped

Disconnect and retry or use different equipment

What this alert means:

Ground fault. Current is leaking through an unsafe path. Possible Line to ground or Neutral to ground fault.

What to do:

Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting. If the issue persists, turn OFF the circuit breaker servicing the Wall Connector, wait 10 seconds, turn the circuit breaker ON again, then try reconnecting the Wall Connector to the vehicle. If the issue persists, consult your electrician or contact Tesla.

**(CC_a004)**

Unable to charge - Wall Connector issue
Wall Connector needs service

What this alert means:

Wall Connector hardware issue. Possible issues include:

1. Contactor not working
2. Self-test of internal ground fault monitoring circuit failed
3. Thermal sensor disconnected
4. Other hardware component issues

What to do:

An internal issue was detected by the Wall Connector.

1. Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.
2. If the issue persists, turn OFF the circuit breaker for the Wall Connector, wait 10 seconds, and turn the circuit breaker ON again. Then try reconnecting the Wall Connector to the vehicle.
3. If the issue persists, have an electrician make sure all wires are properly connected and torqued according to the instructions in the Wall Connector Installation Manual.
4. Once your electrician has completed all work and restored power to the Wall Connector, try charging again by reconnecting the Wall Connector to the vehicle.
5. If the issue persists, the Wall Connector requires service.

(CC_a005)

Unable to charge - Wall Connector GFCI tripped
Disconnect and retry or use different equipment

What this alert means:

Ground fault. Current is leaking through an unsafe path. Possible Line to ground or Neutral to ground fault.

What to do:

Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting. If the issue persists, turn OFF the circuit breaker servicing the Wall Connector, wait 10 seconds, turn the circuit breaker ON again, then try reconnecting the Wall Connector to the vehicle. If the issue persists, consult your electrician or contact Tesla.

(CC_a006)

Unable to charge - Wall Connector overcurrent
Disconnect and retry or use different equipment

What this alert means:

Over current protection.

What to do:

Reduce the vehicle's charge current setting. If the issue persists, service is required.

(CC_a007)

Unable to charge - Input voltage too high
Voltage must be within Wall Connector rating

What this alert means:

Over or under voltage protection.

What to do:



Consult your electrician to ensure appropriate voltage on the circuit breaker that services the Wall Connector.

(CC_a008)

Unable to charge - Input voltage too low

Voltage must be within Wall Connector rating

What this alert means:

Over or under voltage protection.

What to do:

Consult your electrician to ensure appropriate voltage on the circuit breaker that services the Wall Connector.

(CC_a009)

Unable to charge - Input wired incorrectly

Input wiring to Wall Connector must be corrected

What this alert means:

Input miswired: possibly Line and Neutral are swapped.

What to do:

The wiring between the wall power and the Wall Connector has been incorrectly installed. Consult your electrician.

(CC_a010)

Unable to charge - Wall Connector issue

Wall Connector needs service

What this alert means:

Wall Connector hardware issue. Possible issues include:

1. Contactor not working
2. Self-test of internal ground fault monitoring circuit failed
3. Thermal sensor disconnected
4. Other hardware component issues

What to do:

An internal issue was detected by the Wall Connector.

1. Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.
2. If the issue persists, turn OFF the circuit breaker for the Wall Connector, wait 10 seconds, and turn the circuit breaker ON again. Then try reconnecting the Wall Connector to the vehicle.
3. If the issue persists, have an electrician make sure all wires are properly connected and torqued according to the instructions in the Wall Connector Installation Manual.
4. Once your electrician has completed all work and restored power to the Wall Connector, try charging again by reconnecting the Wall Connector to the vehicle.
5. If the issue persists, the Wall Connector requires service.

(CC_a011)

Unable to charge - Wall Connector too hot

Let Wall Connector cool and try again

What this alert means:

Over temperature protection (latchoff).

What to do:



Make sure the Wall Connector is not covered by anything and that there is no heat source nearby. If the problem persists in normal ambient temperatures (under 100°F or 38°C) , service is required.

(CC_a012)

Unable to charge - Wall connection too hot

Outlet or Wall Connector wiring must be checked

High temperature detected by Wall Connector alerts indicate the building connection to the Wall Connector is getting too warm, so charging has stopped to protect the wiring and Wall Connector.

This is not typically an issue with your vehicle or your Wall Connector, but rather an issue with the building wiring. This may be caused by a loose building wiring connection to the Wall Connector and can be fixed quickly by an electrician.

To regain normal charge operation, try the following steps.

If the Wall Connector is plugged into a wall outlet, make sure:

- The plug is fully inserted into the receptacle / outlet
- The plug / outlet area is not blocked or covered by anything
- There is no heat source nearby

If the issue persists or the Wall Connector is hard-wired, contact an electrician to inspect the building wiring connection to the Wall Connector. They should make sure that all wires are properly connected and torqued according to the installation guide for the Wall Connector.

(CC_a013)

Unable to charge - Charge handle too hot

Check charge handle or charge port for debris

What this alert means:

Over temperature protection (latchoff).

What to do:

Make sure the connector is fully inserted into the charge inlet in the vehicle's charging port, is not covered by anything, and there is no heat source nearby. If the issue persists in normal ambient temperatures (under 100°F or 38°C) , service is required.

(CC_a014)

Unable to charge - Wall Connector issue

Wall Connector needs service

What this alert means:

Wall Connector hardware issue. Possible issues include:

1. Contactor not working
2. Self-test of internal ground fault monitoring circuit failed
3. Thermal sensor disconnected
4. Other hardware component issues

What to do:

An internal issue was detected by the Wall Connector.

1. Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.
2. If the issue persists, turn OFF the circuit breaker for the Wall Connector, wait 10 seconds, and turn the circuit breaker ON again. Then try reconnecting the Wall Connector to the vehicle.



3. If the issue persists, have an electrician make sure all wires are properly connected and torqued according to the instructions in the Wall Connector Installation Manual.
4. Once your electrician has completed all work and restored power to the Wall Connector, try charging again by reconnecting the Wall Connector to the vehicle.
5. If the issue persists, the Wall Connector requires service.

(CC_a015)**Unable to charge - Vehicle connection issue****Insert charge handle fully into charge port****What this alert means:**

A communication error occurred between the Wall Connector and the vehicle.

What to do:

Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.

1. If the issue persists, turn OFF the circuit breaker servicing the Wall Connector, wait 10 seconds, turn the circuit breaker ON again, then try reconnecting the Wall Connector to the vehicle.
2. If the issue persists and other charging equipment is available, plug the vehicle into another Wall Connector or a Mobile Connector to determine if the vehicle is able to communicate with other charging equipment.
3. If the issue persists, service is required.

(CC_a016)**Unable to charge - Vehicle connection issue****Insert charge handle fully into charge port****What this alert means:**

A communication error occurred between the Wall Connector and the vehicle.

What to do:

Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.

1. If the issue persists, turn OFF the circuit breaker servicing the Wall Connector, wait 10 seconds, turn the circuit breaker ON again, then try reconnecting the Wall Connector to the vehicle.
2. If the issue persists and other charging equipment is available, plug the vehicle into another Wall Connector or a Mobile Connector to determine if the vehicle is able to communicate with other charging equipment.
3. If the issue persists, service is required.

(CC_a017)**Unable to charge - Vehicle connection issue****Insert charge handle fully into charge port****What this alert means:**

A communication error occurred between the Wall Connector and the vehicle.

What to do:

Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.

1. If the issue persists, turn OFF the circuit breaker servicing the Wall Connector, wait 10 seconds, turn the circuit breaker ON again, then try reconnecting the Wall Connector to the vehicle.
2. If the issue persists and other charging equipment is available, plug the vehicle into another Wall Connector or a Mobile Connector to determine if the vehicle is able to communicate with other charging equipment.
3. If the issue persists, service is required.



(CC_a018)

Unable to charge - Vehicle connection issue

Insert charge handle fully into charge port

What this alert means:

A communication error occurred between the Wall Connector and the vehicle.

What to do:

Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.

1. If the issue persists, turn OFF the circuit breaker servicing the Wall Connector, wait 10 seconds, turn the circuit breaker ON again, then try reconnecting the Wall Connector to the vehicle.
2. If the issue persists and other charging equipment is available, plug the vehicle into another Wall Connector or a Mobile Connector to determine if the vehicle is able to communicate with other charging equipment.
3. If the issue persists, service is required.

(CC_a019)

Unable to charge - Vehicle connection issue

Insert charge handle fully into charge port

What this alert means:

A communication error occurred between the Wall Connector and the vehicle.

What to do:

Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.

1. If the issue persists, turn OFF the circuit breaker servicing the Wall Connector, wait 10 seconds, turn the circuit breaker ON again, then try reconnecting the Wall Connector to the vehicle.
2. If the issue persists and other charging equipment is available, plug the vehicle into another Wall Connector or a Mobile Connector to determine if the vehicle is able to communicate with other charging equipment.
3. If the issue persists, service is required.

(CC_a020)

Unable to charge - Wall Connector issue

Wall Connector needs service

What this alert means:

Wall Connector hardware issue. Possible issues include:

1. Contactor not working
2. Self-test of internal ground fault monitoring circuit failed
3. Thermal sensor disconnected
4. Other hardware component issues

What to do:

An internal issue was detected by the Wall Connector.

1. Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.
2. If the issue persists, turn OFF the circuit breaker for the Wall Connector, wait 10 seconds, and turn the circuit breaker ON again. Then try reconnecting the Wall Connector to the vehicle.
3. If the issue persists, have an electrician make sure all wires are properly connected and torqued according to the instructions in the Wall Connector Installation Manual.



4. Once your electrician has completed all work and restored power to the Wall Connector, try charging again by reconnecting the Wall Connector to the vehicle.
5. If the issue persists, the Wall Connector requires service.

(CC_a021)

Unable to charge - No primary Wall Connector

Check that primary unit is powered and available

What this alert means:

Load sharing (circuit breaker sharing) network: Need one (and only one) Wall Connector set as primary.

What to do:

Only one Wall Connector can be set to a primary configuration. Have your electrician confirm:

1. Only one of the Wall Connectors is set as primary.
2. All other Wall Connectors linked to the primary unit are set to paired position (position F).

(CC_a022)

Unable to charge - More than 1 primary unit

Ensure only 1 Wall Connector is set as primary

What this alert means:

Load sharing (circuit breaker sharing) network: Need one (and only one) Wall Connector set as primary.

What to do:

Only one Wall Connector can be set to a primary configuration. Have your electrician confirm:

1. Only one of the Wall Connectors is set as primary.
2. All other Wall Connectors linked to the primary unit are set to paired position (position F).

(CC_a023)

Unable to charge - Too many Wall Connectors

Ensure no more than 3 units paired with primary

What this alert means:

Load sharing (circuit breaker sharing) network: More than three Wall Connectors are paired with the same primary unit.

What to do:

Consult your electrician to have one or more paired Wall Connectors moved to a different circuit and disconnected (unpaired) from this load sharing (circuit breaker sharing) network.

(CC_a024)

Unable to charge - Low Wall Connector current

Primary unit current setting must be increased

What this alert means:

Incorrect rotary switch setting.

What to do:

Have your electrician adjust the Wall Connector's internal rotary switch to a valid operating current setting. They should first make sure there is no power to the Wall Connector. The correlation between switch setting and current should be printed on the inside of the Wall Connector. Your electrician should also refer to the Set the Operating Current section in the Wall Connector Installation Manual.



If the Wall Connector is set up for load sharing (circuit breaker sharing) and paired with other Wall Connectors, the rotary switch of the primary unit must be set to an operating current setting that allows each paired Wall Connector to receive at least 6A of charge current.

Example: Three Wall Connectors are paired for load sharing. The primary unit needs to be set to a current of at least $3 * 6A = 18A$ or greater.

(CC_a025)

Unable to charge - Wall Connector issue
Wall Connector needs service

What this alert means:

Wall Connector hardware issue. Possible issues include:

1. Contactor not working
2. Self-test of internal ground fault monitoring circuit failed
3. Thermal sensor disconnected
4. Other hardware component issues

What to do:

An internal issue was detected by the Wall Connector.

1. Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.
2. If the issue persists, turn OFF the circuit breaker for the Wall Connector, wait 10 seconds, and turn the circuit breaker ON again. Then try reconnecting the Wall Connector to the vehicle.
3. If the issue persists, have an electrician make sure all wires are properly connected and torqued according to the instructions in the Wall Connector Installation Manual.
4. Once your electrician has completed all work and restored power to the Wall Connector, try charging again by reconnecting the Wall Connector to the vehicle.
5. If the issue persists, the Wall Connector requires service.

(CC_a026)

Unable to charge - Wall Connector issue
Wall Connector needs service

What this alert means:

Wall Connector hardware issue. Possible issues include:

1. Contactor not working
2. Self-test of internal ground fault monitoring circuit failed
3. Thermal sensor disconnected
4. Other hardware component issues

What to do:

An internal issue was detected by the Wall Connector.

1. Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.
2. If the issue persists, turn OFF the circuit breaker for the Wall Connector, wait 10 seconds, and turn the circuit breaker ON again. Then try reconnecting the Wall Connector to the vehicle.
3. If the issue persists, have an electrician make sure all wires are properly connected and torqued according to the instructions in the Wall Connector Installation Manual.
4. Once your electrician has completed all work and restored power to the Wall Connector, try charging again by reconnecting the Wall Connector to the vehicle.



5. If the issue persists, the Wall Connector requires service.

(CC_a027)

Unable to charge - Wall Connector issue

Wall Connector needs service

What this alert means:

Wall Connector hardware issue. Possible issues include:

1. Contactor not working
2. Self-test of internal ground fault monitoring circuit failed
3. Thermal sensor disconnected
4. Other hardware component issues

What to do:

An internal issue was detected by the Wall Connector.

1. Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.
2. If the issue persists, turn OFF the circuit breaker for the Wall Connector, wait 10 seconds, and turn the circuit breaker ON again. Then try reconnecting the Wall Connector to the vehicle.
3. If the issue persists, have an electrician make sure all wires are properly connected and torqued according to the instructions in the Wall Connector Installation Manual.
4. Once your electrician has completed all work and restored power to the Wall Connector, try charging again by reconnecting the Wall Connector to the vehicle.
5. If the issue persists, the Wall Connector requires service.

(CC_a028)

Unable to charge - Incorrect switch setting

Wall Connector rotary switch must be adjusted

What this alert means:

Incorrect rotary switch setting.

What to do:

Have your electrician adjust the Wall Connector's internal rotary switch to a valid operating current setting. They should first make sure there is no power to the Wall Connector. The correlation between switch setting and current should be printed on the inside of the Wall Connector. Your electrician should also refer to the Set the Operating Current section in the Wall Connector Installation Manual.

If the Wall Connector is set up for load sharing (circuit breaker sharing) and paired with other Wall Connectors, the rotary switch of the primary unit must be set to an operating current setting that allows each paired Wall Connector to receive at least 6A of charge current.

Example: Three Wall Connectors are paired for load sharing. The primary unit needs to be set to a current of at least $3 * 6A = 18A$ or greater.

(CC_a029)

Unable to charge - Vehicle connection issue

Insert charge handle fully into charge port

What this alert means:

A communication error occurred between the Wall Connector and the vehicle.

What to do:



Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.

1. If the issue persists, turn OFF the circuit breaker servicing the Wall Connector, wait 10 seconds, turn the circuit breaker ON again, then try reconnecting the Wall Connector to the vehicle.
2. If the issue persists and other charging equipment is available, plug the vehicle into another Wall Connector or a Mobile Connector to determine if the vehicle is able to communicate with other charging equipment.
3. If the issue persists, service is required.

(CC_a030)

Unable to charge - Primary / paired unit mismatch
Wall Connector current ratings must match

What this alert means:

Load sharing (circuit breaker sharing) network: The paired Wall Connectors have different maximum current capabilities.

What to do:

Only Wall Connectors with the same maximum current capabilities can be paired in a load sharing (circuit breaker sharing) network. Have your electrician inspect the type labels on the Wall Connectors and make sure the current capabilities match. It is further recommended that your electrician only pair Wall Connectors with the same part number, as an easy way to make sure paired units are compatible.

(CC_a041)

Charge rate reduced - Wall connection hot
Outlet or Wall Connector wiring must be checked

High temperature detected by Wall Connector alerts indicate the building connection to the Wall Connector is getting too warm, so charging has been slowed to protect the wiring and Wall Connector.

This is not typically an issue with your vehicle or your Wall Connector, but rather an issue with the building wiring. This may be caused by a loose building wiring connection to the Wall Connector and can be fixed quickly by an electrician.

To regain normal charge speed, contact an electrician to inspect the building wiring connection to the Wall Connector. They should make sure that all wires are properly connected and torqued according to the installation guide for the Wall Connector.

(CC_a043)

Wall Connector configuration must be completed
Refer to Installation Guide to enable charging

What this alert means:

Wall Connector configuration is incomplete.

What to do:

The Wall Connector needs to be commissioned to appropriately configure the circuit breaker size and protective earth connection type.

For more information, refer to Commissioning Procedure in the Wall Connector Installation Manual. If the issue persists, contact an electrician to inspect the building wiring connection to the Wall Connector. They should make sure the power output and grounding connections are properly configured according to the installation guide for the Wall Connector.

(CP_a004)

Charging equipment not recognized
Try again or try different equipment

The charge port is unable to detect whether a charge cable is inserted or the type of charge cable connected.

If this alert appears while a charge cable is connected, it should be determined whether the issue is caused by the charging equipment or the vehicle. Try charging the vehicle using different external charging equipment (charge cable, charging station, charging stall, etc.).



- If the vehicle begins charging, the issue was likely with the equipment.
- If the vehicle still does not charge, the issue may be with the vehicle.

If this alert appears while a charge cable is **not** connected or if the issue is suspected to be with the vehicle, inspect the charge port inlet and the charge cable connector for any obstructions (use a flashlight as necessary). Debris, moisture, and/or foreign objects present in the charge port inlet or the charge cable connector can prevent the charge port from properly detecting charge cables.

It is recommended that any debris / foreign objects be removed and any moisture be allowed to dry. Afterward, try re-inserting the cable into the charge port. Charging should now be possible.

- Try charging with multiple, different types of charging equipment.
- Make sure any charge port inlet obstruction has been removed.

(CP_a010)

Charging equipment communication error

Try again or try different equipment

Your vehicle is unable to charge because it cannot communicate effectively with the external charging equipment. It cannot sense a valid control pilot signal coming from the charging equipment.

First, confirm the lack of effective communication is caused by the external charging equipment rather than an issue with your vehicle. This is usually the case.

Try charging the vehicle using different external charging equipment (including charge cable, charging station, or charging stall).

- If the vehicle begins charging, the issue was likely with the equipment.
- If the vehicle still does not charge, the issue may be with the vehicle.

If the issue is suspected to be with the vehicle, inspect the charge port inlet and the charge cable connector for any obstructions (use a flashlight as necessary). Debris, moisture, and/or foreign objects present in the charge port inlet or the charge cable connector can prevent the charge port from properly communicating with the charging equipment.

It is recommended that any debris / foreign objects be removed and any moisture be allowed to dry. Afterward, try re-inserting the cable into the charge port. Charging should now be possible.

As this alert is usually specific to external charging equipment and power sources, and it does not typically indicate an issue with your vehicle that can be resolved by scheduling service, it is recommended that you:

- Try charging with multiple, different types of charging equipment.
- Make sure any charge port inlet obstruction has been removed.

(CP_a043)

Charge port door sensor fault

Charge port may not operate as expected

One of the charge port door sensors is not functioning normally. When this occurs, the charge port may be unable to accurately sense the charge port door position and the charge port may not operate as expected.

- The charge port latch may intermittently remain engaged when the charge port door is opened.
- The charge port light may illuminate only intermittently when the charge port door is opened.

If you encounter these or similar behaviors while the alert is present, try closing the charge port door and then opening it again to restore normal function.

For more information, see [Opening the Charge Port on page 417](#).

**(CP_a046)****Charging equipment communication lost****Check power source and charging equipment**

Charging stopped because communication between the vehicle and the external charging equipment was interrupted.

Confirm whether the external charging equipment is powered by looking for any status lights, displays, or other indicators on the equipment.

If the equipment is **not** powered, try to restore the external charging equipment's power source.

- If attempting to charge at a public station and power is unable to be restored, contact the station operator.
- If attempting to charge at a private station (for example: charging at home) and power is unable to be restored, contact an electrician.

If the equipment is powered, try charging the vehicle using different external charging equipment.

- If the vehicle begins charging, the issue was likely with the equipment.
- If the vehicle still does not charge, the issue may be with the vehicle.
- Make sure the external charging equipment is powered.
- Try charging with multiple, different types of charging equipment.

(CP_a051)**Charge port may not open when pressed****Use another method to open the charge port**

One of the charge port door sensors is not communicating properly. This may cause the charge port to not recognize the request to open when the charge port door is pressed.

You can still use all other usual methods to open the charge port door:

- Request that the charge port door open using your vehicle touchscreen.
- Request that the charge port door open using your Tesla Mobile App.
- With your vehicle unlocked, press the charge handle button on any Tesla charge cable, including a Wall Connector, Mobile Connector, or Supercharger.
- Hold and press the trunk button on your key fob.

For more information, see [Opening the Charge Port on page 417](#).

(CP_a053)**Unable to charge - Charge station not powered****Check power source or try a different station**

Charging cannot begin because the charging equipment is not ready. A charge handle is detected, but the charging station is not communicating with the vehicle. This issue could occur because:

- The charging station is not powered.
- The control pilot signal between the charging station and the vehicle is interrupted.

Try charging the vehicle with different charging equipment or at a different charging station.

If the vehicle starts to charge, the issue was likely with the equipment.

If using a Mobile Connector or Wall Connector, first check the status lights on the front. If no status lights are visible, check the power source and contact an electrician to inspect the building wiring connection to the wall outlet or the Wall Connector to confirm that all wires are properly connected and torqued.



If using other external charging equipment, consult the product's owner's manual to learn how to confirm that the station is powered. Contact an electrician to inspect the building wiring and charging equipment as necessary.

If the vehicle still does not charge, the issue may be with the vehicle.

- Try charging with different charge equipment / at different stations.

(CP_a054)

Charge port latch not engaged

Fully insert charge cable or check for obstruction

The charge port latch is unable to latch the charge cable in the charge port inlet. If the latch is not engaged, AC charging (for example, charging with a Mobile Connector or Wall Connector) will be limited to 16A and DC Fast Charging / Supercharging will be unavailable.

The charge port light will pulse amber if this alert appears during AC charging and will be solid amber if this alert appears when attempting to DC Fast Charge / Supercharge.

Try re-inserting the charge cable fully into the charge port inlet.

If your vehicle begins charging and the charge port light pulses green, the charge cable may not have been fully inserted before. The latch may not have engaged during previous attempts because the cable was not fully inserted. AC charging should no longer be limited, and DC Fast Charging / Supercharging should be available.

If charging is still limited or the vehicle will not charge at all, inspect the charge port inlet and the charge cable connector for any obstructions (use a flashlight as needed). Debris and/or foreign objects in the charge port inlet or the charge cable connector can prevent you from fully inserting the charge cable. If the cable is not fully inserted, the charge port latch will not engage.

It is recommended that any debris / foreign objects be removed. Afterward, try re-inserting the cable into the charge port inlet. AC charging should no longer be limited, and DC Fast Charging / Supercharging should be available.

- Make sure the charge cable is fully inserted during charging.
- Make sure any charge port inlet obstruction has been removed.

(CP_a055)

Charging equipment communication lost

Check power source and charging equipment

Charging stopped because communication between the vehicle and the external charging equipment was interrupted.

Confirm whether the external charging equipment is powered by looking for any status lights, displays, or other indicators on the equipment.

If the equipment is **not** powered, try to restore the external charging equipment's power source.

- If attempting to charge at a public station and power is unable to be restored, contact the station operator.
- If attempting to charge at a private station (for example: charging at home) and power is unable to be restored, contact an electrician.

If the equipment is powered, try charging the vehicle using different external charging equipment.

- If the vehicle begins charging, the issue was likely with the equipment.
- If the vehicle still does not charge, the issue may be with the vehicle.
- Make sure the external charging equipment is powered.
- Try charging with multiple, different types of charging equipment.

**(CP_a056)****Charging stopped - Charge cable disconnected****Close charge port - Press brake pedal and retry**

Charging has stopped because your vehicle has detected that the connection between the charge port and charge cable has been unexpectedly interrupted.

Before disconnecting a charge cable, make sure you first stop charging.

With some external charging equipment, charging may be stopped by pressing the button on the charge handle.

You can also stop charging from your vehicle touchscreen, your Tesla Mobile App, or the charging station.

For more information, see [Stopping Charging on page 423](#).

(CP_a057)**Charging equipment reports error****Check equipment for error code or message**

Charging was interrupted because the external charging equipment has reported a fault that prevents the vehicle from charging.

Inspect the external charging equipment and look for status lights, displays, or other status indicators on the equipment. Consult the equipment owner's manual for further troubleshooting instructions.

Try charging the vehicle with different charging equipment or at a different charging station.

- If the vehicle starts to charge, the issue was likely with the equipment.
- If the vehicle still does not charge, the issue may be with the vehicle.
- Try charging with different charge equipment / at different stations.

(CP_a058)**Unable to AC charge - Unplug and retry****Or try DC Fast Charging / Supercharging**

Your vehicle is unable to AC charge because it has detected one of the following conditions and has tried to charge too many times without success:

- The charge port is unable to detect whether a charge cable is inserted or detect the type of charge cable connected.
- Your vehicle is unable to sense a valid pilot control signal coming from the charging station, so it cannot communicate effectively with the external charging equipment.
- Communication between your vehicle and the external charging equipment has been interrupted.
- The external charging equipment has reported an error that prevents your vehicle from charging.

When this alert is present, there will always be at least one other alert present that identifies a more specific condition.

For more information and troubleshooting suggestions, it is recommended that you check in your vehicle touchscreen for other recent alerts that involve charging.

(CP_a066)**Charging equipment not ready****See equipment instructions to start charging**

Charging cannot begin because the charging station is communicating to your vehicle that either the external charging equipment is not ready or charging is not authorized. The control pilot signal that communicates between the charging station and your vehicle indicates that your vehicle is not allowed to start charging. This could occur because:

- The charging station is actively delaying charging. For example, this can happen because the station has a scheduled charging feature activated.



- The charging station requires further activation before the charge session can begin. Some additional authentication may be needed before the station will start charging your vehicle.
 - For example: a charging card, a mobile app, or a credit card may be required.

Check the charging station for any instructions that explain the steps necessary to enable charging. For example, look for a touchscreen terminal, LED status indicators, printed instructions, or a payment interface that might provide guidance. If you cannot enable charging on the current charging station, try charging the vehicle with different charging equipment or at a different charging station.

- If the vehicle starts to charge, the issue was likely with the equipment.
- If the vehicle still does not charge, the issue may be with the vehicle.

As this alert is usually specific to external charging equipment and power sources, and it does not typically indicate an issue with your vehicle that can be resolved by scheduling service, it is recommended that you:

- Try charging with different charge equipment / at different stations.

(CP_a078)

Cable blocked - Charge port latch may be frozen

Try using Defrost Car button in Mobile App

The charge port latch cannot unlatch the charge cable, and cold ambient temperature is detected.

To remove any strain on the cable, re-insert the charge cable fully into the charge port inlet. Try again to unlatch the charge cable.

If the charge cable still cannot be removed, the charge port latch may be frozen.

Press the Defrost Car button in your Tesla Mobile App to defrost your vehicle for approximately 30 - 45 minutes. This should help thaw any ice on the charge port latch so the charge cable can be removed.

NOTE: Be sure to use Defrost Car in your Mobile App to defrost your vehicle. Adjusting the climate control settings in your vehicle's touchscreen will not be as effective.

If the charge cable still cannot be removed, try the manual release cable in your vehicle's trunk.

1. Make sure your vehicle is not actively charging.
 - In your vehicle touchscreen, access the charging screen.
 - If necessary, press Stop Charging.
2. Open the rear trunk.
3. Pull the charge port release cable downwards to unlatch the charge cable.
 - Note: The release cable is located on the left hand side of the rear trunk. It may be recessed within a small opening of the trunk interior trim.
4. Pull the charge cable from the charge port.

For more information on using the manual release cable, see [Manually Releasing Charge Cable on page 426](#).

(CP_a079)

Charge rate reduced - Charge port may be frozen

Try using Defrost Car button in Mobile App

The charge port latch is unable to secure the charge cable in the charge port inlet, and cold ambient temperature is detected. If the latch is not engaged, AC charging (for example, charging with a Mobile Connector or Wall Connector) will be limited to 16A and DC Fast Charging / Supercharging will be unavailable.

The charge port light will pulse amber if this alert appears during AC charging, and it will be solid amber if this alert appears when attempting to DC Fast Charge / Supercharge.

Try re-inserting the charge cable fully into the charge port inlet.



If your vehicle begins charging and the charge port light pulses green, the charge cable may not have been fully inserted before. The latch may not have engaged during previous attempts because the cable was not fully inserted. AC charging should no longer be limited, and DC Fast Charging / Supercharging should be available.

If charging is still limited or the vehicle will not charge at all, inspect the charge port inlet and the charge cable connector for any obstructions (use a flashlight as needed). Debris and/or foreign objects in the charge port inlet or the charge cable connector can prevent you from fully inserting the charge cable. If the cable is not fully inserted, the charge port latch will not engage.

It is recommended that any debris / foreign objects be removed. Afterward, try re-inserting the cable into the charge port inlet. AC charging should no longer be limited, and DC Fast Charging / Supercharging should be available.

If you have checked for and cleared any debris or foreign objects, but charging is still limited or your vehicle will not charge at all, the charge port latch may be frozen. Press the Defrost Car button in your Tesla Mobile App to defrost your vehicle for approximately 30 - 45 minutes. This should help thaw any ice on the charge port latch so the charge cable can be properly inserted.

NOTE: Be sure to use Defrost Car in your Mobile App to defrost your vehicle. Adjusting the climate control settings in your vehicle's touchscreen will not be as effective.

As this alert usually indicates a temporary condition due to cold ambient temperature or a charge port inlet obstruction, and it does not typically indicate an issue with your vehicle that can be resolved by scheduling service, it is recommended that you:

- Make sure the charge cable is fully inserted during charging.
- Make sure any charge port inlet obstruction has been removed.
- Press the Defrost Car button in your Tesla Mobile App to defrost your vehicle for approximately 30 - 45 minutes before trying to charge again.

If the alert remains present, limited AC charging should still be available.

(CP_a101)

Charge rate reduced - Wall connection hot

Outlet or Wall Connector wiring must be checked

High temperature detected by Wall Connector alerts indicate the building connection to the Wall Connector is getting too warm, so charging has been slowed to protect the wiring and Wall Connector.

This is not typically an issue with your vehicle or your Wall Connector, but rather an issue with the building wiring. This may be caused by a loose building wiring connection to the Wall Connector and can be fixed quickly by an electrician.

To regain normal charge speed, contact an electrician to inspect the building wiring connection to the Wall Connector. They should make sure that all wires are properly connected and torqued according to the installation guide for the Wall Connector.

(CP_a102)

Unable to charge - Wall connection too hot

Outlet or Wall Connector wiring must be checked

High temperature detected by Wall Connector alerts indicate the building connection to the Wall Connector is getting too warm, so charging has stopped to protect the wiring and Wall Connector.

This is not typically an issue with your vehicle or your Wall Connector, but rather an issue with the building wiring. This may be caused by a loose building wiring connection to the Wall Connector and can be fixed quickly by an electrician.

To regain normal charge operation, contact an electrician to inspect the building wiring connection to the Wall Connector. They should make sure that all wires are properly connected and torqued according to the installation guide for the Wall Connector.

(CP_a143)

Charging adapter has electric arc flash hazard

Use different charging equipment

Charging is unavailable because your vehicle has detected an electric arc flash hazard in the third-party charging adapter used to connect a Combined Charging System (CCS) charge handle to your vehicle's charge port.



An electric arc flash can occur if you attempt to unplug **while actively charging with the third-party charging adapter**, and an electric arc flash can cause serious bodily injury and/or property damage.

Follow the steps below to mitigate this risk:

1. Make sure charging is completely stopped.
 - a. Use your vehicle touchscreen to confirm charging has stopped, or to stop charging if necessary.
 - b. Use the charging station display and controls to confirm charging has stopped, or to end any active charging session.
2. Make sure no flashing green or blue light (LED) is visible on your vehicle's charge port.
3. Unplug the charging adapter from your vehicle's charge port.
4. Confirm again that the charging station indicates no active charging session.
5. Unplug the charging adapter from the charge handle.

Use different charging equipment to charge your vehicle.

(DI_a175)

Cruise control unavailable

Cruise Control, including Traffic-Aware Cruise Control, is currently unavailable. Take control and drive your vehicle manually.

Continue to your destination. Your vehicle is OK to drive.

Cruise Control might become unavailable due to many factors, including:

- Driver input or behavior:
 - Unbuckling the driver's seat belt
 - Not closing the doors, front trunk, or trunk
 - Canceling a Cruise Control request
 - Trying to activate Cruise Control below minimum speed of 18mph (30 km/h)
- Environmental / external conditions
- Vehicle System Restraints:
 - May include camera or radar lack of visibility
- Valet Mode is active:
 - For more information, see [Valet Mode on page 183](#).

When any condition preventing Cruise Control activation is no longer present, Cruise Control should be available.

If this alert persists throughout subsequent drives, schedule service at your convenience. Your vehicle is OK to drive in the meantime.

For more information, see [Traffic-Aware Cruise Control on page 299](#).

(DI_a184)

Autopark canceled

Take control

Autopark has been canceled. You need to park or finish parking your vehicle manually.

Once the parking maneuver is complete, apply the brakes and shift into Park. Your vehicle will otherwise remain free-rolling.

Autopark can be canceled due to many factors, including the following:

- Driver input or behavior
 - Moving the steering wheelsteering yoke
 - Pressing the accelerator pedal



- Pressing the brake pedal
- Opening a door and/or exiting the vehicle
- Pressing the Cancel button on the touchscreen
- Environmental / external conditions
 - Steep slope / grade
 - Weather conditions affecting visibility / sensor function
 - Curb cannot be detected
- A trailer is attached to the vehicle
- Vehicle system constraints

Autopark should be available again during your next drive.

If this alert persists throughout subsequent drives, schedule service at your earliest convenience. Your vehicle is OK to drive in the meantime.

For more information, see [To Cancel Parking on page 329](#) and [Limitations on page 329](#).

(DI_a185)

Autopark aborted

Autopark has aborted and the Electronic Parking Brake has been applied. You need to park or finish parking your vehicle manually.

Once the parking maneuver is complete, apply the brakes and shift into Park. Your vehicle will otherwise remain free-rolling.

Autopark can abort due to many factors, including the following:

- Driver input or behavior
 - Using the gear stalk
 - Moving the steering wheelsteering yoke
 - Pressing the accelerator pedal
 - Pressing the brake pedal
 - Opening a door and/or exiting the vehicle
 - Pressing the Cancel button on the touchscreen
- Environmental / external conditions
 - Steep slope / grade
 - Weather conditions affecting visibility / sensor function
 - Curb cannot be detected
- A trailer is attached to the vehicle
- Vehicle system constraints

Autopark should be available again during your next drive.

If this alert persists throughout subsequent drives, contact Tesla Service at your earliest convenience. Your vehicle is OK to drive in the meantime.

For more information, see [To Cancel Parking on page 329](#) and [Limitations on page 329](#).

(DI_a201)

Regenerative braking temporarily reduced Regen will increase as vehicle is driven

Regenerative braking performance has been temporarily reduced to below 65% of its full capacity. The exact reduction is indicated by the dashed lines on the power meter.



While this alert is present, the deceleration rate of the vehicle due to regenerative braking will be reduced and more brake pedal application will be required to slow the vehicle (similar to what is needed in a gas-powered, non-electric, vehicle).

This alert is expected under the following conditions:

- Battery is near full charge:
 - Regenerative braking is reduced when the battery is at 95% charge or higher.
- Battery is cold:
 - The battery may not be warm enough for full regenerative braking performance (possibly at the beginning of a drive).
 - In extremely cold climates, this alert may remain present indefinitely and regenerative braking may remain reduced, as driving the vehicle may not warm the battery enough to fully restore performance.

Typically, driving will clear this alert because it will reduce the battery charge level below 95% and sufficiently warm the battery.

This is a completely normal part of vehicle operation and should not cause alarm. The notice on the screen is for your information only.

For more information on regenerative braking, see the Regenerative Braking section in the Owner's Manual. [Regenerative Braking on page 233](#).

(DI_a245)

Vehicle Hold feature unavailable

Keep brake pedal pressed while stopped

Vehicle Hold is currently unavailable due to system constraints. When stopping, use the brake pedal to bring your vehicle to a complete stop and keep your vehicle stationary.

Continue to your destination. Your vehicle is OK to drive.

If Vehicle Hold is not available during your next drive, contact Tesla Service. Your vehicle is OK to drive in the meantime.

For more information, see [Vehicle Hold on page 252](#).

(ESP_a118)

Assist for low brake performance activated

To stop, keep brake pedal firmly pressed

Hydraulic Fade Compensation is active. This brake assist function activates temporarily to make sure you have full braking capability in conditions where reduced braking performance is detected by your vehicle.

Continue to press the brake pedal as you normally would, and do not "pump" (repeatedly press and release) the pedal as this will interrupt the function.

This alert will clear when your vehicle comes to a stop or you are no longer pressing the brake pedal. It may still be displayed for up to 5 seconds afterward.

When this assist function activates, you may feel the brake pedal pull away from your foot and notice a strong increase in brake pressure. You may also hear a pumping sound coming from the brake hydraulic unit at the front of the vehicle. This will usually last for a few seconds, depending on road surface and vehicle speed. This is completely normal and does not indicate any issue with your vehicle.

Reduced braking performance is usually temporary, and can occur for a number of reasons including high brake temperatures after heavy brake use, or driving in extremely cold or wet conditions. It can also indicate that your brake pads or rotors have worn to the point that normal replacement is needed.

If you continue to experience reduced braking performance which does not improve over time, please contact Tesla service at your convenience for a brake inspection.

For more information, see [Hydraulic Fade Compensation on page 232](#).



(PCS_a016)

Cannot charge - Poor grid power quality possible Retry / Try other charge location or Supercharging

Charging has stopped due to a condition that prevents your vehicle from charging with AC power. DC fast charging / Supercharging should still function as expected.

This condition could occur due to power supply disturbances caused by the external charging equipment or by the electrical power grid. In some cases, this condition can even result from turning on nearby electric devices that draw a lot of power.

If these possible causes can be ruled out, then a condition with your vehicle itself may also be affecting AC charging.

This alert is often accompanied by other alerts that can help you identify and troubleshoot the condition. Start by investigating any other displayed alerts that relate to charging.

Further troubleshooting tips based on equipment type:

- If using a Mobile Connector, try charging your vehicle with a different wall outlet.
 - If your vehicle starts to charge and continues to charge as expected, the issue was likely with the original wall outlet. It is recommended that you contact an electrician to inspect the building wiring connection to that outlet.
 - If your vehicle still does not start to charge, or does not continue to charge as expected, the issue may be with the Mobile Connector or the electrical grid.
- If using a Wall Connector, try charging your vehicle with different charging equipment like a Mobile Connector powered by a separate wall outlet.
 - If your vehicle starts to charge and continues to charge as expected, the issue was likely with the Wall Connector. Contact an electrician to inspect the building wiring connection to the Wall Connector. They should make sure that all wires are properly connected and torqued according to the installation guide for the Wall Connector.

As this alert is usually specific to external charging equipment and power sources, and it does not typically indicate an issue with your vehicle that can be resolved by scheduling service, it is recommended that you:

- Try charging with different wall outlets.
- Try charging with multiple, different types of charging equipment at different locations.

(PCS_a017)

Charging stopped - Power lost while charging Check power source and charging equipment

Power has been lost during charging. This could result from the charging equipment losing power from the source (for example, a wall outlet) or from an issue with the charging equipment.

This alert is often accompanied by other alerts that can help you identify and troubleshoot the issue. Start by investigating any other displayed alerts that relate to charging issues.

Alternatively, you can check Mobile Connector or Wall Connector status lights to confirm power to the device, and also refer to the product owner's manual for troubleshooting information based on blink codes. If using other (non-Tesla) external charging equipment, check for a display or other user interface that provides troubleshooting help.

If there is clearly no power to the charging equipment, check the circuit breaker for the wall outlet / Wall Connector to make sure it has not tripped.

Further troubleshooting tips based on equipment type:

- If using a Mobile Connector, try charging the vehicle with a different wall outlet.
 - If the vehicle starts to charge, the issue was likely with the original wall outlet. It is recommended that you contact an electrician to inspect the building wiring connection to that outlet.
 - If the vehicle still does not charge, the issue may be with the Mobile Connector.
- If using a Wall Connector, try charging the vehicle with different charging equipment like a Mobile Connector powered by a separate wall outlet.



- If the vehicle starts to charge, the issue was likely with the Wall Connector. Contact an electrician to inspect the building wiring connection to the Wall Connector. They should make sure that all wires are properly connected and torqued according to the installation guide for the Wall Connector.
- Try charging with different wall outlets.
- Try charging with different charging equipment.

(PCS_a019)

Charging slowed - Poor grid power quality possible

Unplug and retry / Try different charging location

Charging speed has been reduced due to a condition that affects your vehicle's ability to charge with AC power. DC fast charging / Supercharging should still function as expected.

This condition could occur due to power supply disturbances caused by the external charging equipment or by the electrical power grid. In some cases, this condition can even result from turning on nearby electric devices that draw a lot of power.

If these possible causes can be ruled out, then a condition with your vehicle itself may also be affecting AC charging.

This alert is often accompanied by other alerts that can help you identify and troubleshoot the condition. Start by investigating any other displayed alerts that relate to charging.

Further troubleshooting tips based on equipment type:

- If using a Mobile Connector, try charging your vehicle with a different wall outlet.
 - If charging speed is no longer reduced, the issue was likely with the original wall outlet. It is recommended that you contact an electrician to inspect the building wiring connection to that outlet.
 - If charging speed is still reduced, the issue may be with the Mobile Connector or the electrical grid.
- If using a Wall Connector, try charging your vehicle with different charging equipment like a Mobile Connector powered by a separate wall outlet.
 - If charging speed is no longer reduced, the issue was likely with the Wall Connector. Contact an electrician to inspect the building wiring connection to the Wall Connector. They should make sure that all wires are properly connected and torqued according to the installation guide for the Wall Connector.

As this alert is usually specific to external charging equipment and power sources, and it does not typically indicate an issue with your vehicle that can be resolved by scheduling service, it is recommended that you:

- Try charging with different wall outlets.
- Try charging with multiple, different types of charging equipment at different locations.

(PCS_a032)

Poor electric grid power quality detected

Try different charging station or location

Charging speed has been reduced or charging has been interrupted due to a condition that affects your vehicle's ability to charge with AC power. DC fast charging / Supercharging should still function as expected.

The onboard charger in your vehicle has detected power supply disturbances in the electrical power grid. These disturbances interfere with your vehicle's charging process.

Typical causes of these power supply disturbances include:

- Issues with the building wiring and/or the wall outlet.
- Issues with the external charging equipment.
- Other large electric devices, such as washing machines or air conditioning units, that temporarily draw a lot of power or otherwise disturb the electrical power grid.
- External conditions affecting the electrical power grid.



As this alert is usually specific to external charging equipment and power sources, and it does not typically indicate an issue with your vehicle that can be resolved by scheduling service, it is recommended that you:

- Try charging with different wall outlets.
- Try charging again (disconnect and reconnect to retry) when other large electric devices are not drawing power.
- Try charging with multiple, different types of charging equipment at different locations.

(PCS_a052)

External charging equipment not providing power Check power source or try different equipment

Charging cannot begin due to a condition that prevents your vehicle from charging with AC power. DC fast charging / Supercharging should still function as expected.

Your vehicle has requested AC power from the external charging equipment, but the onboard charger does not detect any supply voltage coming from the equipment.

This can sometimes be caused by a hardware issue specific to the external charging equipment, which prevents the charging equipment from switching power to the vehicle on or off when requested. It could also occur due to another condition affecting the external charging equipment, the power source it is connected to, or your vehicle itself.

As this alert is usually specific to external charging equipment and power sources, and it does not typically indicate an issue with your vehicle that can be resolved by scheduling service, it is recommended that you try charging with multiple, different types of charging equipment.

For more information on troubleshooting Mobile Connector or Wall Connector status lights, refer to the product's Owner's Manual at [Charging & Adapter Product Guides](#). If using other external charging equipment, refer to the manufacturer's provided documentation for troubleshooting tips.

(PCS_a053)

Charge rate reduced - Unexpected voltage drop Remove extension cords / Have wiring inspected

Charging speed has been reduced because the onboard charger in your vehicle has detected a large voltage drop during charging.

Likely causes of this issue include:

- Problems with the building wiring and/or the wall outlet.
- An extension cord or other wiring that cannot support the requested charge current.

This issue can also result from turning on electric devices that draw a lot of power from the same branch circuit while the vehicle is charging.

If this issue has occurred multiple times at your normal charging location, contact an electrician to inspect the electrical installation. They should check the following:

- Any installed charging equipment and its connection to the building wiring.
- The building wiring, including any wall outlet used with a Mobile Connector.
- The electrical connection to the power utility line where it enters the building.

Discuss with the electrician whether the charge current on the vehicle should be lowered, or if the installation should be upgraded to support a higher charge current.

- Try charging with multiple, different types of charging equipment at different locations.
- Contact an electrician to inspect the wiring and equipment at your normal charging location.



(PCS_a054)

Charging stopped due to large voltage drop Remove extension cords / Have wiring inspected

Charging has been interrupted because the onboard charger in your vehicle has detected an unusually large voltage drop.

Likely causes of this issue include:

- Problems with the building wiring and/or the wall outlet.
- An extension cord or other wiring that cannot support the requested charge current.

This issue can also result from turning on electric devices that draw a lot of power from the same branch circuit while the vehicle is charging.

If this issue has occurred multiple times at your normal charging location, contact an electrician to inspect the electrical installation. They should check the following:

- Any installed charging equipment and its connection to the building wiring.
- The building wiring, including any wall outlet used with a Mobile Connector.
- The electrical connection to the power utility line where it enters the building.

Discuss with the electrician whether the charge current on the vehicle should be lowered, or if the installation should be upgraded to support a higher charge current.

- Try charging with multiple, different types of charging equipment at different locations.
- Contact an electrician to inspect the wiring and equipment at your normal charging location.

(PCS_a073)

External charging equipment error detected Try different charging equipment

AC charging cannot begin due to a condition that prevents your vehicle from charging with AC power. DC fast charging / Supercharging should still function as expected.

Your vehicle's onboard charger is detecting input voltage at the charge port when no power has been requested from the external charging equipment, which indicates the external charging equipment is not functioning as expected.

This can sometimes be caused by a hardware issue specific to the external charging equipment, which prevents the charging equipment from switching power to the vehicle on or off when requested. It could also occur due to another condition affecting the external charging equipment, or a condition affecting your vehicle itself.

As this alert is usually specific to external charging equipment, and it does not typically indicate an issue with your vehicle that can be resolved by scheduling service, it is recommended that you try charging with multiple, different types of charging equipment.

(PCS_a090)

Charging slowed - Some AC phases not powered Check power source and charging equipment

Charging speed has been reduced due to a condition that affects your vehicle's ability to charge with AC power. DC fast charging / Supercharging should still function as expected.

Your vehicle's onboard charger has detected that one or more power converters is not receiving the necessary AC input voltage. For example: during three-phase charging, one phase might be missing from the AC input power provided by the external source. This could occur due to a condition affecting the external charging equipment, the power source it is connected to, or your vehicle itself.

As this alert is usually specific to external charging equipment and power sources, and it does not typically indicate an issue with your vehicle that can be resolved by scheduling service, it is recommended that you try charging with multiple, different types of charging equipment.

**(UI_a006)****Service is required
Schedule service now**

This alert is set remotely by Tesla when a condition requiring service is detected on your vehicle.

This alert can be set due to various conditions. When you schedule service, more information should be available.

This alert can only be cleared by a service technician after your vehicle has been serviced.

As this alert can be present due to various conditions, it is recommended that you schedule service at your earliest convenience.

(UI_a137)**Active service connection to vehicle
Service performing remote diagnostics**

A service technician is remotely logged into your vehicle for diagnosis or repair. You may notice some loss of Infotainment functionality while the connection persists, but this alert does not indicate an issue with your vehicle.

Your vehicle is OK to drive.

This alert should clear automatically after the technician completes vehicle diagnosis or repair. You may find it necessary to restart your touchscreen to restore full Infotainment functionality after the alert has cleared. For more information, see Restarting the Touchscreen in your vehicle's [Do It Yourself Guide](#).

If this alert does not clear after 24 hours, it is recommended that you schedule service via your Tesla Mobile App or with an independent service provider. Please note that independent service provider options may vary, based on your vehicle configuration and your location.

(UMC_a002)**Unable to charge - Mobile Connector GFCI tripped
Unplug charge handle from charge port and retry**

The vehicle cannot charge because the ground-fault circuit interrupter (GFCI) in the Mobile Connector has tripped.

Like the GFCI in a wall outlet, this feature is designed to stop the flow of electricity when there is a problem. It has interrupted charging to protect your vehicle and the charging equipment.

This could happen for many reasons. The problem could be in the charge cable, the charge handle, the charge port, or even an onboard vehicle component.

Inspect the charge port as well as the charge handle for pooled water or unusual levels of moisture.

- If you find excessive moisture, wait and let both the inside area of the charge port and the exposed portion of the charge handle dry sufficiently before trying again.

Inspect the charge equipment for damage.

- If the cable is in any way damaged or deteriorated, **do not use it**. Try different charging equipment instead.
- If the cable is in good condition, try charging again with the same Mobile Connector.

If the issue persists and prevents charging, try charging with different charging equipment.

- Try charging with multiple, different types of charging equipment.

(UMC_a004)**Unable to charge with Mobile Connector
Voltage too high / Try a different wall outlet**

The vehicle cannot charge, or charging is interrupted, because **either** the Mobile Connector:

- Detects the wall outlet voltage is too high.



OR

- Detects an unexpected increase in supply voltage from the wall outlet.

Try charging the vehicle with a different wall outlet.

If the vehicle starts to charge, the issue was likely with the original wall outlet. It is recommended that you contact an electrician to inspect the building wiring connection to that outlet.

If the vehicle still does not charge when you try a different wall outlet, try charging at a different location.

- Try charging with different wall outlets.
- Try charging with different charging equipment.

(UMC_a005)

Unable to charge with Mobile Connector

Voltage too low / Try a different wall outlet

The vehicle cannot charge, or charging is interrupted, because **either** the Mobile Connector:

- Does not detect enough supply voltage from the wall outlet.

OR

- Detects an unexpected drop in supply voltage from the wall outlet.

Try charging the vehicle with a different wall outlet.

If the vehicle starts to charge, the issue was likely with the original wall outlet. It is recommended that you contact an electrician to inspect the building wiring connection to that outlet.

If the vehicle still does not charge when you try a different wall outlet, try charging at a different location.

- Try charging with different wall outlets.
- Try charging with different charging equipment.

(UMC_a008)

Unable to charge - Wall plug temperature high

Wall outlet and wiring inspection recommended

High temperature detected by Mobile Connector alerts indicate the outlet used to charge is becoming too warm, so charging has stopped to protect the outlet.

This is not typically an issue with your vehicle or your Mobile Connector, but rather an issue with the outlet. A warm outlet may be caused by a plug that is not fully inserted, a loose building wiring connection to the outlet, or an outlet that is beginning to wear out.

To regain normal charge operation, make sure your adapter is fully plugged into the outlet. If charging speed does not return to normal, contact an electrician to inspect the outlet and building wiring connections to the outlet and complete any repairs needed.

If the outlet is worn, it should be replaced with a high-quality outlet. Consider upgrading to a Tesla Wall Connector for greater convenience and highest charging speed.

(UMC_a013)

Wall plug adapter error - Charge rate reduced

Plug adapter fully into Mobile Connector and retry

Your Mobile Connector is unable to communicate with the wall plug adapter. Because your Mobile Connector cannot monitor the wall plug adapter temperature, charge current is automatically reduced to 8A.

It is recommended that you try the following troubleshooting steps:



1. Unplug your Mobile Connector, including the wall plug adapter, completely from the wall outlet.
2. Make sure the connection between the wall plug adapter and the main body of your Mobile Connector is secure.
 - a. Disconnect the wall plug adapter completely from the main body of your Mobile Connector.
 - b. Fully reinsert the wall plug adapter into the main body of your Mobile Connector by pushing it into the socket until it snaps into place.
3. Try charging again by plugging the Mobile Connector, including wall plug adapter, fully into the wall outlet.
4. If the alert persists, try using a different wall plug adapter (see steps above to make sure the adapter is fully connected to your Mobile Connector).
 - a. If the alert is no longer present, the issue is likely with the wall plug adapter you were using previously.
 - b. If the alert persists, the issue is likely with your Mobile Connector.

It is recommended that you obtain another wall plug adapter or Mobile Connector as needed, based on the troubleshooting steps above.

In the meantime, you can continue to charge with the same equipment. The charge rate will be reduced, as charge current will be limited to 8A while this condition persists.

(UMC_a014)

Wall plug adapter error - Charge rate reduced

Plug adapter fully into Mobile Connector and retry

Your Mobile Connector is unable to communicate with the wall plug adapter. Because your Mobile Connector cannot identify the type of wall outlet the wall plug adapter is connected to, charge current is automatically reduced to 8A.

It is recommended that you try the following troubleshooting steps:

1. Unplug your Mobile Connector, including the wall plug adapter, completely from the wall outlet.
2. Make sure the connection between the wall plug adapter and the main body of your Mobile Connector is secure.
 - a. Disconnect the wall plug adapter completely from the main body of your Mobile Connector.
 - b. Fully reinsert the wall plug adapter into the main body of your Mobile Connector by pushing it into the socket until it snaps into place.
3. Try charging again by plugging the Mobile Connector, including wall plug adapter, fully into the wall outlet.
4. If the alert persists, try using a different wall plug adapter (see steps above to make sure the adapter is fully connected to your Mobile Connector).
 - a. If the alert is no longer present, the issue is likely with the wall plug adapter you were using previously.
 - b. If the alert persists, the issue is likely with your Mobile Connector.

It is recommended that you obtain another wall plug adapter or Mobile Connector as needed, based on the troubleshooting steps above.

In the meantime, you can continue to charge with the same equipment. The charge rate will be reduced, as charge current will be limited to 8A while this condition persists.

(UMC_a015)

Wall plug adapter error - Charge rate reduced

Plug adapter fully into Mobile Connector and retry

Your Mobile Connector is unable to communicate with the wall plug adapter. Because your Mobile Connector cannot identify the type of wall outlet the wall plug adapter is connected to, charge current is automatically reduced to 8A.

It is recommended that you try the following troubleshooting steps:

1. Unplug your Mobile Connector, including the wall plug adapter, completely from the wall outlet.
2. Make sure the connection between the wall plug adapter and the main body of your Mobile Connector is secure.
 - a. Disconnect the wall plug adapter completely from the main body of your Mobile Connector.



- b. Fully reinsert the wall plug adapter into the main body of your Mobile Connector by pushing it into the socket until it snaps into place.
3. Try charging again by plugging the Mobile Connector, including wall plug adapter, fully into the wall outlet.
4. If the alert persists, try using a different wall plug adapter (see steps above to make sure the adapter is fully connected to your Mobile Connector).
 - a. If the alert is no longer present, the issue is likely with the wall plug adapter you were using previously.
 - b. If the alert persists, the issue is likely with your Mobile Connector.

It is recommended that you obtain another wall plug adapter or Mobile Connector as needed, based on the troubleshooting steps above.

In the meantime, you can continue to charge with the same equipment. The charge rate will be reduced, as charge current will be limited to 8A while this condition persists.

(UMC_a017)

Charge rate reduced - Wall plug temperature high

Wall outlet and wiring inspection recommended

High temperature detected by Mobile Connector alerts indicate the outlet used to charge is becoming too warm, so charging has been slowed to protect the outlet.

This is not typically an issue with your vehicle or your Mobile Connector, but rather an issue with the outlet. A warm outlet may be caused by a plug that is not fully inserted, a loose building wiring connection to the outlet, or an outlet that is beginning to wear out.

To regain normal charge speed, make sure your adapter is fully plugged into the outlet. If charging speed does not return to normal, contact an electrician to inspect the outlet and building wiring connections to the outlet and complete any repairs needed.

If the outlet is worn, it should be replaced with a high-quality outlet. Consider upgrading to a Tesla Wall Connector for greater convenience and highest charging speed.

(VCBATT_a180)

Electrical system power reduced

Vehicle may shut down unexpectedly

The electrical system cannot maintain the voltage required to support all vehicle features.

If this alert is present while you are driving, it is possible your vehicle will shut down unexpectedly. It is also possible that your vehicle will not restart after the current drive.

If this alert is present when your vehicle is in Park or when it first wakes, it is possible your vehicle may not have adequate electrical power to start driving. A separate vehicle alert may be present to indicate that condition.

It is recommended that you eliminate or reduce your use of any nonessential features. This can help your vehicle maintain adequate electrical power for essential functions.

If this alert remains active, it is recommended that you schedule service immediately. Without service, your vehicle may not drive, may shut down unexpectedly, or may not restart.

(VCBATT_a182)

Schedule service to replace low voltage battery

Software will not update until battery is replaced

The low voltage battery is showing degraded performance and needs to be replaced. Until the low voltage battery is replaced, vehicle software updates will not complete.

It is recommended that you have the low voltage battery replaced at your earliest convenient opportunity.

You can schedule service via your Tesla Mobile App, or with an independent service provider that offers low voltage battery replacement for your vehicle. Please note that independent service provider options may vary, based on your vehicle configuration and your location.



Your vehicle is OK to drive with this alert present. However, if you delay the low voltage battery replacement, your vehicle may eventually not have enough electrical power to start or to restart after a recent drive.

If the low voltage battery does not have enough electrical power to turn on your vehicle or open the doors, follow the instructions in [Jump Starting the Low Voltage Battery on page 526](#).

For more information on the battery system, see [High Voltage Battery Information on page 415](#).

(VCBATT_a191)

Electrical system power reduced Vehicle shutting down

The low voltage battery cannot provide the electrical support necessary to drive or continue driving. Your vehicle is shutting down to preserve energy for essential functions other than driving.

Your vehicle cannot be driven or continue driving while this condition continues.

If this alert is present while you are driving, your vehicle needs to come to a stop immediately. It is recommended that you:

- Pull over safely immediately
- Use your Mobile App to contact Tesla Roadside Assistance immediately, or seek other roadside assistance if preferred

If you do not pull over safely within a short time, your vehicle may shut down unexpectedly. It is also possible that your vehicle will not restart once parked.

When this alert is present, the electrical system cannot maintain the voltage required to support all vehicle features. Many vehicle functions may no longer work.

It is possible your vehicle may lose all electrical power. If this occurs, you can still use the manual door releases to exit the vehicle if necessary. For more information, see [Opening Doors from the Interior on page 32](#).

This alert may be present due to various vehicle conditions. For more information and further recommended actions, check for other active vehicle alerts.

If this alert remains present, it is recommended that you schedule service immediately. Without service, your vehicle may not drive, may shut down unexpectedly, or may not restart.

(VCFRONT_a192)

Electrical system is unable to support all features Shutting down features to conserve energy

The electrical system cannot support all vehicle features. Your vehicle is shutting down nonessential features to preserve energy for essential functions.

If you are driving when this alert is present, it is possible your vehicle may shut down unexpectedly. It is also possible that your vehicle will not restart once parked.

Nonessential features may be unavailable, including seat heaters, cabin climate control, and in-vehicle entertainment. This is expected behavior intended to help your vehicle maintain adequate electrical power for essential functions, including the ability to operate headlights, windows and doors, hazard lights, and the front trunk (frunk).

It is possible your vehicle may lose all electrical power. If this occurs, you can still use the manual door releases to exit the vehicle if necessary. For more information, see [Opening Doors from the Interior on page 32](#).

This alert may be present due to various vehicle conditions. For more information and further recommended actions, check for other active vehicle alerts.

(VCBATT_a220)

Electrical system is unable to support all features Schedule service

The low voltage battery cannot provide the electrical support necessary to drive or continue driving.



If this alert is present while you are driving, your vehicle needs to come to a stop as soon as possible. Pull over safely at your earliest opportunity.

It is possible your vehicle will shut down unexpectedly. It is also possible that your vehicle will not restart after the current drive.

You may notice that some nonessential features are not available. This is expected behavior due to your vehicle preserving energy for essential functions.

It is recommended that you eliminate or reduce your use of any nonessential features. This can help your vehicle maintain adequate electrical power for essential functions other than driving, until it can be serviced.

If this alert remains present, it is recommended that you schedule service immediately. Without service, your vehicle may not drive, may shut down unexpectedly, or may not restart.

(VCBATT_a402)

Electrical system backup power is unavailable

Vehicle will consume more energy while idle

The backup power source for the electrical system, the low voltage battery, is not available or cannot provide the voltage required to support all vehicle features.

The primary source of electrical power, the high voltage battery system, will continue to support vehicle functions, even when your vehicle is idle. For more information on the high voltage battery, see [About the High Voltage Battery on page 415](#).

You may notice that your vehicle consumes more energy than usual when you are not driving it, or that your vehicle displays a lower projected range than you would normally expect after charging. This is normal vehicle behavior when this alert is present, and it will continue until the backup power source is restored.

You may also notice that some nonessential features are not available. This is expected behavior due to your vehicle preserving energy for essential functions.

It is recommended that you limit or avoid the use of any nonessential features. This can help your vehicle maintain adequate electrical power for essential functions.

There is a chance that an issue affecting the primary power source could cause your vehicle to shut down unexpectedly.

It is recommended that you schedule service at your earliest opportunity, so the backup power source for the electrical system can be restored.

(VCBATT_a478)

Low voltage battery service is required

Schedule service - Vehicle may not restart

The low voltage battery cannot provide the electrical support necessary to drive or continue driving.

If this alert is present while you are driving, your vehicle needs to come to a stop as soon as possible. Pull over safely at your earliest opportunity.

It is possible your vehicle will shut down unexpectedly. It is also possible that your vehicle will not restart after the current drive.

You may notice that some nonessential features are not available. This is expected behavior due to your vehicle preserving energy for essential functions.

It is recommended that you eliminate or reduce your use of any nonessential features. This can help your vehicle maintain adequate electrical power for essential functions other than driving, until it can be serviced.

If this alert remains present, it is recommended that you schedule service immediately. Without service, your vehicle may not drive, may shut down unexpectedly, or may not restart.

**(VCBATT_a496)****Vehicle is preparing to shut down****PULL OVER SAFELY**

The electrical system cannot provide adequate support to drive or continue driving. Your vehicle is preparing to shut down to preserve energy for essential functions other than driving.

Your vehicle cannot be driven or continue driving while this condition continues.

If this alert is present while you are driving, your vehicle needs to come to a stop as soon as possible. It is recommended that you:

- Pull over safely at your earliest opportunity
- Use your Mobile App to contact Tesla Roadside Assistance immediately, or seek other roadside assistance if preferred

If you do not pull over safely within a short time, your vehicle may shut down unexpectedly. It is also possible that your vehicle will not restart once parked.

It is possible your vehicle may lose all electrical power. If this occurs, you can still use the manual door releases to exit the vehicle if necessary. For more information, see [Opening Doors from the Interior on page 32](#).

This alert may be present due to various vehicle conditions. For more information and further recommended actions, check for other active vehicle alerts.

(VCSEC_a221)**Air pressure below recommendation for tires****Check pressure and refill air as needed**

This alert does NOT indicate that there is a flat tire.

The tire pressure monitoring system (TPMS) has detected that the air pressure in one or more of your tires is at least 20% lower than the recommended cold tire pressure. This recommended pressure should be displayed on the Tire and Loading information label.

See [Maintaining Tire Pressures on page 431](#) for detailed information on how to keep the tires properly inflated.

This alert may appear in cold weather because the air in your tires naturally contracts when it becomes cold, decreasing tire pressures.

- Although drops in tire pressure are expected in colder weather, air should still be added to maintain the recommended cold tire pressure.
- The alert may clear as the vehicle is driven. This is because the tires will warm up and the tire pressure will increase.
 - Even if the alert clears, the tires should still be refilled with air once they have cooled. For the best experience with your vehicle, the recommended cold tire pressure should be maintained at all times.

The alert should clear once the Tire Pressure Monitoring System detects that each of your tires is inflated to the recommended cold pressure.

- The alert and Tire Pressure indicator light may still be present immediately after you have filled your tires to the recommended cold pressure, but both should clear once you have driven a short distance.
- You may need to drive over 15 mph (25 km/h) for at least 10 minutes for the Tire Pressure Monitoring System to measure and report your updated tire pressures.

If you repeatedly see this alert for the same tire, have the tire inspected for a slow leak. You can visit a local tire shop or schedule service using your Tesla Mobile App.

For more information on tire pressure and inflation, see [Tire Care and Maintenance on page 431](#).



(VCSEC_a228)

Air pressure in tires very low

PULL OVER SAFELY - Check for flat tire

This alert indicates that one or more of the tires on your vehicle is extremely low or flat.

The tire pressure monitoring system (TPMS) has detected that the air pressure in one or more of your tires is significantly lower than the recommended cold pressure (RCP). This recommended pressure is displayed on the Tire and Loading information label.

You should pull over carefully as soon as possible. In a safe location, check for a flat tire.

You can request Tesla roadside assistance options (mobile tire, loaner wheel, tow) if required. See [Contacting Tesla Roadside Assistance on page 502](#) for more information.

In a non-emergency situation, it is recommended that you visit your local Service Center for assistance.

See [Maintaining Tire Pressures on page 431](#) for detailed information on how to keep the tires properly inflated.

The alert should clear once the Tire Pressure Monitoring System has a consistent tire pressure measurement for each of your tires of at least 30 psi.

- The alert and Tire Pressure indicator light may still be present immediately after you have filled your tires to the recommended cold pressure, but both should clear once you have driven a short distance.
- You may need to drive over 15 mph (25 km/h) for at least 10 minutes for the Tire Pressure Monitoring System to measure and report your updated tire pressures.

For more information on tire pressure, inflation, and maintenance, see [Tire Care and Maintenance on page 431](#).

Troubleshooting Alerts

APP_w048

Autopilot features temporarily unavailable

Features may be restored on next drive

What this alert means:

Autopilot features are currently unavailable on your vehicle. Depending on the configuration of your vehicle, Autopilot features that are disabled may include:

- Autosteer
- Traffic-Aware Cruise Control
- Automatic Emergency Braking
- Forward Collision Warning
- Lane Departure Warning

What to do:

This alert can be set for several reasons. Check for additional alerts that indicate the cause of this condition.

Typically, Autopilot features are restored on your next drive. If this alert persists across multiple drives, schedule service at your earliest convenience.

For more information and the full list of Autopilot features, see [About Autopilot on page 286](#).

APP_w207

Autosteer temporarily unavailable

What this alert means:



Autosteer is temporarily unavailable. This could be a temporary condition caused by an external factor, such as:

- Missing or faded lane markers.
- Narrow or winding roads.
- Poor visibility due to rain, snow, fog, or other weather.
- Extremely hot or cold temperatures.
- Bright light due to other vehicle headlights, direct sunlight, or other light sources.

This alert will also be present if you exceeded the maximum speed limit for Autosteer with Autosteer active. In this case, Autosteer will not be available for the rest of your current drive.

What to do:

Continue to your destination. If Autosteer is not available by the time you reach your destination, and remains unavailable during your next planned drive, check for the following:

- Damage or obstruction caused by mud, ice, snow, or other environmental factors
- Obstruction caused by an object mounted on the vehicle, like a bike rack
- Obstructions caused by adding paint or adhesive products like wraps, stickers, or rubber coatings to your vehicle
- A damaged or misaligned bumper

If there are no obvious obstructions, or if you find damage to the vehicle, schedule service at your convenience. Your vehicle is OK to drive in the meantime.

For more information, see [Autosteer on page 310](#).

APP_w218

Autosteer speed limit exceeded

Take control of steering wheel

Take control of steering yoke

What this alert means:

Autosteer is unavailable because your vehicle has exceeded the maximum speed limit for this driver assistance feature.

What to do:

Take immediate control of the steering wheel and maintain control until you reach your destination.

In most cases, Autosteer will not be available for the rest of your current drive. To reset it, bring the vehicle to a complete stop and shift into Park. When you shift into Drive to travel to your next destination, Autosteer should be available again.

NOTE: If this alert becomes active while you are driving in Germany, Autosteer should be available again once your vehicle is traveling below the Autosteer speed limit.

If Autosteer is not available during your next drive, and remains unavailable throughout subsequent drives, schedule service at your convenience. Your vehicle is OK to drive in the meantime.

For more information, see [Autosteer on page 310](#).

APP_w221

Cruise control unavailable

Reduced front radar visibility

What this alert means:

Traffic-Aware Cruise Control and Autosteer are unavailable because the radar located in the front bumper area of your vehicle has no or low visibility.

This could be a temporary obstruction caused by factors like snow, ice, dirt, or mud.

**What to do:**

Continue to your destination. Your vehicle is OK to drive. Traffic-Aware Cruise Control and Autosteer will remain unavailable as long as the radar lacks adequate visibility.

If the alert persists throughout your drive, examine the front bumper before your next planned drive and attempt to clear any obstruction. See the [About Autopilot on page 286](#) sections "How It Works" and "Cleaning Cameras and Sensors" for more information on clearing dirt or debris from that area of the vehicle.

If this alert persists throughout subsequent drives but no obstruction is visible on the front bumper where the radar is located, schedule service at your earliest convenience. Your vehicle is OK to drive in the meantime.

APP_w222**Cruise control unavailable****Reduced front camera visibility****What this alert means:**

Traffic-Aware Cruise Control and Autosteer are unavailable because one or more of the front cameras in your vehicle is blocked or blinded by external conditions.

Traffic-Aware Cruise Control and Autosteer will remain unavailable while a front camera lacks adequate visibility. Cameras can be blocked or blinded by:

- Dirt or debris on the camera surface.
- Environmental conditions like rain, fog, snow, or dew.
- Bright sunlight or glare from another light source.
- Condensation (water droplets or mist) on the camera surface.

What to do:

Continue to your destination. Your vehicle is OK to drive.

This is often a temporary issue that clears up on its own. If the alert does not clear by the end of your drive:

- Inspect and clean the front camera area at the top center of the windshield before your next planned drive.
- Check the camera surface for condensation, dirt, or other debris and attempt to clear any obstruction.

See the [About Autopilot on page 286](#) sections "How It Works" and "Cleaning Cameras and Sensors" for more information on clearing dirt or debris from that area of the vehicle.

Although condensation on the inside of the front camera enclosure cannot be wiped clean, you can usually clear it quicker by following these steps:

1. Pre-condition the cabin with the temperature set to High and A/C turned ON.
2. Turn on the front windshield defroster.

If this alert persists throughout subsequent drives but no front camera obstruction is visible, schedule service at your earliest convenience. Your vehicle is OK to drive in the meantime.

APP_w224**Cruise control unavailable****Continue driving to allow cameras to calibrate****What this alert means:**

Traffic-Aware Cruise Control and Autosteer are unavailable because the cameras on your vehicle are not fully calibrated.

Your vehicle must maneuver with great precision when features like Traffic-Aware Cruise Control and Autosteer are active. Before these features can be used for the first time, the cameras must complete an initial self-calibration. Occasionally, one or more cameras can become uncalibrated.



What to do:

Continue to your destination. Your vehicle is OK to drive.

Traffic-Aware Cruise Control and Autosteer will remain unavailable until camera calibration is complete.

When calibration is complete, Traffic-Aware Cruise Control and Autosteer should be available.

For your convenience, a calibration progress indicator is displayed on the touchscreen. Calibration typically completes after your vehicle has driven 20–25 miles (32–40 km), but the distance varies depending on road and environmental conditions. For example, driving on a straight road with highly visible lane markings helps the cameras calibrate quicker.

If the alert persists and camera calibration has not completed after your vehicle has driven 100 miles (160 km) or more, or Traffic-Aware Cruise Control and Autosteer remain unavailable despite successful camera calibration, schedule service at your earliest convenience. Your vehicle is OK to drive in the meantime.

APP_w304

Camera blocked or blinded

Clean camera or wait for it to regain visibility

What this alert means:

One or more of the vehicle cameras is blocked or blinded due to external conditions. When the cameras cannot provide accurate visual information, some or all Autopilot features may be temporarily unavailable.

Cameras can be blocked or blinded by:

- Dirt or debris on the camera surface.
- Environmental conditions like rain, fog, snow, or dew.
- Bright sunlight or glare from another light source.
- Condensation (water droplets or mist) on the camera surface.

What to do:

Continue to your destination. Your vehicle is OK to drive. This is often a temporary issue that will be resolved when condensation evaporates or a particular environmental condition is no longer present.

If the alert does not clear by the time you reach your destination, check camera surfaces for condensation, dirt, or other debris. For camera locations, see [About Autopilot on page 286](#).

Clean the cameras as necessary before your next planned drive. For recommended cleaning procedures, see [Cleaning Cameras and Sensors on page 292](#).

If you continue to see this alert after cleaning the cameras, check the inside surfaces of the door pillar camera enclosures for condensation. Although condensation inside the camera enclosures cannot be wiped clean, you can usually clear it faster by following these steps:

1. Pre-condition the cabin with the temperature set to High and A/C turned ON.
2. Turn on the front windshield defroster.
3. Direct the air vents toward the door pillar cameras.

For more information on clearing condensation from camera enclosures, see [Cleaning Cameras and Sensors on page 292](#).

If the alert does not clear by the end of your next planned drive, despite cleaning the indicated camera(s) and following recommended steps to clear condensation, schedule service at your next convenient opportunity. Your vehicle is OK to drive in the meantime.

BMS_u006

Vehicle shutting down - PULL OVER SAFELY

Battery charge level too low

What this alert means:



Your vehicle has detected that the high voltage battery does not have enough energy remaining to support driving.

Your vehicle will be unable to drive or continue driving until charged.

If this alert is present while you are driving, your vehicle needs to shut down. A separate vehicle alert should be present to indicate this condition. It is also possible your vehicle may shut down unexpectedly.

If this alert is present when your vehicle is parked, you may be unable to drive.

This alert is usually present because your vehicle's high voltage battery charge level has been reduced through normal operation.

What to do:

Charge your vehicle immediately. Charging your vehicle should restore your vehicle's ability to drive.

If this alert occurs during subsequent drives, despite a displayed battery charge level of 5% or higher, schedule service at your earliest convenience.

For more information on the high voltage battery, see [High Voltage Battery Information on page 415](#).

For more information on charging, see [Charging Instructions on page 417](#).

BMS_u018

Maximum battery charge level reduced

OK to drive - Schedule service

What this alert means:

Your vehicle has detected a condition internal to the high voltage battery that is limiting the battery's performance. As a result, maximum charge level and range are reduced. Service is required to restore full performance.

What to do:

If this alert persists, schedule service soon. Without service, your vehicle's maximum charge level and range will remain limited.

Your vehicle is OK to drive and charge.

For more information on the high voltage battery, see [High Voltage Battery Information on page 415](#).

BMS_u030

Charging adapter has electric arc flash hazard

Use different charging equipment

What this alert means:

Charging is unavailable because your vehicle has detected an electric arc flash hazard in the third-party charging adapter used to connect a Combined Charging System (CCS) charge handle to your vehicle's charge port.

An electric arc flash can occur if you attempt to unplug **while actively charging with the third-party charging adapter**, and an electric arc flash can cause serious bodily injury and/or property damage.

What to do:

Follow the steps below to mitigate this risk:

- Make sure charging is completely stopped.
 1. Use your vehicle touchscreen to confirm charging has stopped, or to stop charging if necessary.
 2. Use the charging station display and controls to confirm charging has stopped, or to end any active charging session.
- Make sure no flashing green or blue light (LED) is visible on your vehicle's charge port.
- Unplug the charging adapter from your vehicle's charge port.
- Confirm again that the charging station indicates no active charging session.



- Unplug the charging adapter from the charge handle.

Use different charging equipment to charge your vehicle. For more information on charging, see [Charging Instructions on page 417](#).

You can also try charging your vehicle using a Tesla Supercharger or Destination Charging location, all of which can be located through the map on your vehicle's touchscreen display. See [Maps and Navigation on page 368](#) for more details.

CC_f001

Unable to charge - Insufficient grounding

Proper wiring or outlet grounding must be verified

What this alert means:

No ground connection detected in the Wall Connector.

What to do:

Have the Wall Connector inspected by an electrician to make sure it is properly grounded. Your electrician should ensure there is proper grounding at your circuit breaker or power distribution box and also ensure that appropriate connections are made to the Wall Connector.

For more information, see the [installation guide](#) for your Wall Connector.

CC_f002

Unable to charge - Insufficient grounding

Disconnect and retry or use different equipment

What this alert means:

Ground fault. Current is leaking through an unsafe path. Possible Line to ground or Neutral to ground fault.

What to do:

Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting. If the issue persists, turn OFF the circuit breaker servicing the Wall Connector, wait 10 seconds, turn the circuit breaker ON again, then try reconnecting the Wall Connector to the vehicle. If the issue persists, consult your electrician or contact Tesla.

For more information, see the [installation guide](#) for your Wall Connector.

CC_f003

Unable to charge - Wall Connector GFCI tripped

Disconnect and retry or use different equipment

What this alert means:

Ground fault. Current is leaking through an unsafe path. Possible Line to ground or Neutral to ground fault.

What to do:

Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting. If the issue persists, turn OFF the circuit breaker servicing the Wall Connector, wait 10 seconds, turn the circuit breaker ON again, then try reconnecting the Wall Connector to the vehicle. If the issue persists, consult your electrician or contact Tesla.

For more information, see the [installation guide](#) for your Wall Connector.

CC_f004

Unable to charge - Wall Connector issue

Wall Connector needs service

What this alert means:

Wall Connector hardware issue. Possible issues include:



1. Contactor not working
2. Self-test of internal ground fault monitoring circuit failed
3. Thermal sensor disconnected
4. Other hardware component issues

What to do:

An internal issue was detected by the Wall Connector.

1. Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.
2. If the issue persists, turn OFF the circuit breaker for the Wall Connector, wait 10 seconds, and turn the circuit breaker ON again. Then try reconnecting the Wall Connector to the vehicle.
3. If the issue persists, have an electrician make sure all wires are properly connected and torqued according to the instructions in the Wall Connector Installation Manual.
4. Once your electrician has completed all work and restored power to the Wall Connector, try charging again by reconnecting the Wall Connector to the vehicle.
5. If the issue persists, the Wall Connector requires service.

For more information, see the [installation guide](#) for your Wall Connector.

CC_f005

Unable to charge - Wall Connector GFCI tripped
Disconnect and retry or use different equipment

What this alert means:

Ground fault. Current is leaking through an unsafe path. Possible Line to ground or Neutral to ground fault.

What to do:

Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting. If the issue persists, turn OFF the circuit breaker servicing the Wall Connector, wait 10 seconds, turn the circuit breaker ON again, then try reconnecting the Wall Connector to the vehicle. If the issue persists, consult your electrician or contact Tesla.

For more information, see the [installation guide](#) for your Wall Connector.

CC_f006

Unable to charge - Wall Connector overcurrent
Disconnect and retry or use different equipment

What this alert means:

Over current protection.

What to do:

Reduce the vehicle's charge current setting. If the issue persists, service is required.

For more information, see the [installation guide](#) for your Wall Connector.

CC_f007

Unable to charge - Input voltage too high
Voltage must be within Wall Connector rating

What this alert means:

Over or under voltage protection.

What to do:

Consult your electrician to ensure appropriate voltage on the circuit breaker that services the Wall Connector.



For more information, see the [installation guide](#) for your Wall Connector.

CC_f008

Unable to charge - Input voltage too low
Voltage must be within Wall Connector rating

What this alert means:

Over or under voltage protection.

What to do:

Consult your electrician to ensure appropriate voltage on the circuit breaker that services the Wall Connector.

For more information, see the [installation guide](#) for your Wall Connector.

CC_f009

Unable to charge - Input wired incorrectly
Input wiring to Wall Connector must be corrected

What this alert means:

Input miswired: possibly Line and Neutral are swapped.

What to do:

The wiring between the wall power and the Wall Connector has been incorrectly installed. Consult your electrician.

For more information, see the [installation guide](#) for your Wall Connector.

CC_f010

Unable to charge - Wall Connector issue
Wall Connector needs service

What this alert means:

Wall Connector hardware issue. Possible issues include:

1. Contactor not working
2. Self-test of internal ground fault monitoring circuit failed
3. Thermal sensor disconnected
4. Other hardware component issues

What to do:

An internal issue was detected by the Wall Connector.

1. Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.
2. If the issue persists, turn OFF the circuit breaker for the Wall Connector, wait 10 seconds, and turn the circuit breaker ON again. Then try reconnecting the Wall Connector to the vehicle.
3. If the issue persists, have an electrician make sure all wires are properly connected and torqued according to the instructions in the Wall Connector Installation Manual.
4. Once your electrician has completed all work and restored power to the Wall Connector, try charging again by reconnecting the Wall Connector to the vehicle.
5. If the issue persists, the Wall Connector requires service.

For more information, see the [installation guide](#) for your Wall Connector.



CC_f011

**Unable to charge - Wall Connector too hot
Let Wall Connector cool and try again**

What this alert means:

Over temperature protection (latchoff).

What to do:

Make sure the Wall Connector is not covered by anything and that there is no heat source nearby. If the problem persists in normal ambient temperatures (under 100°F or 38°C) , service is required.

For more information, see the [installation guide](#) for your Wall Connector.

CC_f012

**Unable to charge - Wall connection too hot
Outlet or Wall Connector wiring must be checked**

High temperature detected by Wall Connector alerts indicate the building connection to the Wall Connector is getting too warm, so charging has stopped to protect the wiring and Wall Connector.

This is not typically an issue with your vehicle or your Wall Connector, but rather an issue with the building wiring. This may be caused by a loose building wiring connection to the Wall Connector and can be fixed quickly by an electrician.

To regain normal charge operation, try the following steps.

If the Wall Connector is plugged into a wall outlet, make sure:

- The plug is fully inserted into the receptacle / outlet
- The plug / outlet area is not blocked or covered by anything
- There is no heat source nearby

If the issue persists or the Wall Connector is hard-wired, contact an electrician to inspect the building wiring connection to the Wall Connector. They should make sure that all wires are properly connected and torqued according to the installation guide for the Wall Connector.

For more information, see the [installation guide](#) for your Wall Connector.

CC_f013

**Unable to charge - Charge handle too hot
Check charge handle or charge port for debris**

What this alert means:

Over temperature protection (latchoff).

What to do:

Make sure the connector is fully inserted into the charge inlet in the vehicle's charging port, is not covered by anything, and there is no heat source nearby. If the issue persists in normal ambient temperatures (under 100°F or 38°C) , service is required.

For more information, see the [installation guide](#) for your Wall Connector.

CC_f014

**Unable to charge - Wall Connector issue
Wall Connector needs service**

What this alert means:

Wall Connector hardware issue. Possible issues include:



1. Contactor not working
2. Self-test of internal ground fault monitoring circuit failed
3. Thermal sensor disconnected
4. Other hardware component issues

What to do:

An internal issue was detected by the Wall Connector.

1. Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.
2. If the issue persists, turn OFF the circuit breaker for the Wall Connector, wait 10 seconds, and turn the circuit breaker ON again. Then try reconnecting the Wall Connector to the vehicle.
3. If the issue persists, have an electrician make sure all wires are properly connected and torqued according to the instructions in the Wall Connector Installation Manual.
4. Once your electrician has completed all work and restored power to the Wall Connector, try charging again by reconnecting the Wall Connector to the vehicle.
5. If the issue persists, the Wall Connector requires service.

For more information, see the [installation guide](#) for your Wall Connector.

CC_f015

Unable to charge - Vehicle connection issue
Insert charge handle fully into charge port

What this alert means:

A communication error occurred between the Wall Connector and the vehicle.

What to do:

Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.

1. If the issue persists, turn OFF the circuit breaker servicing the Wall Connector, wait 10 seconds, turn the circuit breaker ON again, then try reconnecting the Wall Connector to the vehicle.
2. If the issue persists and other charging equipment is available, plug the vehicle into another Wall Connector or a Mobile Connector to determine if the vehicle is able to communicate with other charging equipment.
3. If the issue persists, service is required.

For more information, see the [installation guide](#) for your Wall Connector.

CC_f016

Unable to charge - Vehicle connection issue
Insert charge handle fully into charge port

What this alert means:

A communication error occurred between the Wall Connector and the vehicle.

What to do:

Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.

1. If the issue persists, turn OFF the circuit breaker servicing the Wall Connector, wait 10 seconds, turn the circuit breaker ON again, then try reconnecting the Wall Connector to the vehicle.
2. If the issue persists and other charging equipment is available, plug the vehicle into another Wall Connector or a Mobile Connector to determine if the vehicle is able to communicate with other charging equipment.
3. If the issue persists, service is required.



For more information, see the [installation guide](#) for your Wall Connector.

CC_f017

Unable to charge - Vehicle connection issue

Insert charge handle fully into charge port

What this alert means:

A communication error occurred between the Wall Connector and the vehicle.

What to do:

Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.

1. If the issue persists, turn OFF the circuit breaker servicing the Wall Connector, wait 10 seconds, turn the circuit breaker ON again, then try reconnecting the Wall Connector to the vehicle.
2. If the issue persists and other charging equipment is available, plug the vehicle into another Wall Connector or a Mobile Connector to determine if the vehicle is able to communicate with other charging equipment.
3. If the issue persists, service is required.

For more information, see the [installation guide](#) for your Wall Connector.

CC_f018

Unable to charge - Vehicle connection issue

Insert charge handle fully into charge port

What this alert means:

A communication error occurred between the Wall Connector and the vehicle.

What to do:

Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.

1. If the issue persists, turn OFF the circuit breaker servicing the Wall Connector, wait 10 seconds, turn the circuit breaker ON again, then try reconnecting the Wall Connector to the vehicle.
2. If the issue persists and other charging equipment is available, plug the vehicle into another Wall Connector or a Mobile Connector to determine if the vehicle is able to communicate with other charging equipment.
3. If the issue persists, service is required.

For more information, see the [installation guide](#) for your Wall Connector.

CC_f019

Unable to charge - Vehicle connection issue

Insert charge handle fully into charge port

What this alert means:

A communication error occurred between the Wall Connector and the vehicle.

What to do:

Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.

1. If the issue persists, turn OFF the circuit breaker servicing the Wall Connector, wait 10 seconds, turn the circuit breaker ON again, then try reconnecting the Wall Connector to the vehicle.
2. If the issue persists and other charging equipment is available, plug the vehicle into another Wall Connector or a Mobile Connector to determine if the vehicle is able to communicate with other charging equipment.
3. If the issue persists, service is required.

For more information, see the [installation guide](#) for your Wall Connector.



CC_f020

Unable to charge - Wall Connector issue
Wall Connector needs service

What this alert means:

Wall Connector hardware issue. Possible issues include:

1. Contactor not working
2. Self-test of internal ground fault monitoring circuit failed
3. Thermal sensor disconnected
4. Other hardware component issues

What to do:

An internal issue was detected by the Wall Connector.

1. Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.
2. If the issue persists, turn OFF the circuit breaker for the Wall Connector, wait 10 seconds, and turn the circuit breaker ON again. Then try reconnecting the Wall Connector to the vehicle.
3. If the issue persists, have an electrician make sure all wires are properly connected and torqued according to the instructions in the Wall Connector Installation Manual.
4. Once your electrician has completed all work and restored power to the Wall Connector, try charging again by reconnecting the Wall Connector to the vehicle.
5. If the issue persists, the Wall Connector requires service.

For more information, see the [installation guide](#) for your Wall Connector.

CC_f021

Unable to charge - No primary Wall Connector
Check that primary unit is powered and available

What this alert means:

Load sharing (circuit breaker sharing) network: Need one (and only one) Wall Connector set as primary.

What to do:

Only one Wall Connector can be set to a primary configuration. Have your electrician confirm:

1. Only one of the Wall Connectors is set as primary.
2. All other Wall Connectors linked to the primary unit are set to paired position (position F).

For more information, see the [installation guide](#) for your Wall Connector.

CC_f022

Unable to charge - More than 1 primary unit
Ensure only 1 Wall Connector is set as primary

What this alert means:

Load sharing (circuit breaker sharing) network: Need one (and only one) Wall Connector set as primary.

What to do:

Only one Wall Connector can be set to a primary configuration. Have your electrician confirm:

1. Only one of the Wall Connectors is set as primary.
2. All other Wall Connectors linked to the primary unit are set to paired position (position F).



For more information, see the [installation guide](#) for your Wall Connector.

CC_f023

Unable to charge - Too many Wall Connectors

Ensure no more than 3 units paired with primary

What this alert means:

Load sharing (circuit breaker sharing) network: More than three Wall Connectors are paired with the same primary unit.

What to do:

Consult your electrician to have one or more paired Wall Connectors moved to a different circuit and disconnected (unpaired) from this load sharing (circuit breaker sharing) network.

For more information, see the [installation guide](#) for your Wall Connector.

CC_f024

Unable to charge - Low Wall Connector current

Primary unit current setting must be increased

What this alert means:

Incorrect rotary switch setting.

What to do:

Have your electrician adjust the Wall Connector's internal rotary switch to a valid operating current setting. They should first make sure there is no power to the Wall Connector. The correlation between switch setting and current should be printed on the inside of the Wall Connector. Your electrician should also refer to the Set the Operating Current section in the Wall Connector Installation Manual.

If the Wall Connector is set up for load sharing (circuit breaker sharing) and paired with other Wall Connectors, the rotary switch of the primary unit must be set to an operating current setting that allows each paired Wall Connector to receive at least 6A of charge current.

Example: Three Wall Connectors are paired for load sharing. The primary unit needs to be set to a current of at least $3 * 6A = 18A$ or greater.

For more information, see the [installation guide](#) for your Wall Connector.

CC_f025

Unable to charge - Wall Connector issue

Wall Connector needs service

What this alert means:

Wall Connector hardware issue. Possible issues include:

1. Contactor not working
2. Self-test of internal ground fault monitoring circuit failed
3. Thermal sensor disconnected
4. Other hardware component issues

What to do:

An internal issue was detected by the Wall Connector.

1. Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.
2. If the issue persists, turn OFF the circuit breaker for the Wall Connector, wait 10 seconds, and turn the circuit breaker ON again. Then try reconnecting the Wall Connector to the vehicle.



3. If the issue persists, have an electrician make sure all wires are properly connected and torqued according to the instructions in the Wall Connector Installation Manual.
4. Once your electrician has completed all work and restored power to the Wall Connector, try charging again by reconnecting the Wall Connector to the vehicle.
5. If the issue persists, the Wall Connector requires service.

For more information, see the [installation guide](#) for your Wall Connector.

CC_f026

Unable to charge - Wall Connector issue Wall Connector needs service

What this alert means:

Wall Connector hardware issue. Possible issues include:

1. Contactor not working
2. Self-test of internal ground fault monitoring circuit failed
3. Thermal sensor disconnected
4. Other hardware component issues

What to do:

An internal issue was detected by the Wall Connector.

1. Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.
2. If the issue persists, turn OFF the circuit breaker for the Wall Connector, wait 10 seconds, and turn the circuit breaker ON again. Then try reconnecting the Wall Connector to the vehicle.
3. If the issue persists, have an electrician make sure all wires are properly connected and torqued according to the instructions in the Wall Connector Installation Manual.
4. Once your electrician has completed all work and restored power to the Wall Connector, try charging again by reconnecting the Wall Connector to the vehicle.
5. If the issue persists, the Wall Connector requires service.

For more information, see the [installation guide](#) for your Wall Connector.

CC_f027

Unable to charge - Wall Connector issue Wall Connector needs service

What this alert means:

Wall Connector hardware issue. Possible issues include:

1. Contactor not working
2. Self-test of internal ground fault monitoring circuit failed
3. Thermal sensor disconnected
4. Other hardware component issues

What to do:

An internal issue was detected by the Wall Connector.

1. Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.
2. If the issue persists, turn OFF the circuit breaker for the Wall Connector, wait 10 seconds, and turn the circuit breaker ON again. Then try reconnecting the Wall Connector to the vehicle.



3. If the issue persists, have an electrician make sure all wires are properly connected and torqued according to the instructions in the Wall Connector Installation Manual.
4. Once your electrician has completed all work and restored power to the Wall Connector, try charging again by reconnecting the Wall Connector to the vehicle.
5. If the issue persists, the Wall Connector requires service.

For more information, see the [installation guide](#) for your Wall Connector.

CC_f028

Unable to charge - Incorrect switch setting

Wall Connector rotary switch must be adjusted

What this alert means:

Incorrect rotary switch setting.

What to do:

Have your electrician adjust the Wall Connector's internal rotary switch to a valid operating current setting. They should first make sure there is no power to the Wall Connector. The correlation between switch setting and current should be printed on the inside of the Wall Connector. Your electrician should also refer to the Set the Operating Current section in the Wall Connector Installation Manual.

If the Wall Connector is set up for load sharing (circuit breaker sharing) and paired with other Wall Connectors, the rotary switch of the primary unit must be set to an operating current setting that allows each paired Wall Connector to receive at least 6A of charge current.

Example: Three Wall Connectors are paired for load sharing. The primary unit needs to be set to a current of at least $3 * 6A = 18A$ or greater.

For more information, see the [installation guide](#) for your Wall Connector.

CC_f029

Unable to charge - Vehicle connection issue

Insert charge handle fully into charge port

What this alert means:

A communication error occurred between the Wall Connector and the vehicle.

What to do:

Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.

1. If the issue persists, turn OFF the circuit breaker servicing the Wall Connector, wait 10 seconds, turn the circuit breaker ON again, then try reconnecting the Wall Connector to the vehicle.
2. If the issue persists and other charging equipment is available, plug the vehicle into another Wall Connector or a Mobile Connector to determine if the vehicle is able to communicate with other charging equipment.
3. If the issue persists, service is required.

For more information, see the [installation guide](#) for your Wall Connector.

CC_f030

Unable to charge - Primary / paired unit mismatch

Wall Connector current ratings must match

What this alert means:

Load sharing (circuit breaker sharing) network: The paired Wall Connectors have different maximum current capabilities.

What to do:



Only Wall Connectors with the same maximum current capabilities can be paired in a load sharing (circuit breaker sharing) network. Have your electrician inspect the type labels on the Wall Connectors and make sure the current capabilities match. It is further recommended that your electrician only pair Wall Connectors with the same part number, as an easy way to make sure paired units are compatible.

For more information, see the [installation guide](#) for your Wall Connector.

CC_f041

Charge rate reduced - Wall connection hot

Outlet or Wall Connector wiring must be checked

What this alert means:

High temperature detected by Wall Connector alerts indicate the building connection to the Wall Connector is getting too warm, so charging has been slowed to protect the wiring and Wall Connector.

This is not typically an issue with your vehicle or your Wall Connector, but rather an issue with the building wiring. This may be caused by a loose building wiring connection to the Wall Connector and can be fixed quickly by an electrician.

What to do:

Contact an electrician to inspect the building wiring connection to the Wall Connector. They should make sure that all wires are properly connected and torqued according to the installation guide for the Wall Connector.

For more information, see the [installation guide](#) for your Wall Connector.

CHG_f035

Charging equipment communication error

Try again or try different equipment

What this alert means:

Your vehicle is unable to charge because it cannot communicate effectively with the external charging equipment. It cannot sense a valid control pilot signal coming from the charging equipment.

This alert is usually specific to external charging equipment and power sources and does not typically indicate an issue with your vehicle that can be resolved by scheduling service.

What to do:

First, confirm the lack of effective communication is caused by the external charging equipment rather than an issue with your vehicle. This is usually the case.

Try charging the vehicle using different external charging equipment (including charge cable, charging station, or charging stall).

- If the vehicle begins charging, the issue was likely with the equipment.
- If the vehicle still does not charge, the issue may be with the vehicle.

If the issue is suspected to be with the vehicle, inspect the charge port inlet and the charge cable connector for any obstructions, such as debris, moisture, and/or foreign objects. Make sure any charge port inlet obstruction has been removed and any moisture has been allowed to dry, then try re-inserting the cable into the charge port.

You can also try charging your vehicle using a Tesla Supercharger or Destination Charging location, all of which can be located through the map on your vehicle's touchscreen display. See [Maps and Navigation on page 368](#) for more details.

For more information on troubleshooting Mobile Connector or Wall Connector status lights, refer to the product's Owner's Manual at [Charging & Adapter Product Guides](#).

For more information on charging, see [Charging Instructions on page 417](#).



CHG_f083

**Cannot charge - Poor grid power quality possible
Retry / Try other charge location or Supercharging**

What this alert means:

Power has been lost during charging. This could result from the charging equipment losing power from the source (for example, a wall outlet) or from an issue with the charging equipment.

What to do:

This alert is often accompanied by other alerts that can help you identify and troubleshoot the issue. Start by investigating any other displayed alerts that relate to charging issues.

Alternatively, you can check Mobile Connector or Wall Connector status lights to confirm power to the device, and also refer to the product owner's manual for troubleshooting information based on blink codes. If using other (non-Tesla) external charging equipment, check for a display or other user interface that provides troubleshooting help.

If there is clearly no power to the charging equipment, check the circuit breaker for the wall outlet / Wall Connector to make sure it has not tripped.

Further troubleshooting tips based on equipment type:

- If using a Mobile Connector, try charging the vehicle with a different wall outlet.
 - If the vehicle starts to charge, the issue was likely with the original wall outlet.
 - If the vehicle still does not charge, the issue may be with the Mobile Connector.
- If using a Wall Connector, try charging the vehicle with different charging equipment like a Mobile Connector powered by a separate wall outlet.
 - If the vehicle starts to charge, the issue was likely with the Wall Connector.

If the issue is with the original wall outlet or the Wall Connector, contact an electrician to inspect the wiring connection.

This alert is usually specific to external charging equipment and power sources and does not typically indicate an issue with your vehicle that can be resolved by scheduling service.

You can also try charging your vehicle using a Tesla Supercharger or Destination Charging location, all of which can be located through the map on your vehicle's touchscreen display. See [Maps and Navigation on page 368](#) for more details.

For more information on troubleshooting Mobile Connector or Wall Connector status lights, refer to the product's Owner's Manual at [Charging & Adapter Product Guides](#).

CHG_f091

**Charging equipment not recognized
Try again or try different equipment**

What this alert means:

The charge port is unable to detect whether a charge cable is inserted, or the type of charge cable connected.

This alert is usually specific to external charging equipment and power sources and does not typically indicate an issue with your vehicle that can be resolved by scheduling service.

What to do:

If this alert appears while a charge cable **is** connected, determine whether the issue is caused by the charging equipment or the vehicle. Try charging the vehicle using different external charging equipment (including charge cable, charging station, or charging stall).

- If the vehicle begins charging, the issue was likely with the equipment.
- If the vehicle still does not charge, the issue may be with the vehicle.



If this alert appears while a charge cable is **not** connected or if the issue is suspected to be with the vehicle, inspect the charge port inlet and the charge cable connector for any obstructions, such as debris, moisture, and/or foreign objects. Make sure any charge port inlet obstruction has been removed and any moisture has been allowed to dry, then try re-inserting the cable into the charge port.

You can also try charging your vehicle using a Tesla Supercharger or Destination Charging location, all of which can be located through the map on your vehicle's touchscreen display. See [Maps and Navigation on page 368](#) for more details.

For more information on troubleshooting Mobile Connector or Wall Connector status lights, refer to the product's Owner's Manual at [Charging & Adapter Product Guides](#).

For more information on charging, see [Charging Instructions on page 417](#).

CHGS_f083

**Cannot charge - Poor grid power quality possible
Retry / Try other charge location or Supercharging**

What this alert means:

Power has been lost during charging. This could result from the charging equipment losing power from the source (for example, a wall outlet) or from an issue with the charging equipment.

What to do:

This alert is often accompanied by other alerts that can help you identify and troubleshoot the issue. Start by investigating any other displayed alerts that relate to charging issues.

Alternatively, you can check Mobile Connector or Wall Connector status lights to confirm power to the device, and also refer to the product owner's manual for troubleshooting information based on blink codes. If using other (non-Tesla) external charging equipment, check for a display or other user interface that provides troubleshooting help.

If there is clearly no power to the charging equipment, check the circuit breaker for the wall outlet / Wall Connector to make sure it has not tripped.

Further troubleshooting tips based on equipment type:

- If using a Mobile Connector, try charging the vehicle with a different wall outlet.
 - If the vehicle starts to charge, the issue was likely with the original wall outlet.
 - If the vehicle still does not charge, the issue may be with the Mobile Connector.
- If using a Wall Connector, try charging the vehicle with different charging equipment like a Mobile Connector powered by a separate wall outlet.
 - If the vehicle starts to charge, the issue was likely with the Wall Connector.

If the issue is with the original wall outlet or the Wall Connector, contact an electrician to inspect the wiring connection.

This alert is usually specific to external charging equipment and power sources and does not typically indicate an issue with your vehicle that can be resolved by scheduling service.

You can also try charging your vehicle using a Tesla Supercharger or Destination Charging location, all of which can be located through the map on your vehicle's touchscreen display. See [Maps and Navigation on page 368](#) for more details.

For more information on troubleshooting Mobile Connector or Wall Connector status lights, refer to the product's Owner's Manual at [Charging & Adapter Product Guides](#).

CHG_u001

**Charge rate reduced - Unexpected voltage drop
Remove extension cords / Have wiring inspected**

What this alert means:

Charging speed has been reduced because the onboard charger in your vehicle has detected a large voltage drop during charging.



Likely causes of this issue include:

- Problems with the building wiring and/or the wall outlet.
- An extension cord or other wiring that cannot support the requested charge current.

This issue can also result from turning on electric devices that draw a lot of power from the same branch circuit while the vehicle is charging.

What to do:

If this issue has occurred multiple times at your normal charging location, contact an electrician to inspect the electrical installation. They should check the following:

- Any installed charging equipment and its connection to the building wiring.
- The building wiring, including any wall outlet used with a Mobile Connector.
- The electrical connection to the power utility line where it enters the building.

Discuss with the electrician whether the charge current on the vehicle should be lowered, or if the installation should be upgraded to support a higher charge current.

This alert is usually specific to external charging equipment and power sources and does not typically indicate an issue with your vehicle that can be resolved by scheduling service.

You can also try charging your vehicle using a Tesla Supercharger or Destination Charging location, all of which can be located through the map on your vehicle's touchscreen display. See [Maps and Navigation on page 368](#) for more details.

For more information on troubleshooting Mobile Connector or Wall Connector status lights, refer to the product's Owner's Manual at [Charging & Adapter Product Guides](#).

CHG_u002

Charging stopped due to large voltage drop

Remove extension cords / Have wiring inspected

What this alert means:

Charging has been interrupted because the onboard charger in your vehicle has detected an unusually large voltage drop.

Likely causes of this issue include:

- Problems with the building wiring and/or the wall outlet.
- An extension cord or other wiring that cannot support the requested charge current.

This issue can also result from turning on electric devices that draw a lot of power from the same branch circuit while the vehicle is charging.

What to do:

If this issue has occurred multiple times at your normal charging location, contact an electrician to inspect the electrical installation. They should check the following:

- Any installed charging equipment and its connection to the building wiring.
- The building wiring, including any wall outlet used with a Mobile Connector.
- The electrical connection to the power utility line where it enters the building.

Discuss with the electrician whether the charge current on the vehicle should be lowered, or if the installation should be upgraded to support a higher charge current.

This alert is usually specific to external charging equipment and power sources and does not typically indicate an issue with your vehicle that can be resolved by scheduling service.



You can also try charging your vehicle using a Tesla Supercharger or Destination Charging location, all of which can be located through the map on your vehicle's touchscreen display. See [Maps and Navigation on page 368](#) for more details.

For more information on troubleshooting Mobile Connector or Wall Connector status lights, refer to the product's Owner's Manual at [Charging & Adapter Product Guides](#).

CHG_u004

Charging stopped - Power lost while charging

Check power source and charging equipment

What this alert means:

Power has been lost during charging. This could result from the charging equipment losing power from the source (for example, a wall outlet) or from an issue with the charging equipment.

What to do:

This alert is often accompanied by other alerts that can help you identify and troubleshoot the issue. Start by investigating any other displayed alerts that relate to charging issues.

Alternatively, you can check Mobile Connector or Wall Connector status lights to confirm power to the device, and also refer to the product owner's manual for troubleshooting information based on blink codes. If using other (non-Tesla) external charging equipment, check for a display or other user interface that provides troubleshooting help.

If there is clearly no power to the charging equipment, check the circuit breaker for the wall outlet / Wall Connector to make sure it has not tripped.

Further troubleshooting tips based on equipment type:

- If using a Mobile Connector, try charging the vehicle with a different wall outlet.
 - If the vehicle starts to charge, the issue was likely with the original wall outlet.
 - If the vehicle still does not charge, the issue may be with the Mobile Connector.
- If using a Wall Connector, try charging the vehicle with different charging equipment like a Mobile Connector powered by a separate wall outlet.
 - If the vehicle starts to charge, the issue was likely with the Wall Connector.

If the issue is with the original wall outlet or the Wall Connector, contact an electrician to inspect the wiring connection.

This alert is usually specific to external charging equipment and power sources and does not typically indicate an issue with your vehicle that can be resolved by scheduling service.

You can also try charging your vehicle using a Tesla Supercharger or Destination Charging location, all of which can be located through the map on your vehicle's touchscreen display. See [Maps and Navigation on page 368](#) for more details.

For more information on troubleshooting Mobile Connector or Wall Connector status lights, refer to the product's Owner's Manual at [Charging & Adapter Product Guides](#).

CHG_u005

Unable to charge - Charge station not powered

Check power source or try a different station

What this alert means:

Charging cannot begin because the charging equipment is not ready. A charge handle is detected, but the charging station is not communicating with the vehicle. This issue could occur because:

- The charging station is not powered.
- The control pilot signal between the charging station and the vehicle is interrupted.

This alert is usually specific to external charging equipment and power sources and does not typically indicate an issue with your vehicle that can be resolved by scheduling service.

**What to do:**

Try charging the vehicle with different charging equipment or at a different charging station.

- If the vehicle begins charging, the issue was likely with the equipment.
- If the vehicle still does not charge, the issue may be with the vehicle.

If using a Mobile Connector or Wall Connector, first check the status lights on the front. If no status lights are visible, check the power source and contact an electrician to inspect the building wiring connection to the wall outlet or the Wall Connector to confirm that all wires are properly connected and torqued.

If using other external charging equipment, consult the product's owner's manual to learn how to confirm that the station is powered. Contact an electrician to inspect the building wiring and charging equipment as necessary.

For more information on troubleshooting Mobile Connector or Wall Connector status lights, refer to the product's Owner's Manual at [Charging & Adapter Product Guides](#).

You can also try charging your vehicle using a Tesla Supercharger or Destination Charging location, all of which can be located through the map on your vehicle's touchscreen display. See [Maps and Navigation on page 368](#) for more details.

CHG_u006**Charge port latch not engaged****Fully insert charge cable or check for obstruction****What this alert means:**

The charge port latch is unable to latch the charge cable in the charge port inlet. If the latch is not engaged, AC charging (for example, charging with a Mobile Connector or Wall Connector) will be limited to 16A and DC Fast Charging / Supercharging will be unavailable.

The charge port light will pulse amber if this alert appears during AC charging and will be solid amber if this alert appears when attempting to DC Fast Charge / Supercharge.

This alert is usually specific to external charging equipment and power sources and does not typically indicate an issue with your vehicle that can be resolved by scheduling service.

What to do:

Try re-inserting the charge cable fully into the charge port inlet.

If your vehicle begins charging and the charge port light pulses green, the charge cable may not have been fully inserted before. AC charging should no longer be limited, and DC Fast Charging / Supercharging should be available.

If charging is still limited or the vehicle will not charge at all, inspect the charge port inlet and the charge cable connector for any obstructions, such as debris, moisture, and/or foreign objects. Make sure any charge port inlet obstruction has been removed and any moisture has been allowed to dry, then try re-inserting the cable into the charge port.

If charging is still limited or the vehicle will not charge at all, make sure the charge port latch manual release cable (located on the left-hand side in the trunk) has not been pulled. Make sure the handle (usually ring-shaped or a strap) for the manual release cable is free of obstructions and that nothing is attached to it (like a cargo net or umbrella). For more information on the charge port latch manual release, see [Manually Releasing Charge Cable on page 426](#) [Manually Releasing Charge Cable on page 427](#).

You can also try charging your vehicle using a Tesla Supercharger or Destination Charging location, all of which can be located through the map on your vehicle's touchscreen display. See [Maps and Navigation on page 368](#) for more details.

For more information on troubleshooting Mobile Connector or Wall Connector status lights, refer to the product's Owner's Manual at [Charging & Adapter Product Guides](#).

For more information on charging, see [Charging Instructions on page 417](#).

**CHG_u007****Charging equipment reports error****Check equipment for error code or message****What this alert means:**

Charging was interrupted because the external charging equipment has reported a fault that prevents the vehicle from charging.

This alert is usually specific to external charging equipment and power sources and does not typically indicate an issue with your vehicle that can be resolved by scheduling service.

What to do:

Inspect the external charging equipment and look for status lights, displays, or other status indicators on the equipment. For more information on troubleshooting Mobile Connector or Wall Connector status lights, refer to the product's Owner's Manual at [Charging & Adapter Product Guides](#).

Try charging the vehicle with different charging equipment or at a different charging station.

- If the vehicle begins charging, the issue was likely with the equipment.
- If the vehicle still does not charge, the issue may be with the vehicle.

You can also try charging your vehicle using a Tesla Supercharger or Destination Charging location, all of which can be located through the map on your vehicle's touchscreen display. See [Maps and Navigation on page 368](#) for more details.

CHG_u010**External charging equipment error detected****Try different charging equipment****What this alert means:**

AC charging cannot begin due to a condition that prevents your vehicle from charging with AC power. DC fast charging / Supercharging should still function as expected.

Your vehicle's onboard charger is detecting input voltage at the charge port when no power has been requested from the external charging equipment, which indicates the external charging equipment is not functioning as expected.

This can sometimes be caused by a hardware issue specific to the external charging equipment, which prevents the charging equipment from switching power to the vehicle on or off when requested. It could also occur due to another condition affecting the external charging equipment, or a condition affecting your vehicle itself.

What to do:

This alert is usually specific to external charging equipment and power sources and does not typically indicate an issue with your vehicle that can be resolved by scheduling service.

Try charging with multiple, different types of charging equipment.

You can also try charging your vehicle using a Tesla Supercharger or Destination Charging location, all of which can be located through the map on your vehicle's touchscreen display. See [Maps and Navigation on page 368](#) for more details.

For more information on troubleshooting Mobile Connector or Wall Connector status lights, refer to the product's Owner's Manual at [Charging & Adapter Product Guides](#).

CHG_u012**Power grid or vehicle issue limiting AC charging****Unplug and retry / Try different charging location****What this alert means:**

Charging speed has been reduced due to a condition that affects your vehicle's ability to charge with AC power. DC fast charging / Supercharging should still function as expected.



This may be due to power supply disturbances caused by the external charging equipment or by the electrical power grid. In some cases, this condition may be the result of using nearby electric devices that draw a lot of power.

If these possible causes can be ruled out, then a condition with your vehicle itself may also be affecting AC charging.

What to do:

If this alert is accompanied by another alert that specifies the condition affecting AC charging, start by investigating that alert.

Further troubleshooting tips based on equipment type:

- If using a Mobile Connector, try charging the vehicle with a different wall outlet.
 - If the vehicle starts to charge, the issue was likely with the original wall outlet.
 - If the vehicle still does not charge, the issue may be with the Mobile Connector.
- If using a Wall Connector, try charging the vehicle with different charging equipment like a Mobile Connector powered by a separate wall outlet.
 - If the vehicle starts to charge, the issue was likely with the Wall Connector.

If the issue is with the original wall outlet or the Wall Connector, contact an electrician to inspect the wiring connection.

You can also try charging your vehicle using a Tesla Supercharger or Destination Charging location, all of which can be located through the map on your vehicle's touchscreen display. See [Maps and Navigation on page 368](#) for more details.

If this alert persists when attempting to charge at multiple locations and with different charging equipment, it is recommended that you schedule service.

For more information on troubleshooting Mobile Connector or Wall Connector status lights, refer to the product's Owner's Manual at [Charging & Adapter Product Guides](#).

CHG_u013

Charging equipment communication lost

Check power source and charging equipment

What this alert means:

Charging stopped because communication between the vehicle and the external charging equipment was interrupted.

This alert is usually specific to external charging equipment and power sources and does not typically indicate an issue with your vehicle that can be resolved by scheduling service.

What to do:

Confirm whether the external charging equipment is powered by looking for any status lights, displays, or other indicators on the equipment. For more information on troubleshooting Mobile Connector or Wall Connector status lights, refer to the product's Owner's Manual at [Charging & Adapter Product Guides](#).

If the equipment is **not** powered, try to restore the external charging equipment's power source.

- If attempting to charge at a public station and power is unable to be restored, contact the station operator.
- If attempting to charge at a private station (for example: charging at home) and power is unable to be restored, contact an electrician.

If the equipment is powered, try charging the vehicle using different external charging equipment.

- If the vehicle begins charging, the issue was likely with the equipment.
- If the vehicle still does not charge, the issue may be with the vehicle.

You can also try charging your vehicle using a Tesla Supercharger or Destination Charging location, all of which can be located through the map on your vehicle's touchscreen display. See [Maps and Navigation on page 368](#) for more details.



For more information on troubleshooting Mobile Connector or Wall Connector status lights, refer to the product's Owner's Manual at [Charging & Adapter Product Guides](#).

CHG_u014**Charging equipment reports error****Check equipment for error code or message****What this alert means:**

Charging was interrupted because the external charging equipment has reported a fault that prevents the vehicle from charging.

This alert is usually specific to external charging equipment and power sources and does not typically indicate an issue with your vehicle that can be resolved by scheduling service.

What to do:

Inspect the external charging equipment and look for status lights, displays, or other status indicators on the equipment. For more information on troubleshooting Mobile Connector or Wall Connector status lights, refer to the product's Owner's Manual at [Charging & Adapter Product Guides](#).

Try charging the vehicle with different charging equipment or at a different charging station.

- If the vehicle begins charging, the issue was likely with the equipment.
- If the vehicle still does not charge, the issue may be with the vehicle.

You can also try charging your vehicle using a Tesla Supercharger or Destination Charging location, all of which can be located through the map on your vehicle's touchscreen display. See [Maps and Navigation on page 368](#) for more details.

CHG_w032**Charge rate reduced - Wall connection hot****Outlet or Wall Connector wiring must be checked****What this alert means:**

High temperature detected by Wall Connector alerts indicate the building connection to the Wall Connector is getting too warm, so charging has been slowed to protect the wiring and Wall Connector.

This is not typically an issue with your vehicle or your Wall Connector, but rather an issue with the building wiring. This may be caused by a loose building wiring connection to the Wall Connector and can be fixed quickly by an electrician.

What to do:

Contact an electrician to inspect the building wiring connection to the Wall Connector. They should make sure that all wires are properly connected and torqued according to the installation guide for the Wall Connector.

Wall Connector installation guides can be found [here](#).

CHG_w037**Unable to charge - Wall connection too hot****Outlet or Wall Connector wiring must be checked****What this alert means:**

High temperature detected by Wall Connector alerts indicate the building connection to the Wall Connector is getting too warm, so charging has been slowed to protect the wiring and Wall Connector.

This is not typically an issue with your vehicle or your Wall Connector, but rather an issue with the building wiring. This may be caused by a loose building wiring connection to the Wall Connector and can be fixed quickly by an electrician.

What to do:

Contact an electrician to inspect the building wiring connection to the Wall Connector. They should make sure that all wires are properly connected and torqued according to the installation guide for the Wall Connector.



For more information, see the [installation guide](#) for your Wall Connector.

CP_w043

Charge port door sensor fault

Charge port may not operate as expected

What this alert means:

One of the charge port door sensors is not functioning normally. When this occurs, the charge port may be unable to accurately sense the charge port door position and the charge port may not operate as expected.

- The charge port latch may intermittently remain engaged when the charge port door is opened.
- The charge port light may illuminate only intermittently when the charge port door is opened.

What to do:

Try closing the charge port door and then opening it again.

For more information, see [Opening the Charge Port on page 417](#).

For more information on charging, see [Charging Instructions on page 417](#).

CP_w054

Charge port latch not engaged

Fully insert charge cable or check for obstruction

What this alert means:

The charge port latch is unable to latch the charge cable in the charge port inlet. If the latch is not engaged, AC charging (for example, charging with a Mobile Connector or Wall Connector) will be limited to 16A and DC Fast Charging / Supercharging will be unavailable.

The charge port light will pulse amber if this alert appears during AC charging and will be solid amber if this alert appears when attempting to DC Fast Charge / Supercharge.

This alert is usually specific to external charging equipment and power sources and does not typically indicate an issue with your vehicle that can be resolved by scheduling service.

What to do:

Try re-inserting the charge cable fully into the charge port inlet.

If your vehicle begins charging and the charge port light pulses green, the charge cable may not have been fully inserted before. AC charging should no longer be limited, and DC Fast Charging / Supercharging should be available.

If charging is still limited or the vehicle will not charge at all, inspect the charge port inlet and the charge cable connector for any obstructions, such as debris, moisture, and/or foreign objects. Make sure any charge port inlet obstruction has been removed and any moisture has been allowed to dry, then try re-inserting the cable into the charge port.

If charging is still limited or the vehicle will not charge at all, make sure the charge port latch manual release cable (located on the left-hand side in the trunk) has not been pulled. Make sure the handle (usually ring-shaped or a strap) for the manual release cable is free of obstructions and that nothing is attached to it (like a cargo net or umbrella). For more information on the charge port latch manual release, see [Manually Releasing Charge Cable on page 426](#) [Manually Releasing Charge Cable on page 427](#).

You can also try charging your vehicle using a Tesla Supercharger or Destination Charging location, all of which can be located through the map on your vehicle's touchscreen display. See [Maps and Navigation on page 368](#) for more details.

For more information on troubleshooting Mobile Connector or Wall Connector status lights, refer to the product's Owner's Manual at [Charging & Adapter Product Guides](#).

For more information on charging, see [Charging Instructions on page 417](#).



DI_f138

Front motor disabled - OK to drive

Vehicle power may be limited

What this alert means:

Your vehicle's front motor is unavailable. Power, speed, and acceleration may be reduced as your vehicle uses the rear motor(s) to continue driving.

What to do:

Continue to your destination. Your vehicle is OK to drive.

In some cases, your vehicle may be unable to continue driving. If this occurs, another vehicle alert should also be present to provide more information and recommended actions.

This alert may be caused by a temporary condition that will be resolved automatically. If this alert clears during your current drive, or is no longer present when you start your next drive, it was likely caused by a temporary condition. No action is required.

This alert may also indicate a condition requiring front motor inspection and service. If this alert persists throughout subsequent drives, it is recommended that you schedule service. Your vehicle is OK to drive in the meantime.

DI_u006

Vehicle automatically parked to prevent rollaway

Fasten seatbelt and close door to stay in gear

What this alert means:

Your vehicle has automatically shifted into Park (P) because it determined the driver was leaving or no longer present. This is expected vehicle behavior under various circumstances.

Your vehicle will automatically shift into Park if **all** of these conditions are true:

- Autopark is not active
- Your vehicle is traveling slower than 1.4 mph (2.25 km/h) in Drive or Reverse
- The last driver activity was detected more than 2 seconds ago. Driver activity includes:
 - Pressing the brake and/or accelerator pedal
 - Manually steering the vehicle.

And at least **two** of these conditions are true:

1. Driver seatbelt is detected as unbuckled.
 2. Driver is not detected as present.
 3. Driver door is detected as open.
-
1. Driver seatbelt is detected as unbuckled
 2. Driver is not detected as present
 3. Driver door is detected as open
 4. One or more of the sensors used to detect the three conditions above (seatbelt buckle, seat occupancy, door latch) is not working as expected

Your vehicle will also automatically shift into Park if **any** of these conditions is true:

- Door is detected as open
- Seatbelt is detected as unbuckled while speed is less than 0.1mph (0.15 km/h) in Drive or Reverse
- No driver activity is detected for 60 seconds



NOTE: If your vehicle is running software from 2015 or later, it will automatically shift into Park immediately when **all three** of the conditions above are true, regardless of vehicle speed or last detected press of the brake / accelerator pedal.

Your vehicle will also automatically shift into Park if **all** of these conditions are true:

- Vehicle hold is engaged
- Your vehicle is in Drive (D) or Reverse (R)
- Driver door is detected as open

NOTE: Your vehicle will also automatically shift into Park when a charge cable is connected to the charge port.

What to do:

For more information on automatic shifting into Park, see [Park on page 198](#)[Park on page 202](#).

DI_u015

Cruise control unavailable

What this alert means:

Cruise Control, including Traffic-Aware Cruise Control, is currently unavailable.

Cruise Control might be unavailable because:

- The driver canceled the request.
- The driver unbuckled their seatbelt.
- The front trunk, trunk, or a door is open.
- The vehicle is traveling below the Cruise Control minimum speed of 18 mph (30 km/h).
- There is an environmental condition, such as limited visibility.
- Valet mode is active.

What to do:

Take control and drive your vehicle manually.

When any condition preventing Cruise Control activation is no longer present, Cruise Control should be available. If this alert persists throughout subsequent drives, schedule service at your earliest convenience. Your vehicle is OK to drive in the meantime.

For more information, see [Traffic-Aware Cruise Control on page 299](#).

DI_u024

Autopark canceled

Take control

What this alert means:

Autopark has been canceled.

Autopark might have been canceled because:

- The driver pressed the Cancel button on the touchscreen.
- The driver moved the steering wheel/steering yoke.
- The driver pressed the accelerator pedal, pressed the brake pedal, or opened a door.
- There is a steep slope / grade.
- There is a weather condition affecting visibility.
- The curb cannot be detected.
- A trailer is attached to the vehicle.



What to do:

Park, or finish parking, your vehicle manually.

Autopark should be available again during your next drive.

For more information, see [To Cancel Parking on page 329](#) and [Limitations on page 329](#).

DI_u025

Autopark aborted

What this alert means:

Autopark has aborted and the Electronic Parking Brake has been applied.

Autopark might have been canceled because:

- The driver pressed the Cancel button on the touchscreen.
- The driver moved the steering wheelsteering yoke.
- The driver pressed the accelerator pedal, pressed the brake pedal, or opened a door.
- There is a steep slope / grade.
- There is a weather condition affecting visibility.
- The curb cannot be detected.
- A trailer is attached to the vehicle.

What to do:

Park, or finish parking, your vehicle manually.

Autopark should be available again during your next drive.

For more information, see [To Cancel Parking on page 329](#) and [Limitations on page 329](#).

DI_u032

Adaptive ride control disabled

Drive with caution

What this alert means:

The speed of your vehicle is limited to 90 mph (144 km/h) due to an issue with the Adaptive Suspension Damping system.

The system cannot provide real-time adjustments to the suspension system to optimize both ride and handling, and as a result your ride may be softer than usual.

What to do:

If this alert persists throughout subsequent drives, schedule service at your earliest convenience. Your vehicle is OK to drive in the meantime.

This alert is accompanied by a red indicator light on the instrument panel. For more information, see [Air Suspension on page 385](#).

DI_w039

Regenerative braking unavailable

Use brake pedal as needed

What this alert means:

Regenerative braking performance is temporarily reduced, and there is less automatic deceleration when you lift your foot off the accelerator pedal while driving.

This alert may occur when:



- High voltage battery is near full charge. Regenerative braking is reduced when the battery is at 95% charge or higher.
- High voltage battery is not warm enough. This can happen at the beginning of a drive. It may happen frequently in colder climates.

What to do:

Your vehicle is OK to drive.

Use the brake pedal as needed to slow your vehicle, just as you would in a gas-powered, non-electric vehicle.

Driving your vehicle usually clears this alert, because it reduces the battery charge below 95% and/or sufficiently heats the battery.

NOTE: In colder climates, this alert may remain present indefinitely and automatic deceleration may remain limited, as driving your vehicle may not heat the battery enough to restore full regenerative braking performance. You can use Defrost Car in the Tesla Mobile App to warm up the high voltage battery before you drive and restore normal regenerative braking. For more information, see [Cold Weather Best Practices on page 284](#).

This alert, by itself, does not typically indicate a condition requiring service. If this alert persists across drives, it may indicate a condition affecting your vehicle's regenerative braking ability, and it is recommended you schedule service at your earliest convenience.

For more information, see [Regenerative Braking on page 233](#).

DI_w138**Front motor disabled - OK to drive****Vehicle power may be limited****What this alert means:**

Your vehicle's front motor is unavailable. Power, speed, and acceleration may be reduced as your vehicle uses the rear motor(s) to continue driving.

What to do:

Continue to your destination. Your vehicle is OK to drive.

In some cases, your vehicle may be unable to continue driving. If this occurs, another vehicle alert should also be present to provide more information and recommended actions.

This alert may be caused by a temporary condition that will be resolved automatically. If this alert clears during your current drive, or is no longer present when you start your next drive, it was likely caused by a temporary condition. No action is required.

This alert may also indicate a condition requiring front motor inspection and service. If this alert persists throughout subsequent drives, it is recommended that you schedule service. Your vehicle is OK to drive in the meantime.

DI_w168**Vehicle Hold feature unavailable****Keep brake pedal pressed while stopped****Keep brake pedal pressed while stopped****What this alert means:**

Vehicle Hold is currently unavailable due to system constraints. When stopping, use the brake pedal to bring your vehicle to a complete stop and keep your vehicle stationary.

What to do:

Continue to your destination. Your vehicle is OK to drive.

If this alert persists throughout subsequent drives, schedule service at your earliest convenience. Your vehicle is OK to drive in the meantime.



For more information, see [Vehicle Hold on page 252](#).

DI_w172

Powertrain requires service

Avoid hard acceleration

What this alert means:

An issue has been detected in the powertrain system.

Your vehicle has detected excessive backlash (lash) between the drive unit and the wheels. High, or excessive, lash is indicative of mechanical wear.

There are many possible causes, so a powertrain inspection is needed.

What to do:

It is recommended that you schedule service as soon as possible for a powertrain inspection.

Your vehicle is OK to drive in the meantime. You can drive to your immediate destination and to a service center. Avoid hard or heavy acceleration, as this puts more stress on the powertrain.

Schedule a service appointment at your earliest opportunity. If this issue is not addressed, your vehicle might unexpectedly stop while you are driving.

GTW_w017

Electrical system power reduced

Non-essential features may be unavailable

What this alert means:

Some non-essential features, like seat heaters or cabin heating / cooling, may be unavailable or may operate at a reduced level. This is expected behavior designed to help your vehicle maintain adequate electrical power for essential functions.

What to do:

This alert may be present due to various vehicle conditions. For more information and further recommended actions, check for other alerts specific to conditions affecting your vehicle's electrical system.

GTW_w018

Electrical system power reduced

Non-essential features may be unavailable

What this alert means:

Some non-essential features, like seat heaters or cabin heating / cooling, may be unavailable or may operate at a reduced level. This is expected behavior designed to help your vehicle maintain adequate electrical power for essential functions.

What to do:

This alert may be present due to various vehicle conditions. For more information and further recommended actions, check for other alerts specific to conditions affecting your vehicle's electrical system.

GTW_w174

12V battery must be replaced - Schedule service

Software will not update until battery is replaced

What this alert means:

The low voltage battery is showing degraded performance and needs to be replaced. Until the low voltage battery is replaced, vehicle software updates will not complete.

What to do:

It is recommended that you have the low voltage battery replaced at your earliest convenient opportunity.



You can schedule service via your Tesla Mobile App, or with an independent service provider that offers low voltage battery replacement for your vehicle. Please note that independent service provider options may vary, based on your vehicle configuration and your location.

Your vehicle is OK to drive with this alert present. However, if you delay the low voltage battery replacement, your vehicle may eventually not have enough electrical power to start or to restart after a recent drive.

If the low voltage battery does not have enough electrical power to turn on your vehicle or open the doors, see [Battery Care on page 415](#) for recommended actions.

For more information on the battery system, see [High Voltage Battery Information on page 415](#).

GTW_w360

Assist for low brake performance activated

To stop, keep brake pedal firmly pressed

What this alert means:

Hydraulic Fade Compensation is active. This brake assist function activates temporarily to make sure you have full braking capability in conditions where reduced braking performance is detected by your vehicle.

When this assist function activates, you may feel the brake pedal pull away from your foot and notice a strong increase in brake pressure. You may also hear a pumping sound coming from the brake hydraulic unit at the front of the vehicle. This will usually last for a few seconds, depending on road surface and vehicle speed. This is completely normal and does not indicate any issue with your vehicle.

What to do:

Continue to press the brake pedal as you normally would, and do not "pump" (repeatedly press and release) the pedal as this will interrupt the function.

This alert will clear when your vehicle comes to a stop or you are no longer pressing the brake pedal. It may still be displayed for up to 5 seconds afterward.

Reduced braking performance is usually temporary, and can occur for a number of reasons including high brake temperatures after heavy brake use, or driving in extremely cold or wet conditions. It can also indicate that your brake pads or rotors have worn to the point that normal replacement is needed.

If you continue to experience reduced braking performance which does not improve over time, please contact Tesla service at your convenience for a brake inspection.

For more information, see [Hydraulic Fade Compensation on page 232](#).

GTW_w405

Electrical system power reduced

Vehicle may shut down unexpectedly

What this alert means:

The electrical system cannot maintain the voltage required to support all vehicle features.

If this alert is present while you are driving, it is possible your vehicle will shut down unexpectedly.

It is also possible that your vehicle will not restart after the current drive.

What to do:

It is recommended that you eliminate or reduce your use of any non-essential features. This can help your vehicle maintain adequate electrical power for essential functions. It may also prevent your vehicle from shutting down before you reach your immediate destination, although this is not guaranteed.

If this alert remains active, schedule service immediately. Without service, your vehicle may shut down unexpectedly or may not restart.

**MCU_u019**

Active service connection to vehicle
Service performing remote diagnostics

What this alert means:

A service technician is remotely logged into your vehicle for diagnosis or repair. You may notice some loss of Infotainment functionality while the connection persists, but this alert does not indicate an issue with your vehicle.

Your vehicle is OK to drive.

What to do:

This alert should clear automatically after the technician completes vehicle diagnosis or repair. You may find it necessary to restart your touchscreen to restore full Infotainment functionality after the alert has cleared. For more information, see [Restarting the Touchscreen in your vehicle's Do It Yourself Guide](#).

If this alert does not clear after 24 hours, it is recommended that you schedule service via your Tesla Mobile App or with an independent service provider. Please note that independent service provider options may vary, based on your vehicle configuration and your location.

MCU_w008

Air pressure in tires very low
PULL OVER SAFELY - Check for flat tire

What this alert means:

This alert indicates that one or more of the tires on your vehicle is extremely low or flat.

The tire pressure monitoring system (TPMS) has detected that the air pressure in one or more of your tires is significantly lower than the recommended cold tire pressure.

What to do:

You should pull over carefully as soon as possible. In a safe location, check for a flat tire.

You can request Tesla roadside assistance options (mobile tire, loaner wheel, tow) if required. See [Contacting Tesla Roadside Assistance on page 502](#) for more information.

In a non-emergency situation, it is recommended that you visit a local tire shop for assistance or schedule service using your Tesla Mobile App.

See [Maintaining Tire Pressures on page 431](#) for detailed information on where to find the recommended cold pressure (RCP) for your vehicle's tires, how to check tire pressures, and how to keep your tires properly inflated.

The alert will clear once the TPMS has a consistent tire pressure measurement for each of your tires within 3 psi of the recommended cold pressure.

- The alert and Tire Pressure indicator light may still be present immediately after you have filled your tires to the recommended cold pressure, but both should clear once you have driven a short distance.
- You may need to drive over 15 mph (25 km/h) for at least 10 minutes for the Tire Pressure Monitoring System to measure and report your updated tire pressures.

For more information on tire pressure and inflation, see [Tire Care and Maintenance on page 431](#).

MCU_w010

Air pressure below recommendation for tires
Check pressure and refill air as needed

What this alert means:

This alert does NOT indicate that there is a flat tire.



The tire pressure monitoring system (TPMS) has detected that the air pressure in one or more of your tires is at least 20% lower than the recommended cold tire pressure.

See [Maintaining Tire Pressures on page 431](#) for detailed information on where to find the recommended cold pressure (RCP) for your vehicle's tires, how to check tire pressures, and how to keep your tires properly inflated.

This alert may appear in cold weather because the air in your tires naturally contracts when it becomes cold, decreasing tire pressures.

What to do:

Add air to maintain the recommended cold tire pressure. Although drops in tire pressure are expected in colder weather, the recommended cold tire pressure should be maintained at all times.

The alert may clear as the vehicle is driven. This is because the tires will warm up and the tire pressure will increase. Even if the alert clears, the tires should still be refilled with air once they have cooled.

The alert will clear once the Tire Pressure Monitoring System detects that each of your tires is inflated to the recommended cold pressure.

- The alert and Tire Pressure indicator light may still be present immediately after you have filled your tires to the recommended cold pressure, but both should clear once you have driven a short distance.
- You may need to drive over 15 mph (25 km/h) for at least 10 minutes for the Tire Pressure Monitoring System to measure and report your updated tire pressures.

If you repeatedly see this alert for the same tire, have the tire inspected for a slow leak. You can visit a local tire shop or schedule service using your Tesla Mobile App.

For more information on tire pressure and inflation, see [Tire Care and Maintenance on page 431](#).

For more information on tire pressure and inflation, see [Tire Care and Maintenance on page 431](#).

MCU_w029

Service is required

Schedule service now

What this alert means:

This alert is set remotely by Tesla when a condition requiring service is detected on your vehicle.

This alert can be set due to various conditions. When you schedule service, more information should be available.

This alert can only be cleared by a service technician after your vehicle has been serviced.

What to do:

As this alert can be present due to various conditions, it is recommended that you schedule service at your earliest convenience.

TAS2_a313

Adaptive ride control degraded

Ride comfort may be reduced

What this alert means:

There is an issue with your vehicle's Adaptive Suspension Damping system. As a result, the system cannot provide real-time adjustments to the suspension system to optimize both ride and handling.

Instead, all dampers are receiving fixed current. Your ride may be softer or firmer than usual.

What to do:

If this alert persists throughout subsequent drives, schedule service at your earliest convenience. Your vehicle is OK to drive in the meantime.



This alert is accompanied by a yellow indicator light on the instrument panel. For more information, see [Air Suspension on page 385](#).

TAS2_a314

Adaptive ride control degraded

Drive with caution

What this alert means:

There is an issue with your vehicle's Adaptive Suspension Damping system. As a result, the system cannot provide real-time adjustments to the suspension system to optimize both ride and handling, and your ride may be softer than usual.

What to do:

If this alert persists throughout subsequent drives, schedule service at your earliest convenience. Your vehicle is OK to drive in the meantime.

This alert is accompanied by a red indicator light on the instrument panel. For more information, see [Air Suspension on page 385](#).

THC_u0005

Air conditioning temporarily reduced

Vehicle systems being cooled

What this alert means:

Cabin air conditioning performance has been temporarily reduced because your vehicle needs to focus on cooling the high voltage battery (Battery) and/or powertrain. This is completely normal and does not indicate a problem with your vehicle or the air conditioning (A/C) system.

In addition to cooling the vehicle interior, the A/C system also cools the Battery. The A/C system's priority is to cool the Battery to make sure it stays within an optimal temperature range that supports longevity and best performance.

In high temperature environments, it is normal for your vehicle to focus more for brief periods on cooling the Battery. When this happens, it is most often because the vehicle is supercharging in hot weather.

What to do:

No action is required. Your vehicle is OK to drive.

The alert should clear in a short time, and cabin air conditioning performance should return to normal. In some cases, the alert and vehicle behavior will continue until supercharging is complete.

If the alert persists over multiple drives and is accompanied by other alerts that indicate potential issues with the A/C system, contact Tesla Service at your convenience to schedule an A/C system inspection.

THC_w0100

Battery heating unavailable - Charge rate reduced

Charging may be unavailable in cold temperatures

What this alert means:

A condition affecting the performance of your vehicle's high voltage battery heater has been detected.

Without adequate heating of the high voltage battery, charging speed (charge rate) may be reduced. Your vehicle may also be unable to charge in cold ambient temperatures (cold weather) while high voltage battery heating remains unavailable.

What to do:

Your vehicle is OK to drive. Your vehicle is also OK to charge and connect to a charging station. However, your vehicle may be unable to charge, or may charge more slowly than expected, in cold ambient temperatures.

If possible, try charging your vehicle in a closed environment like a garage, where warmer ambient temperatures may make high voltage battery heating unnecessary.



If driving in cold ambient temperatures, it is recommended that you do **NOT** rely on charging stations along your route to reach your destination, as the high voltage battery may be too cold to charge.

- If you need to charge, try to charge your vehicle immediately after a drive. The high voltage battery may still be warm from the previous drive.
- Leaving your vehicle parked in cold ambient temperatures after a drive will cause the high voltage battery to cool, and charging may become unavailable.

Similarly, it is recommended that you do not rely on regenerative braking to charge the high voltage battery while driving in cold ambient temperatures, as regenerative braking may be unavailable if the battery temperature is too low. For more information, see [Regenerative Braking on page 233](#).

This alert may be present due to many conditions. It may be caused by a temporary condition that requires no action to resolve.

However, if this alert persists over multiple drives, or is accompanied by other alerts indicating potential issues with your vehicle's heating and/or air conditioning system, it is recommended that you schedule service at your earliest reasonable opportunity.

For more information on charging, see [Charging Instructions on page 417](#).

For more information on the high voltage battery, see [High Voltage Battery Information on page 415](#).

UMC_w001

Unable to charge with Mobile Connector

Inadequate outlet grounding - Try another outlet

What this alert means:

The Mobile Connector has detected that the electrical outlet has insufficient grounding, likely caused by an inadequate or missing ground connection.

This does not indicate an issue with your Mobile Connector or vehicle, but instead points to an issue with the wall outlet / electrical installation the Mobile Connector is connected to.

What to do:

Have the electrical installation inspected by an electrician. Your electrician should make sure there is proper grounding at your circuit breaker or power distribution box, and also make sure that appropriate connections are made to the outlet, before you attempt to plug in the Mobile Connector again.

If you need to charge in the meantime, try charging using a different outlet, at another location, or with another type of charging station.

You can also try charging your vehicle using a Tesla Supercharger or Destination Charging location, all of which can be located through the map on your vehicle's touchscreen display. See [Maps and Navigation on page 368](#) for more details.

For more information on troubleshooting Mobile Connector status lights and charging issues, refer to the [product's owner's manual](#).

UMC_w002

Unable to charge - Mobile Connector GFCI tripped

Unplug charge handle from charge port and retry

What this alert means:

The vehicle cannot charge because the ground-fault circuit interrupter (GFCI) in the Mobile Connector has tripped.

Like the GFCI in a wall outlet, this feature is designed to stop the flow of electricity when there is a problem. It has interrupted charging to protect your vehicle and the charging equipment.

This could happen for many reasons. The problem could be in the charge cable, the charge handle, the charge port, or even an onboard vehicle component.

**What to do:**

Inspect the charge port and the charge handle for pooled water or unusual levels of moisture. If you find excessive moisture, wait and let both the inside area of the charge port and the exposed portion of the charge handle dry sufficiently before trying again.

Inspect the charge equipment for damage.

- If the cable is in any way damaged or deteriorated, **do not use it**. Try different charging equipment instead.
- If the cable is in good condition, try charging again with the same Mobile Connector.

If the issue persists and prevents charging, try charging with different charging equipment.

This alert is usually specific to external charging equipment and power sources and does not typically indicate an issue with your vehicle that can be resolved by scheduling service.

You can also try charging your vehicle using a Tesla Supercharger or Destination Charging location, all of which can be located through the map on your vehicle's touchscreen display. See [Maps and Navigation on page 368](#) for more details.

For more information on troubleshooting Mobile Connector status lights and charging issues, refer to the [product's owner's manual](#).

UMC_w004**Unable to charge with Mobile Connector****Voltage too high / Try a different wall outlet****What this alert means:**

The vehicle cannot charge, or charging is interrupted, because **either** the Mobile Connector:

- Detects the wall outlet voltage is too high, **or**
- Detects an unexpected increase in supply voltage from the wall outlet.

What to do:

Try charging the vehicle with a different wall outlet. If the vehicle starts to charge, the issue was likely with the original wall outlet. Contact an electrician to inspect the building wiring connection to that outlet.

If the vehicle still does not charge when you try a different wall outlet, try charging at a different location.

You can also try charging your vehicle using a Tesla Supercharger or Destination Charging location, all of which can be located through the map on your vehicle's touchscreen display. See [Maps and Navigation on page 368](#) for more details.

For more information on troubleshooting Mobile Connector status lights and charging issues, refer to the [product's owner's manual](#).

UMC_w005**Unable to charge with Mobile Connector****Voltage too low / Try a different wall outlet****What this alert means:**

The vehicle cannot charge, or charging is interrupted, because **either** the Mobile Connector:

- Does not detect enough supply voltage from the wall outlet, **or**
- Detects an unexpected drop in supply voltage from the wall outlet.

What to do:

Try charging the vehicle with a different wall outlet. If the vehicle starts to charge, the issue was likely with the original wall outlet. Contact an electrician to inspect the building wiring connection to that outlet.

If the vehicle still does not charge when you try a different wall outlet, try charging at a different location.



This alert is usually specific to external charging equipment and power sources and does not typically indicate an issue with your vehicle that can be resolved by scheduling service.

You can also try charging your vehicle using a Tesla Supercharger or Destination Charging location, all of which can be located through the map on your vehicle's touchscreen display. See [Maps and Navigation on page 368](#) for more details.

For more information on troubleshooting Mobile Connector status lights and charging issues, refer to the [product's owner's manual](#).

UMC_w007

Mobile Connector control box temperature high

Let Mobile Connector cool to resume charging

What this alert means:

Charging has been interrupted because the Mobile Connector has detected a high temperature inside its control box housing.

What to do:

Make sure the Mobile Connector is not covered by anything, and that there is no heat source nearby. If the problem persists in normal ambient temperatures (under 100°F or 38°C), service is required.

You can also try charging your vehicle using a Tesla Supercharger or Destination Charging location, all of which can be located through the map on your vehicle's touchscreen display. See [Maps and Navigation on page 368](#) for more details.

For more information on troubleshooting Mobile Connector status lights and charging issues, refer to the [product's owner's manual](#).

UMC_w008

Unable to charge - Wall plug temperature high

Wall outlet and wiring inspection recommended

What this alert means:

High temperature detected by Mobile Connector alerts indicate the outlet used to charge is becoming too warm, so charging has stopped to protect the outlet.

This does not indicate an issue with your Mobile Connector or vehicle, but instead points to an issue with the wall outlet / electrical installation the Mobile Connector is connected to.

A warm outlet may be caused by a plug that is not fully inserted, a loose building wiring connection to the outlet, or an outlet that is beginning to wear out.

What to do:

Make sure your adapter is fully plugged into the outlet. If charging speed does not return to normal, contact an electrician to inspect the outlet and building wiring connections to the outlet and complete any repairs needed.

If the outlet is worn, it should be replaced with a high-quality outlet. Consider upgrading to a Tesla Wall Connector for greater convenience and highest charging speed.

UMC_w009

Cannot charge - Charge handle temperature high

Check charge handle or charge port for debris

What this alert means:

Charging has been interrupted because the Mobile Connector has detected a high temperature in the charge handle that connects to your vehicle's charge port.

What to do:

Make sure the Mobile Connector is fully inserted into your vehicle's charge port inlet.



Inspect the charge port inlet and the Mobile Connector handle for any obstructions or moisture. Make sure any obstruction in the charge port or Mobile Connector handle has been removed and any moisture has been allowed to dry, then try re-inserting the Mobile Connector handle into the charge port.

Also make sure the charge handle of the Mobile Connector is not covered by anything, and that there is no heat source nearby.

If the alert persists in normal ambient temperatures (under 100°F or 38°C), and occurs during multiple charging attempts, this may indicate a condition affecting the Mobile Connector or your vehicle. It is recommended that you schedule service at your convenience.

You can also try charging your vehicle using a Tesla Supercharger or Destination Charging location, all of which can be located through the map on your vehicle's touchscreen display. See [Maps and Navigation on page 368](#) for more details.

For more information on troubleshooting Mobile Connector status lights and charging issues, refer to the [product's owner's manual](#).

UMC_w010

Mobile Connector to adapter connection hot

Let cool - Plug adapter fully into Mobile Connector

What this alert means:

Charging has been interrupted because the Mobile Connector has detected a high temperature at the connection between the wall plug adapter and the control box.

What to do:

Make sure the wall plug adapter is fully connected to the Mobile Connector control box.

Also make sure the wall plug adapter is not covered by anything, and that there is no heat source nearby.

After unplugging from the power source (wall outlet), inspect the wall plug adapter connection and the Mobile Connector control box connection for any obstructions or moisture. Make sure any obstruction has been removed and any moisture has been allowed to dry, then try re-inserting the wall plug adapter into the Mobile Connector and then connecting to the power source (wall outlet).

Once the Mobile Connector control box temperature has decreased and any obstruction has been removed, the alert should clear and charging should be possible.

You can also try charging your vehicle using a Tesla Supercharger or Destination Charging location, all of which can be located through the map on your vehicle's touchscreen display. See [Maps and Navigation on page 368](#) for more details.

For more information on troubleshooting Mobile Connector status lights and charging issues, refer to the [product's owner's manual](#).

UMC_w011

Charging equipment communication error

Try again or try different equipment

What this alert means:

Your vehicle is unable to charge because it cannot communicate effectively with the Mobile Connector. The Mobile Connector cannot confirm via proximity detection that the charge handle is fully connected to your vehicle.

What to do:

First, confirm the lack of effective communication is caused by the Mobile Connector rather than an issue with your vehicle. This is usually the case.

To confirm this, try charging the vehicle using different external charging equipment.

- If the vehicle begins charging, the issue was likely with the Mobile Connector.
- If the vehicle still does not charge, the issue may be with the vehicle.



Inspect the charge port inlet and the Mobile Connector handle for any obstructions (use a flashlight as necessary). Make sure any obstruction has been removed and any moisture has been allowed to dry, then try re-inserting the Mobile Connector handle into the charge port.

This alert is usually specific to external charging equipment and power sources and does not typically indicate an issue with your vehicle that can be resolved by scheduling service.

You can also try charging your vehicle using a Tesla Supercharger or Destination Charging location, all of which can be located through the map on your vehicle's touchscreen display. See [Maps and Navigation on page 368](#) for more details.

For more information on troubleshooting Mobile Connector status lights and charging issues, refer to the [product's owner's manual](#).

For more information on charging, see [Charging Instructions on page 417](#).

UMC_w012

Charging equipment communication error

Try again or try different equipment

What this alert means:

Your vehicle is unable to charge because it cannot communicate effectively with the Mobile Connector. The Mobile Connector detects that it cannot generate or maintain a valid control pilot signal.

What to do:

First, confirm the lack of effective communication is caused by the Mobile Connector rather than an issue with your vehicle. This is usually the case.

To confirm this, try charging the vehicle using different external charging equipment.

- If the vehicle begins charging, the issue was likely with the Mobile Connector.
- If the vehicle still does not charge, the issue may be with the vehicle.

Inspect the charge port inlet and the Mobile Connector handle for any obstructions (use a flashlight as necessary). Make sure any obstruction has been removed and any moisture has been allowed to dry, then try re-inserting the Mobile Connector handle into the charge port.

This alert is usually specific to external charging equipment and power sources and does not typically indicate an issue with your vehicle that can be resolved by scheduling service.

You can also try charging your vehicle using a Tesla Supercharger or Destination Charging location, all of which can be located through the map on your vehicle's touchscreen display. See [Maps and Navigation on page 368](#) for more details.

For more information on troubleshooting Mobile Connector status lights and charging issues, refer to the [product's owner's manual](#).

For more information on charging, see [Charging Instructions on page 417](#).

UMC_w013

Wall plug adapter error - Charge rate reduced

Plug adapter fully into Mobile Connector and retry

What this alert means:

Your Mobile Connector is unable to communicate with the wall plug adapter. Because your Mobile Connector cannot monitor the wall plug adapter temperature, charge current is automatically reduced to 8A.

What to do:

1. Unplug your Mobile Connector, including the wall plug adapter, completely from the wall outlet.
2. Make sure the connection between the wall plug adapter and the main body of your Mobile Connector is secure.
 - a. Disconnect the wall plug adapter completely from the main body of your Mobile Connector.



- b. Fully reinsert the wall plug adapter into the main body of your Mobile Connector by pushing it into the socket until it snaps into place.
3. Try charging again by plugging the Mobile Connector, including wall plug adapter, fully into the wall outlet.
4. If the alert persists, try using a different wall plug adapter (see steps above to make sure the adapter is fully connected to your Mobile Connector).
 - a. If the alert is no longer present, the issue is likely with the wall plug adapter you were using previously.
 - b. If the alert persists, the issue is likely with your Mobile Connector.

If needed, obtain another wall plug adapter or Mobile Connector.

In the meantime, you can continue to charge with the same equipment. The charge rate will be reduced, as charge current will be limited to 8A while this condition persists.

You can also try charging your vehicle using a Tesla Supercharger or Destination Charging location, all of which can be located through the map on your vehicle's touchscreen display. See [Maps and Navigation on page 368](#) for more details.

For more information on troubleshooting Mobile Connector status lights and charging issues, refer to the [product's owner's manual](#).

UMC_w014

Wall plug adapter error - Charge rate reduced

Plug adapter fully into Mobile Connector and retry

What this alert means:

Your Mobile Connector is unable to communicate with the wall plug adapter. Because your Mobile Connector cannot identify the type of wall outlet the wall plug adapter is connected to, charge current is automatically reduced to 8A.

What to do:

1. Unplug your Mobile Connector, including the wall plug adapter, completely from the wall outlet.
2. Make sure the connection between the wall plug adapter and the main body of your Mobile Connector is secure.
 - a. Disconnect the wall plug adapter completely from the main body of your Mobile Connector.
 - b. Fully reinsert the wall plug adapter into the main body of your Mobile Connector by pushing it into the socket until it snaps into place.
3. Try charging again by plugging the Mobile Connector, including wall plug adapter, fully into the wall outlet.
4. If the alert persists, try using a different wall plug adapter (see steps above to make sure the adapter is fully connected to your Mobile Connector).
 - a. If the alert is no longer present, the issue is likely with the wall plug adapter you were using previously.
 - b. If the alert persists, the issue is likely with your Mobile Connector.

If needed, obtain another wall plug adapter or Mobile Connector. In the meantime, you can continue to charge with the same equipment. The charge rate will be reduced, as charge current will be limited to 8A while this condition persists.

You can also try charging your vehicle using a Tesla Supercharger or Destination Charging location, all of which can be located through the map on your vehicle's touchscreen display. See [Maps and Navigation on page 368](#) for more details.

For more information on troubleshooting Mobile Connector status lights and charging issues, refer to the [product's owner's manual](#).

UMC_w015

Wall plug adapter error - Charge rate reduced

Plug adapter fully into Mobile Connector and retry

What this alert means:

Your Mobile Connector is unable to communicate with the wall plug adapter. Because your Mobile Connector cannot identify the type of wall outlet the wall plug adapter is connected to, charge current is automatically reduced to 8A.



What to do:

1. Unplug your Mobile Connector, including the wall plug adapter, completely from the wall outlet.
2. Make sure the connection between the wall plug adapter and the main body of your Mobile Connector is secure.
 - a. Disconnect the wall plug adapter completely from the main body of your Mobile Connector.
 - b. Fully reinsert the wall plug adapter into the main body of your Mobile Connector by pushing it into the socket until it snaps into place.
3. Try charging again by plugging the Mobile Connector, including wall plug adapter, fully into the wall outlet.
4. If the alert persists, try using a different wall plug adapter (see steps above to make sure the adapter is fully connected to your Mobile Connector).
 - a. If the alert is no longer present, the issue is likely with the wall plug adapter you were using previously.
 - b. If the alert persists, the issue is likely with your Mobile Connector.

If needed, obtain another wall plug adapter or Mobile Connector. In the meantime, you can continue to charge with the same equipment. The charge rate will be reduced, as charge current will be limited to 8A while this condition persists.

You can also try charging your vehicle using a Tesla Supercharger or Destination Charging location, all of which can be located through the map on your vehicle's touchscreen display. See [Maps and Navigation on page 368](#) for more details.

For more information on troubleshooting Mobile Connector status lights and charging issues, refer to the [product's owner's manual](#).

UMC_w016

Mobile Connector control box temperature high Maximum charge rate reduced

What this alert means:

Charge current has been temporarily reduced because the Mobile Connector has detected increased temperature inside its control box housing.

What to do:

Make sure the Mobile Connector is not covered by anything, and that there is no heat source nearby. If the problem persists in normal ambient temperatures (under 100°F or 38°C), service is required.

You can also try charging your vehicle using a Tesla Supercharger or Destination Charging location, all of which can be located through the map on your vehicle's touchscreen display. See [Maps and Navigation on page 368](#) for more details.

For more information on troubleshooting Mobile Connector status lights and charging issues, refer to the [product's owner's manual](#).

UMC_w017

Charge rate reduced - Wall plug temperature high Wall outlet and wiring inspection recommended

What this alert means:

High temperature detected by Mobile Connector alerts indicate the outlet used to charge is becoming too warm, so charging has been slowed to protect the outlet.

This is not typically an issue with your vehicle or your Mobile Connector, but rather an issue with the outlet. A warm outlet may be caused by a plug that is not fully inserted, a loose building wiring connection to the outlet, or an outlet that is beginning to wear out.

What to do:

Make sure your adapter is fully plugged into the outlet. If charging speed does not return to normal, contact an electrician to inspect the outlet and building wiring connections to the outlet and complete any repairs needed.



If the outlet is worn, it should be replaced with a high-quality outlet. Consider upgrading to a Tesla Wall Connector for greater convenience and highest charging speed.

UMC_w018

Charge rate reduced - Handle temperature high

Check charge handle or charge port for debris

What this alert means:

Charge current has been temporarily reduced because the Mobile Connector has detected increased temperature in the charge handle that connects to your vehicle's charge port.

What to do:

Make sure the Mobile Connector is fully inserted into your vehicle's charge port inlet.

Inspect the charge port inlet and the Mobile Connector handle for any obstructions or moisture. Make sure any obstruction in the charge port or Mobile Connector handle has been removed and any moisture has been allowed to dry, then try re-inserting the Mobile Connector handle into the charge port.

Also make sure the charge handle of the Mobile Connector is not covered by anything, and that there is no heat source nearby.

If the alert persists in normal ambient temperatures (under 100°F or 38°C), and occurs during multiple charging attempts, this may indicate a condition affecting the Mobile Connector or your vehicle. It is recommended that you schedule service at your convenience.

You can also try charging your vehicle using a Tesla Supercharger or Destination Charging location, all of which can be located through the map on your vehicle's touchscreen display. See [Maps and Navigation on page 368](#) for more details.

For more information on troubleshooting Mobile Connector status lights and charging issues, refer to the [product's owner's manual](#).

UMC_w019

Mobile Connector to adapter connection hot

Maximum charge rate reduced

What this alert means:

Charge current has been reduced because the Mobile Connector has detected a high temperature at the connection between the wall plug adapter and the control box.

What to do:

Make sure the wall plug adapter is fully connected to the Mobile Connector control box.

After unplugging from the power source (wall outlet), inspect the wall plug adapter connection and the Mobile Connector control box connection for any obstructions or moisture.

It is recommended that any debris / foreign objects be removed. Make sure any obstruction has been removed and any moisture has been allowed to dry, then try re-inserting the wall plug adapter into the Mobile Connector and then connecting to the power source (wall outlet).

Also make sure the wall plug adapter is not covered by anything, and that there is no heat source nearby. If the alert persists in normal ambient temperatures (under 100°F or 38°C), and occurs during multiple charging attempts, this may indicate a condition affecting the Mobile Connector or your vehicle. It is recommended that you schedule service at your convenience.

You can also try charging your vehicle using a Tesla Supercharger or Destination Charging location, all of which can be located through the map on your vehicle's touchscreen display. See [Maps and Navigation on page 368](#) for more details.

For more information on troubleshooting Mobile Connector status lights and charging issues, refer to the [product's owner's manual](#).



Gen 1

Safety Information

Save These Important Safety Instructions

This document contains important instructions and warnings that must be followed when using your Mobile Connector.

Warnings

-  **WARNING:** Read this entire document before using the Mobile Connector. Failure to do so or to follow any of the instructions or warnings in this document can result in fire, electrical shock, serious injury or death.
-  **WARNING:** Use the Mobile Connector only within the specified operating parameters.
-  **WARNING:** The Mobile Connector is designed only for charging a Tesla vehicle (excluding Tesla Roadster). Do not use it for any other purpose or with any other vehicle or object. The Mobile Connector is intended only for vehicles that do not require ventilation during charging.
-  **WARNING:** Do not use the Mobile Connector's adapters in any outlet for which they are not designed.
-  **WARNING:** Do not use (or discontinue using) the Mobile Connector if it is defective, appears cracked, frayed, broken or otherwise damaged, or fails to operate.
-  **WARNING:** Do not attempt to open, disassemble, repair, tamper with, or modify the Mobile Connector. The Mobile Connector is not user-serviceable. Contact Tesla for any repairs.
-  **WARNING:** Do not use an extension cord, a multi-outlet adapter, a multi-plug, a conversion plug, or a power strip to plug in the Mobile Connector.
-  **WARNING:** Do not disconnect the Mobile Connector from the wall outlet when the vehicle is charging.
-  **WARNING:** Do not plug the Mobile Connector into a damaged, loose or worn power outlet. Ensure that the prongs on the Mobile Connector fit snugly into the wall outlet.
-  **WARNING:** Do not connect the Mobile Connector into a power outlet that is not properly grounded.
-  **WARNING:** Do not expose the Mobile Connector to flammable or harsh chemicals or vapors. Do not use or store the Mobile Connector in a recessed area or below floor level. When using the Mobile Connector in an inside location such as a garage, position the Mobile Connector's main controller at least 18 inches (46 cm) above the floor.
-  **WARNING:** Do not use the Mobile Connector when either you, the vehicle or the Mobile Connector is exposed to severe rain, snow, electrical storm or other inclement weather.
-  **WARNING:** When transporting the Mobile Connector, handle with care to prevent damage to any of its components. Do not subject the Mobile Connector to strong force or impact. Do not pull, twist, tangle, drag or step on the Mobile Connector or any of its components.
-  **WARNING:** Protect the Mobile Connector from moisture, water and foreign objects at all times. If any exist or appear to have corroded or damaged the Mobile Connector, do not use the Mobile Connector.
-  **WARNING:** If rain falls during charging, do not allow rain water to run along the length of charge cable, causing the electrical outlet or charging port to become wet.
-  **WARNING:** Do not plug the Mobile Connector into an electrical outlet that is submerged in water or covered in snow. If, in this situation, the Mobile Connector is already plugged in and needs to be unplugged, turn off the breaker before unplugging the Mobile Connector.
-  **WARNING:** Do not touch the Mobile Connector's end terminals with sharp metallic objects, such as wire, tools or needles. Do not forcefully fold any part of the Mobile Connector or damage it with sharp objects. Do not insert foreign objects into any part of the Mobile Connector.
-  **WARNING:** Do not charge a vehicle that is covered with a non-Tesla approved car cover.
-  **WARNING:** Ensure that the Mobile Connector's charging cable does not obstruct pedestrians or other vehicles or objects.



 **WARNING:** Use of the Mobile Connector may affect or impair the operation of medical or implantable electronic devices, such as an implantable cardiac pacemaker or an implantable cardioverter defibrillator. Before using the Mobile Connector, check with the electronic device manufacturer concerning the effects that charging may have on any such electronic device.

 **WARNING:** Do not use cleaning solvents to clean the Mobile Connector.

Cautions

 **CAUTION:** Do not use private power generators as a power source for charging.

 **CAUTION:** Do not operate the Mobile Connector in temperatures outside its operating range of -22°F to +122°F (-30°C to +50°C).

 **CAUTION:** Store the Mobile Connector in a clean dry place in temperatures between -40°F and +185°F (-40°C and +85°C).

General Information

Specifications

Use only a 120 volt, 208 volt or 240 volt AC supply, 50/60 hertz wall outlet that has a dedicated and properly grounded circuit, and is rated for at least 15 amps.

If possible, use a dedicated receptacle with a single socket. If the receptacle has two sockets, do not plug any other items into the other socket.

The Mobile Connector is 20 feet (6 meters) long. Use an existing outlet or install a new outlet within approximately 13 feet (4 meters) of the vehicle's charge port and at least 18 inches (45 cm) above the ground. The charge port is located on the left side of the vehicle, behind a door that is part of the rear tail light assembly.

 **WARNING:** Do not use an extension cord, a multi-outlet adapter, a multi-plug, a conversion plug, or a power strip to plug in the Mobile Connector.

Charging Time

Charging times vary based on the voltage and current available from the power outlet, subject to various conditions. Charge time also depends on ambient temperature and the vehicle's Battery temperature. If the Battery is not within the optimal temperature range for charging, the vehicle heats or cools the Battery before or during charging.

To estimate the total time it takes to recharge the Battery in hours (from near zero percent to near one hundred percent), divide the battery size (kWh) by power (kW). Different adapters provide different current and power outputs.

While you are charging your vehicle, you can also touch the **Charging** icon to review the charging status information; it displays the time remaining until fully charged at the currently selected charge level.

For more information on how long it takes to charge your Tesla vehicle, go to www.tesla.com/support.

Adapters

The Mobile Connector includes two outlet adapters: one for a standard 120 volt household outlet and a second adapter for a 240 volt outlet. For faster charging, use a 240 volt outlet. Consult an electrician to install a 240 volt outlet where you plan to park your Tesla vehicle.

NEMA 5-15 Adapter



NEMA 14-50 Adapter

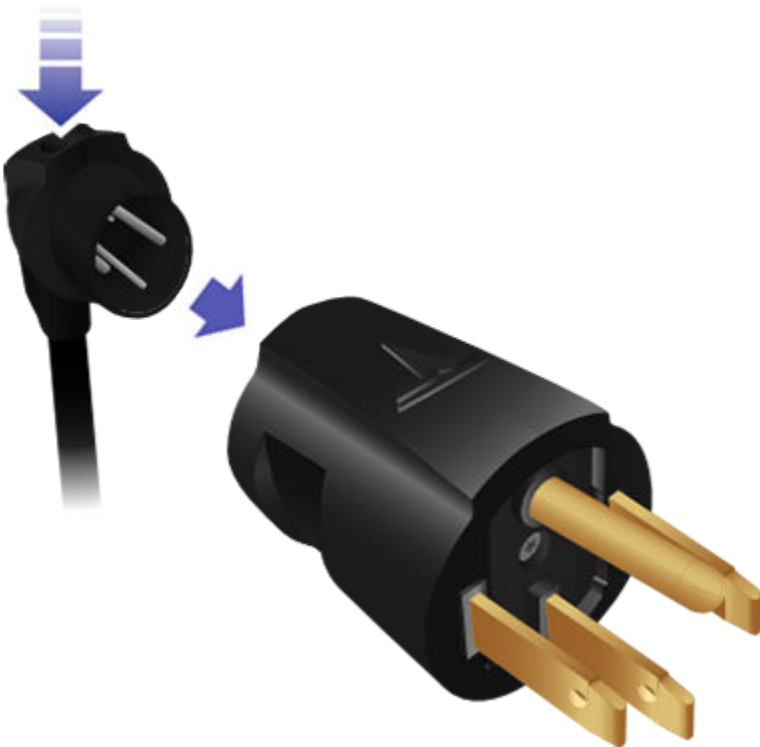


Additional adapters are available for purchase. For details, go to: shop.tesla.com.

NOTE: Images in this document are for demonstration purposes only.

Removing the Adapter

To remove an adapter, push the button on the Mobile Connector's charge cable and pull the adapter from its socket.

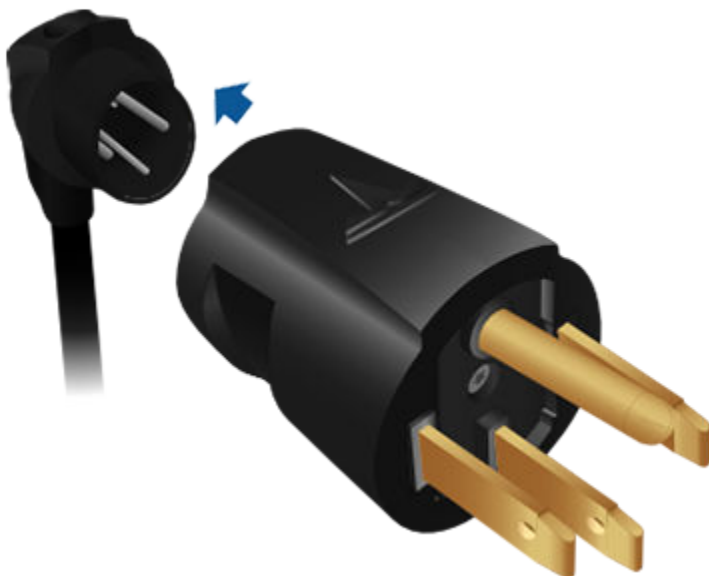


Attaching the Adapter

To attach an adapter, line up the adapter with the Mobile Connector's charge cable and push until it snaps into place.



Mobile Connector



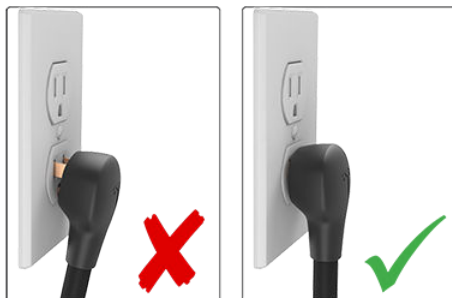
How to Charge

Plugging In

 **CAUTION:** Always inspect the Mobile Connector and adapter for damage prior to each use.

1. Ensure that the Mobile Connector's adapter matches the outlet you want to use.
2. Plug the Mobile Connector's adapter into the power outlet. The adapter should be inserted completely into the power outlet.

NOTE: Second generation adapter shown.



3. With your vehicle unlocked, press the button on the top of the Mobile Connector handle. The charge port door opens.



NOTE: Your vehicle is unlocked when the key is nearby and automatic unlocking is enabled. You can also open the charge port door using any of these methods:



4. Plug the Mobile Connector handle into your vehicle's charge port.
5. When you plug the Mobile Connector into your vehicle, the charge port indicator light pulses green during charging, and the vehicle displays charging information. The display turns off after you close all doors, and the charge port indicator light stops pulsing shortly after you lock the vehicle.

Unplugging

When charging is complete, the light stops pulsing and turns solid green.

1. With the vehicle unlocked, press and hold the button on the Mobile Connector handle, wait for the charge port indicator light to turn white, and then pull the Mobile Connector out of the charge port.

NOTE: To prevent unauthorized unplugging of the charge cable, the vehicle must be unlocked or able to recognize a key nearby before you can disconnect the charge cable.

NOTE: When the latch in the charge port retracts, the Mobile Connector stops supplying power and you can safely unplug it from the vehicle.

2. The charge port door automatically closes after you remove the charge cable.

NOTE: If your vehicle is not equipped with a motorized charge port door, you may need to push the charge port door closed.

Tesla recommends leaving the Mobile Connector plugged into the wall outlet to reduce wear and tear from day-to-day use. If you do not plan to use the Mobile Connector for a while (such as when you leave for vacation), unplug it, and store it in an appropriate location.

For More Information

For more detailed information on how to charge your vehicle (adjust charge settings, view charging status, etc.), refer to the charging section in the vehicle Owner's Manual.

Troubleshooting

Gen 1 Mobile Connector Status Lights

Under normal conditions, when charging is in progress, the Mobile Connector's lights illuminate sequentially, and the red light is off. Identify problems by paying attention to these lights.

NOTE: In some cases, you may need to reset the device by pressing the **RESET** button located on the back.

Front



Back





Mobile Connector

Green Lights	Red Light	What it means	What to do
All lights streaming	Off	Charging is in progress	Nothing. The Mobile Connector is successfully charging.
All on	Off	Power on. Mobile Connector is powered, but not charging, or scheduled charging is enabled	Make sure the Mobile Connector is plugged into the vehicle.
Off	1 flash	Ground fault. Electrical current is leaking through a potentially unsafe path	This should automatically reset in 15 minutes. If not, ensure no one is touching or inside the vehicle, then press the RESET button.
Off	2 flashes	Self check failed	Unplug the Mobile Connector from the vehicle and press the RESET button. Plug the Mobile Connector back into the vehicle. If the error persists, unplug the Mobile Connector from both the vehicle and the power outlet, then plug it back in. When plugging back in, always plug it into the outlet first.
Off	3 flashes	Contact failed	Unplug the Mobile Connector from the vehicle and wait 10 seconds. If the error persists, contact your closest Service Center (https://www.tesla.com/findus).
Off	4 flashes	The ground assurance monitoring circuit has detected loss of ground	Make sure the power outlet is properly grounded. Consider connecting to a different outlet. If uncertain, ask your electrician.
Off	5 flashes	Sense circuit fault	Make sure the Mobile Connector's adapter is attached properly.
Off	6 flashes	Thermal fault	Consider charging in a cooler area, such as indoors or in the shade.
Off	More than 6 flashes	The Mobile Connector may need repair	Contact your closest Service Center (https://www.tesla.com/findus).
Off	Off	Power lost	Unplug the Mobile Connector and check that the power outlet has power.

Questions?

ChargingInstallation@tesla.com

For 24/7 technical support: 1-877-79TESLA (1-877-798-3752)

For home charging installation inquiries: 1-650-681-6133

Gen 2

Safety Information

Save These Important Safety Instructions

This document contains important instructions and warnings that must be followed when using your Mobile Connector.

Warnings

WARNING: Read this entire document before using the Mobile Connector. Failure to do so or to follow any of the instructions or warnings in this document can result in fire, electrical shock, serious injury or death.

WARNING: Use the Mobile Connector only within the specified operating parameters.

WARNING: The Mobile Connector is designed only for charging a Tesla vehicle (excluding Tesla Roadster). Do not use it for any other purpose or with any other vehicle or object. The Mobile Connector is intended only for vehicles that do not require ventilation during charging.

WARNING: Do not use the Mobile Connector's adapters in any outlet for which they are not designed.



-  **WARNING:** Do not use (or discontinue using) the Mobile Connector if it is defective, appears cracked, frayed, broken or otherwise damaged, or fails to operate.
-  **WARNING:** Do not attempt to open, disassemble, repair, tamper with, or modify the Mobile Connector. The Mobile Connector is not user-serviceable. Contact Tesla for any repairs.
-  **WARNING:** Do not use an extension cord, a multi-outlet adapter, a multi-plug, a conversion plug, or a power strip to plug in the Mobile Connector.
-  **WARNING:** Do not disconnect the Mobile Connector from the wall outlet when the vehicle is charging.
-  **WARNING:** Do not plug the Mobile Connector into a damaged, loose or worn power outlet. Ensure that the prongs on the Mobile Connector fit snugly into the wall outlet.
-  **WARNING:** Do not connect the Mobile Connector into a power outlet that is not properly grounded.
-  **WARNING:** Do not expose the Mobile Connector to flammable or harsh chemicals or vapors. Do not use or store the Mobile Connector in a recessed area or below floor level. When using the Mobile Connector in an inside location such as a garage, position the Mobile Connector's main controller at least 18 inches (46 cm) above the floor.
-  **WARNING:** Do not use the Mobile Connector when either you, the vehicle or the Mobile Connector is exposed to severe rain, snow, electrical storm or other inclement weather.
-  **WARNING:** When transporting the Mobile Connector, handle with care to prevent damage to any of its components. Do not subject the Mobile Connector to strong force or impact. Do not pull, twist, tangle, drag or step on the Mobile Connector or any of its components.
-  **WARNING:** Protect the Mobile Connector from moisture, water and foreign objects at all times. If any exist or appear to have corroded or damaged the Mobile Connector, do not use the Mobile Connector.
-  **WARNING:** If rain falls during charging, do not allow rain water to run along the length of charge cable, causing the electrical outlet or charging port to become wet.
-  **WARNING:** Do not plug the Mobile Connector into an electrical outlet that is submerged in water or covered in snow. If, in this situation, the Mobile Connector is already plugged in and needs to be unplugged, turn off the breaker before unplugging the Mobile Connector.
-  **WARNING:** Do not touch the Mobile Connector's end terminals with sharp metallic objects, such as wire, tools or needles. Do not forcefully fold any part of the Mobile Connector or damage it with sharp objects. Do not insert foreign objects into any part of the Mobile Connector.
-  **WARNING:** Do not charge a vehicle that is covered with a non-Tesla approved car cover.
-  **WARNING:** Ensure that the Mobile Connector's charging cable does not obstruct pedestrians or other vehicles or objects.
-  **WARNING:** Use of the Mobile Connector may affect or impair the operation of medical or implantable electronic devices, such as an implantable cardiac pacemaker or an implantable cardioverter defibrillator. Before using the Mobile Connector, check with the electronic device manufacturer concerning the effects that charging may have on any such electronic device.
-  **WARNING:** Do not use cleaning solvents to clean the Mobile Connector.

Cautions

-  **CAUTION:** Do not use private power generators as a power source for charging.
-  **CAUTION:** Do not operate the Mobile Connector in temperatures outside its operating range of -22°F to +122°F (-30°C to +50°C).
-  **CAUTION:** Store the Mobile Connector in a clean dry place in temperatures between -40°F and +185°F (-40°C and +85°C).



Mobile Connector

General Information

Mobile Connector Component Overview



1. Handle
2. Button on handle
3. Cable
4. NEMA 5-15 Adapter
5. NEMA 14-50 Adapter (if equipped)
6. Mobile Connector controller
7. Status lights

Specifications

Use only a 120 volt, 208 volt or 240 volt AC supply, 50/60 hertz wall outlet that has a dedicated and properly grounded circuit, and is rated for at least 15A.



If possible, use a dedicated receptacle with a single socket. If the receptacle has two sockets, do not plug any other items into the other socket.

The Mobile Connector is 20 feet (6 meters) long. Use an existing outlet or install a new outlet within approximately 13 feet (4 meters) of the vehicle's charge port and at least 18 inches (45 cm) above the ground. The charge port is located on the left side of the vehicle, behind a door that is near the rear tail light assembly.



WARNING: Do not use an extension cord, a multi-outlet adapter, a multi-plug, a conversion plug, or a power strip to plug in the Mobile Connector.

Specifications Reference

Description	Specifications
Voltage	100-240 volt AC single-phase
Maximum Current	32A maximum; controlled by the appropriate adapter
Grid Frequency	50 or 60 Hz
Cable Length	20 ft (6 m) with adapter installed
Mobile Connector Controller Dimensions	Height: 7.1 in (179.8 mm) Width: 3.2 in (81.7 mm) Depth: 1.9 in (47.3 mm)
Weight	5.2 lbs (2.4 kg)
Operating Temperature	-22°F to +122°F (-30°C to +50°C)
Enclosure Type	4X
Ventilation	Not Required

Charging Time

Charging times vary based on the voltage and current available from the power outlet, subject to various conditions. Charge time also depends on ambient temperature and the vehicle's Battery temperature. If the Battery is not within the optimal temperature range for charging, the vehicle heats or cools the Battery before or during charging.

To estimate the total time it takes to recharge the Battery in hours (from near zero percent to near one hundred percent), divide the battery size (kWh) by power (kW). Different adapters provide different current and power outputs.

While you are charging your vehicle, you can also touch the **Charging** icon to review the charging status information; it displays the time remaining until fully charged at the currently selected charge level.

For more information on how long it takes to charge your Tesla vehicle, go to www.tesla.com/support.

Charging Rate Reference

Adapter	Current	Power at 120 Volts
5-20	16A	1.7 kW
5-15	12A	1.3 kW

Adapter	Current	Power at 240 Volts
14-50, 6-50	32A	7.6 kW
14-30, 10-30	24A	5.7 kW



Mobile Connector

Adapter	Current	Power at 240 Volts
6-20	16A	3.8 kW
6-15	12A	2.8 kW

Adapters

The Mobile Connector includes two outlet adapters: one for a standard 120 volt household outlet and a second adapter for a 240 volt outlet. For faster charging, use a 240 volt outlet. Consult an electrician to install a 240 volt outlet where you plan to park your Tesla vehicle.

NOTE: Depending on date of manufacture, your Mobile Connector may not include the NEMA 14-50 adapter. However, one can be purchased from Tesla.

NEMA 5-15 Adapter



NEMA 14-50 Adapter



Additional adapters may be available for purchase. For details, go to: shop.tesla.com.

Removing the Adapter

To remove an adapter, firmly grasp the adapter and pull it from its socket.





Mobile Connector

Attaching the Adapter

To attach an adapter, line up the adapter with the controller of the Mobile Connector and push it into the socket until it snaps into place.

NOTE: The Mobile Connector automatically detects the attached adapter and sets the appropriate current draw.



How to Charge

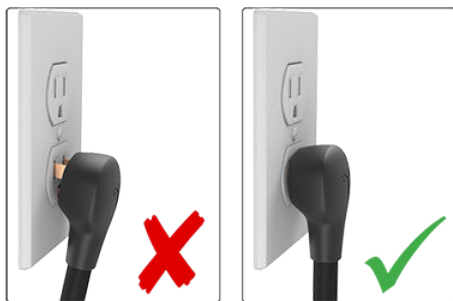
Plugging In



CAUTION: Always inspect the Mobile Connector and adapter for damage prior to each use.

1. Ensure that the Mobile Connector's adapter matches the outlet you want to use.
2. Plug the Mobile Connector's adapter into the power outlet. The adapter should be inserted completely into the power outlet.

NOTE: Second generation adapter shown.



3. With your vehicle unlocked, press the button on the top of the Mobile Connector handle. The charge port door opens.



NOTE: Your vehicle is unlocked when the key is nearby and automatic unlocking is enabled. You can also open the charge port door using any of these methods:

4. Plug the Mobile Connector handle into your vehicle's charge port.
5. When you plug the Mobile Connector into your vehicle, the charge port indicator light pulses green during charging, and the vehicle displays charging information. The display turns off after you close all doors, and the charge port indicator light stops pulsing shortly after you lock the vehicle.



Unplugging

When charging is complete, the light stops pulsing and turns solid green.

1. With the vehicle unlocked, press and hold the button on the Mobile Connector handle, wait for the charge port indicator light to turn white, and then pull the Mobile Connector out of the charge port.

NOTE: To prevent unauthorized unplugging of the charge cable, the vehicle must be unlocked or able to recognize a key nearby before you can disconnect the charge cable.

NOTE: When the latch in the charge port retracts, the Mobile Connector stops supplying power and you can safely unplug it from the vehicle.

2. The charge port door automatically closes after you remove the charge cable.

NOTE: If your vehicle is not equipped with a motorized charge port door, you may need to push the charge port door closed.

Tesla recommends leaving the Mobile Connector plugged into the wall outlet to reduce wear and tear from day-to-day use. If you do not plan to use the Mobile Connector for a while (such as when you leave for vacation), unplug it, and store it in an appropriate location.

For More Information

For more detailed information on how to charge your vehicle (adjust charge settings, view charging status, etc.), refer to the charging section in the vehicle Owner's Manual.

Troubleshooting

Gen 2 Mobile Connector Status Lights

Under normal conditions, when charging is in progress, the Tesla logo lights illuminate sequentially, and the red light is off. Identify problems by paying attention to these lights.



In some cases, you may need to reset the device by unplugging the Mobile Connector from the vehicle or from the power outlet.

Green Lights	Red Light	What it means	What to do
All on for 1 second	Off	Start-up sequence.	Nothing. The Mobile Connector is starting up.
All on	Off	Power on. Mobile Connector is powered and standing by, but not charging.	Make sure the Mobile Connector is plugged into the vehicle.
Streaming	Off	Charging is in progress.	Nothing. The Mobile Connector is successfully charging.



Mobile Connector

Green Lights	Red Light	What it means	What to do
Streaming	1 flash	Charging current is reduced due to high temperature detected in the vehicle connector.	Unplug the Mobile Connector from the vehicle, and then plug it back in. Consider charging in a cooler area, such as indoors or in the shade. If the error persists, contact your closest Service Center (https://www.tesla.com/findus).
Streaming	2 flashes	Charging current is reduced due to high temperature detected in the input plug that connects to the Mobile Connector controller.	Unplug the Mobile Connector from both the vehicle and the wall. Ensure that the adapter is fully inserted, plug the Mobile Connector into the wall, and then plug it into the vehicle. If the error persists, contact your closest Service Center (https://www.tesla.com/findus).
Streaming	3 flashes	Charging current is reduced due to high temperature detected in the Mobile Connector controller.	Unplug the Mobile Connector from the vehicle, and then plug it back in. Consider charging in a cooler area, such as indoors or in the shade. If the error persists, contact your closest Service Center (https://www.tesla.com/findus).
Streaming	4 flashes	Charging current is reduced due to high temperature detected in the wall plug.	Make sure the power outlet is suitable for charging and that the plug is seated correctly. Consider connecting to a different outlet. If uncertain, ask your electrician.
Streaming	5 flashes	Charging current is reduced due to a detected fault in the adapter.	Make sure the Mobile Connector's adapter is attached properly.
Off	1 flash	Ground fault. Electrical current is leaking through a potentially unsafe path.	Unplug the Mobile Connector from the vehicle and then plug it back in. Try a different outlet. If the error persists, contact your closest Service Center (https://www.tesla.com/findus).
Off	2 flashes	Ground loss. The Mobile Connector detects a loss of ground.	Make sure the power outlet is properly grounded. Consider connecting to a different outlet. If uncertain, ask your electrician.
Off	3 flashes	Relay/contacter fault.	Unplug the Mobile Connector from the vehicle and then plug it back in. Try a different outlet. If the error persists, contact your closest Service Center (https://www.tesla.com/findus).
Off	4 flashes	Over- or under-voltage protection.	Make sure the power outlet is suitable for charging and that the plug is seated correctly. Consider connecting to a different outlet. If uncertain, ask your electrician.
Off	5 flashes	Adapter fault.	Make sure the Mobile Connector's adapter is attached properly.
Off	6 flashes	Pilot fault. The pilot level is incorrect.	Unplug the Mobile Connector from the vehicle and then plug it back in. Try a different outlet. If the error persists, contact your closest Service Center (https://www.tesla.com/findus).
Off	7 flashes	Software error or mismatch.	Update the vehicle's software, if available. If an update is not available, contact your closest Service Center (https://www.tesla.com/findus).
Off	On	Self check failed.	Unplug the Mobile Connector from the vehicle then plug it back in. If the error persists, unplug the Mobile Connector from both the vehicle and the power outlet, then plug it back in.
All on	1 flash	Thermal fault.	Consider charging in a cooler area, such as indoors or in the shade. If the error persists, contact your closest Service Center (https://www.tesla.com/findus).
All on	5 flashes	Adapter fault. Charging current is limited to 8A.	Unplug the Mobile Connector from the vehicle. Plug the Mobile Connector back into the vehicle. If the error persists, unplug the Mobile Connector from both the vehicle and the power outlet, then plug it back in.
Off	Off	Power lost.	Unplug the Mobile Connector and check that the power outlet has power.



Questions?

ChargingInstallation@tesla.com

For 24/7 technical support: [1-877-79TESLA \(1-877-798-3752\)](tel:1-877-79TESLA)

For home charging installation inquiries: [1-650-681-6133](tel:1-650-681-6133)



Declarations of Conformity

Declarations of Conformity

FCC and IC Certification

Component	Manufacturer	Model	Operating Frequency (MHz)	FCC ID	IC
B Pillar Endpoint	Tesla	1614291	13.56 2400-2483.5 6500-8000	2AEIM-1614291	20098-1614291
Security Controller	Tesla	1614280	2400-2483.5	2AEIM-1614280	20098-1614280
Fascia Endpoint	Tesla	1613851	2400-2483.5 6500-8000	2AEIM-1613851	20098-1613851
Key fob	Tesla	1614283	2400-2483.5 6500-8000	2AEIM-1614283	20098-1614283
TPMS	Tesla	1472547	2400-2483.5	2AEIM-1472547	20098-1472547
Radar (if equipped)	Continental	ARS 4-B	76000-77000	OAYARS4B	4135A-ARS4B
Homelink	Gentex	ADHL5C	286-440MHz	NZLADHL5C	4112A-ADHL5C
CarPC	Tesla	1960000	--	XMR2020AG525RGL YZP-ATC5CPC001	10224A-2020AG525R 7414C-ATC5CPC001
Wireless Charger	Tesla	WC4	127.72 KHz 13.56 2400-2483.5	2AEIM-WC4	20098-WC4
Wireless Charger	Tesla	WC3	127.72KHz	2AEIM-WC3	20098-WC3
BT USB hub	Tesla	1642783	2400-2483.5	2AEIM-1642783	20098-1642783
In-cabin radar*	Tesla	1616631	60000-64000	2AEIM-1616631	20098-1616631

* The in-cabin radar is restricted to factory installation.

The devices listed above comply with Part 15 of the FCC rules and Industry Canada's license-exempt RSS Standard(s) and EU Directive 2014/53/EU.

Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by Tesla could void your authority to operate the equipment.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Radiation Exposure Statement

The products comply with the FCC/IC RF Exposure for Low Power Consumer Wireless Power Transfer. RF exposure limits are set forth for an uncontrolled environment and are safe for intended operation as described in this manual. The farthest RF exposure demonstrated by compliance was at 20cm and farther from the user's body; set the device to low output power if such function is available.



Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé.

Déclaration d'exposition aux radiations

Le produit est conforme à l'exposition RF IC pour le transfert de puissance sans fil de consommateurs de faible puissance. La limite d'exposition RF fixée pour un environnement non contrôlé est sans danger pour le fonctionnement prévu tel que décrit dans ce manuel. L'exposition RF supplémentaire que la conformité a été démontrée à 20cm et plus de séparation du corps de l'utilisateur ou de mettre l'appareil à la puissance de sortie inférieure si une telle fonction est disponible.

Mexico

IFT-008-SCFI-2015 / NOM-208-SCFI-2016

Key fob, model: 1614283, IFT #: RLVTE1621-3394

La operación de este equipo está sujeta a las siguientes dos condiciones:

1. Es posible que este equipo o dispositivo no cause interferencia perjudicial.
2. Este equipo debe aceptar cualquier interferencia, incluyendo la que pueda causar su operación no deseada.

Radio Frequency Information

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician to help.



CAUTION: This equipment and its antennas must not be co-located or operated with another antenna or transmitter.

Canada

CAN ICES-003 (B)/NMB-003(B)

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radioexempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé.

Déclaration d'exposition aux radiations

Le produit est conforme à l'exposition RF IC pour le transfert de puissance sans fil de consommateurs de faible puissance. La limite d'exposition RF fixée pour un environnement non contrôlé est sans danger pour le fonctionnement prévu tel que décrit dans ce manuel. L'exposition RF supplémentaire que la conformité a été démontrée à 20cm et plus de séparation du corps de l'utilisateur ou de mettre l'appareil à la puissance de sortie inférieure si une telle fonction est disponible.



Declarations of Conformity

Declarations of Conformity

Key and Passive Unlocking System

FCC Certification

Model Number	Mfr	Frequency	Tested For
A-0749G02	Pektron	315 MHz	USA Canada Mexico Taiwan
A-0749G12	Pektron	315 MHz	USA Canada Mexico Taiwan
WC1	Tesla	127.7 KHz	Global

The devices listed above comply with Part 15 of the FCC rules, Industry Canada's license-exempt RSS Standard(s) and EU Directive 2014/53/EU.

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by Tesla could void your authority to operate the equipment.

La Operación de Este Equipo no está Sujeta a las dos following conditions:

1. Es Posible Que Este Equipo o Dispositivo no causar interferencia perjudicial.
2. Este Equipo o Dispositivo debe Aceptar Cualquier interferencia. Incluyendo La Que Pueda causar do Operación no Deseada.

Radiation Exposure Statement

The product complies with the FCC/IC RF Exposure for Low Power Consumer Wireless Power Transfer. The RF exposure limit set forth for an uncontrolled environment and are safe for intended operation as described in this manual. The furthest RF exposure that compliance was demonstrated at 20cm and greater separation from the user body or set the device to lower output power if such function is available.

IC Certification

CAN ICES-3 (B)/NMB-3(B)

The following device is used in vehicles in Canada:

- Key fob Model Number: 002 and A-0749G12 (315 MHz)
- Key fob Manufacturer: Pektron

Per IC 10176A-002, this device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.



Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radioexempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1. L'Appareil ne doit pas produire de brouillage, et
2. L'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé.

Déclaration d'exposition aux radiations:

Le produit est conforme à l'exposition RF IC pour le transfert de puissance sans fil de consommateurs de faible puissance. La limite d'exposition RF fixée pour un environnement non contrôlé est sans danger pour le fonctionnement prévu tel que décrit dans ce manuel. L'exposition RF supplémentaire que la conformité a été démontrée à 20cm et plus de séparation du corps de l'utilisateur ou de mettre l'appareil à la puissance de sortie inférieure si une telle fonction est disponible.

IC Certification

La Operación de Este Equipo no está Sujeta a las dos condiciones siguientes:

1. Es Posible Que Este Equipo o Dispositivo no causar interferencia perjudicial.
2. Este Equipo o Dispositivo debe Aceptar Cualquier interferencia. Incluyendo La Que Pueda causar do Operación no Deseada.

MIC Certification

Model Number	Mfr	MHz	Tested For
A-0749G04/A-0749G14	Pektron	315	Japan

CE Certification

Model #	Mfr	MHz	Tested For
A-0749G01 and A-0749G11	Pektron	433	Europe Australia New Zealand Singapore South Korea
A-0749G05 and A-0749G15	Pektron	433	China Hong Kong Korea

The devices listed above comply with CE standards. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by Tesla could void your authority to operate the equipment.



Declarations of Conformity

Tire Pressure Monitoring System

FCC IDs: TZSTPMS201, Z9F-201FS43X

IC ID: 11852A-201FS4X

The tire pressure monitoring system (TPMS) complies with Part 15 of the FCC rules and RSS-210 of Innovation, Science and Economic Development Canada. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by Tesla could void your authority to operate the equipment.

HomeLink

This device complies with Part 15 of the FCC rules, RSS-210 Industry Canada, and with EU Directive 2014/53/EU.

Operation is subject to the following conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications to the device not expressly approved by the manufacturer or Tesla could void your authority to operate the equipment.

Radio Frequency Information

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Declarations of Conformity

Key and Passive Unlocking System

FCC Certification

Model Number	Mfr	Frequency	Tested For
Key fob 1048598	Tesla	2.4 GHz	USA Canada Mexico Taiwan
WC1	Tesla	127.7KHz	Global



The devices listed above comply with Part 15 of the FCC rules, Industry Canada's license-exempt RSS Standard(s) and EU Directive 2014/53/EU.

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by Tesla could void your authority to operate the equipment.

La Operación de Este Equipo no está Sujeta a las dos following conditions:

1. Es Posible Que Este Equipo o Dispositivo no causar interferencia perjudicial.
2. Este Equipo o Dispositivo debe Aceptar Cualquier interferencia. Incluyendo La Que Pueda causar do Operación no Deseada.

Radiation Exposure Statement

The product complies with FCC/IC RF Exposure for Low Power Consumer Wireless Power Transfer. The RF exposure limit set forth for an uncontrolled environment is safe for the operations intended, as described in this manual. Compliance was demonstrated at a distance of 20 cm or greater between the human body and the device. If the function is available, the device's output power could be lowered.

IC Certification

The following device is used in vehicles in Canada:

- Key fob Model Number: 1048598 (2.4 GHz)
- Key fob Manufacturer: Tesla

Per IC 20098-1048598, this device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radioexempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1. L'Appareil ne doit pas produire de brouillage, et
2. L'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé.

Déclaration d'exposition aux radiations:

Le produit est conforme à l'exposition RF IC pour le transfert de puissance sans fil de consommateurs de faible puissance. La limite d'exposition RF fixée pour un environnement non contrôlé est sans danger pour le fonctionnement prévu tel que décrit dans ce manuel. L'exposition RF supplémentaire que la conformité a été démontrée à 20cm et plus de séparation du corps de l'utilisateur ou de mettre l'appareil à la puissance de sortie inférieure si une telle fonction est disponible.

IC Certification

La Operación de Este Equipo no está Sujeta a las dos condiciones siguientes:

1. Es Posible Que Este Equipo o Dispositivo no causar interferencia perjudicial.
2. Este Equipo o Dispositivo debe Aceptar Cualquier interferencia. Incluyendo La Que Pueda causar do Operación no Deseada.



Declarations of Conformity

Central Body Controller

FCC Certification

Model Number	Mfr	MHz / GHz	Tested For
Central Body Controller 1031503	Tesla	315 / 2.4	USA Canada

Per FCC ID 2AEIM-1031503, the devices listed above comply with Part 15 of the FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by Tesla could void your authority to operate the equipment.

IC Certification

The following device is used in vehicles in Canada:

- Central Body Controller Model Number: 1031503 (315 MHz / 2.4 GHz)
- Central Body Controller Manufacturer: Tesla

Per IC 20098-1031503, this device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Integral Component Only

The Central Body Controller is an integral part of the vehicle that is installed and secured around other interior trim components. The Central Body Controller is designed and intended for use only as an integral component and cannot be sold and/or marketed separately.

Tire Pressure Monitoring System

FCC IDs: TZSTPMS201, Z9F-201FS43X

IC ID: 11852A-201FS4X

The tire pressure monitoring system (TPMS) complies with Part 15 of the FCC rules and RSS-210 of Innovation, Science and Economic Development Canada. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by Tesla could void your authority to operate the equipment.

HomeLink

This device complies with Part 15 of the FCC rules, RSS-210 Industry Canada, and with EU Directive 2014/53/EU.

Operation is subject to the following conditions:

- This device may not cause harmful interference.



- This device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications to the device not expressly approved by the manufacturer or Tesla could void your authority to operate the equipment.

Radio Frequency Information

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Declarations of Conformity

FCC and IC Certification

Component	Manufacturer	Model	Operating Frequency (MHz)	FCC ID	IC
B Pillar Endpoint	Tesla	1607773	13.56 2400-2483.5 6500-8000	2AEIM-1607773	20098-1607773
Security Controller	Tesla	1614280	2400-2483.5	2AEIM-1614280	20098-1614280
Fascia Endpoint	Tesla	1613851	2400-2483.5 6500-8000	2AEIM-1613851	20098-1613851
Key fob	Tesla	1614285	2400-2483.5 6500-8000	2AEIM-1614285	20098-1614285
TPMS	Tesla	1472547	2400-2483.5	2AEIM-1472547	20098-1472547
Radar (if equipped) (if equipped)	Continental	ARS 4-B	76000-77000	OAYARS4B	4135A-ARS4B
Homelink	Gentex	ADHL5C	286-440	NZLADHL5C	4112A-ADHL5C
CarPC	Tesla	1960000	--	XMR2020AG525RGL YZP-ATC5CPC001	10224A-2020AG525R 7414C-ATC5CPC001
Wireless Charger	Tesla	WC4	127.72 KHz 13.56 2400-2483.5	2AEIM-WC4	20098-WC4
BT USB hub	Tesla	1642783	2400-2483.5	2AEIM-1642783	20098-1642783
In-Cabin Radar*	Tesla	1616631	60000-64000	2AEIM-1616631	20098-1616631
Wireless Charger	Tesla	WC3	127.72 KHz	2AEIM-WC3	20098-WC3



Declarations of Conformity

*The in-cabin radar is restricted to factory installation.

The devices listed above comply with Part 15 of the FCC rules and Industry Canada's license-exempt RSS Standard(s) and EU Directive 2014/53/EU.

Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by Tesla could void your authority to operate the equipment.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Radiation Exposure Statement

The products comply with the FCC/IC RF Exposure for Low Power Consumer Wireless Power Transfer. RF exposure limits are set forth for an uncontrolled environment and are safe for intended operation as described in this manual. The farthest RF exposure demonstrated by compliance was at 20cm and farther from the user's body; set the device to low output power if such function is available.

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé.

Déclaration d'exposition aux radiations

Le produit est conforme à l'exposition RF IC pour le transfert de puissance sans fil de consommateurs de faible puissance. La limite d'exposition RF fixée pour un environnement non contrôlé est sans danger pour le fonctionnement prévu tel que décrit dans ce manuel. L'exposition RF supplémentaire que la conformité a été démontrée à 20cm et plus de séparation du corps de l'utilisateur ou de mettre l'appareil à la puissance de sortie inférieure si une telle fonction est disponible.

Radio Frequency Information

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician to help.

 **CAUTION:** This equipment and its antennas must not be co-located or operated with another antenna or transmitter.

Canada

CAN ICES-3 (B)/NMB-3(B)

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.



Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé.

Déclaration d'exposition aux radiations:

Le produit est conforme à l'exposition RF IC pour le transfert de puissance sans fil de consommateurs de faible puissance. La limite d'exposition RF fixée pour un environnement non contrôlé est sans danger pour le fonctionnement prévu tel que décrit dans ce manuel. L'exposition RF supplémentaire que la conformité a été démontrée à 20cm et plus de séparation du corps de l'utilisateur ou de mettre l'appareil à la puissance de sortie inférieure si une telle fonction est disponible.

Mexico

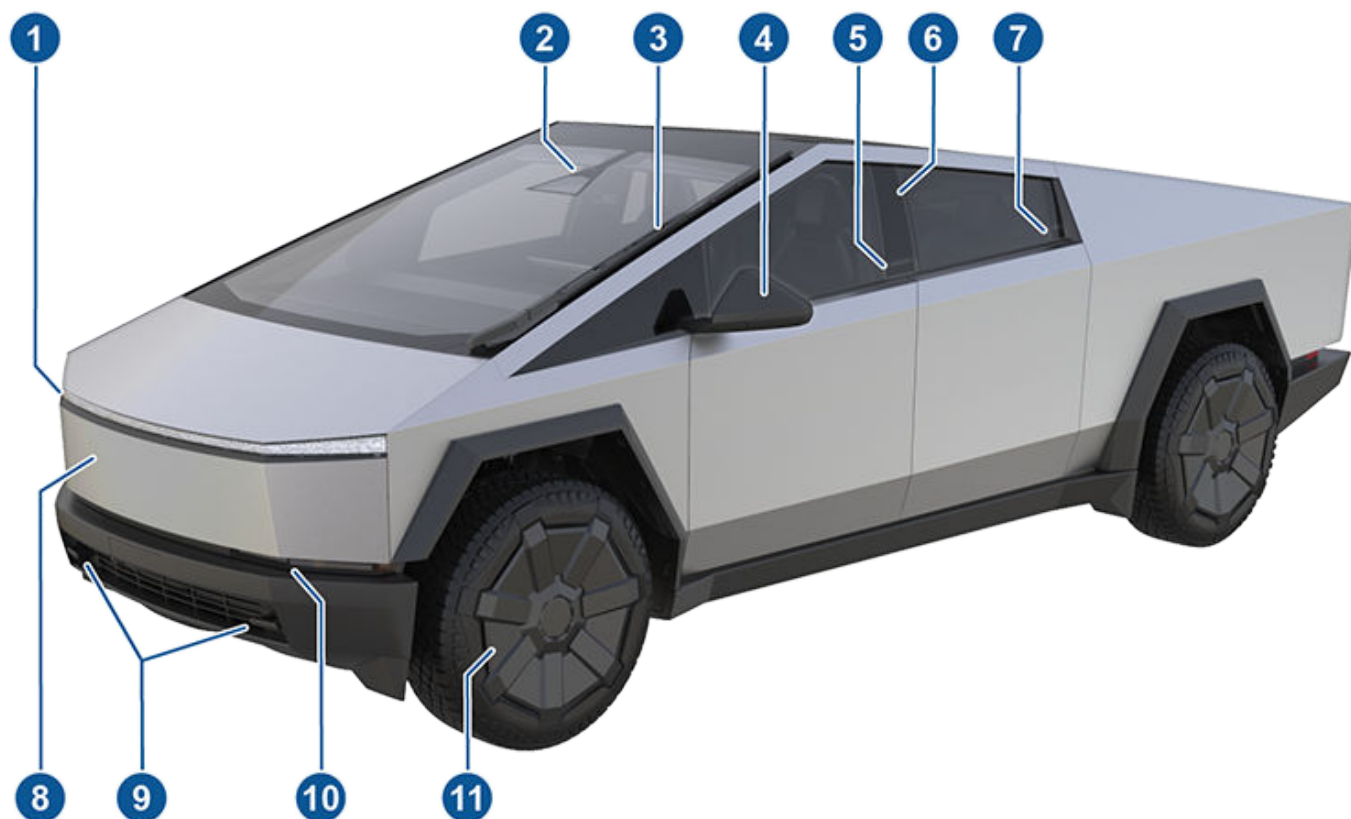
IFT-008-SCFI-2015 / NOM-208-SCFI-2016

La operación de este equipo está sujeta a las siguientes dos condiciones:

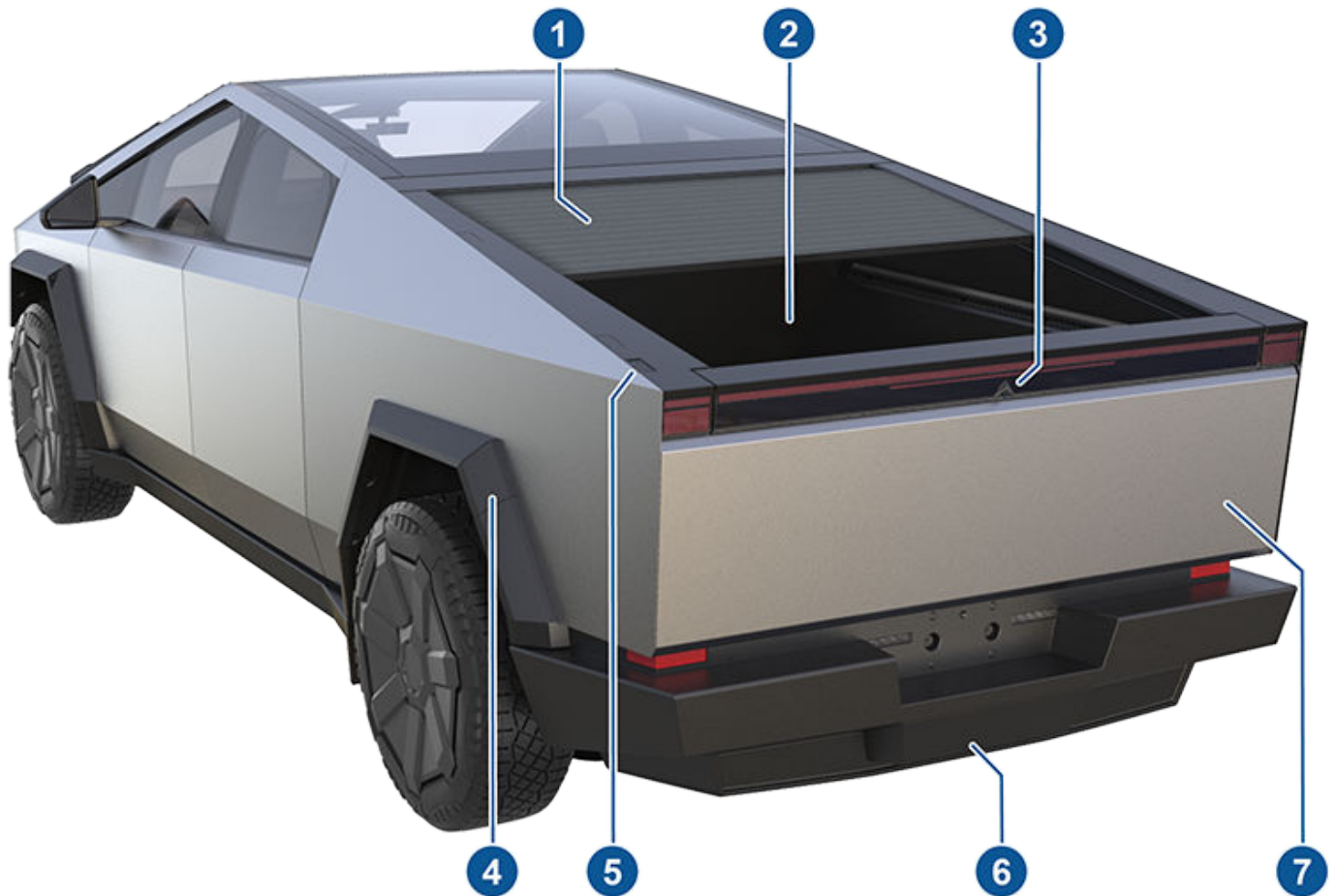
1. Es posible que este equipo o dispositivo no cause interferencia perjudicial.
2. Este equipo debe aceptar cualquier interferencia, incluyendo la que pueda causar su operación no deseada.



Exterior



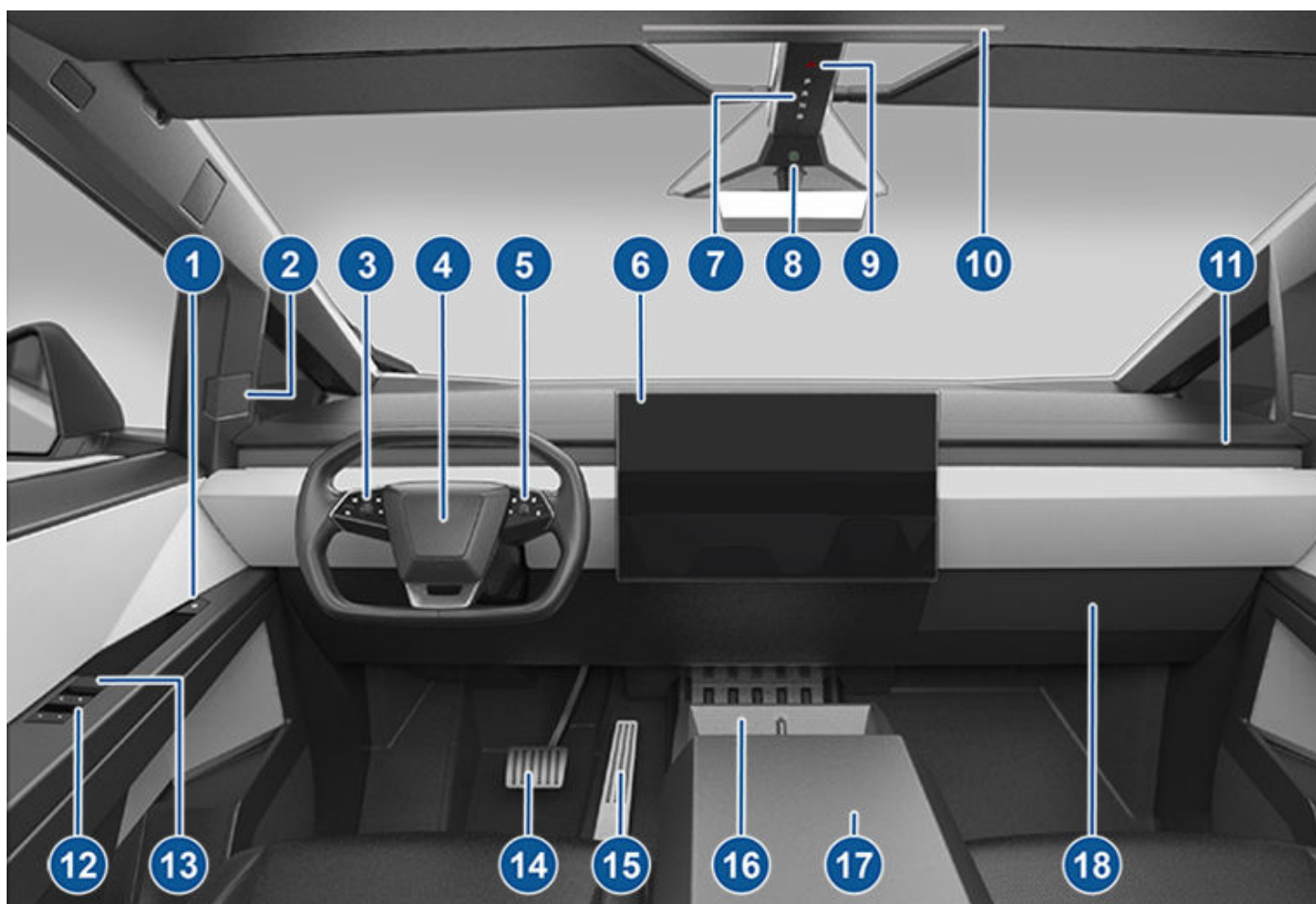
1. Signature light bar ([Lights on page 756](#))
2. Autopilot cameras ([Cameras on page 669](#))
3. Wiper blade ([Windshield Wiper and Washers on page 760](#))
4. Exterior mirrors ([Mirrors on page 753](#))
5. Front exterior door release button ([Doors on page 678](#))
6. Key card reader ([Keys on page 674](#))
7. Rear exterior door release button ([Doors on page 678](#))
8. Powered frunk ([Powered Frunk on page 717](#))
9. Front tow hooks ([Instructions for Transporters on page 938](#))
10. Front exterior lights ([Lights on page 756](#))
11. Wheels and tires ([Wheel and Tire Specifications on page 907](#))



1. Tonneau cover ([Cargo Bed on page 720](#))
2. Cargo bed ([Cargo Bed on page 720](#))
3. Rear-facing camera ([Rear-Facing Camera on page 670](#))
4. Charge port ([Charging Instructions on page 872](#))
5. Exterior cargo bed switch ([Accessing the Cargo Bed on page 721](#))
6. Tow hitch cover ([Towing a Trailer on page 784](#))
7. Tailgate ([Cargo Bed on page 720](#))



Interior



1. Interior door open button ([Doors on page 678](#))
2. Blind spot indicator and speaker ([#unique_1105 on page](#))
3. Left scroll button ([Left Scroll Button on page 749](#))
4. Horn ([Horn on page 751](#))
5. Right scroll button ([Right Scroll Button on page 751](#))
6. Touchscreen ([Touchscreen on page 647](#))
7. Secondary drive mode selector on overhead console ([Shifting on page 200](#))
8. Cabin camera ([Cabin Camera on page 672](#))
9. Hazard warning flashers ([Hazard Warning Flashers on page 758](#))
10. Front passenger dome light ([Lights on page 756](#))

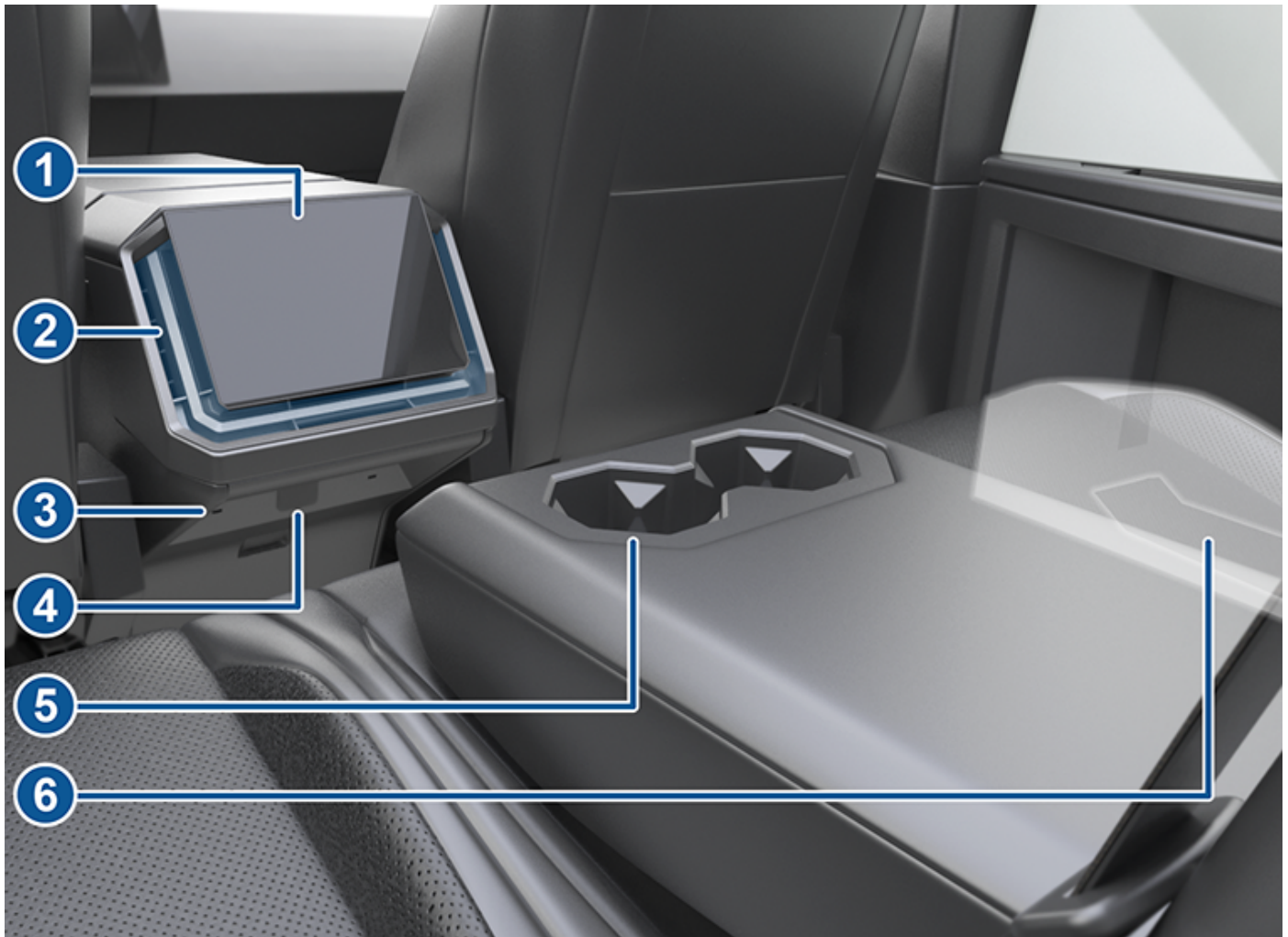


CAUTION: Model S/Model X is equipped with an in-cabin sensor located near the front passenger dome light to ensure certain vehicle and safety components are working properly. Do not block or obstruct the sensor. Doing so may cause inaccurate readings, such as for occupant detection, parking brake engagement, vehicle display settings, etc.

11. Climate control vent ([Adjusting the Front and Rear Vents on page 849](#))
12. Power window switches ([Windows on page 682](#))
13. Manual door release ([Opening Doors with No Power on page 950](#))
14. Brake pedal ([Braking and Stopping on page 762](#))
15. Accelerator pedal ([On-Road Modes on page 769](#))
16. Wireless phone chargers and key card readers ([Wireless Phone Chargers on page 661](#) and [Key Card on page 675](#))
17. Center console ([Center Console on page 713](#))



18. Glovebox (Glovebox on page 715)



1. Rear touchscreen ([Rear Touchscreen on page 652](#))
2. Rear climate control vents ([Adjusting the Front and Rear Vents on page 849](#))
3. USB ports ([USB-C Ports on page 660](#))
4. Rear outlet (120V) ([Interior Electronics on page 660](#))
5. Cup holders ([Rear Console on page 713](#))
6. Rear door mechanical release ([Opening a Rear Door with No Power on page 950](#))

NOTE: The door mechanical release should only be used in emergency situations.

Touchscreen

NOTE: Throughout this Owner's Manual, the front touchscreen is referred to as the "touchscreen" whereas the rear touchscreen is referred to as the "rear touchscreen".



WARNING: Always pay attention to road and traffic conditions when driving. To minimize driver distraction and ensure the safety of vehicle occupants as well as other road users, avoid using the touchscreen to adjust settings while the vehicle is in motion.



Overview

Use the touchscreen to control many features that, in traditional vehicles, are controlled using physical buttons (for example, adjusting the cabin heating and air conditioning, headlights, etc.). You also use the touchscreen to control media, navigate, use entertainment features, and customize Model S/Model X to suit your preferences. For hands-free access to common touchscreen controls, use voice commands (see [Voice Commands on page 391](#)).

If the touchscreen is unresponsive or demonstrates unusual behavior, you can restart it (see [Restarting the Touchscreen on page 650](#)).

CAUTION: Do not apply a screen protector on the touchscreen. Doing so can result in unintended inputs to the touchscreen (phantom inputs), delayed response or unresponsiveness to touches, electrostatic discharge which can damage the touchscreen, etc. Any damage caused by installing a screen protector is not covered by the warranty.

The following shows the touchscreen while Model S/Model X is parked.

NOTE: Illustrations are provided to improve conceptual understanding only. Depending on vehicle options, software version, market region and regional and language settings, the details displayed on the screen will differ.



1. **Navigation:** Find or navigate to a destination (see [Maps and Navigation on page 368](#)).
2. **Status bar:** This area on the top of the touchscreen displays the time of day, the outside temperature, and more (see [Top Status Bar Icons on page 649](#)).
3. **Drive mode strip:** Use to shift into Park, Reverse, or Drive. Swipe right from the upper-left side of the screen to display the drive mode strip (see [Shifting on page 200](#)).
NOTE: To shift into Neutral, open **Controls**, then press and hold the **Neutral** icon.
4. **Vehicle status:** This area dynamically displays the current status of Model S/Model X as you drive, park, open doors, turn lights on, etc. Monitor this area when driving as it displays important information such as driving speed and warning messages (see [Vehicle Status on page 654](#)). When in Park, you can interact with the vehicle and open the powered frunk, tonneau, tailgate, and charge port door, and change the ride height setting. This area is also used for shortcut cards for media, tire pressures, and trip information.
5. **Controls:** Control various features and customize Model S/Model X to suit your preferences. The Controls screen appears over the map. Touch an option on the Controls screen to display the various settings and preferences associated with the chosen option.



To search for a specific setting, touch **Search** at the top of the Controls tab.



When an information icon displays beside a specific setting, touch to display a popup that provides helpful details about the associated setting.

NOTE: Many vehicle controls, settings, and preferences (such as climate, media, and navigation) can be adjusted hands-free using voice commands (see [Voice Commands on page 391](#)).

6. **Climate controls (driver):** Use the left and right arrows to decrease/increase cabin temperature. Touch **Split** on the popup to display separate controls for the driver and passenger. Touch the temperature icon to customize climate control settings (see [Operating Climate Controls on page 844](#)). The passenger climate controls display when temperature controls have been **Split** to provide separate controls for the driver and passenger.
7. **Map Orientation:** Touch to toggle the orientation of the map between North Up and Heading Up (see [Maps and Navigation on page 368](#)).
8. **My Apps:** For one-touch access to frequently used apps and controls, you can choose what displays here (see [Customizing My Apps on page 653](#)).
9. **App Launcher:** Touch the app launcher to open the app tray. Then touch any app to open it. The app you choose displays on top of the map. To close an app, drag it downward or press the **X** in the corner of the app.
10. **Recent App(s):** Displays the most recently used app(s). The number of recent apps displayed here depends on how many apps have been added to **My Apps**. If you add the maximum number of apps to **My Apps**, only the most recent app displays.
11. **Volume Control:** Controls the volume of media player and phone calls (see [Volume Controls on page 376](#)). The volume of navigation instructions is controlled separately (see [Maps and Navigation on page 368](#)).

Top Status Bar Icons



Touch to lock/unlock all doors and closures.



Displays the local weather conditions. Touch to display more detailed information about the weather and air quality, including chance of rain, humidity, and UV index. Requires premium connectivity.

72°F

Displays the current temperature. If your vehicle is equipped with premium connectivity, you can also touch to display more detailed information about the weather and air quality, including chance of rain, humidity, and UV index.



Displays on the touchscreen status bar only when Model S/Model X detects that the local Air Quality Index (AQI) value is poor. A poor AQI will have yellow, orange, red, purple, or maroon numbers. Touch to display more detailed information about the weather and air quality, including chance of rain, humidity, and UV index. Requires premium connectivity.

4:20 pm

Your vehicle automatically updates the time. If the time is incorrect, confirm your vehicle has internet and GPS connectivity with the latest software. To switch between 12 and 24 hour format, touch **Controls > Display**.



Displays on the touchscreen status bar only when Model S/Model X detects a programmed myQ Smart Garage within range (see [HomeLink Universal Transceiver on page 400](#)).



Overview



Displays on the touchscreen status bar only when Model S/Model X is parked. Add, configure (including **Valet Mode** and **Use Easy Entry**), or quickly switch driver profiles. Driver profiles can also be accessed from the top of any Controls screen (see [Driver Profiles on page 182](#)).



Available when Model S/Model X is parked, touch to manually enable or disable Sentry Mode for the current drive cycle. To automatically turn Sentry Mode on (or off) every time you leave your vehicle, enable the setting from **Controls > Safety > Sentry Mode** (see [Sentry Mode on page 840](#)).

NOTE: If you turn Sentry Mode on or off from **Controls > Sentry Mode**, the shortcuts on the vehicle's touchscreen and mobile app will only work for the current drive cycle.



Displays when Model S/Model X is connected to a Wi-Fi network.



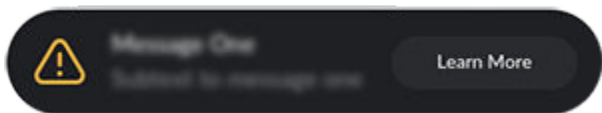
Displays when Model S/Model X cellular connectivity is available or being used.



Appears when your vehicle's GPS location is actively being accessed in the Tesla app by the owner, an added driver, or a third party app you're using. To disable, navigate to **Controls > Safety > Allow Mobile Access** on the touchscreen.

Popup Messages and Vehicle Alerts

Popup messages appear at the bottom of the touchscreen. For example, a seat belt reminder appears if a seat belt is unfastened in an occupied seat, an alert appears to notify you of an incoming phone call, and voice commands appear when in use. If applicable, touch options from these popup messages (for example, accept/decline a phone call, choose an option from the headlight menu, etc.). To dismiss a popup message, swipe it downward.



If an alert appears on your vehicle's touchscreen, touch **Learn More** for more details regarding the alert and how it can be resolved (see [Troubleshooting Alerts on page 543](#)). You can view a list of vehicle alerts and notifications by touching the bell icon at the top of **Controls**.

NOTE: Not all alerts provide additional information at this time.

Restarting the Touchscreen

You can restart your touchscreen if it is unresponsive or demonstrates unusual behavior.

WARNING: Only restart the touchscreen while the vehicle is stopped and in Park. The vehicle status display, safety warnings, backup camera, etc. will not be visible during the restart.

1. Shift into Park.
2. Hold down both scroll buttons on the steering wheel until the touchscreen turns black.



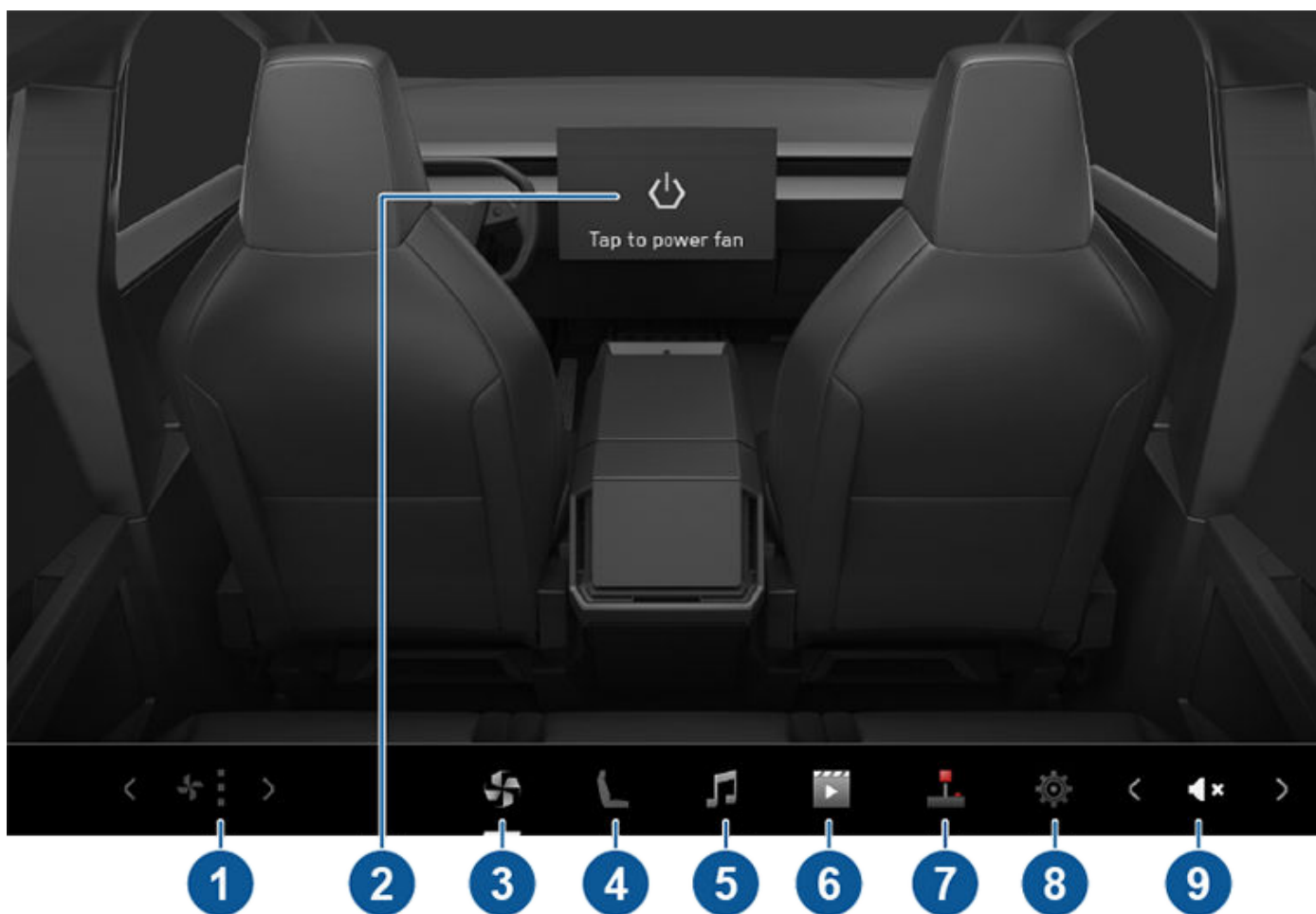
3. Wait approximately 30 seconds for the touchscreen to restart. If the touchscreen is still unresponsive or demonstrating unusual behavior after a few minutes, try power cycling the vehicle, if possible (see [Starting and Powering Off](#) on page 741).

NOTE: Restarting the touchscreen also activates the drive mode selector on the overhead console.

NOTE: Pressing the scroll buttons only restarts the touchscreen. It does not restart any other vehicle component and does not power Model S/Model X off and on.



Rear Touchscreen



The rear touchscreen provides rear passengers with access to:

1. **Fan Speed:** Touch the arrows to decrease/increase the fan speed.
NOTE: You can also use the front touchscreen to adjust climate settings in the rear cabin (see [Operating Climate Controls on page 844](#)).
2. **Power:** Touch to turn the rear climate control system on or off.
3. **Climate:** Touch to turn the rear fan on or off and control the direction of air flow from the rear vents (see [Adjusting the Front and Rear Vents on page 849](#)).
4. **Seats:** Control rear seat heaters and move the front passenger seat forward/rearward using the arrows.
5. **Media:** Play, pause, skip or rewind through the currently playing song (see [Media on page 375](#)).
6. **Video:** Access video streaming services.
7. **Arcade:** Play various video games on the rear touchscreen.
8. **Settings:** Touch to pair up to two sets of Bluetooth headphones, change the brightness or clean the display.
NOTE: Connect headphones to listen to audio from the rear touchscreen. The vehicle supports up to two Bluetooth devices at a time (such as one phone and one headset).
9. **Volume:** Touch the arrows to adjust the volume.

NOTE: Adjusting the media and volume controls also adjusts the front cabin settings.



Rear Screen Remote Control



To control the rear screen from the front display, open the rear screen remote control app from the app launcher. Besides audio, video and climate controls, you can lock the rear display in the app or by touching **Controls > Display > Lock Rear Display**.

Customizing My Apps

For one-touch access to commonly used apps and controls, you can customize what displays in the **My Apps** area on the touchscreen's bottom bar:

1. Enter customization mode by touching and holding any app or control in the **My Apps** area. If this area is empty, touch the app launcher (the ellipsis icon).
2. Drag your desired app or control from the app tray onto the **My Apps** area in the bottom bar.

NOTE: Controls (for example, defrosters and seat heaters) appear in the app tray only when you enter customization mode by touching and holding an app. Seat heaters selected from the app tray appear next to the temperature, instead of in the **My Apps** area.

Remove an app or control from the **My Apps** area by touching and holding, then touching its associated "X".

When you've added the maximum number of apps or controls to **My Apps**, adding an additional app removes the rightmost app.

Customizing Display and Sound Settings

Touch **Controls > Display** to adjust display settings to suit your preferences:

- **Appearance:** Customize the display to be **Dark** or **Light**. When set to **Auto**, the brightness changes automatically based on ambient lighting conditions.
- **Reduce Blue Light:** When enabled, the display automatically adjusts to use warmer colors at night.
- **Cybertruck Logo:** When enabled, the display shows the Model S/Model X logo when it is powered on. When disabled, the display shows the Tesla logo when it is powered on.
- **Brightness:** Drag the slider to manually control the brightness level. If **Display Mode** is set to **Auto**, the touchscreen further adjusts based on both the ambient lighting conditions and your brightness preference. Model S/Model X remembers your chosen brightness preference and adjusts the touchscreen accordingly.
- **Rear View Camera:** Choose when to display the feed from the rear view camera. When set to **Auto**, the rear view camera feed displays automatically when the tonneau cover is closed.
- **Screen Clean Mode:** When enabled, your touchscreen darkens and temporarily disables to facilitate cleaning. Follow the onscreen instructions to exit Screen Clean Mode.
- **Touchscreen Language:** Select the language that the touchscreen displays.
NOTE: Model S/Model X must be in Park to change the language. When you change the language, you experience a brief delay as the touchscreen restarts.
- **Lock Rear Display:** Lock access to the rear touchscreen.
- **Time:** Choose to display time in either 12 or 24 hour format.
- **Energy Display:** Choose to display remaining energy and charging units as either a percentage of battery energy remaining, or as an estimate of the distance you can drive.
NOTE: When anticipating when you need to charge, use energy estimate as a general guideline only. Many factors have an impact on energy consumption (see [Getting Maximum Range on page 261](#)).
- **Distance:** Choose to display range using miles or kilometers.



Overview

- **Temperature:** Choose to display temperature using Fahrenheit or Celsius.
- **Tire Pressure:** Choose to display tire pressures using BAR or PSI.

In addition to customizing the display, you can enable Joe Mode to reduce the volume of all chimes that are not related to critical safety issues. Touch **Controls > Safety > Joe Mode** to enable.

Naming your Vehicle

To further personalize your vehicle, you can name it. Touch **Controls > Software > Name Your Vehicle** located on the right side of the touchscreen below the image of your Model S/Model X.

If your vehicle already has a name, touch the existing name to change it. Enter the new name in the popup and touch **Save**. The name of your Model S/Model X appears in the Tesla mobile app, where you can also change it.

Erasing Personal Data

You can erase all personal data (saved addresses, music favorites, etc.) and restore all customized settings to their factory defaults. This is useful when transferring ownership of Model S/Model X. Touch **Controls > Service > Factory Reset**. Before erasing, Model S/Model X verifies your credentials by prompting you to enter the user name and password associated with your Tesla account.

Vehicle Status

Overview

The touchscreen displays the status of Model S/Model X at all times. What you see depends on whether the vehicle is:

- Parked (see [Touchscreen on page 647](#)).
- Driving (see [Driving Status on page 658](#)).
- Charging (see [Charging Status on page 873](#)).

When Model S/Model X is parked, the status area shows the drive mode, estimated range, suspension height and available adjustments, and an exterior view of the vehicle with buttons you can touch to open the tonneau cover, tailgate, powered frunk, and charge port door.

When you press the brake pedal, Model S/Model X powers up and indicator lights flash briefly. Unless an indicator light applies to the current situation (for example, a seat belt is not fastened), it should turn off. If an indicator light fails to turn on or off, schedule a service appointment.

Cards

The bottom of the vehicle status display also shows shortcut "Cards" for quick access to Media, tire pressure data, trip information, and more. Swipe the cards to the left or right to customize your cards shortcuts.

Indicator Lights

The following indicator lights illuminate to advise or alert you of a specific status or condition.

BRAKE

If the touchscreen displays this red brake indicator at any time other than briefly when you first start Model S/Model X, a brake system fault is detected, or the level of the brake fluid is low. Contact Tesla immediately. Apply steady pressure and keep the brake pedal firmly pressed to stop the vehicle when safe to do so.

USA:



Canada:

If the touchscreen displays this red brake indicator at any time other than briefly when you first start Model S/Model X, a brake system fault is detected, or the level of the brake fluid is low. Contact Tesla immediately. Apply steady pressure and keep the brake pedal firmly pressed to stop the vehicle when safe to do so.



USA:

When you manually apply the parking brake using the touchscreen, the red parking brake indicator lights up on the touchscreen.



Canada:

When you manually apply the parking brake using the touchscreen, the red parking brake indicator lights up on the touchscreen.



USA:

If the parking brake experiences an electrical issue, the amber parking brake indicator lights up and a fault message displays on the touchscreen.



Canada:

If the parking brake experiences an electrical issue, the amber parking brake indicator lights up and a fault message displays on the touchscreen.



A seat belt for an occupied seat is not fastened. See [Seat Belts on page 689](#).



Airbag safety. If this indicator does not flash on briefly when Model S/Model X prepares to drive, or if it remains on, contact Tesla immediately. See [Airbag Status Indicator on page 705](#).



A door or the powered frunk is open.



Model S/Model X detects a faulty electrical connection for the trailer lights. Some, or all, trailer lights may not be functioning. Pull over as soon as safety permits and inspect the trailer lights for faulty cabling or connections. If the issue is resolved and the red icon persists, manually turn Trailer Mode off and on again. See [Towing a Trailer on page 784](#).



Tire pressure warning. The pressure of a tire is out of specification. If a fault with the Tire Pressure Monitoring System (TPMS) is detected, the indicator flashes. For a TPMS fault, schedule a service appointment. See [Tire Pressures on page 897](#).



The tailgate is open. See [Cargo Bed on page 720](#).



Overview



The powered frunk is open. See [Powered Frunk on page 717](#).



This indicator flashes when the electronic stability control systems are actively minimizing wheel spin by controlling brake pressure and motor power. See [Traction Control on page 766](#). If this indicator remains on, a fault is detected and you should immediately contact Tesla.



Electronic stability control systems are no longer minimizing wheel spin. See [Off-Road Driving on page 775](#).

ABS

USA:

The ABS indicator briefly flashes amber on the touchscreen when you first start Model SModel X. If this indicator lights up at any other time, an ABS fault has occurred and the ABS is not operating. Contact Tesla. The braking system remains fully operational and is not affected by an ABS failure. However, braking distances may increase. Drive cautiously and avoid heavy braking.

Canada:



The ABS indicator briefly flashes amber on the touchscreen when you first start Model SModel X. If this indicator lights up at any other time, an ABS fault has occurred and the ABS is not operating. Contact Tesla. The braking system remains fully operational and is not affected by an ABS failure. However, braking distances may increase. Drive cautiously and avoid heavy braking.

BRAKE

The touchscreen displays this amber brake indicator if a brake booster fault is detected. Apply steady pressure and keep the brake pedal firmly pressed to stop the vehicle when safe to do so. Hydraulic Boost Compensation will be active (see [Hydraulic Boost Compensation on page 763](#)).

USA:



The touchscreen displays this amber brake indicator if a brake booster fault is detected. Apply steady pressure and keep the brake pedal firmly pressed to stop the vehicle when safe to do so. Hydraulic Boost Compensation will be active (see [Hydraulic Boost Compensation on page 763](#)).

Canada:



Vehicle power is currently being limited because the energy remaining in the Battery is low, the vehicle's systems are being heated or cooled, or an error is detected by a drive inverter.



Rear fog lights are enabled. See [Lights on page 756](#).



Model SModel X detects a connection for trailer lights but Trailer Mode is disabled. It is likely that a carrying accessory has been connected. See [Towing a Trailer on page 784](#)



Appears when regenerative braking is limited. See [Regenerative Braking on page 763](#) for more information.



Fog lights are enabled. See [Lights on page 756](#).



Parking lights are on (side marker lights, tail lights, and license plate lights). See [Lights on page 756](#).



Low beam headlights are on. See [Lights on page 756](#).



High beam headlights are on and Auto High Beam is disabled or currently unavailable. See [Headlights on page 756](#).



Auto High Beam is enabled and high beams are on. Model SModel X is ready to turn off the high beams if needed. See [Headlights on page 756](#).



Trailer Mode is active. See [Towing a Trailer on page 784](#).



Some of the energy stored in the Battery may not be available due to cold weather conditions. In cold weather, charging rates may also be limited. If Model SModel X is plugged in, you can heat your Battery by turning on climate control with the mobile app. This icon disappears when the Battery is sufficiently warm.



Vehicle Hold is actively applying the brakes. See [Vehicle Hold on page 764](#).



Pedestrian Warning System is disabled. See [Pedestrian Warning System on page 267](#).



Auto High Beam is enabled but high beams are not on because another vehicle is detected in front of Model SModel X. When there is no longer another vehicle detected, high beams automatically turn back on. See [Headlights on page 756](#).

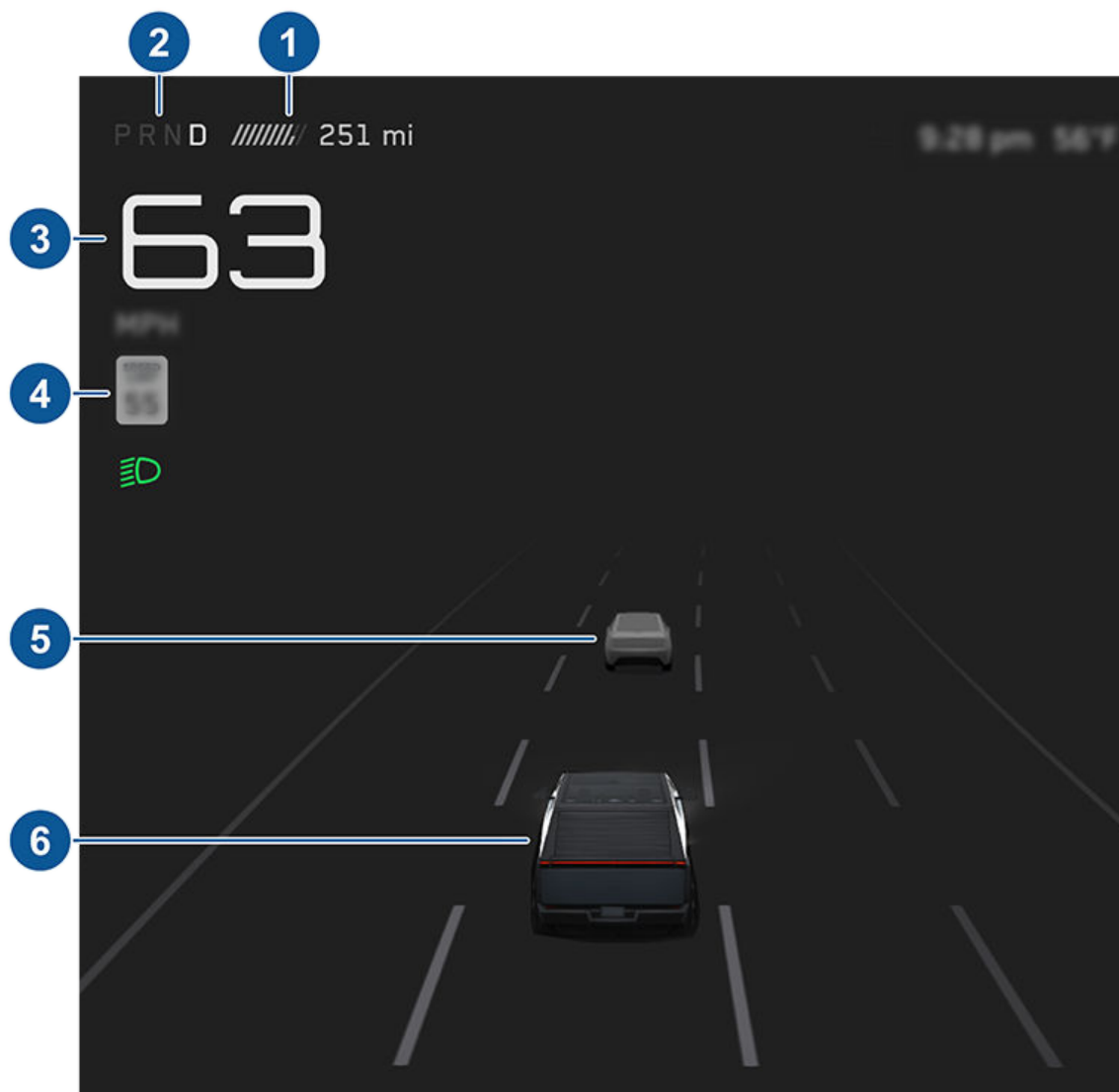


Overview

See [Popup Messages and Vehicle Alerts on page 650](#) for more information about alert popups on your vehicle's touchscreen.

Driving Status

When Model S/Model X is driving (or ready to drive), the touchscreen shows your current driving status and real-time visualization of the road as detected by the Autopilot components (see [Cameras on page 669](#)). The visualization automatically zooms in and out to better utilize touchscreen space and inform you when a vehicle is detected in your blind spot.



The touchscreen also shows the following:

1. Total estimated driving distance (or energy) available. You can toggle between driving distance and percentage of Battery energy remaining by touching the displayed value. You can also change how energy is displayed by touching **Controls > Display > Energy Display**. When anticipating when you need to charge, use range estimates as a general guideline only.
2. Currently selected drive mode: Park, Reverse, Neutral, or Drive (see [Shifting on page 200](#)).
3. Driving speed.
4. The speed limit that is currently being detected by Speed Assist (see [Speed Assist on page 344](#)). The icon associated with the detected speed limit reflects the style of speed limit signs used in your market region.

NOTE: A blue outline may appear around the speed limit icon to notify that you are above the speed limit.

5. Other cars detected on the road (as applicable).



6. Your Model S Model X. Colored lines radiate from the image of your Model S Model X as objects are detected (other motorists, guard rails, etc.). The location of the lines correspond to the location of the detected object. The color of the lines (white, yellow, orange, or red) represents the object's proximity to Model S Model X, with white being the farthest and red being very close and requiring your immediate attention. See [Lane Assist on page 336](#).



WARNING: Pay attention to important alert messages that display at the bottom of the vehicle status area of the touchscreen. Ignoring these messages can result in serious injury or death.



WARNING: Although the touchscreen shows surrounding traffic, some vehicles may not be displayed. Never rely on the detected displayed vehicles to determine if a vehicle is present (for example, in your blind spot). Always use your mirrors and perform shoulder checks.



Interior Electronics

In addition to storage compartments and cup holders (see [Interior Storage on page 713](#)), the Model SModel X interior supports various electronics such as an RFID transmitter that reads key cards (see [Keys on page 674](#)), USB-C ports, wireless phone chargers, a power outlet in the center console, and a power outlet below the rear touchscreen.

USB-C Ports

Model SModel X has four USB ports.

There are three USB-C ports in the center console, each of which can provide up to 65W of power:

- One USB-C port is located in the front compartment of the center console. This port can be used to charge a USB-C device.



- Two USB-C ports are located below the rear touchscreen and can be used to charge USB-C devices.



NOTE: Use USB 3.0 compliant cables to connect a device to a USB-C port. Using non-compliant cables may result in slower charging, connection problems, or degraded performance.



NOTE: If all three USB-C ports are in use at the same time, power to each port will be reduced.



CAUTION: Do not use the USB-C ports to power a device with a power rating that exceeds the limits listed above.

There is also a USB-A port in the glovebox. This port is equipped with a USB-A flash drive. This port can be used to play media from a phone or USB-A drive (see [Playing Media from Devices on page 377](#)) or to save Sentry Mode and Dashcam video footage.



NOTE: Do not connect multiple devices using a USB hub. This can prevent connected devices from charging or from being recognized by Media Player, Sentry Mode, Dashcam, etc.

Wireless Phone Chargers

Wireless phone chargers are integrated into the front console, providing up to 15W of power to charge Qi-enabled phones. To charge your phone, place it on one of the two charge pads. The phone must be in direct contact with the wireless charger. Your device may feel warm while charging, but this is a normal effect of inductive charging.



CAUTION: Before you charge, remove any objects (coins, keys, metal objects, etc.) between the phone and charger, as well as any NFC cards (for example, the vehicle key card, credit cards, or hotel key) placed on or behind the phone (like with integrated phone cases). Damage to NFC cards can occur when you charge the phone without first removing the card.

NOTE: The wireless phone chargers are in the same location as the key card readers (see [Key Card on page 675](#)).



When placed on the wireless charger, your phone charges whenever the vehicle is powered on (the touchscreen is on and you are in the vehicle). Your phone does not charge when you leave the vehicle unless a feature, such as Sentry Mode, is enabled.



NOTE: The phone must be in direct contact with the wireless charger. If you place objects between the phone and the charger (for example, credit cards, key cards, coins, keys, metal objects, etc.), or if your phone case is too large or is made of metal, the wireless charger may not work. Try removing the phone from its case before placing it on the charger.

NOTE: The wireless phone charger does not charge if the vehicle's high voltage Battery is discharged.

Interior Power Outlets

The Model S Model X center console is equipped with two NEMA 5-20 120V power outlets capable of providing up to 20A combined. To enable power to the outlets, touch **Controls > Outlets & Mods**. Touch **Enable Cabin Outlets on Entry** to enable them by default when you enter Model S Model X.

If an outlet is not providing power as expected, see [Troubleshooting AC Outlets on page 665](#).

NOTE: The 120V power outlets provide 20A maximum draw between both outlets. If multiple devices are plugged in and drawing power at the same time, power to each device may be reduced or interrupted.

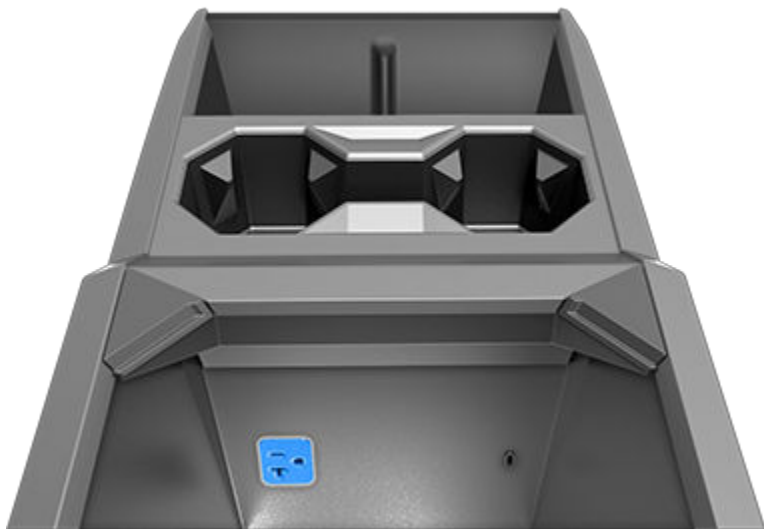
NOTE: Power to AC outlets may be disabled in very low ambient temperatures.

NOTE: Power to AC outlets is disabled when an AC charging cable is connected to Model S Model X even if the vehicle is not actively charging.

Power to AC outlets is still available when Model S Model X is DC charging (while Supercharging, for example). See [Charging Instructions on page 872](#).

NOTE: Two 120V power outlets are also located in the cargo bed, in addition to a 240V power outlet (see [Cargo Bed Outlets on page 664](#)).

To access the front power outlet, open the front compartment of the center console (see [Interior Storage on page 713](#)). The power outlet is located on the front wall of the compartment:



The rear power outlet is located below the rear touchscreen:



NOTE: To have the cabin outlets continue supplying power even when Model SModel X is not occupied, touch **Controls > Outlets & Mods** and enable **Keep On Cabin and Bed Outlets** (see [Keep On Cabin and Bed Outlets on page 665](#)). You can also enable **CyberTent Mode** and turn on outlets to keep them on when camping (see [CyberTent Mode on page 665](#)).

-  **CAUTION:** Leaving a device plugged in depletes the high voltage Battery. Power to the outlets shuts off when the capacity of the high voltage Battery is very low.
-  **CAUTION:** Damage to a device or data loss (such as from a laptop or external drive) due to a sudden loss of power is not covered by the warranty.
-  **CAUTION:** Always check each outlet for damage before use.
-  **CAUTION:** Damage to Model SModel X caused by an external device that is plugged in to an outlet is not covered by the warranty.
-  **WARNING:** The power outlets and a device's plug can become hot.
-  **WARNING:** As with any outlet, do not leave children unattended near the cabin outlets.
-  **WARNING:** Do not insert any objects into the outlets other than electrical plugs. Treat the outlets on Model SModel X the same as you would any other outlet, and take care to ensure proper handling. Misusing outlets can cause serious injury.



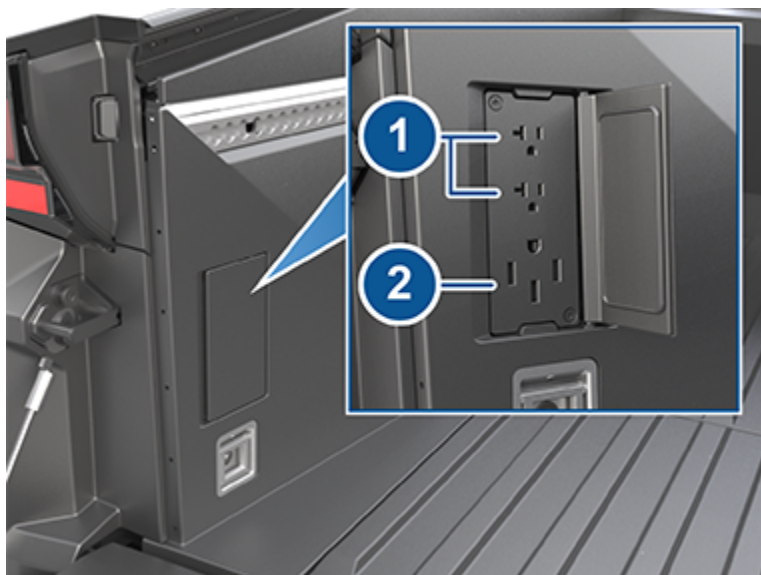
Cargo Bed Outlets

Your Model S Model X has three AC power outlets located in the cargo bed.

To access the outlets:

1. Open the tailgate (see [Cargo Bed on page 720](#)).
2. Locate the outlet cover on the left side of the bed.
3. Pull the left side of the panel to open the cover.

The outlet cover must be open in order for the outlets to provide power.



1. 120V power outlets (20A maximum draw, combined)
2. 240V power outlet (40A maximum draw, combined)

The 120V power outlets provide a maximum of 20A across both cargo bed outlets. This is independent from the 120V outlets in the cabin which also provide a maximum of 20A across both cabin outlets (see [Interior Power Outlets on page 662](#)). It is possible to pull 20A from the cabin and 20A from the cargo bed at the same time. All AC power outlets combined (120V cabin, 120V cargo bed, and the 240V cargo bed outlet) are limited to a combined maximum of 40A. If multiple devices are plugged in and drawing power at the same time, power to each device may be reduced or interrupted.

The outlets stop providing power when Model S Model X is no longer occupied (when you leave the vehicle and close the doors).

To enable power to the outlets, touch **Controls > Outlets & Mods** on the touchscreen. From here you can toggle power to all AC outlets and each power feed (see [Connecting Accessories to the 48V Power Feeds on page 919](#)). While the outlets are supplying power, the touchscreen shows the amount of power being used.

You can also enable power to the outlets and power feeds using the mobile app.

NOTE: Leaving a device plugged in depletes the high voltage Battery. Even if nothing is plugged in, the outlets draw small amounts of power from the Battery whenever they are enabled. When the charge level of the high voltage Battery is very low, power to the outlets shuts off and a message is displayed on the touchscreen. Leaving a device plugged in does not deplete the low voltage battery.

 **CAUTION:** Do not use the AC outlets to power a device with a power rating that exceeds the limits listed above.



Keep On Cabin and Bed Outlets

If you want the outlets to continue supplying power even when the vehicle is not occupied, touch **Controls > Outlets & Mods** and enable **Keep On Cabin and Bed Outlets**. After 12 hours, or once the high voltage Battery has less than 5% remaining energy, the outlets shut off. **Keep On Cabin and Bed Outlets** is automatically enabled whenever you turn on the outlets using the mobile app.

CyberTent Mode

After installing the CyberTent, enable **CyberTent Mode** for optimal comfort. **CyberTent Mode**:

- Levels the suspension.
- Opens the tonneau cover and keeps it open by disabling the switches.
- Displays controls to adjust the front and rear lights.
- Allows outlets to be kept on indefinitely.

NOTE: Using **CyberTent Mode** and keeping the outlets or lights on may increase power usage.

- Disables walk-away lock.

NOTE: It is your responsibility to ensure the vehicle is appropriately locked or attended to at all times.

To enable, touch **Controls > Outlets & Mods > CyberTent Mode**. Model SModel X cannot be driven while **CyberTent Mode** is enabled.

Overload Capability

The AC outlets on Model SModel X are all capable of providing additional surge current to start almost all devices (such as power tools, motors, and compressors) up to 110LRA.

Troubleshooting AC Outlets

AC outlets may be disabled in the following scenarios:

- Very low ambient temperatures.
- When an AC charging cable is connected to Model SModel X even if the vehicle is not actively charging.
- The high voltage Battery does not have enough charge.
- GFCI or overcurrent detection has been tripped.

If one or more outlets unexpectedly stops providing power, first ensure that you have enabled power to the outlets (touch **Controls > Outlets & Mods**) and that the high voltage Battery has enough remaining charge.

Each power outlet in Model SModel X is equipped with overcurrent detection and a ground fault circuit interrupter (GFCI), which interrupts the power supply to an outlet if an issue is detected, such as a current leakage. In this case, the outlets will turn off. Overcurrent detection may happen if multiple devices plugged in at once draw too much power from the AC power outlets.



CAUTION: Use only "UL" Listed devices with the AC power outlets in Model SModel X.



CAUTION: Damage to a device or data loss (such as from a laptop or external drive) due to a sudden loss of power is not covered by the warranty.

If an outlet is still not providing power, the GFCI or overcurrent detection may have been tripped. When an outlet is faulted, an option to reset the outlets becomes available. To reset:

1. Disconnect all devices from all AC outlets (three outlets in the cargo bed and two in the center console).
2. Touch **Controls > Outlets & Mods > Reset**.
3. Reconnect devices and re-enable power to the outlets by touching **Controls > Outlets & Mods > AC Outlets**.



NOTE: Power to AC outlets is still available when Model SModel X is DC charging (while Supercharging, for example). See [Charging Instructions on page 872](#).

Warnings and Cautions

-  **CAUTION:** Always check each outlet for damage before use.
-  **CAUTION:** Keep the outlet cover closed when the cargo bed outlets are not in use.
-  **CAUTION:** Keep the outlet cover closed when Cybertruck is AC charging, especially in wet weather. AC charging may be disabled if moisture enters one of the outlets.
-  **CAUTION:** Damage to Model SModel X caused by an external device that is plugged in to an outlet is not covered by the warranty.
-  **CAUTION:** Use caution when driving Model SModel X while devices are plugged into the cargo bed outlets. Ensure that all objects in the cargo bed are properly secured (see [Securing Cargo on page 724](#)).
-  **WARNING:** A power outlet and a device's plug can become hot. Use caution when unplugging a device.
-  **WARNING:** Do not insert any objects into the outlets other than electrical plugs. Treat the outlets on Model SModel X the same as you would any other outlet, and take care to ensure proper handling. Misusing outlets can cause serious injury.
-  **WARNING:** Protect the cargo bed outlets from moisture, water, and foreign objects at all times. If you see a foreign object in an outlet, or if the outlets appear corroded or damaged, do not use them.
-  **WARNING:** Do not use the cargo bed outlets if they are wet or covered in snow.
-  **WARNING:** If rain falls while an accessory is plugged in and drawing power from the cargo bed outlets, do not allow rain water to run along the length of charge cable, causing the outlets to become wet.
-  **WARNING:** Do not connect a power source (such as a solar panel or external battery) to a cargo bed outlet.
-  **WARNING:** As with any power outlet, do not leave children unattended near the cargo bed outlets and ensure the outlet cover is closed when the outlets are not in use.



Voice Commands

Use voice commands to easily control settings and preferences without using the touchscreen. You can ask Model S or Model X to do just about anything, such as adjusting climate controls and media preferences. Available commands include most features that are managed by the touchscreen except driving-related commands, for example shifting drive modes.

Voice commands are designed to understand natural requests. You can use voice commands to:

- Adjust climate preferences.
- Tweak the windshield wiper speed and frequency.
- Control various aspects of your vehicle.
- Navigate to a location.
- Call a contact.
- Interact with apps and settings.

To initiate a voice command, fully press the microphone button on the right side of the steering wheel or the touch button on the right side of the steering wheel. When you hear a chime, make your request and the vehicle responds.



Examples of Voice Commands

Here is a list of example voice commands. This is not an exhaustive list. Tesla is constantly working to improve voice commands.

NOTE: To choose the language you want to use for voice commands, touch **Controls > Display > Voice Recognition Language**.

Climate Controls

Adjust your climate preferences using voice commands:

- "Make it cooler".
- "Make it warmer".
- "Turn on/off the driver's seat heater".
- "Cool down the passenger".
- "Direct airflow to my face".
- "Sync climate".
- "Increase/decrease the fan speed".



- "Turn on recirculate".

Windshield Wipers

Update the windshield wiper speed and frequency based on changing road and weather conditions:

- "Speed up the wipers".
- "Increase/decrease windshield wiper speed by...".
- "Turn on/off the wipers".
- "Spray the windshield".

Vehicle Controls

You can also modify various controls in your vehicle using voice commands:

- "Sentry Mode on/off".
- "Keep my car safe".
- "Lock/unlock the doors".
- "Turn on Dog Mode".
- "Fold/unfold the mirrors".
- "Open/close charge port".
- "Start/stop charging".
- "Show me the tire pressures".
- "Open the glovebox".

Navigation

To search for, or navigate to, a location, say:

- "Where is [location]"?
- "Drive to [location]".
- "Navigate to [location]"
- "Show nearby Superchargers".
- "I'm feeling hungry/lucky" (see [I'm Feeling Lucky, Hungry on page 371](#)).

If you have defined a navigation address for your home or work locations, you can use a voice command to navigate there by saying "Navigate home" or "Take me to work".

Contacts

To call or text a contact on your Bluetooth-connected phone (see [Phone and Calendar on page 381](#)), say:

- "Call [contact name/phone number]".
- "Re-dial [contact name/phone number]".
- "Text [contact name/phone number]".

Media

To listen to and adjust your media preferences, say:

- "Listen to [song name]".
- "Listen to [song name] by [artist name]".
- "Lower/raise the volume".



- "Skip to next".
- "Pause/play song".
- "Change the radio to...".
- "Change the source to [media source]".

To improve voice command recognition accuracy, provide multiple cues in your command, such as artist and song.

Apps and Settings

Easily navigate through your apps and settings using voice commands:

- "Open [Toybox/browser/theater/phone]".
- "Search for...".
- "The screen is too bright".
- "Show me the Owner's Manual".

Some apps and settings are only accessible while in Park.

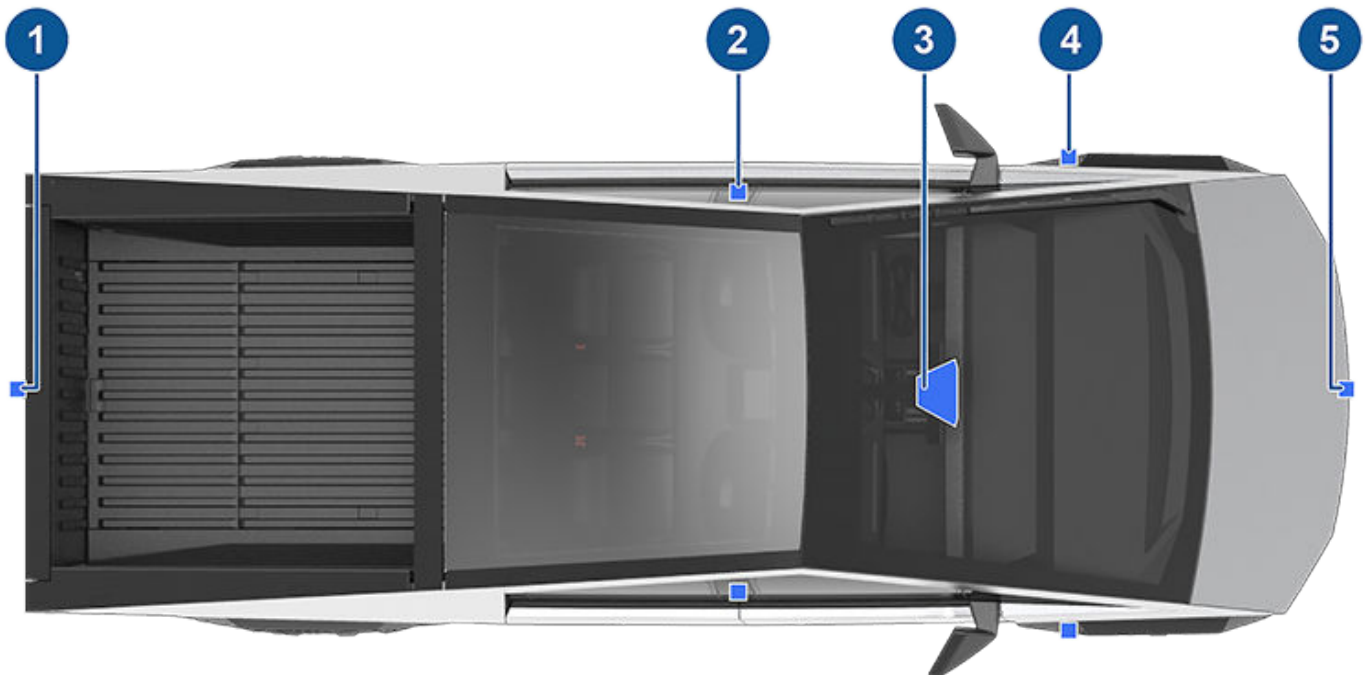
You can also file a bug report by saying "report", "feedback", or "bug report".

For a complete list of voice commands, go to <https://www.tesla.com/support/voice-commands>.

NOTE: Tesla is continuously improving the ability of Model S/Model X to recognize voice commands. To support these ongoing quality improvements, Tesla captures short voice recordings anonymously. To protect your privacy, these short recordings are not associated with your personal information or with your vehicle's identification number. Tesla assures that it is not possible to search any system for a recording associated with a specific customer or vehicle.

Cameras

Your Model S/Model X includes the following components that actively monitor the surrounding area:



1. A camera is mounted on the tailgate.
2. A camera is mounted in each door pillar.
3. Two cameras are mounted to the windshield above the rear view mirror.



Overview

4. A camera is mounted above each front wheel.
5. A camera is mounted above the grille on the front bumper.

Viewing Camera Feeds

The Camera app shows the views from the side cameras, rear-facing camera, and front-facing camera. To open the Camera app, you can either:

- Open the app launcher and touch the Camera app.



- Touch the camera icon on the right side of the steering wheel.



Swipe up or down to switch between the rear and front camera views.

The camera app opens automatically when you shift into Reverse.

Rear-Facing Camera

Model S Model X is equipped with a rear-facing camera mounted on the tailgate.



Whenever you shift into Reverse, the touchscreen displays the view from the rear-facing camera. Lines show your driving path based on the position of the steering wheel. These lines adjust as you move the steering wheel. The tailgate must be fully closed in order to see the rear view and lines on the display.

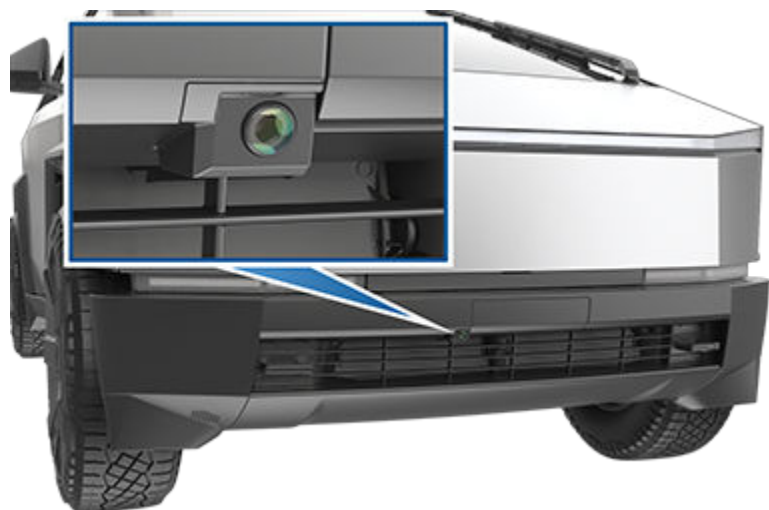
You can choose to always show the rear view camera feed when the tonneau cover is closed by touching **Controls > Display > Rear View Camera > Auto**.

If a black screen appears on the touchscreen instead of the rear view camera feed when in Reverse, use the rear view mirrors and ensure your surroundings are safe before continuing to Reverse. If inoperability of the rear view camera persists, try restarting the touchscreen (see [Restarting the Touchscreen on page 650](#)). If the camera feed still shows as a black screen after that, use the mobile app to schedule a service appointment.

WARNING: Never depend on the cameras to inform you if the area around you is free of objects and/or people. The cameras may not detect objects or barriers that can potentially cause damage or injury. In addition, several external factors can reduce the performance of the cameras, including a dirty or obstructed lens. Therefore, depending on the cameras to determine if Model S/Model X is approaching an obstruction can result in damage to the vehicle and/or objects and can potentially cause serious injury. Always inspect the area with your own eyes. When reversing, perform shoulder checks and use all mirrors. Use the cameras for guidance purposes only. It is not intended to replace your own direct visual checks and is not a substitute for careful driving.

Front-Facing Camera

Your Model S/Model X is equipped with a front-facing camera located above the grille on the front fascia.





Overview

To display the view from the front-facing camera at any time, open the app launcher and touch the Camera app or touch the camera icon on the right side of the steering wheel. Swipe up or down to switch between the rear, front, and side camera views.

WARNING: Never depend on the camera to inform you if the area around you is free of objects and/or people. The camera may not detect objects or barriers that can potentially cause damage or injury. In addition, several external factors can reduce the performance of the cameras, including a dirty or obstructed lens. Therefore, depending on the cameras to determine if Model S/Model X is approaching an obstruction can result in damage to the vehicle and/or objects and can potentially cause serious injury. Always inspect the area with your own eyes. Use the camera for guidance purposes only. It is not intended to replace your own direct visual checks and is not a substitute for careful driving.

Cabin Camera

Your Model S/Model X is equipped with a cabin camera located above the rear view mirror.



The cabin camera can determine driver inattentiveness and enhances active safety features (such as Forward Collision Warning). You can also view the feed from this camera in the Tesla mobile app when Sentry Mode Live Camera is enabled (see [Sentry Mode on page 840](#)).

Data Sharing

By default, images and video from the camera do not leave the vehicle itself and are not transmitted to anyone, including Tesla, unless you enable data sharing. If you enable data sharing and a safety critical event occurs (such as a collision), Model S/Model X shares short cabin camera video clips with Tesla to help us develop future safety enhancements and continuously improve the intelligence of features that rely on the cabin camera. Data may also be shared if diagnostics are required on cabin camera functionality. Cabin camera does not perform facial recognition or any other method of identity verification. To protect your privacy, cabin camera data is not associated with your vehicle identification number.

To adjust your data sharing preferences touch **Controls > Software > Data Sharing > Allow Cabin Camera Analytics**. You can change your data sharing settings at any time.

Cleaning a Camera

To ensure a clear picture, the camera lens must be clean and free of obstructions, condensation, or damage.

Condensation can form inside the camera enclosures, especially if you park outside in cold or wet conditions. The touchscreen may display an alert stating that a camera is blocked and that some (or all) Autopilot features may be temporarily restricted until the camera vision is clear. To proactively dry the condensation, precondition the cabin by setting it to a warm temperature, turning the windshield defroster on, and directing the front air vents toward the door pillars (see [Mobile App on page 406](#)).

Remove any build-up of dirt or debris by spraying water onto the camera lens and carefully drying it with a microfiber cloth. Clean the camera lens at least weekly during wet weather (snow, rain, sleet) and every month during dry weather.



The front-facing camera is equipped with a sprayer nozzle. To clean the front-facing camera, touch the app launcher, select the Camera app, and press the spray icon.



CAUTION: Do not use chemical-based or abrasive cleaners. Doing so can damage the surface of the lens.

Drive to Calibrate Cameras

Before some Autopilot features can be used for the first time or after some types of service repairs, cameras must complete a self-calibration process. When the cameras are calibrating, the instrument cluster displays a progress indicator. When calibration is complete, Autopilot features are available for use.

Calibration typically completes after driving 20–25 miles (32–40 km), but the distance varies depending on the conditions. Calibration completes more quickly when driving on a straight road that has multiple lanes and highly visible lane markings in both the driving lane and adjacent lanes (at least two lanes over on each side of the vehicle). For best results, drive in the middle lane of a multi-lane highway (ideally with at least five lanes) that has clear lane markings and minimal traffic.

Schedule a service appointment only if your Model SModel X has not completed the calibration process after driving approximately 100 miles (160 km) in the described conditions.

If a camera has shifted from its previously calibrated position (for example, the camera or windshield was replaced), clear the calibration by touching **Controls > Service > Camera Calibration > Clear Calibration**. When the calibration is cleared, Model SModel X repeats the calibration process.

NOTE: Model SModel X must repeat the calibration process if the cameras are serviced by Tesla, and in some cases after a software update.

NOTE: If you attempt to use a feature that is not available until the calibration process is complete, the feature is not available and the touchscreen displays a message.



Keys

Types of Keys

NOTE: In the event you lose both key cards, schedule a service appointment through the mobile app to replace and pair them.

Model SModel X supports the following types of keys:

- **Phone key** – You can set up your personal phone as a "phone key" that communicates with Model SModel X using Bluetooth (BLE). A phone key supports automatic locking and unlocking.
- **Key card** – Tesla provides key cards that communicate with Model SModel X using short range radio-frequency identification (RFID) signals. The key card is used to "authenticate" phone keys to work with Model SModel X and to add or remove other keys. Unlike the phone key, the key card does not support automatic locking and unlocking and must be touched against a card reader. In situations where your phone key has a dead battery, or is lost or stolen, use your key card to unlock, drive, and lock Model SModel X.

Model SModel X supports a total of 19 keys, which can include phone keys and key cards.

 **CAUTION:** Remember to bring a key (and a backup key) with you when you drive. Although you can drive Model SModel X away from a detected key, you will be unable to power it back on after it powers off.

Phone Key

 **CAUTION:** Do not leave your paired phone in your vehicle (for example, if you are hiking or at the beach). If you must leave your phone in the vehicle, disable Bluetooth and/or turn the phone off and ensure that you keep a key card with you.

Using your phone as a key is a convenient way to access your Model SModel X. As you approach your vehicle, the smartphone's Bluetooth signal is detected and the doors unlock when you press a door open button. Likewise, when you exit and walk away with the phone key, doors automatically lock (provided the **Walk-Away Door Lock** feature is turned on; see [Walk-Away Door Lock on page 680](#)).

Before you can use a phone to access Model SModel X, follow these steps to authenticate it:

1. Download the Tesla mobile app to your phone.
2. Log into the Tesla mobile app using your Tesla account username and password.

NOTE: You must remain logged in to your Tesla account to use your phone to access Model SModel X.

NOTE: If multiple vehicles are linked to your Tesla account, Model SModel X opens the most recent vehicles in the mobile app for easy access.

3. Confirm:
 - Your phone's Bluetooth setting is turned on.
 - The Tesla mobile app can access your phone's Bluetooth. On your phone, navigate to Settings, choose the Tesla mobile app, and ensure the Bluetooth setting is turned on.
 - Allow the Tesla mobile app to access your location. For the best experience, keep the mobile app running in the background.
 - Mobile access is enabled for your vehicle. On the touchscreen, touch **Controls > Safety > Allow Mobile Access**.

NOTE: Model SModel X communicates with your phone using Bluetooth. Keep in mind that your phone must have enough battery power to support Bluetooth (some phones disable Bluetooth when the battery is low).

4. While inside or near the vehicle, open the Tesla mobile app and touch **Set Up Phone Key** on the main screen, or navigate to **Security > Set Up Phone Key**. Follow the prompts on the mobile app and vehicle touchscreen to set up your phone key.

NOTE: You must have your key card available in order to set up a phone key.

To view a list of keys that can currently access Model SModel X, or to remove a phone key, touch **Controls > Locks** (see [Managing Keys on page 676](#)).



Model S/Model X can connect to three phone keys simultaneously. Therefore, if more than three phone keys are detected and you want to authenticate or pair a different phone, move the other connected phone key(s) out of range or turn off its Bluetooth setting.

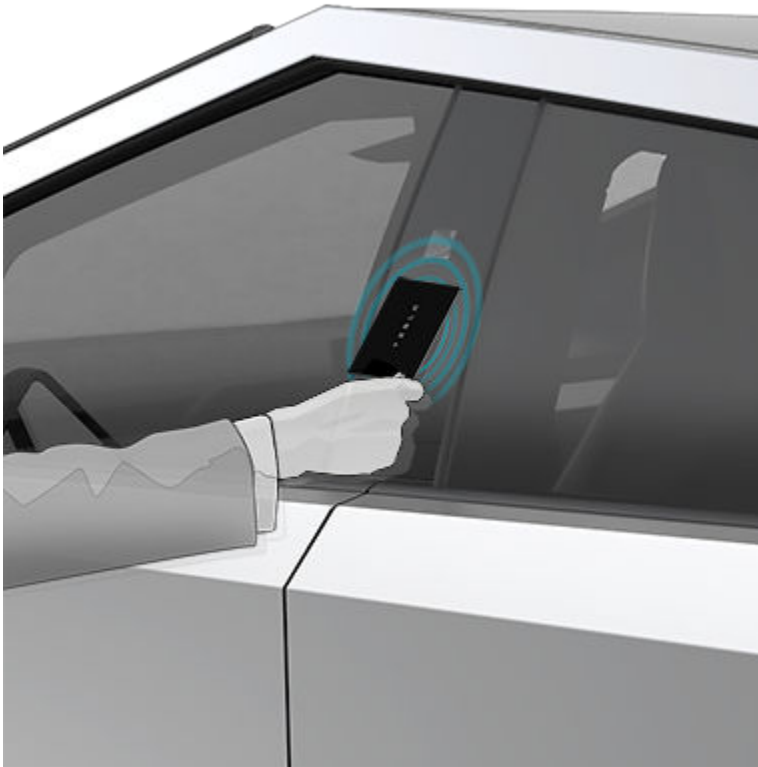
Once a phone has been authenticated, it no longer requires an internet connection to be used as a phone key for Model S/Model X. However, to use the phone hands-free, access your phone's contacts, play media from it, etc., you must also pair it and connect it as a Bluetooth device (see [Bluetooth on page 731](#)).

NOTE: Some Android smartphones with NFC capability can be used to lock/unlock your vehicle, just like using a key card. Ensure the Tesla mobile app is correctly paired to your vehicle and enable the NFC function on your phone. Once enabled, simply hold the phone to the driver's side door pillar to lock or unlock the door. Refer to your smartphone's instructions for specific information on how to do this.

Key Card

Tesla provides you with two Model S/Model X key cards, designed to fit in your wallet.

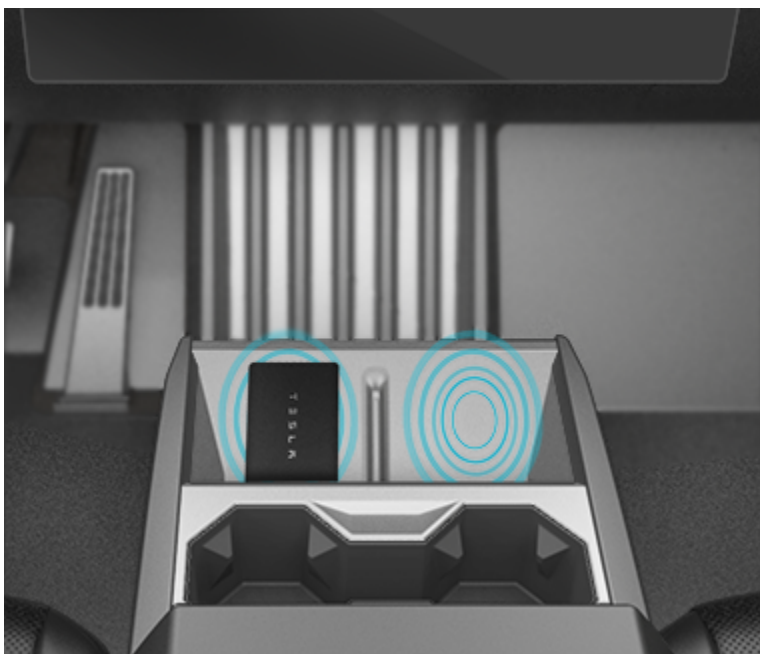
To use a key card to unlock or lock Model S/Model X from outside, position the card as shown and tap it against the card reader located approximately one third the way up of the driver's side door pillar. When Model S/Model X detects the key card, the exterior lights flash, the mirrors unfold or fold (if Fold Mirrors is on), the horn sounds (if Lock Confirmation Sound is on), and the doors unlock or lock. You may need to hold the key card against the transmitter for a few seconds.



Once inside, power up Model S/Model X by pressing the brake pedal within two minutes of scanning the key card (see [Starting and Powering Off on page 741](#)). If you wait longer than two minutes, you must re-authenticate by placing the key card near one of the card readers located on the wireless phone chargers on the center console. When your key card is detected, your two-minute authentication period restarts.



Opening and Closing



NOTE: If enabled, Walk-Away Door Lock (see [Walk-Away Door Lock on page 680](#)) operates only when you walk away using a phone key. When you walk away carrying your key card, Model SModel X does not automatically lock.

Managing Keys

To display a list of all keys that can access Model SModel X, touch **Controls** > **Locks**. An icon displays next to each key to indicate whether the key is a phone key or a key card. Use this list to manage keys that have access to Model SModel X. To add or delete keys, see [Adding Keys from the Touchscreen on page 676](#).

Model SModel X supports up to 19 keys. When you reach this limit, you must delete a key before adding a new one.

NOTE: You can use the same key for more than one Tesla vehicle. This prevents you from having to deal with multiple keys when you switch vehicles. If you customize the name of an authenticated key card on one vehicle (by touching the pencil icon), any other vehicle to which the key card is authenticated also displays the changed name.

Adding Keys from the Touchscreen

If you have a key card that is already paired with your vehicle, you can pair a new key using the touchscreen.

1. On the touchscreen, touch **Controls** > **Locks** > **Keys** > **Add Key**.
2. Scan your key card on one of the card readers located on the wireless phone chargers on the center console.
3. Scan a key card that has already been paired to the vehicle to confirm new key pairing.
4. When complete, the key list includes the new key. Touch the associated pencil icon to customize the name of the key.

Adding Keys from the Mobile App

In the event that you don't have a working key card, you can add a new key using the mobile app.

NOTE: Only the owner of the vehicle is able to pair a new key using the mobile app.

NOTE: Pairing a key with the mobile app is supported with version 4.29.0 of the Tesla mobile app on vehicles with software versions 2022.40 or higher.

1. While inside or near the vehicle, open the Tesla mobile app on your smartphone.
2. Touch **Security & Drivers**.
3. Touch **Add Key Card**.
4. Scan your key card on one of the card readers located on the wireless phone chargers on the center console.



5. When the key is paired successfully, the mobile app shows a confirmation message. Touch **Done** in the mobile app and remove the key card from the card reader.
6. When complete, the key list on the touchscreen includes the new key. Touch the associated pencil icon to customize the name of the key.

Removing Keys

When you no longer want a key to access Model S/Model X (for example, you lost your phone or key card, etc.), follow these steps to remove it.

1. On the touchscreen, touch **Controls > Locks**.
2. In the key list, find the key that you would like to delete and touch its associated trash icon.
3. When prompted, scan an authenticated key on the card reader to confirm the deletion. When complete, the key list no longer includes the deleted key.

NOTE: Model S/Model X requires at least one authenticated key card or key fob at all times. If only one key card remains on the key list, you cannot delete it.

Replacing Key cards

If you lose a key card, you can purchase replacement ones on the Tesla Shop. When ready to pair, simply follow the steps in [Managing Keys on page 676](#). Remember to remove your old key cards from **Controls > Locks > Keys** for security purposes.

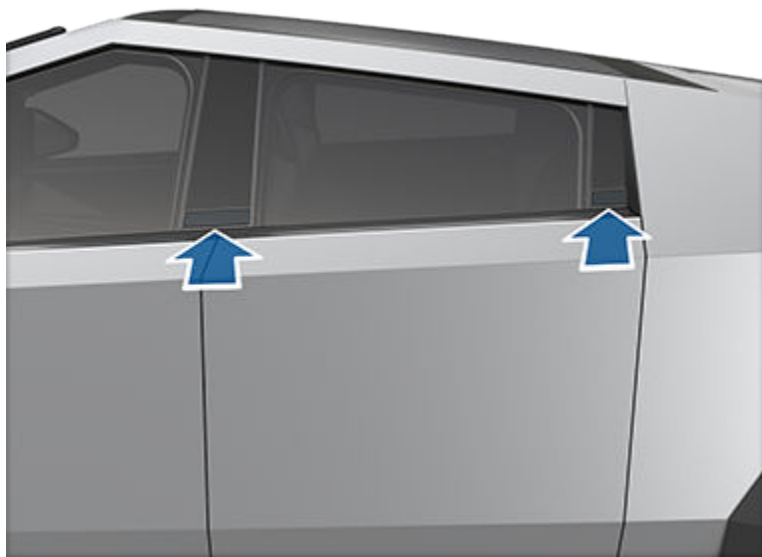


Opening and Closing

Doors

Opening and Closing Doors from Outside

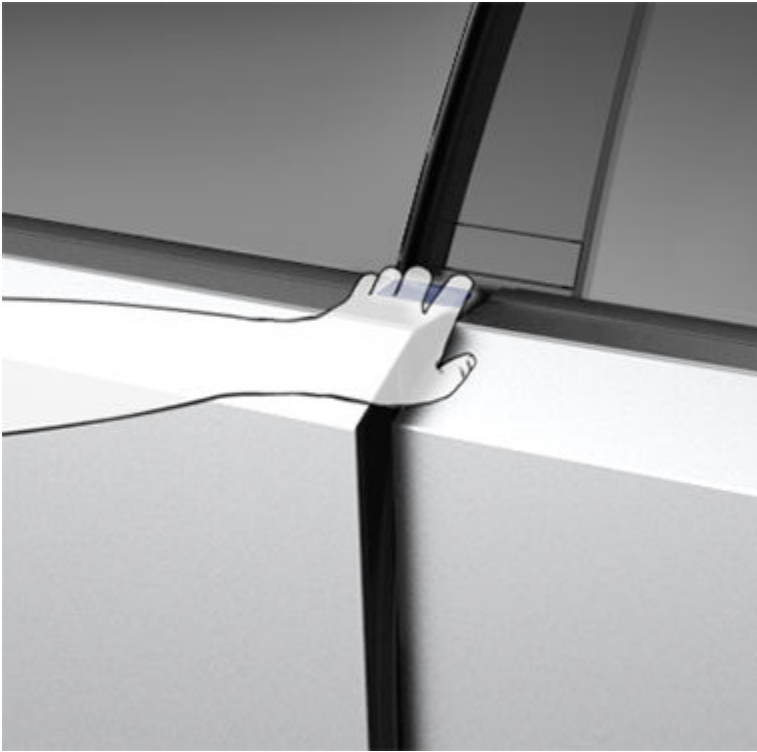
Doors are electrically powered. When you approach Model SModel X carrying a phone key, the doors and tailgate automatically unlock. To open a door, press the exterior door release button on the pillar to the right of each door.



The doors do not automatically lock/unlock when you approach Model SModel X carrying only a key card. You must manually lock/unlock the vehicle. See [Keys on page 674](#) for more information.

WARNING: Use caution around the panel edges on Model SModel X, including the doors, powered frunk, tailgate, and surrounding panels.

WARNING: When pulling the door open, always grasp the door at the top, as shown. Keep hands and fingers away from the opening edge and supervise children if they open and close the doors. This is especially important when handling a front door where the opening edge can cause injury when opening or closing the associated rear door. Neglecting to follow the correct opening procedure for front and rear doors can lead to injury.



Whenever a door is open, the Door Open indicator displays on the touchscreen. Also, the image of the Model S Model X on the touchscreen's **Controls** window provides a visual representation of the open door(s).

To close a door from the outside, manually push it shut. Make sure no objects are in the way before closing the door.

Opening Doors from the Interior

To open a door while sitting inside, press interior door open button, located at the top of the interior door handle, and push the door open.



NOTE: To prevent children from opening the rear doors, turn on child locks (see [Child Locks on page 681](#)).



Opening and Closing

NOTE: In the unlikely event that Model SModel X has no low voltage power, you will be unable to open the doors with the interior door open button. See [Opening Doors with No Power on page 950](#) for more information.

Interior Locking and Unlocking

While sitting inside Model SModel X, you can lock or unlock all doors, the tailgate, and the powered frunk by touching the lock icon on the touchscreen.



The icon changes to indicate whether doors are locked or unlocked.

When you stop Model SModel X and engage Park, you can choose to unlock all doors. To turn this feature on or off, touch **Controls > Locks > Unlock on Park**.

Model SModel X automatically locks all doors (including the powered frunk and tailgate) when your driving speed exceeds 5 mph (8 km/h). The touchscreen displays a message if the tailgate remains open after the vehicle locks.

Walk-Away Door Lock

NOTE: Model SModel X will still lock, even if the tonneau cover is open. In other words, once the vehicle is locked, the tonneau cover is locked in its current position and cannot be open/closed using the tonneau cover switch on the vehicle. Always double check to make sure the tonneau cover is closed.

The doors, tailgate, and powered frunk can automatically lock when you walk away carrying your phone key. To turn this feature on or off, touch **Controls > Locks > Walk-Away Door Lock**.

When the vehicle locks, the exterior lights flash once. To also sound a confirmation chime when Model SModel X locks, touch **Controls > Locks > Lock Confirmation Sound**.

Model SModel X does not automatically lock if:

- You choose **Exclude Home** and Model SModel X is parked at the location you have designated as Home. For details on how to designate a location as Home, see [Home, Work, and Favorite Destinations on page 371](#).
- A key is detected inside Model SModel X (such as your phone or a key card resting on the card reader).
- A door or the powered frunk is not fully closed.
- The phone key's Bluetooth is not able to communicate with the vehicle or the phone's battery is dead.
- If Model SModel X detects an authenticated phone key for several minutes after you exit the vehicle and close all doors, Walk-Away Lock disables and doors do not lock when you walk away. In this case, you must manually lock your vehicle using a key card until after your next drive.
- The driver exits the vehicle without using the driver's door.

NOTE: It is your responsibility to ensure Model SModel X is locked, even when Walk-Away Door Lock is enabled. You can check if Model SModel X is locked from the Tesla mobile app (see [Mobile App on page 406](#)).

Driver Door Unlock Mode

Enabling **Controls > Locks > Driver Door Unlock Mode** only unlocks the driver's door when you first unlock Model SModel X. To unlock the remaining doors, long press the interior door open button, or use the touchscreen or mobile app.

Disabling **Driver Door Unlock Mode** unlocks all doors, the powered frunk, and the tailgate when you first unlock Model SModel X.

Car Left Open Notifications

Receive a mobile notification if a door, the powered frunk and/or windows are left open or if Model SModel X is left unlocked unexpectedly. Touch **Controls > Locks > Car Left Open Notifications**.



NOTE: Model S/Model X will still lock, even if the tonneau cover is open. Always double check to make sure the tonneau cover is closed. **Car Left Open Notifications** may not notify you if the tonneau cover is left open.

Child Locks

Model S/Model X has child locks on the rear doors to prevent them from being opened using the interior door open buttons. On the touchscreen, touch **Controls > Locks > Child Lock**. You can choose **Both** to engage the child lock on both rear doors, or you can choose **Left** or **Right** to engage it on just a specific door.



WARNING: Tesla recommends turning on child locks whenever a child is seated in a rear seat.



Opening and Closing

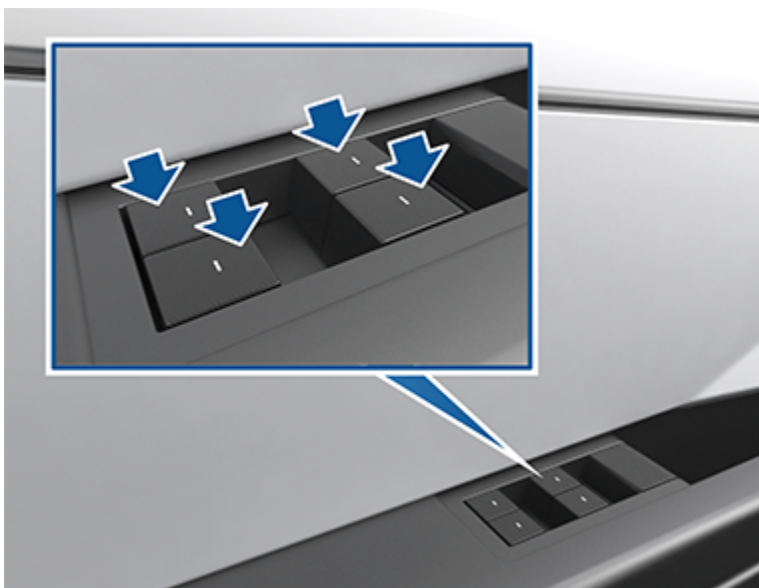
Windows

Opening and Closing

CAUTION: The windows automatically lower slightly when you open or close a door. This is normal and avoids damage to the window when the door opens. If you manually raise a window when the door is open, ensure it is slightly lowered before closing the door.

Press down on a switch to lower the associated window. Window switches operate at two levels:

- To lower a window fully, press the switch all the way down and immediately release.
- To lower a window partially, press the switch gently and release when the window is where you want it.



Similarly, pull a switch to raise the associated window:

- To raise a window fully, pull the switch all the way up and immediately release.
- To raise a window partially, pull the switch gently and release when the window is where you want it.

NOTE: If a window is fully lowered and you open the associated door, the window rises slightly. Likewise, if you fully lower a window while the door is already open, it stops slightly above the edge of the door. To fully lower a window while the door is open, press the switch again.

If a window is left open unintentionally, Model S Model X can send a notification to the mobile app (touch **Controls > Locks > Car Left Open Notification**, then choose **Doors & Windows**). However, it is your responsibility to ensure windows are closed after leaving the vehicle; do not rely on notifications to inform you.

Enable **Close Windows on Lock** by touching **Controls > Locks > Close Windows on Lock** to automatically close the windows whenever the vehicle locks.

NOTE: See [Cold Weather Best Practices on page 284](#) for information on preparing windows for cold weather.

WARNING: Before closing a window, it is the driver's responsibility to ensure that all occupants, especially children, do not have any body parts extended through the window's opening. Failure to do so can cause serious injury.

WARNING: Never leave children unattended in Model S Model X.

Locking Rear Windows

To disable the rear window switches, touch **Controls > Locks > Window Lock**. Once locked, the rear windows can only be controlled from the driver's window switch. Touch **Window Lock** again to re-enable the rear window switches.



WARNING: To ensure safety, it is recommended that you lock the rear window switches whenever children are seated in the rear seats.

Calibrating Windows

In the unlikely event that a window behaves unexpectedly (fails to open or close properly, goes down more than normal when the door opens, etc.), you can calibrate it to potentially fix the issue.

To calibrate a window:

1. Close the door with the affected window.
2. Sit in the driver's seat and close the driver door.
3. Using the window's switch on the driver's door, fully **raise** the affected window until it stops.
4. Using the window's switch on the driver's door, fully **lower** the affected window until it stops.
5. Repeat step 3 and fully **raise** the affected window until it stops.

If this does not resolve the issue after performing a few times, use your mobile app to schedule a Service appointment.

UV Index Rating

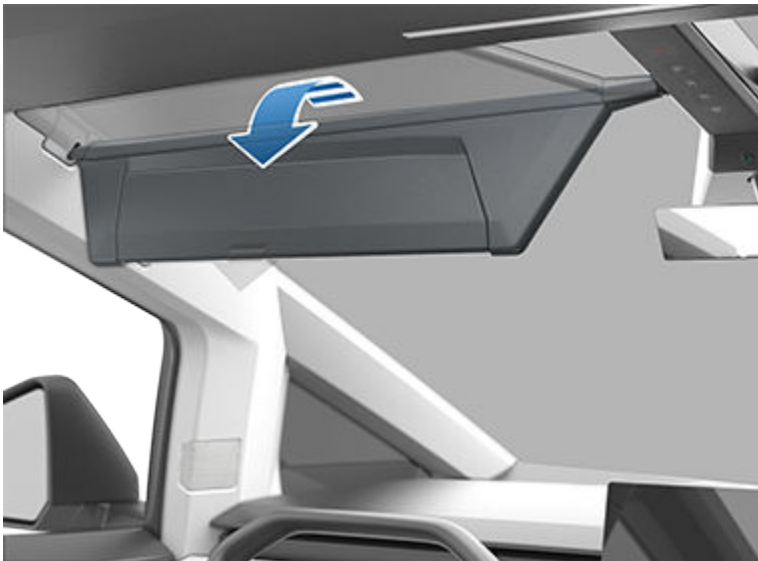
The windshield, windows, and glass roof in Model S Model X are excellent at protecting you from UV (ultraviolet) rays. The glass components score less than two on the UV Index scale. Review your region's UV Index specifications for more information.



WARNING: It is the occupant's responsibility to take the necessary precautions to ensure adequate UV protection.

Sun Visors and Vanity Mirrors

To protect occupants from sunlight coming through the windshield and side windows, flip the sun visor downward.



You can lower the extender or pivot the entire sun visor to the driver's window side provide maximum shade. Simply pull the inboard side of the sun visor out of the magnetic clip and pivot toward the window. Pivot the sun visor to return it back to its initial position and lock in place.



Opening and Closing



To expose the vanity mirror, lower the visor extender, then lower the mirror cover. While the cover is lowered, the mirror is exposed and lights are illuminated.



Front and Rear Seats

Correct Driving Position

The seat, head support, seat belt and airbags work together to maximize your safety. Using these correctly ensures greater protection.



Position the seat so you can wear the seat belt correctly, while being as far away from the front airbag as possible:

1. Sit upright with both feet on the floor and the seat back in an upright position.
2. Make sure you can easily reach the pedals and that your arms are slightly bent when holding the steering wheel. Your chest should be at least 10 inches (25 cm) from the center of the airbag cover.
3. Place the shoulder section of the seat belt mid-way between your neck and your shoulder. Fit the lap section of the belt tightly across your hips, not across your stomach.

Adjusting Front Seats

NOTE: Only front seats in Model S/Model X can be adjusted. The rear bench seat is stationary.



Seating and Safety Restraints



1. Move seat forward/backward and adjust the seat's height and tilt angle up/down.
2. Adjust backrest.
3. Adjust lumbar support.

⚠ WARNING: Before adjusting a front seat, check that the area around the seat is free of obstacles (people and objects).

⚠ WARNING: Do not adjust seats while driving. Doing so increases the risk of a collision.

⚠ WARNING: Riding in a moving vehicle with the seat back reclined too much can result in serious injuries in a collision, as you could slide under the lap belt or be propelled into the seat belt. Ensure seat backs are reclined no more than 30 degrees when the vehicle is moving.



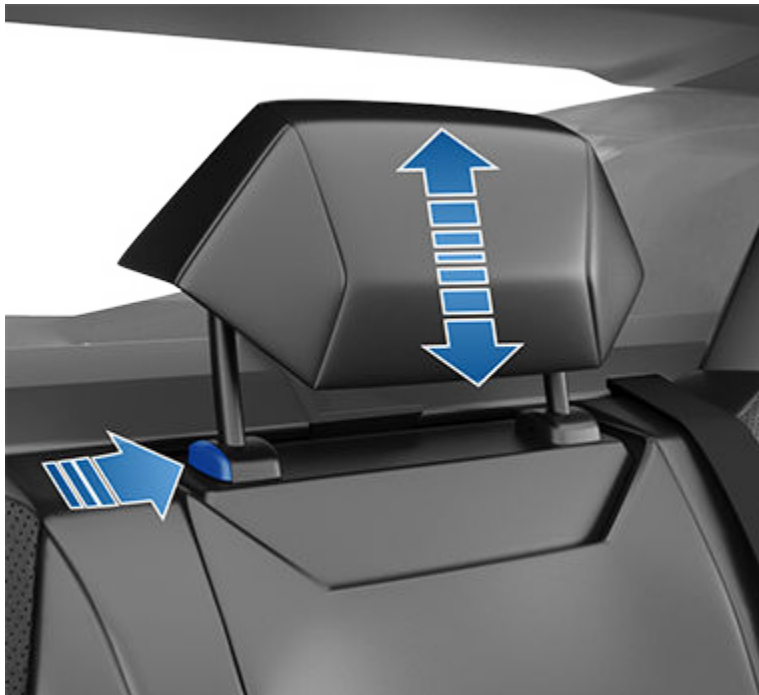
Head Supports

The front seats and the rear outboard seats are equipped with integrated head supports that you cannot adjust.

The rear center seat is equipped with an adjustable head support that you can raise and lower:

- When the seat is occupied by a passenger that is not in a child safety seat, align the center of the corresponding head support with the center of the occupant's head, and ensure the head support is locked into position.
- When the seat is occupied by a child safety seat equipped with an upper tether strap, leave the head support in the raised position after routing the upper tether straps under it.

To raise the head support, pull it upward to the desired position. To lower it, press and hold the button on the base of the post on the right side of the head support while pushing the head support downward.



 **WARNING:** To minimize the risk of severe injury or death in the event of a collision, ensure that the rear center head support is positioned correctly before driving.

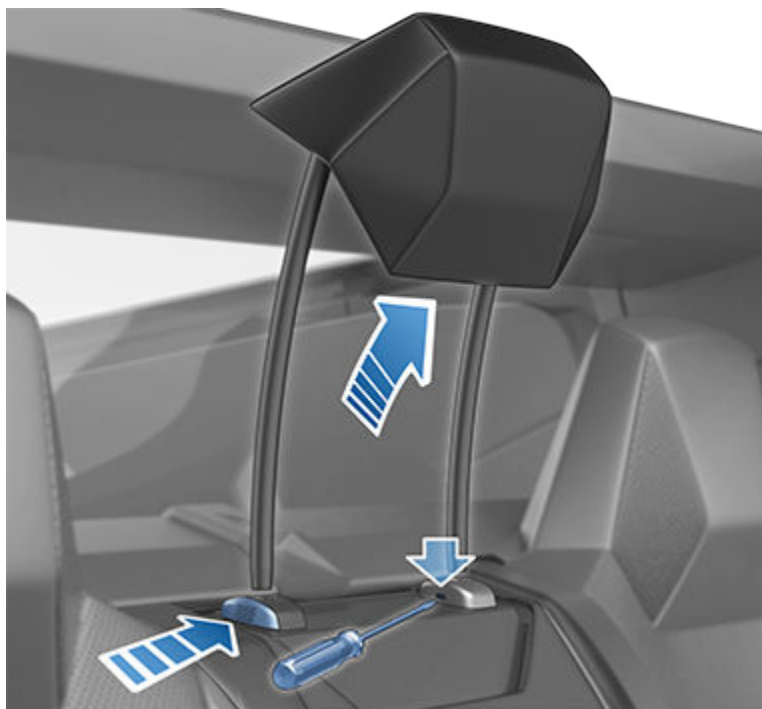
Removing/Installing the Rear Center Head Support

To remove the rear center head support:

1. Fully raise the head support by pulling it upward.
2. Press and hold the button located on the base at the right side of the head support.
3. Insert a short, flat object (such as a small flat-head screwdriver) into the opening in the base of the opposite post and pull the head support upward.



Seating and Safety Restraints



To re-install the rear center head support:

1. With the front of the head support facing forward, align both posts into the corresponding holes on the seat back.
2. While holding the button on the base of the post, press downward on the head support until it clicks into place.
3. Pull upward on the head support to ensure that it is secure.

WARNING: Ensure that the head support is correctly installed before seating an occupant. Failure to do so increases the risk of injury or death if a collision occurs.

Seat Heaters

All seats (except the rear center seat) are equipped with seat heaters that operate at three levels from 3 (highest) to 1 (lowest). For details on how to operate the seat heaters, see [Climate Controls on page 844](#).

WARNING: To avoid burns resulting from prolonged use, individuals who have peripheral neuropathy, or whose capacity to feel pain is limited because of diabetes, age, neurological injury, or some other condition, should exercise caution when using the climate control system and seat heaters.

Seat Covers

WARNING: Do not use seat covers on a seat equipped with a seat-mounted airbag (see [Location of Airbags on page 704](#)). Doing so could restrict deployment of the seat-mounted side airbags if a collision occurs. Also, if the vehicle is equipped with an occupant detection system that is used to determine the status of the passenger front airbag, seat covers may interfere with this system.



Seat Belts

Wearing Seat Belts

Using seat belts and child safety seats is the most effective way to protect occupants if a collision occurs. Therefore, wearing a seat belt is required by law in most jurisdictions.

All seats are equipped with three-point inertia reel seat belts. Inertia reel belts are automatically tensioned to allow occupants to move comfortably during normal driving conditions.

Seat Belt Reminders



The seat belt reminder on the touchscreen alerts you if a seat belt for an occupied driver or passenger seat is unbuckled. If all occupants are buckled up and the reminder stays on, re-buckle seat belts to ensure they are correctly latched. Also remove any heavy objects (such as a briefcase) from an unoccupied seat. If the reminder light continues to stay on, schedule a service appointment.

You can temporarily disable a seat belt reminder associated with a rear seating position. This is useful when you are carrying an object in a rear seat that triggers the seat belt reminder alert. To disable the reminder, touch the associated seat on the seat belt reminder popup message that displays on the touchscreen when a seat belt reminder is active. When a reminder is disabled, the seat belt reminder icon is replaced by a seat icon, for the current drive only. Touch the seat again to re-enable the reminder.



WARNING: Seat belts must be worn by passengers in all seating positions. Do not disable a seat belt reminder when the seating position is occupied by a passenger.

To Fasten a Belt

1. Ensure correct positioning of the seat (see [Correct Driving Position on page 685](#)).
2. Draw the belt out smoothly, ensuring the belt lays flat across the pelvis, chest and mid-point of your collar bone, between the neck and shoulder. Ensure the belt is routed correctly and is not twisted. Never sit on the seat belt or any seat belt component.



WARNING: A twisted or incorrectly routed seat belt can cause damage and interfere with the functionality of the seat belt system.

3. Insert the latch plate into the buckle and press together until you hear a click indicating it is locked in place.



4. Pull the belt to check that it is securely fastened.
5. Pull the diagonal part of the belt toward the reel to remove excess slack.

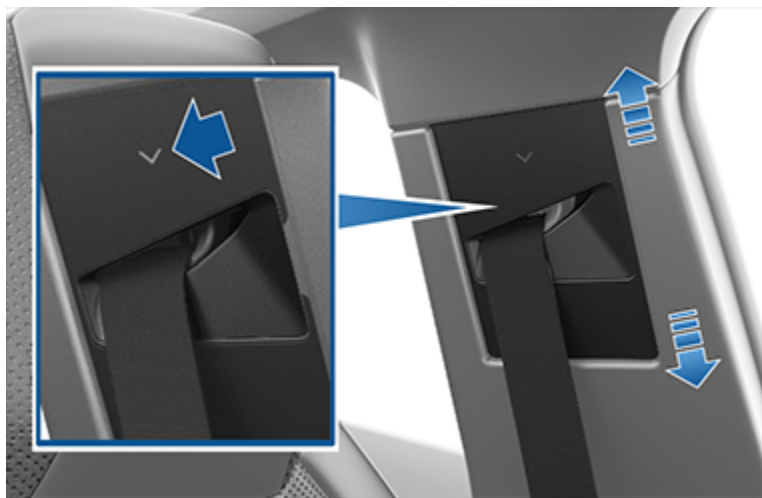


Seating and Safety Restraints

To Adjust the Shoulder Anchor Height

Model S/Model X is equipped with an adjustable shoulder anchor for each front seat to ensure that the seat belt is positioned correctly. The seat belt should lay flat across the mid-point of your collar bone while in the correct driving position (see [Correct Driving Position on page 685](#)). Adjust the height of the shoulder anchor if the seat belt is not positioned correctly:

1. To raise the shoulder anchor, slide it upwards.
2. To lower the shoulder anchor, press and hold the arrow above the shoulder anchor while sliding the anchor downward. The arrow has a softer area underneath that engages a release button, allowing you to lower the anchor. Release the button when the shoulder anchor is in the desired position.



3. Without pressing the button, pull firmly downward on the seat belt to check that it is locked into position.

WARNING: Ensure that the seat belt is positioned correctly and that the shoulder anchor is locked into position before driving. Riding in a moving vehicle with the seat belt positioned incorrectly or with the shoulder anchor not locked into position can reduce the effectiveness of the seat belt in a collision.

To Release a Belt

Hold the belt near the buckle to prevent the belt from retracting too quickly, then press the button on the buckle. The belt retracts automatically. Ensure there is no obstruction that prevents the belt from fully retracting. The belt should not hang loose. If a seat belt does not fully retract, schedule a service appointment.

Automatic Locking Retractor

All passenger seat belts include an automatic locking retractor (ALR) that you use to lock the seat belt in place. These self-locking retractors are typically used to securely hold a seat belt retained child safety seat (see [Installing Seat Belt Retained Child Seats on page 696](#)). To engage the locking retractor:

1. Fully extract the seat belt webbing (beyond the length needed for a typical adult occupant).
2. Fasten the seat belt as you normally would (see [To Fasten a Belt on page 689](#)).
3. Allow the belt to retract. You will hear a clicking sound. The ALR mechanism operates as a ratchet, winding in slack and preventing the seat belt from extending.

The automatic locking retractor disengages by unbuckling and fully retracting the seat belt. The belt can then be worn as a normal belt, sliding freely in and out and locking tight only in an emergency.

WARNING: Do not use the automatic locking retractor (ALR) feature for booster seats in which a large child is restrained by the vehicle's seat belts directly, and therefore not using a child safety seat's integrated restraints.



Wearing Seat Belts When Pregnant

Do not put the lap or shoulder sections of the seat belt over the abdominal area. Wear the lap section of the belt as low as possible across the hips, not the waist. Position the shoulder portion of the belt between the breasts and to the side of the abdomen. Consult your doctor for specific guidance.



-  **WARNING:** If the seat belt is uncomfortable, adjust the seating position instead of wearing the seat belt incorrectly.
-  **WARNING:** Never place anything between you and the seat belt to cushion the impact in the event of a collision.

Seat Belt Pre-tensioners

The front seat belts are equipped with pre-tensioners that work in conjunction with the airbags in a collision. The pre-tensioners automatically retract both the seat belt lower anchor and the upper shoulder webbing, reducing slack in both the lap and diagonal portions of the belts, resulting in reduced forward movement of the occupant.



Seating and Safety Restraints



The seat belts in all rear seating positions are equipped with shoulder pre-tensioners to retract the seat belt webbing to reduce forward movement of the occupant. If the pre-tensioners and airbags did not activate in an impact, this does not mean they malfunctioned. It usually means that the strength or type of force needed to activate them was not present.

- ⚠ WARNING:** Do not bend, sit on, or interfere with the pre-tensioner assembly. Doing so can cause damage that interferes with the proper functionality of the seat belt system.
- ⚠ WARNING:** Once the seat belt pre-tensioners have been activated, they must be replaced. After any collision, have the airbags, seat belt pre-tensioners and any associated components checked and, if necessary, replaced.

Testing Seat Belts

To confirm that seat belts are operating correctly, perform these simple checks on each seat belt:

1. With the seat belt fastened, give the webbing nearest the buckle a quick and forceful pull. The buckle should remain securely locked.
2. With the seat belt fastened, give the webbing closest to the door a quick and forceful pull. The permanent seat belt attachment should remain securely locked. Never attempt to remove this attachment.
3. With the belt unfastened, unreel the webbing to its limit. Check that unreeling is free from snags, and visually check the webbing for wear. Allow the webbing to retract, checking that retraction is smooth and complete.
4. With the webbing half unreeled, hold the tongue plate and pull forward quickly. The mechanism should lock automatically and prevent further unreeling.

If a seat belt fails any of these tests, have the vehicle serviced before driving with the seat occupied.

For information about cleaning seat belts, see [Seat Belts on page 448](#).

Seat Belt Warnings

- ⚠ WARNING:** Seat belts should be worn by all occupants at all times, even if driving for a very short distance. Failure to do so increases the risk of injury or death if a collision occurs.
- ⚠ WARNING:** Secure small children in a suitable child safety seat as described in the Owner's Manual. Always follow the child safety seat manufacturer's instructions when installing.



-  **WARNING:** Ensure that all seat belts are worn correctly. An improperly worn seat belt increases the risk of injury or death if a collision occurs.
-  **WARNING:** Never sit on top of any seat belt component. Doing so can cause damage or interfere with the proper deployment of safety equipment.
-  **WARNING:** Do not wear seat belts over hard, fragile or sharp items in clothing, such as pens, keys, eyeglasses, etc. The pressure from the seat belt on such items can cause injury.
-  **WARNING:** Seat belts should not be worn with any part of the strap twisted.
-  **WARNING:** Each seat belt assembly must be used by one occupant only. It is dangerous to put a seat belt around a child being carried on an occupant's lap.
-  **WARNING:** Seat belts that have been worn in a collision must be inspected or replaced, if necessary, even if damage to the assembly is not obvious.
-  **WARNING:** Seat belts that show signs of wear (such as fraying), or have been cut or damaged in any way, must be replaced.
-  **WARNING:** Avoid contaminating a seat belt's components with any chemicals, liquids, grit, dirt or cleaning products. If a seat belt fails to retract or latch into the buckle, it must be replaced immediately.
-  **WARNING:** Do not make modifications or additions that can prevent a seat belt mechanism from taking up slack, or that can prevent a seat belt from being adjusted to remove slack. A seat belt with slack greatly reduces occupant protection.
-  **WARNING:** Do not make modifications that can interfere with the operation of a seat belt, or that can cause a seat belt to become inoperable.
-  **WARNING:** Do not use third party comfort and convenience products that attach to the seat belts.
-  **WARNING:** When seat belts are not in use, they should be fully retracted and not hanging loose. If a seat belt does not fully retract, schedule a service appointment.
-  **WARNING:** The seat belt system has no user serviceable parts and may contain pyrotechnics. Do not disassemble, remove, or replace components.



Seating and Safety Restraints

Child Safety Seats

Passenger Front Airbag Must Be OFF

Your Model S Model X seat belts are designed for adults and larger children. You must restrain infants and small children in the rear seats only, and you must use a suitable child safety seat appropriate for the child's age, weight, and size.

-  **WARNING:** Never seat a child in the front passenger seat, even if using a child restraint system.
-  **WARNING:** Never seat a child on a seat with an ACTIVE AIRBAG in front of it. DEATH or SERIOUS INJURY to the child can occur.

Refer to the following label located on the sun visors.

NOTE: The image shown below is representative only and may not be identical to the label in your vehicle.



Model S Model X has an occupancy sensor in the front passenger seat that controls the status of the passenger front airbag (see [Front Passenger Occupant Detection on page 707](#)).



Before driving with a child seat on the front passenger seat (if permitted in your market region), always double-check the status of the passenger front airbag to confirm that it is OFF. The Passenger Airbag OFF indicator displays on the touchscreen when the airbag is off. When off, the passenger airbag does not inflate when a collision occurs.

When the vehicle detects a passenger in the front seat, the passenger airbag is on. When on, the Passenger Airbag OFF icon should NOT be visible on the touchscreen. In this case, the airbag will inflate when a collision occurs.

-  **WARNING:** It is the driver's responsibility to confirm that the passenger front airbag is OFF when a child is seated in the front passenger seat. If the passenger front airbag fails to disable with a child seat in position, place the child and child restraint system in the rear seat and schedule a service appointment.
-  **WARNING:** Always ensure that all Model S Model X seats are locked in position before traveling. Failure to do so increases the risk of injury. Pay attention to all warnings displayed on the touchscreen.
-  **WARNING:** Do not associate the **Easy Entry** setting with the driver's profile when a child is seated in a rear seat. Doing so can cause the driver's seat to push against the child, especially when a child is seated in a forward-facing child seat or booster seat. Do not rely on Model S Model X to recognize or accommodate a child seated in the rear seats while using this setting (see [Driver Profiles on page 182](#)).



Choosing a Child Safety Seat

All children age 12 and under should ride in the rear seats. Always use a child safety seat suitable for a young child's age and weight. The following table is based on child safety seat recommendations determined by the National Highway Traffic Safety Administration (NHTSA). For more information, go to www.nhtsa.gov/ChildSafety/Guidance.

Category	Infants	Toddlers	Young children
Age	Birth to 1 year*	Over 1 year*	4 years and older, and less than 57 in. (145 cm) tall
Weight	Up to at least 20 lbs (9 kg)*	Over 20 lbs (9 kg) (minimum) and up to 40 lbs (18 kg)*	Over 40 lbs (18 kg)
Type of child safety seat	Rear facing (or convertible)	Forward facing (or convertible)*	Forward facing or seat belt retained booster seat****
Seat position	Rear facing only*	Rear facing as long as possible, then forward facing*	Forward facing
Recommended attachment method	If combined weight of child and safety seat is up to 65 lbs (29 kg), attach using either LATCH** (lower anchor only) or the seat belt only.*** If combined weight of child and safety seat is over 65 lbs (29 kg), attach using the seat belt only.***	If combined weight of child and safety seat is up to 65 lbs (29 kg), attach using either LATCH** (both lower anchors and top tether anchor), or the seat belt and upper tether strap.*** If combined weight of child and safety seat is over 65 lbs (29 kg), attach using the seat belt and upper tether strap.***	Secure the booster seat using lower LATCH anchors (if available) and then restrain the child with the seat belt. If the booster seat is not equipped with LATCH** anchors, then secure the booster seat with the child using the seat belt. However, if the combined weight of the child and booster seat exceeds 65 lbs (29 kg), secure the booster seat with the child using the seat belt only.*****

*Many child safety seats currently available allow children to ride rear-facing using the child safety seat's integrated 5-point harness for a longer period of time BASED UPON SPECIFIC HEIGHT AND WEIGHT LIMITS. Keep your child in a rear facing seat for as long as possible. CHECK THE CHILD SAFETY SEAT MANUFACTURER'S INSTRUCTIONS AND CAREFULLY FOLLOW ALL INSTRUCTIONS.

**LATCH ("Lower Anchors and Tethers for Children") and ISOFIX are international standards for attachment points for child safety seats in passenger cars that enable compliant child safety seats to be quickly and safely secured. The system has other regional names including LUAS ("Lower Universal Anchorage System") or Canfix in Canada. It has also been called the "Universal Child Safety Seat System" or UCSSS.

***Subject to instructions provided by the child safety seat manufacturer.

****Keep your child in a forward facing child safety seat with a harness and tether until the child reaches the child safety seat's maximum allowable height or weight as specified by the manufacturer of the child safety seat.

*****In the center seating position, the vehicle's head support can be adjusted if the booster seat is not equipped with an integrated head support.



WARNING: Do not use LATCH anchors with child safety seats or booster seats that have an integral safety belt where the combined weight of the child plus the child safety seat exceeds 65 lbs (29 kg).



WARNING: Laws that govern how and where children should be carried when traveling in a vehicle are subject to change. It is the driver's responsibility to keep up to date on, and comply with, all current regulations in the region(s) where Model S Model X is driven. To check the child passenger safety laws for states in the U.S., go to: http://www.ghsa.org/html/stateinfo/laws/childsafety_laws.html.



Seating and Safety Restraints

Seating Larger Children

If a child is too large to fit into a child safety seat, but too small to safely fit into the standard seat belts, use a booster seat appropriate for the child's age and size. Carefully follow the manufacturer's instructions to secure the booster seat.



WARNING: Larger children in booster seats should wear the seat belt like an adult. Do not fully extend the seat belt webbing to engage the automatic locking retracting (ALR).

Installing Child Safety Seats

There are two general methods used to install child safety seats:

- Seat belt retained - these seats are secured using the vehicle's seat belts. All passenger seating positions in Model S/Model X support the use of seat belt retained child safety seats.
- LATCH retained - these seats attach to anchor bars built into the rear seats. All rear seating positions in Model S/Model X support the use of LATCH retained child safety seats.

Check the child safety seat manufacturer's instructions and the table in this manual to determine which installation method to use. Some child safety seats can be installed using either method. Always follow the child safety seat manufacturer's instructions.

Installing Seat Belt Retained Child Seats

First, make sure that the child safety seat is appropriate for the weight, height, and age of the child.

Avoid dressing the child in bulky clothing and do not place any objects between the child and the restraint system.

Adjust harnesses for every child, every trip.

To securely hold child safety seats, all passenger seating positions are equipped with an automatic locking retractor (ALR) feature that, by fully extracting the seat belt (beyond the length needed for a typical adult occupant), locks the belt into place until the seat belt is unbuckled and the webbing is fully retracted. The ALR mechanism operates as a ratchet, winding in slack and preventing the seat belt from extending any further until it has been completely rewound. When installing a child safety seat with integrated restraints, engage the belt's automatic locking retractor by pulling the seat belt webbing until it is **fully** extended. The ALR system engages only when the seat belt is at its maximum extension point.



The automatic locking retractor (ALR) feature is not used for booster seats in which a large child is restrained by the vehicle's seat belts directly, and therefore not using a child safety seat's integrated restraints.

NOTE: An automatic locking retractor disengages only when the seat belt is unbuckled and fully retracted. The belt can then be worn as a normal belt, sliding freely in and out and locking tight only in an emergency. Once disengaged, the belt must be fully extended to re-engage the locking mechanism whenever you install a child safety seat.

Always follow the detailed instructions provided by the child safety seat manufacturer. General guidelines are provided below.

1. Place the child safety seat in Model S Model X and fully extend the seat belt (doing so engages the automatic locking retractor (see [Automatic Locking Retractor on page 690](#)).
2. Route the webbing and buckle the seat belt in accordance with the child safety seat manufacturer's instructions.



3. Allow the seat belt webbing to retract, and remove all slack while firmly pushing the child safety seat into the seat.
4. Once all slack has been removed, forcefully pull the seat belt webbing to confirm that the automatic locking retractor is engaged.

NOTE: The automatic locking retractor disengages only after unbuckling and fully retracting the seat belt webbing. Once disengaged, the belt must be fully extended to re-engage the locking mechanism.

5. Attach the child safety seat's upper tether strap(s) (if equipped), as required by the manufacturer of the child safety seat (see [Attaching Upper Tether Straps on page 699](#)).

Installing LATCH (ISOFIX) Child Seats

Lower LATCH anchors are provided in all rear seating positions. The anchors are located between the seat's back rest and cushion. The exact location of each anchor is identified by a child safety seat identification label. The label is located on the seat back, directly above its associated anchor.



Seating and Safety Restraints



Carefully read and follow the instructions provided by the manufacturer of the child restraint system. The instructions describe how to slide the child restraint system onto the seat's anchor bars until you hear it "click" into place. You may need to push the child restraint system firmly against the seat back to ensure it fits snugly.



Adjust until the child restraint system is fitted firmly against the seat back. Ensure the child restraint system fits snugly.



Before seating a child, ensure that the child restraint system is securely installed. Grasp the front of the child restraint system with one hand on each side, and attempt to:

- Twist the child restraint system from side to side.
- Pull the child restraint system away from the seat.

If the child restraint system moves away from the seat, both latches are not fully engaged onto the seat's anchor bars. You must reinstall it and try again. It is critical that both latches on the child restraint system are fully engaged.



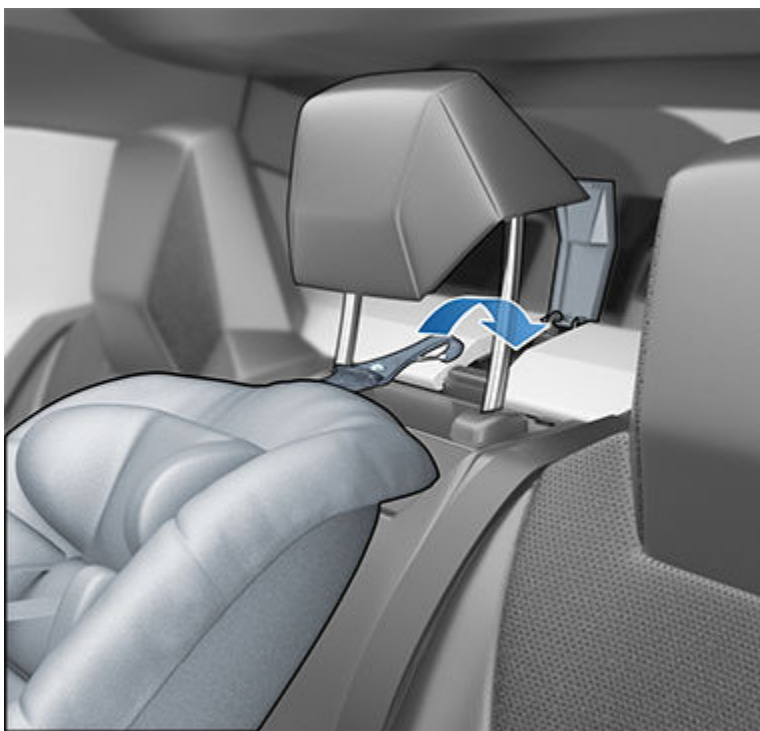
WARNING: Do not use LATCH anchors with child seats or booster seats that have an integrated safety belt where the combined weight of the child plus the child restraint system exceeds 65 lbs (29 kg).

Attaching Upper Tether Straps

If the child safety seat is equipped with an upper tether strap, attach its hook(s) to the anchor point located behind the associated rear seat. To access the center anchor point, flip the cover upward. To access an outboard anchor point, slide the cover to one side.

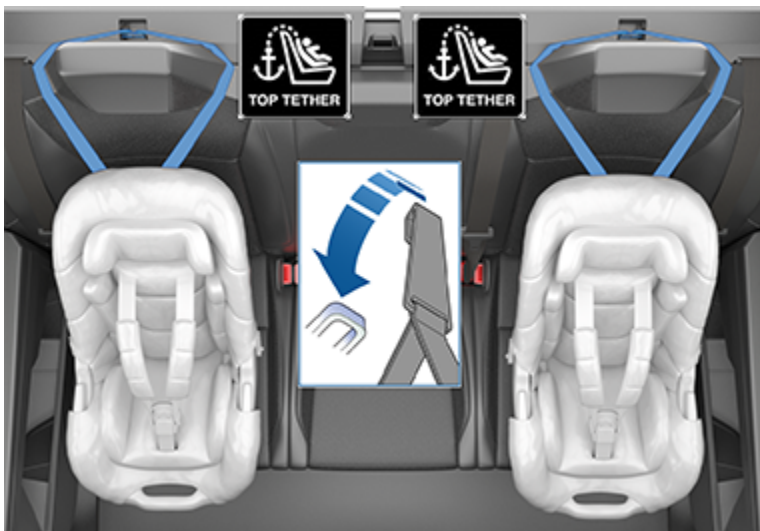


Seating and Safety Restraints

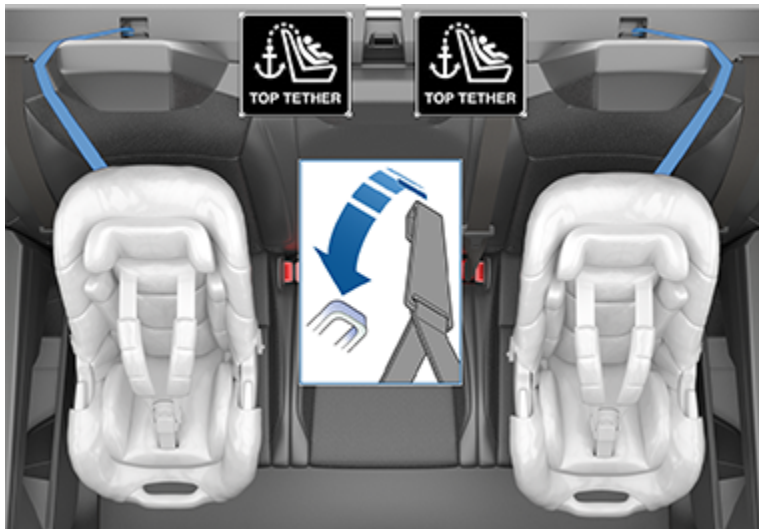


WARNING: Tighten upper tether straps according to the instructions provided by the manufacturer of the child safety seat.

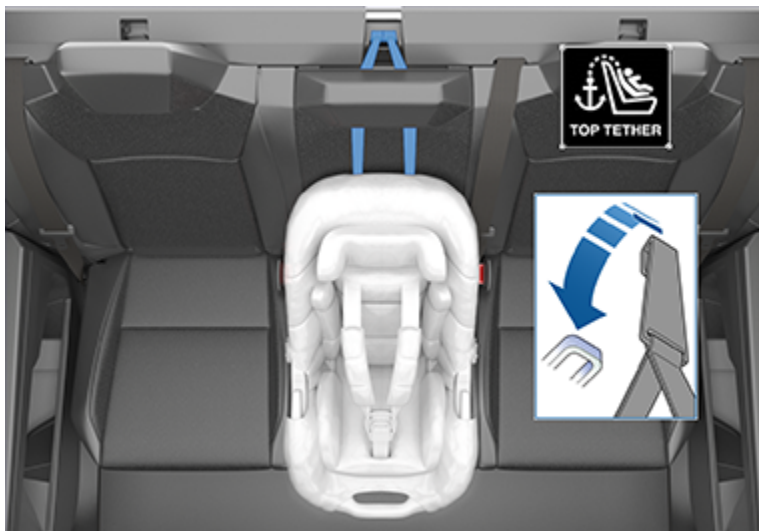
For the outboard seats, position dual-strap tethers on each side of the head support:



For the outboard seats, position single-strap tethers on the outside of the head support:



For the center seat, route dual-strap tethers between the posts under the head support. Lift the head support (see [Head Supports on page 687](#)), then route the straps. Keep the head support in the raised position.

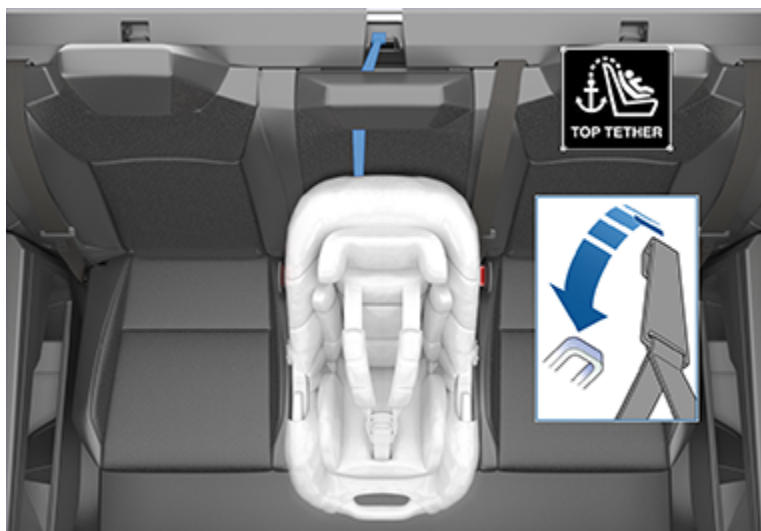


WARNING: In the center seat, do not run dual-strap tethers on each side of the head support.

For the center seat, route a single-strap tether between the posts under the head support. Lift the head support (see [Head Supports on page 687](#)), then route the strap. Keep the head support in the raised position.



Seating and Safety Restraints



Testing a Child Safety Seat

Before seating a child, always make sure the child safety seat is not loose:

1. Hold the child safety seat by the belt path and try to slide the safety seat from side to side and front to back.
2. If the seat moves more than one inch (2.5 cm), it is too loose. Tighten the belt or reconnect the LATCH retained child safety seat.
3. If you are unable to reduce slack, try a different seat location or try another child safety seat.

Child Safety Seat Warnings

- WARNING:** Extreme hazard! Do not seat a child on the front passenger seat even if you are using a child safety seat. This seat has an airbag in front of it. Although this airbag is disabled when Model S Model X detects a lightweight passenger, do not rely on technology to protect your child.
- WARNING:** Child restraint systems are designed to be secured in vehicle seats by lap belts or the lap belt portion of a lap-shoulder belt. Children could be endangered in a crash if their child restraints are not properly secured in the vehicle.
- WARNING:** According to collision statistics, a child is safer when properly restrained in a rear seat instead of the front seat.
- WARNING:** Do not use a forward facing child safety seat until your child weighs over 20 lbs (9 kg) and can sit independently. Up to the age of two, a child's spine and neck are not sufficiently developed to avoid injury in a frontal impact.
- WARNING:** Do not allow a baby or infant to be held on an adult's lap. All children must be restrained in an appropriate child safety seat at all times.
- WARNING:** To ensure children are safely seated, follow all instructions provided in this document and by the manufacturer of the child safety seat.
- WARNING:** Children should ride in a rear facing child safety seat using the seat's integrated 5-point harness for as long as possible.
- WARNING:** Do not use seat belt extenders on a seat belt that is being used to install a child safety seat or booster seat.
- WARNING:** When seating larger children, make sure the child's head is supported and the child's seat belt is properly adjusted and fastened. The shoulder portion of the belt must be away from the face and neck, and the lap portion must not be over the stomach.
- WARNING:** Never attach two child safety seats to one anchor point. In a collision, one anchor point may be incapable of securing both seats.
- WARNING:** Child restraint anchors are designed to withstand only those loads imposed by correctly fitted child restraints. Under no circumstances are they to be used for adult seat belts, harnesses, or for attaching other items or equipment to the vehicle.



WARNING: Always check harnesses and tether straps for damage and wear.



WARNING: Never leave a child unattended, even if the child is secured in a child safety seat.



WARNING: Never use a child safety seat that has been involved in a collision. Have the seat inspected or replaced as described in the child safety seat manufacturer's instructions.

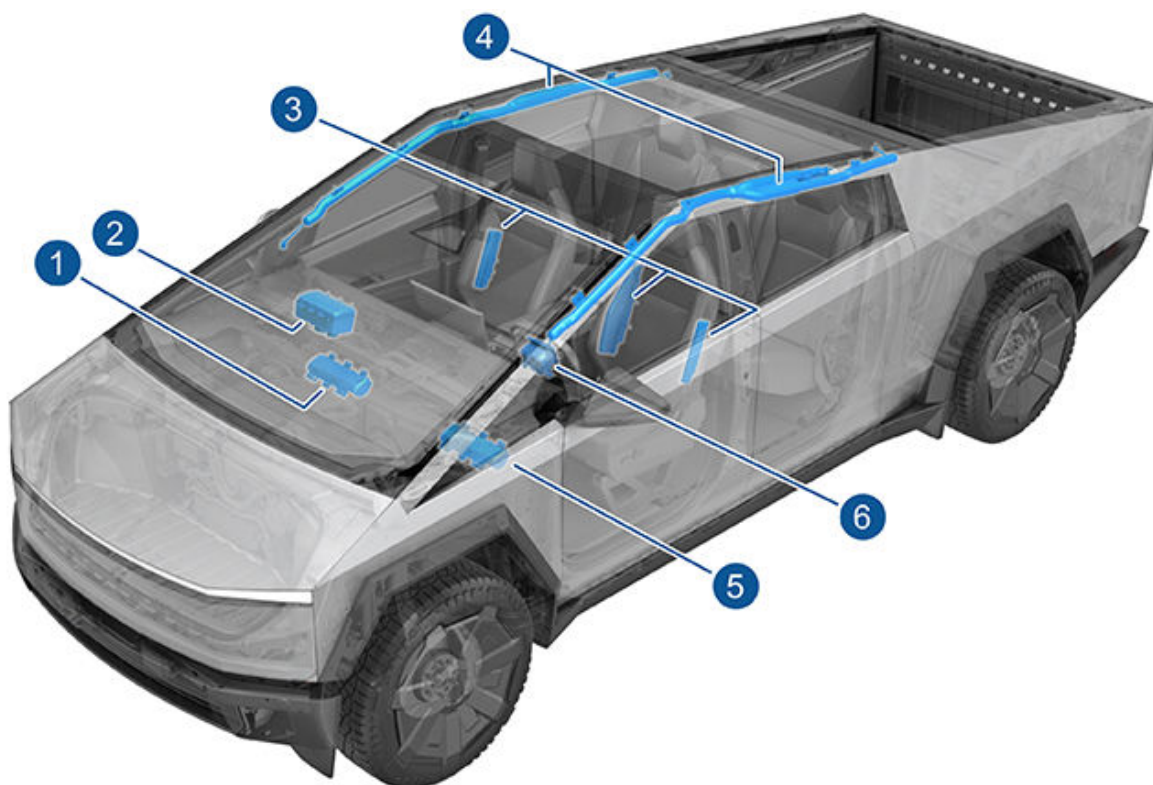


Airbags

Location of Airbags

Airbags are located in the approximate areas shown below. Airbag warning information is printed on the sun visors.

Model S Model X is equipped with an airbag and lap/shoulder belt at both front seating positions. The airbag is a supplemental restraint at those seating positions. All occupants, including the driver, should always wear their seat belts whether or not an airbag is also provided at their seating position to minimize the risk of severe injury or death in the event of a crash.



1. Passenger knee airbag
2. Passenger front airbag
3. Seat-mounted airbags
4. Curtain airbags
5. Driver knee airbag
6. Driver front airbag



How Airbags Work

Airbags inflate when sensors detect an impact that exceeds deployment thresholds. These thresholds are designed to predict the severity of a crash in time for the airbags to help protect the vehicle's occupants. Airbags inflate instantly with considerable force accompanied by a loud noise. The inflated bag, together with the seat belts, limits movement of occupants to reduce the risk of injury.

Front airbags are not ordinarily designed to inflate in rear collisions, rollovers, side collisions and when braking heavily or driving over bumps and potholes. Likewise, front airbags may not inflate in all frontal collisions, such as minor front collisions, underride collisions, or minor impacts with narrow objects (such as posts or poles). Significant superficial damage can occur to the vehicle without the airbags inflating and, conversely, a relatively small amount of structural damage can cause airbags to inflate. Therefore, the external appearance of the vehicle after a collision does not represent whether or not the front airbags should have inflated.



WARNING: Before modifying your vehicle to accommodate a person with disabilities in a way that may affect the airbag system, schedule a service appointment.

Types of Airbags

Model S/Model X has the following types of airbags:

- **Front airbags:** The front airbags are designed to reduce injuries if larger children or adults are riding in the front seats. Follow all warnings and instructions related to seating a child on the front passenger seat (if permitted in your market region).
- **Knee airbags:** Knee airbags and the front airbags work together. The knee airbags limit the forward motion of the front seat occupants by restricting leg movement, thereby positioning the occupants so that the front airbags work more effectively.
- **Seat-mounted airbags:** A seat-mounted side airbag in the front seats helps protect the pelvis and the thorax region of the torso. The seat-mounted airbag on the inside portion of the driver's seat helps protect the head and torso. Seat-mounted airbags on both the impacted and non-impacted side of the vehicle inflate in the event of a severe side impact or a severe offset frontal impact.
- **Curtain airbags:** Curtain airbags help protect the head. Curtain airbags on both the impacted and non-impacted side of the vehicle inflate only if a severe side impact occurs, or if the vehicle rolls over.

Airbag Status Indicator

The status of the passenger front airbag displays on the touchscreen:



The Passenger Airbag Off indicator displays on the touchscreen when the passenger front airbag is OFF. When the passenger front airbag is OFF, it does not inflate when a collision occurs. When driving with a child seat on the front passenger seat (if permitted in your market region), always double-check the status of the passenger front airbag to confirm that it is OFF.

To protect an adult occupying the front passenger seat, ensure the passenger front airbag is ON – when ON, a Passenger Airbag OFF icon should not be visible on the touchscreen. When the passenger airbag is ON, it may inflate when a collision occurs.



The airbag indicator displays on the touchscreen for a few seconds at the start of every drive while checking the following functionality, as applicable:

- Airbags
- Seat belts with pre-tensioners and load limiters
- Impact sensors
- Occupant sensors
- Seat belt sensors
- Passive safety component wiring harnesses
- Onboard restraint controlled components (ex: accelerometer and other passive safety components)



Seating and Safety Restraints

After this check, the airbag indicator turns off. If the airbag system detects a fault in any of the previously mentioned components, the airbag warning indicator stays on. In this case contact Tesla service immediately. Do not drive the vehicle until the airbag system is inspected by Tesla.



Front Passenger Occupant Detection

Model S Model X has an occupancy sensor in the front passenger seat that controls the status of the front airbag.

NOTE: The occupancy classification system (OCS) meets the regulatory requirement of FMVSS 208 and automatically detects when inflating the passenger front airbag would be unnecessary or potentially harmful.

 **WARNING:** Seating an infant in a rear facing child restraint system on a seat equipped with an operational airbag can cause serious injury or death.

Object Classification	OCS Passenger Airbag Status*	Indicator status	Notes
Empty	OFF	PASSENGER AIRBAG OFF	
Object	OFF or ON	PASSENGER AIRBAG OFF or PASSENGER AIRBAG ON	Depends on material/contents
Rear-facing child restraint system designed for children up to One Year Old	OFF	PASSENGER AIRBAG OFF	Less than 22 lbs (10 kg)
Forward facing child restraint system	OFF	PASSENGER AIRBAG OFF	Less than 35 lbs (16 kg)
Child in a booster seat	OFF	PASSENGER AIRBAG OFF	Less than 51 lbs (23 kg)
Large child	OFF or ON	PASSENGER AIRBAG OFF or PASSENGER AIRBAG ON	51 lbs (23 kg) or more and less than 103 lbs (47 kg)
5th percentile female or larger (by weight)	ON	PASSENGER AIRBAG ON	Over approximately 103 lbs (47 kg)

*If the passenger airbag status indicator does not match the situation, do not use the seat. The passenger must ride in a different seat. Schedule a service appointment.

NOTE: It takes approximately six seconds after you power on Model S Model X for the occupant classification system (OCS) to report accurate status of the front passenger airbag. As a result, when you first power on Model S Model X, even in situations when it should be OFF because the seat is occupied by a weight of 20 lbs (9 kg) or less, it will take the touchscreen approximately six seconds to display the status, PASSENGER AIRBAG OFF. If it fails to do so, schedule a service appointment and do not seat a child in the front passenger seating position.

To make sure the sensing system can correctly detect occupancy status, eliminate the following:

- Objects lodged under the seat.
- Heavy objects sitting on the seat (briefcase, large purse).
- Objects wedged between the seat back and seat cushion.
- Cargo interfering with the seat.
- Aftermarket items attached to, or sitting on or between, the seat and occupant including but not limited to covers, mats, blankets, etc.

These conditions can interfere with the occupancy sensor. If you have eliminated the above possibilities, and the airbag status is still incorrect, ask passengers to ride in the rear seats and schedule a service appointment to have the airbag system checked.

NOTE: The front passenger occupancy sensor affects the operation of the passenger front airbags only. The side airbags are not affected.

 **WARNING:** If the front passenger airbag is not turning on or off as expected based on the weight thresholds previously described, schedule a service appointment immediately.

 **WARNING:** If seating a child in the front passenger seat is legally permissible in your market region, it is the driver's responsibility to ensure that the passenger front airbag is OFF. Never seat a child in a rear facing safety seat in the front passenger seat with an active airbag. DEATH or SERIOUS INJURY to the child can occur. Per recommendations by the National Highway Traffic Safety Administration, all occupants age 12 and under must ride in the rear seats.



Seating and Safety Restraints

 **WARNING:** Do not use seat covers on the front seats. Doing so could reduce the accuracy of the occupant detection system.



Ensuring Accurate Occupant Detection

To help ensure an occupant in the front passenger seat can be accurately detected, the passenger must:

- Wear a seat belt.
- Sit upright on the center of the seat cushion, with shoulders resting against the seat back and legs extended comfortably in front with feet on the floor. See [Examples of Correct and Incorrect Seating Positions on page 710](#).
- Remain positioned on the seat cushion and not lift their weight off the seat (for example, by pushing their feet against the floor or pressing on the center console or armrest to lift up).
- Never wear thick, wet, or bulky clothing (such as ski wear or padded clothing).

In addition to the items listed above, the following situations can interfere with the accuracy of the occupant classification system:

- Incorrectly placing a child restraint system so that the entire lower section is not positioned against the seat cushion.
- Objects lodged under the seat or wedged between the seat back and cushion.
- Heavy objects sitting on the seat (briefcase, large purse).
- Cargo interfering with the seat.

These conditions can interfere with the occupancy sensor. If you have eliminated the above possibilities, and the airbag status is still incorrect, instruct passengers to ride in the rear seats and schedule a service appointment to have the airbag system checked.

NOTE: Tesla follows NHTSA (National Highway Traffic Safety Administration) recommendations that all occupants age 12 and under be seated in a rear seat.

NOTE: The front passenger occupancy sensor affects the operation of the passenger front and side airbags.



WARNING: Failure to follow the above instructions can adversely affect the Occupant Classification System (OCS) which can cause serious injury or death.



WARNING: If the front passenger airbag is not turning on or off as expected, do not seat a passenger in the front passenger seat. Schedule a service appointment.



WARNING: To ensure accuracy of the occupant detection system, do not make any modifications to the front passenger seat.



Seating and Safety Restraints

Examples of Correct and Incorrect Seating Positions

Correct seating position:



Incorrect seating position - the passenger's feet must be on the floor:



Incorrect seating position - the passenger must not slide forward on the seat cushion:



Incorrect seating position - the passenger must not recline the backrest to a laying down position when the vehicle is moving:





Seating and Safety Restraints

Inflation Effects

 **WARNING:** When airbags inflate, a fine powder is released. This powder can irritate the skin and should be thoroughly flushed from the eyes and from any cuts or abrasions.

After inflation, the airbags deflate to provide a gradual cushioning effect for the occupants and to ensure the driver's forward vision is not obscured.

If airbags have inflated, or if your vehicle has been in a collision, always have the airbags, seat belt pre-tensioners and any associated components checked and, if necessary, replaced.

In a collision, in addition to the airbags inflating:

- Doors unlock.
- Hazard warning lights turn on.
- Interior lights turn on.
- High voltage is disabled (you must contact Roadside Assistance to restore high voltage power).
- Seat belt pre-tensioners retract the seat belt anchor and seat belt webbing.

NOTE: Depending on the nature of the impact and the forces involved, doors may not unlock in a collision and/or damage may prevent them from opening. In such cases, the door may need to be opened using the interior manual release, or other means of extrication (for example, exiting through another door, breaking the window, etc.).

Airbag Warnings

 **WARNING:** Do not place objects over or near airbags because any such objects could cause harm if the vehicle is in a crash severe enough to cause the airbag to inflate.

 **WARNING:** All occupants, including the driver, should always wear their seat belts, whether or not an airbag is also provided at their seating position, to minimize the risk of severe injury or death in the event of a collision.

 **WARNING:** Front seat occupants should not place their arms over the airbag module, as an inflating airbag can cause fractures or other injuries.

 **WARNING:** Airbags inflate with considerable speed and force, which can cause injury. To limit injuries, ensure that occupants are wearing seat belts and are correctly seated, with the seat positioned as far back as possible. The National Highway Traffic Safety Administration (NHTSA) recommends a minimum distance of 10 inches (25 cm) between an occupant's chest and an airbag.

 **WARNING:** Children should not be seated on the front passenger seat unless permitted by regulations in your market region. Follow all regulations in your region for the appropriate way to seat a child based on the child's weight, size, and age. The safest place to seat infants and young children is in a rear seating position. Seating an infant or child in a rear-facing child restraint system on a seat equipped with an operational airbag can cause serious injury or death.

 **WARNING:** To ensure correct inflation of the side airbags, maintain an unobstructed gap between an occupant's torso and the side of Model S/Model X.

 **WARNING:** Passengers shouldn't lean their heads against doors. Doing so can cause injury if a curtain airbag inflates.

 **WARNING:** Do not allow passengers to obstruct the operation of an airbag by placing feet, knees or any other part of the body on or near an airbag.

 **WARNING:** Do not attach or place objects on or near the front airbags, the side of the front seats, the headliner at the side of the vehicle, or any other airbag cover that could interfere with inflation of an airbag. These include but are not limited to: steering wheel covers, decals, seat cushions or pillows, etc. Objects can cause serious injury if the vehicle is in a collision severe enough to cause the airbag to inflate.

 **WARNING:** Do not use seat covers on the front seats. Doing so could restrict deployment of the seat-mounted airbags if a collision occurs.

 **WARNING:** Following inflation, some airbag components are hot. Do not touch until they have cooled.



Interior Storage

Center Console

In addition to housing wireless phone chargers, USB-C outlets, and a 120V power outlet (see [Interior Electronics on page 660](#)), the center console includes cup holders, a storage compartment, and a rear touchscreen.

To open the main storage compartment, squeeze the latch and pivot the cover upward. To close, lower the cover and make sure it latches shut.



Rear Console

Model S Model X has a rear console integrated in the center of the second row. This console can serve as an arm rest for rear passengers and includes two cup holders.

To lower the console, pull the loop in the seat back and pull down the center seat head rest. The loop must be fully retracted back into place in order to lock the arm rest in the lowered or raised positions.



Storage Areas



To raise the console, push the head rest all the way upward until the console securely latches into place.

Rear Seat Storage

To maximize cargo space in the second row, the seat cushions can be folded upwards. The rear seat is split into two sections. While pulling the tab on the inside of the rear door, pull the front of the seat upwards until you hear a click.



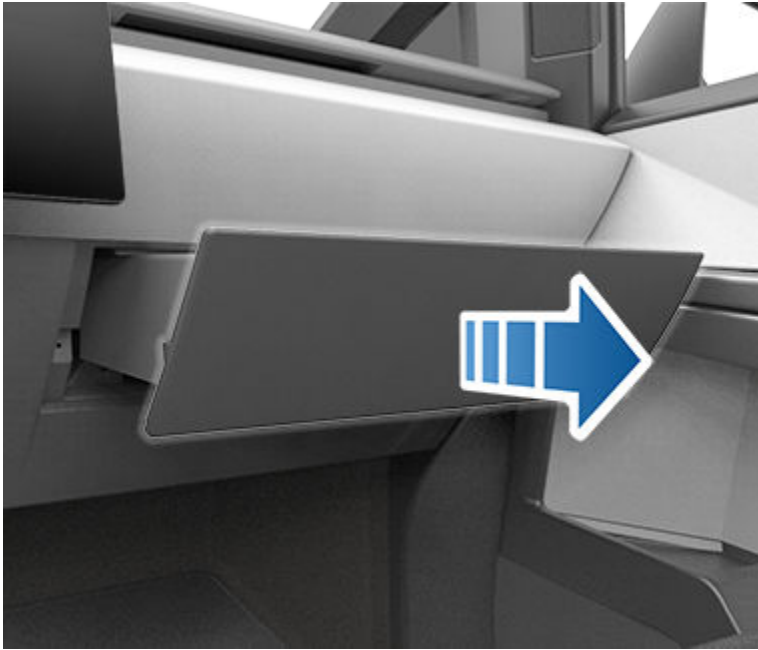
To put the seats down again, pull the tab while pressing down on the corresponding seat cushion.

WARNING: When folding the rear seat cushion up, ensure that the area is clear of objects and hands and that they are fully locked into place before driving. When folding the rear seat cushions down, ensure that they are fully folded down and locked into place before a passenger sits down.



Glovebox

To open the glovebox, touch **Controls** > **Glovebox**. The glovebox opens and the light turns on. You can also open the glovebox with a voice command (see [Voice Commands on page 391](#)).



To close the glovebox, touch **Glovebox** again.

For additional glovebox security, touch **Controls** > **Safety** > **Glovebox PIN** to set a 4-digit PIN that must be re-entered to open the glovebox (see [Glovebox PIN on page 394](#)).

NOTE: If you leave the glovebox open, its light eventually turns off.

NOTE: The glovebox locks whenever closed and you lock Model S/Model X using the mobile app, key card, you leave Model S/Model X carrying your phone key (if Walk-Away Door Lock is turned on), or if Valet Mode is active (see [Valet Mode on page 183](#)). It does not lock when Model S/Model X is locked by touching the lock icon on the touchscreen.



WARNING: When driving, keep the glovebox closed to prevent injury to a passenger if a collision or sudden stop occurs.

Seat Pockets

A pocket on the back side of each front seat provides convenient storage for small items. Avoid placing sharp objects in the seat pockets to prevent tears.

Door Panels

There is additional storage for small items on the inside of each front and rear door panel.

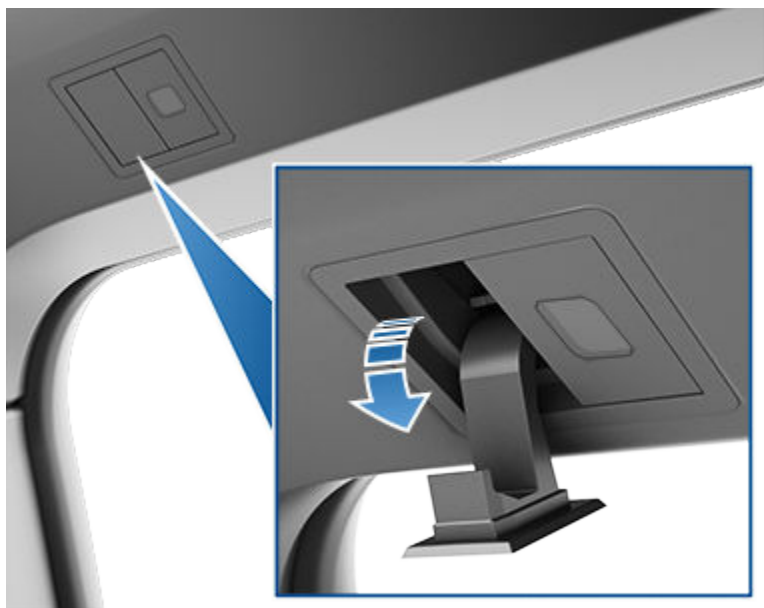
NOTE: In the unlikely event that Model S/Model X has no low voltage power, a rear door manual release is located in each rear door pocket. For more information, see [Opening Doors with No Power on page 950](#).

Coat Hangers

Your Model S/Model X has a coat hanger on each side of the vehicle above the rear window in the second row, next to the reading light. Push the coat hanger to release it. Push it again to retract it.



Storage Areas





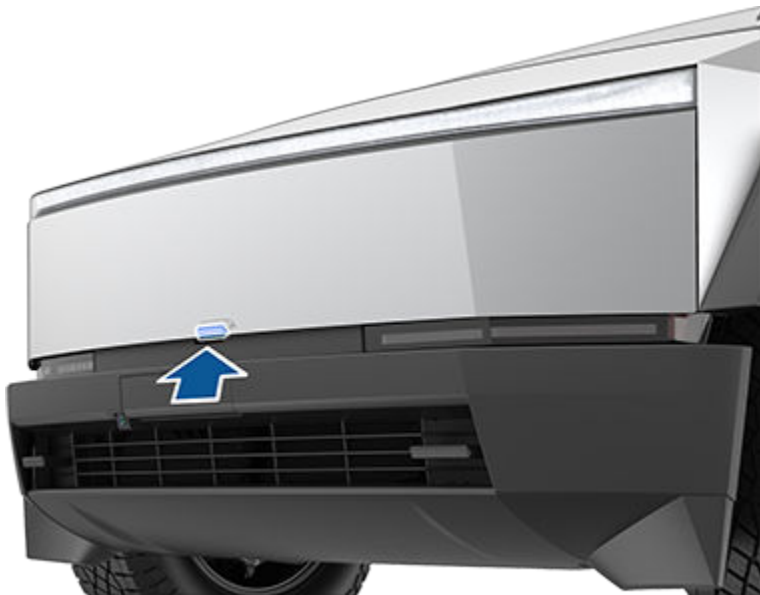
Powered Frunk

Opening

-  **WARNING:** Before opening or closing the hood, it is important to check that the area around the hood is free of obstacles (people and objects). Failure to do so may result in damage or serious injury.
-  **WARNING:** Use caution around the panel edges on Model S/Model X, including the doors, powered frunk, tailgate, and surrounding panels.

To open the powered frunk, ensure Model S/Model X is in Park, and then do one of the following before opening the hood:

- Touch the associated **Open** icon on the touchscreen.
- Press the **Frunk** button in the mobile app.
- Press the center button under the hood closure.



NOTE: In the unlikely event that Model S/Model X has no low voltage power, you will be unable to open the powered frunk using the touchscreen or the button under the hood closure. Instead, see [Opening the Powered Frunk with No Power on page 944](#).



Storage Areas



When a door or the powered frunk is open, the touchscreen displays the Door Open indicator light. The vehicle avatar also shows the door, powered frunk, or tailgate status.

Adjust the Opening Height of the Powered Frunk

You can adjust the opening height of the powered frunk to make it easier to reach or to avoid low-hanging ceilings or objects (for example, a garage door or light):

1. Open the powered frunk, then manually lower or raise it to the desired opening height.
2. Press and hold the powered frunk button on the front of the vehicle for three seconds until you hear a confirmation chime.
3. Confirm that you have set it to the desired height by closing the powered frunk, then reopening it.

Closing

WARNING: Before driving, you must ensure that the hood is securely latched in the fully closed position by carefully trying to lift the front edge of the hood upward and confirming there is no movement. It is the driver's responsibility to ensure that the powered frunk is properly closed before driving.

Close the powered frunk in any of the following ways:

- Press the center button under the hood closure.



- Press the emergency release button in the powered frunk.
- Press the **Frunk** button in the mobile app.
- Touch the associated **Close** icon on the touchscreen.

WARNING: Ensure that all hands and other objects are free of the powered frunk before closing it.

CAUTION: Do not try to manually close the powered frunk. Doing so may cause damage.

If the powered frunk is left open when you attempt to shift out of Park, a notification requiring you to confirm your intent to drive appears on the touchscreen. If you choose to keep the powered frunk open while driving, your vehicle speed is limited.

The powered frunk locks when:

- You lock Model S/Model X using the touchscreen, key or mobile app.



- You leave Model S/Model X carrying your phone key (if [Walk-Away Door Lock on page 55](#)/[Walk-Away Door Lock on page 41](#) is turned on).
- Valet mode is active (see [Valet Mode on page 183](#)).

Load Limits

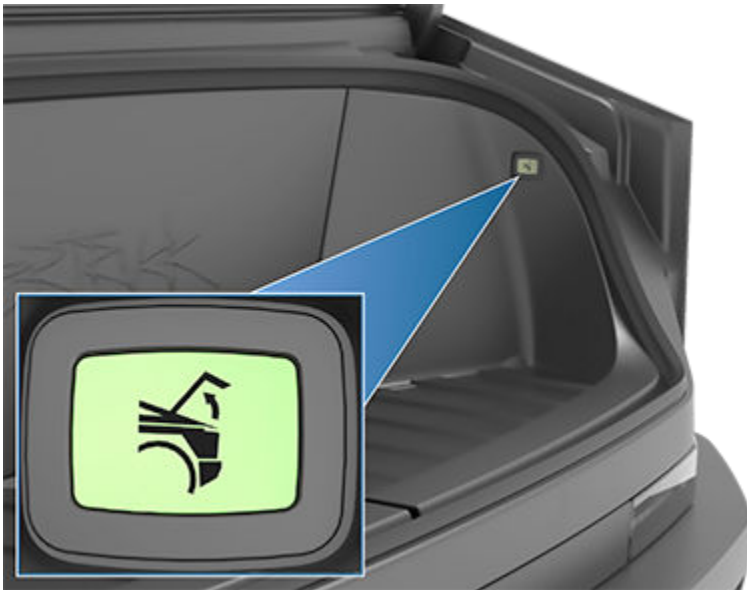


CAUTION: Never load more than 440 lbs (200 kg) in the powered frunk. Doing so can cause damage.



WARNING: When loading cargo, always consider the vehicle's GVWR and GAWR ratings (see [Vehicle Loading on page 928](#)). The GVWR is the maximum allowable total mass of the vehicle including all passengers, fluids, and cargo, and the GAWR is the maximum allowable total mass permitted on an axle.

Interior Emergency Release



An illuminated interior release button inside the powered frunk allows a person locked inside to get out.

Press the interior release button to unlatch the powered frunk, then push up on the hood. If the powered frunk is already open, pressing the interior release button closes it.

NOTE: The interior release button glows following a brief exposure to ambient light.



WARNING: People should never climb inside the powered frunk. Never shut the powered frunk when a person is inside.



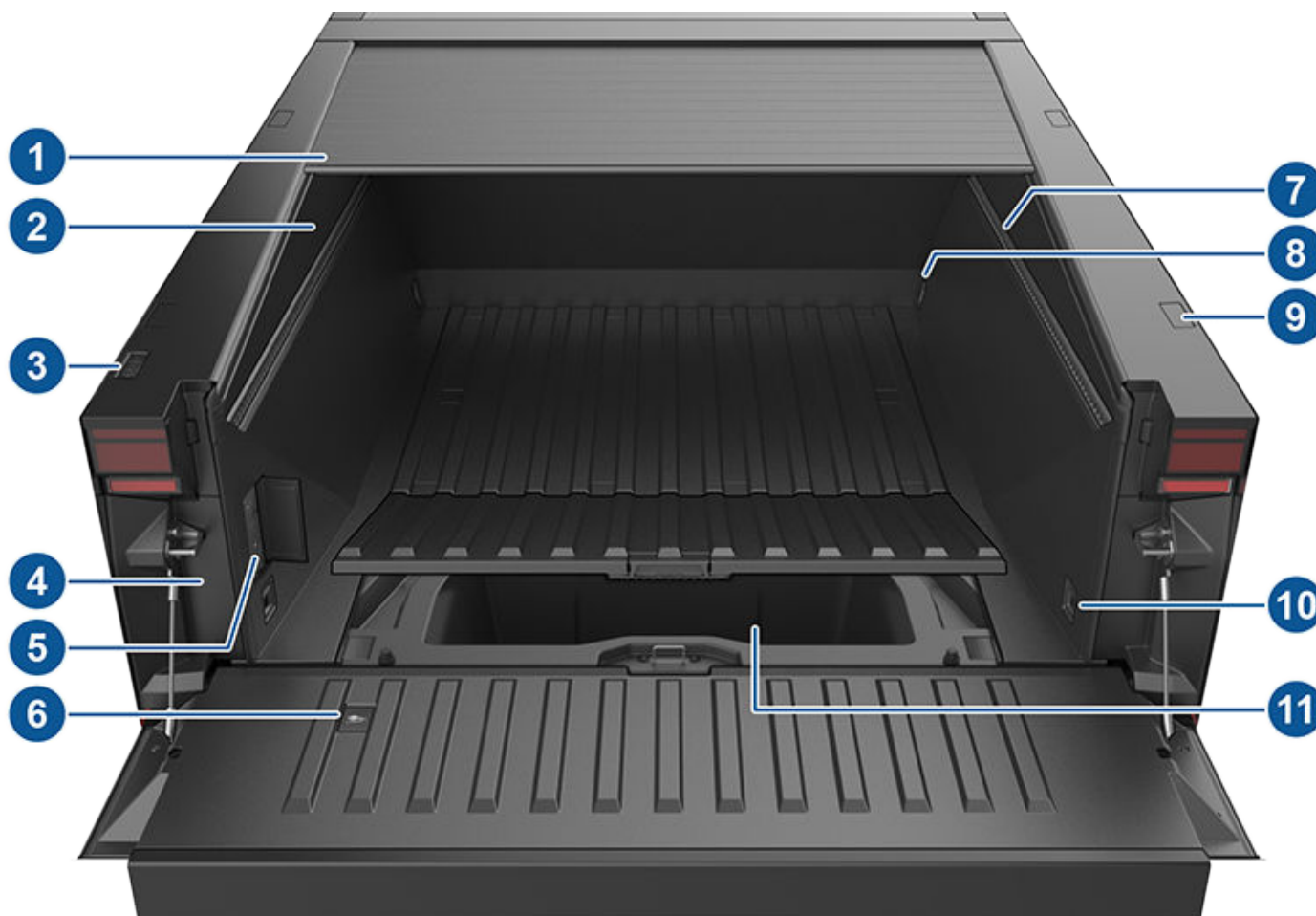
WARNING: Care should be taken to ensure that objects inside the powered frunk do not bump against the release button, causing the hood to accidentally open.



Cargo Bed

Overview

WARNING: Passengers must always be seated in seats with seat belts fastened at all times when the vehicle is in motion. Never allow passengers or pets to ride in the cargo bed, even with the tonneau cover closed. Doing so can result in serious injury or death.



1. Tonneau cover ([Accessing the Cargo Bed on page 721](#))
2. LED light bars ([Lights on page 756](#))
3. Tailgate and tonneau cover switches ([Accessing the Cargo Bed on page 721](#))
4. Charge port manual release ([Manually Releasing Charge Cable on page 877](#))
5. Power outlets ([Cargo Bed Outlets on page 664](#))
6. Tailgate emergency release ([Tailgate Emergency Release on page 723](#))
7. L-tracks ([Securing Cargo on page 724](#))
8. Front tie-downs ([Securing Cargo on page 724](#))
9. Attachment points ([Securing Cargo on page 724](#))
10. Rear tie-downs ([Securing Cargo on page 724](#))
11. Sealed storage ([Under Bed Compartment on page 724](#))

For dimensions, weight capacities, and storage volumes of the cargo bed and its associated components, see [Dimensions, Weights, and Cargo Capacity on page 932](#).

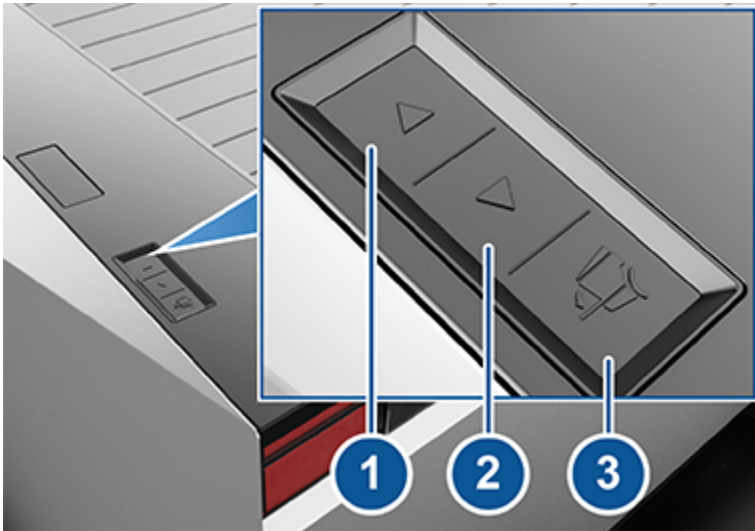


CAUTION: Although the tonneau cover protects contents from the majority of water during rain, snow, etc., it does not make the cargo bed waterproof. Water ingress and/or condensation can occur. Therefore, do not store items that can be damaged by water under the tonneau cover. Store water-sensitive items in the cab, the [Under Bed Compartment on page 724](#), or the [Powered Frunk on page 717](#).

WARNING: Never fill, store, or transport volatile solvents, chemicals, or liquids anywhere in the cargo bed or the under bed compartment. Doing so can cause spills, or allow fumes to accumulate, resulting in damage, serious injury, or death.

Accessing the Cargo Bed

When Model S Model X is parked, use these exterior switches to access the cargo bed:



1. **Tonneau Open** - Fully press and release to fully open the tonneau cover. Press a second time to pause the cover. To open the tonneau cover partially, press lightly and release the button when desired.
2. **Tonneau Close** - Fully press and release to fully close the tonneau cover. Press a second time to pause the cover. To close the tonneau cover partially, press lightly and release when desired.
3. **Tailgate Open** - Press to release the tailgate latch. The tailgate drops but integrated struts prevent it from falling forcefully.

NOTE: If the tonneau cover does not open or close when you fully press and release the tonneau open or tonneau close button, respectively, you may need to calibrate the tonneau cover. For more information, see [Troubleshooting the Tonneau Cover on page 722](#). You can still press lightly to partially open or close the tonneau cover.

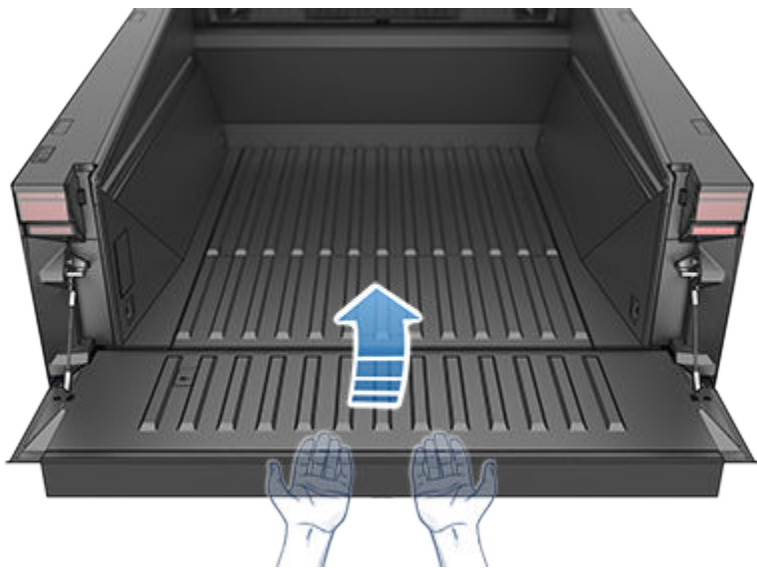
You can also use the mobile app and the touchscreen to open and close the tonneau cover. On the touchscreen, touch **Controls > Tonneau**.

CAUTION: Do not drop anything onto the tonneau cover or place objects on top that could fall off. Avoid allowing objects or debris to enter the tracks or interfere with the motors.

To close the tailgate, first remove all objects and ensure the hinge area is free of debris. Then lift the tailgate from the bottom with both hands and press it firmly against the cargo bed to ensure it latches into position. Pull the closed tailgate toward you to ensure it is fully latched into position. If the tailgate is open or unlatched, the touchscreen displays a message.



Storage Areas



WARNING: When closing the tonneau cover, keep hands and objects away from the tonneau cover tracks. Failure to do so can cause damage or injury.

WARNING: When closing the tailgate, keep hands and objects away from the perimeter, the hinges, etc. Failure to do so can cause damage or serious injury.

Troubleshooting the Tonneau Cover

The tonneau cover does not open or close when:

- Model S Model X is locked, or is not in Park.
- There is an obstacle blocking the tonneau cover from closing. In this case, remove the object and try again.

WARNING: Although the tonneau cover is designed to stop moving if it detects an obstacle when closing, do not rely on the tonneau cover to prevent damage or injury.

- Model S Model X has no low voltage power. In this case, it is necessary to open the powered frunk before attempting to jump start Model S Model X. For more information, see [If Vehicle Has No Power on page 939](#).

NOTE: The tonneau cover locks into place (whether opened or closed) when **Walk-Away Door Lock** is enabled. Always double check that the tonneau cover is closed, or intentionally left open, before walking away from your vehicle (see [Walk-Away Door Lock on page 680](#) for more information). **Car Left Open Notifications** may not notify you if the tonneau cover is left open.

If the tonneau cover does not open or close as expected:

1. Make sure that Model S Model X is unlocked and in Park.
2. Wait several minutes and then try again.
3. Inspect the tracks to ensure there's no debris or object in the way of the tonneau cover.



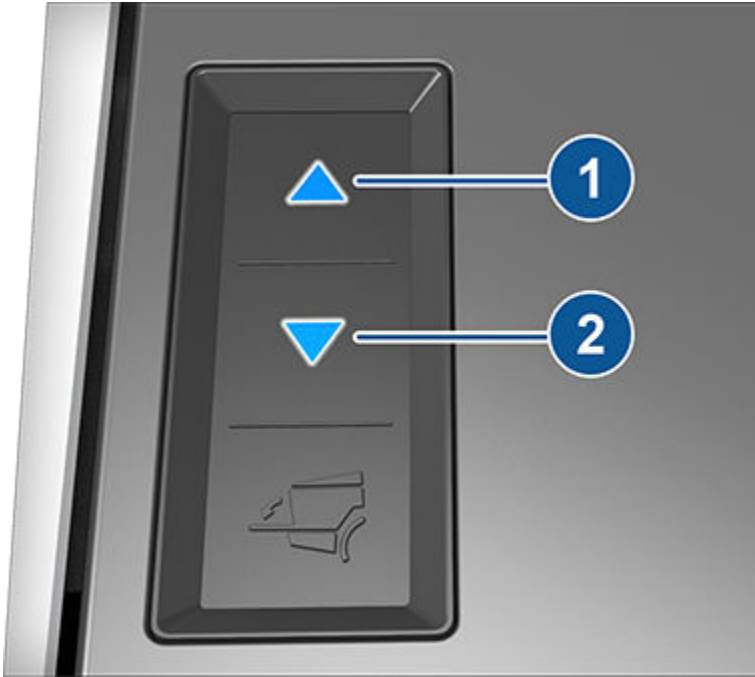


4. Calibrate the tonneau cover:

- Touch **Calibrate** on the touchscreen (on the exterior view of the vehicle, where you would normally touch to open or close the tonneau cover) and follow the onscreen instructions.

NOTE: The **Calibrate** option only appears on the touchscreen when the tonneau cover needs to be calibrated.

- Or, to calibrate the tonneau cover manually: Press and hold the Open button (1) until the cover is fully open and wait for it to stall. Then, press and hold the Close button (2) until the cover is fully closed and stalled.



If the tonneau cover still does not function as expected, schedule a Service appointment.

Tailgate Emergency Release

An interior release, located on the inside of the tailgate, allows a person trapped in the cargo bed to open the tailgate when Model SModel X is parked.



To use the emergency release, flip the cover upward to access the pull strap, then pull the strap firmly toward you.



WARNING: People should never be inside the cargo bed when the Model SModel X is moving. Never shut the tailgate when a person is inside.

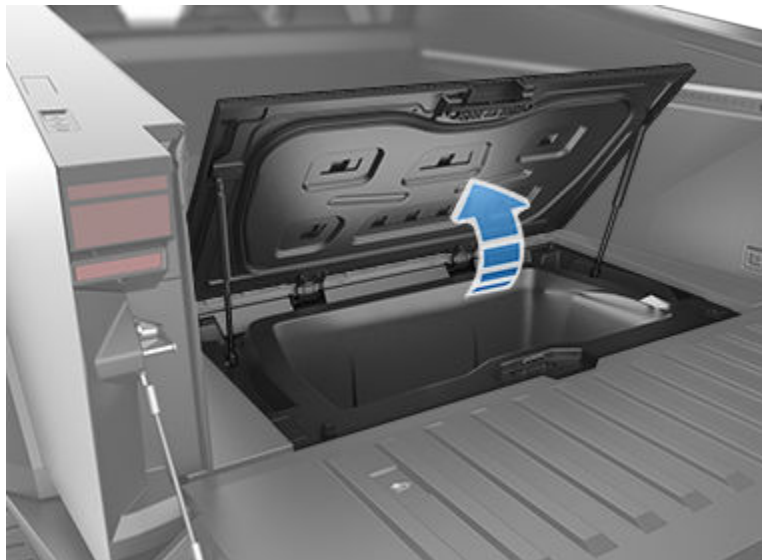


Storage Areas

Under Bed Compartment

The cargo bed features a sealed storage compartment. To open:

1. Open the tailgate (see [Accessing the Cargo Bed on page 721](#)).
2. Grasp the handle and flip the cover fully upward.



Once open, integrated struts hold the cover in the raised position.

The under bed compartment features a drain plug that allows you to use it to store water and/or ice. To open the drain plug, simply turn it counter-clockwise and pull it up. Remember to re-install the drain plug once the compartment is fully drained.

To close the under bed compartment, push it fully downward until the latch engages.

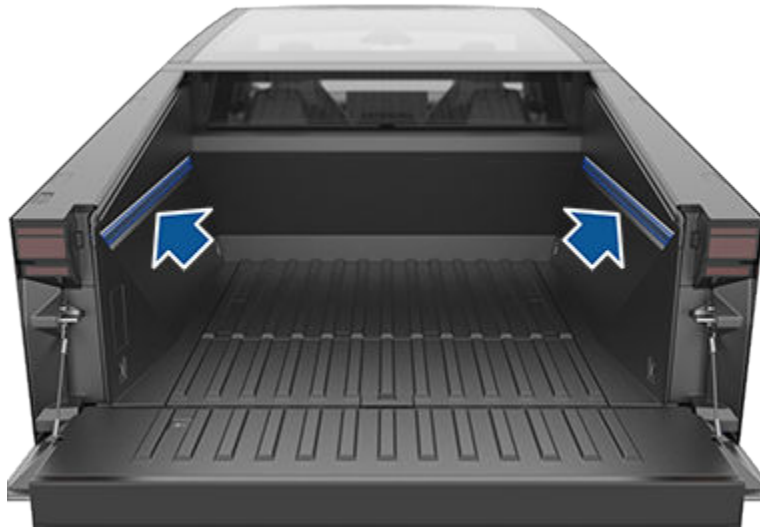
⚠ CAUTION: Take care when closing the lid to the under bed storage compartment. Slamming the lid shut may cause damage or injury.

⚠ CAUTION: Do not load more than 220 lb (100 kg) in the under bed compartment. Doing so can cause damage.

Securing Cargo

Model SModel X features multiple options that make it easy to secure cargo:

- Two integrated L-track rails, running lengthwise along the top of each side of the cargo bed are compatible with standard fittings (not included) and provide multiple anchoring options.



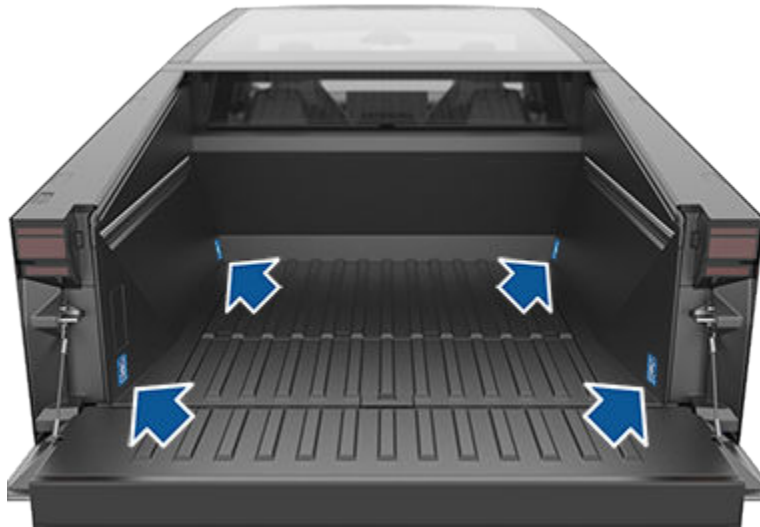
- Four tie-down anchors - one at each bottom corner of the cargo bed.



CAUTION: Do not use the tie-down anchors or L-tracks for towing. They are intended to secure cargo such as a spare tire. See [Towing a Trailer on page 784](#) for more information.



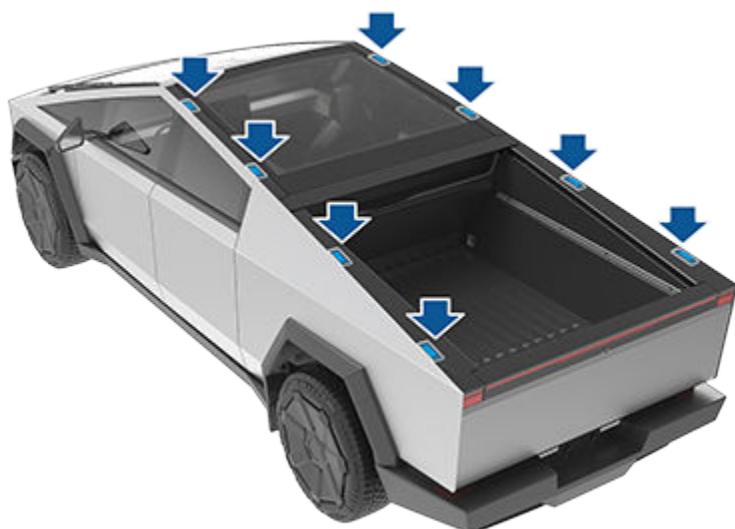
CAUTION: The maximum force between any two anchor points must not exceed 707 lb (320 kg). Doing so may cause damage.



- Eight attachment anchor points, four distributed on each side above the cab and on the rails of the cargo bed. These anchor points are designed to accommodate accessory racks. To access the anchor points, press down on the inboard side of the covers to pivot them to their open position. To close the covers, carefully pull the cover down towards the outboard side of the vehicle until they are flush with the vehicle trim.



Storage Areas



⚠ WARNING: Before driving while carrying objects in the cargo bed, always ensure the cargo is evenly distributed and adequately secured to prevent it from shifting or falling onto a roadway. Failure to do so can compromise vehicle stability, damage the cargo bed, and cause serious personal injury or death to passengers and other road users.

Mobile App

The Tesla mobile app allows you to communicate with Model S/Model X remotely using your iPhone® or Android™ phone.

NOTE: The information below may not represent an exhaustive list of the functions available on the Tesla mobile app. To ensure access to new and improved features, download updated versions of the mobile app as they become available.

To Use the Mobile App

To set up the Tesla mobile app to communicate with your Model S/Model X:

1. Download the Tesla mobile app to your phone.
2. Log in to the Tesla mobile app by entering your Tesla account credentials.
3. Enable mobile access to your Model S/Model X by touching **Controls** > **Safety** > **Mobile Access** (see [Controls on page 348](#)).

Your phone and vehicle must both be actively connected to cellular service to allow the mobile app to communicate with your vehicle. Tesla recommends that you always have a functional physical key readily available if parking in an area with limited or absent cellular service, such as an indoor parking garage.

NOTE: In the event that you require lockout assistance from Tesla due to a non-warranty issue, such as having limited cellular connectivity and having no secondary key available, your expenses are not covered under the Roadside Assistance policy.

NOTE: Tesla does not support the use of third party applications to contact Model S/Model X.

Overview

The Tesla mobile app's home screen allows you to:

- See the name of your vehicle (if you have one).
- View your vehicle's estimated range.
- See which drive mode the vehicle is in (Park, Reverse, Neutral, Drive).
- Lock or unlock your vehicle.
- Enable maximum defrost to warm your vehicle in cold conditions.
- Check your vehicle's charging information and open or close the charge port.
- Open the front trunk.
- View your vehicle's odometer, VIN, and current firmware version.

Media settings appear on the mobile app to pause, play, rewind, fast forward, and adjust the volume of the media currently playing in the vehicle.

For supported video sources, send videos to Tesla Theater by sharing the link through the mobile app. Navigate to the movie, show, or video you want to play on your phone and touch the share button. Share the video with the Tesla app and it appears on the touchscreen if Model S/Model X is in Park.

Profile

In the Profile tab located at the top corner of your phone's screen (shown as an avatar icon), you can:

- Switch to a different vehicle associated with your Tesla account, if you have access to more than one.
- Navigate the Tesla Shop.
- Access the Tesla inbox.
- Manage your account information and view your order history.
- View and customize notifications you receive under the Settings tab, such as Calendar sync, when your security alarm has been triggered, charging updates, and new software updates. You can start updates from afar and check its progress.

Phone Key

Set up your phone as the key (as described in [Phone Key on page 20](#)). Once authenticated, your phone's Bluetooth signal is detected as you approach your vehicle and the doors unlock when you press a door handle. Likewise, when you exit and walk away with the phone, doors automatically lock (provided the **Walk-Away Door Lock** feature is turned on, as described in [Walk-Away Door Lock on page 41](#)). You must be near your vehicle and have a key card ready to set up your phone as a phone key.

NOTE: Always carry a key card or key fob as a backup key, in case your phone loses power or you misplace your phone.

Controls

The Controls tab allows you to do the following:

- Open the front or rear trunk.
- Lock or unlock Model S/Model X from afar.
- Open or close the charge port.
- Flash the lights or honk the horn to find where Model S/Model X is parked.
- Enable Keyless Driving.

NOTE: Keyless Driving can be used when you do not have your key or to bypass PIN to Drive in cases where you forgot your PIN or your touchscreen is unresponsive (see [PIN to Drive on page 394](#)).

- Open and close your garage door if your vehicle has a programmed HomeLink connection, if available (see [HomeLink Universal Transceiver on page 400](#)).

Climate

You can check the interior temperature and heat or cool the cabin before driving (even if it's in a garage), control the seat heaters, and defrost the windshield:

- Enable or disable **Defrost Car** defrost which helps melt snow, ice, and frost on the windshield, windows, and mirrors.
- Customizing climate controls allows you to precondition the cabin to your desired temperature and turn on or off the steering wheel/steering yoke and seat heaters.
- Vent or close the sunroof. Vent the windows.

Using the mobile app to precondition Model S/Model X also warms the Battery as needed. The mobile app will notify you once your vehicle has reached the desired preconditioning temperature.

NOTE: In extremely cold weather or icy conditions, it is possible that your charge port latch may freeze in place. In cases where you cannot remove or insert the charge cable, or the vehicle is not Supercharging due to the latch being frozen in place, use your Tesla mobile app to precondition your vehicle on **HI** for approximately 30–45 minutes (you must use your mobile app to precondition the vehicle; setting your climate to **HI** using the touchscreen is not effective). This can help thaw ice on the charge port latch so the charge cable can be removed or inserted.

NOTE: In extremely cold weather or icy conditions, it is possible that your charge port latch may freeze in place. In cases where you cannot remove or insert the charge cable, or the vehicle is not Supercharging due to the latch being frozen in place, use your Tesla mobile app to enable **Defrost Car** for approximately 30–45 minutes. This can help thaw ice on the charge port latch so the charge cable can be removed or inserted.

Location

Locate Model S/Model X with directions, or track its movement across a map.

Summon

You can park or retrieve Model S/Model X using Summon (see [Summon on page 330](#)) or Smart Summon (see [Smart Summon on page 333](#)).



Security

The Security tab allows you to do the following:

- Pair your phone to the vehicle (see [Phone Key on page 20](#)).
- Enable or disable Sentry Mode (see [Using Sentry Mode on page 397](#)).
- Enable or disable Valet Mode (see [Valet Mode on page 183](#)).
- Enable or disable Speed Limit Mode and receive notifications when the vehicle's driving speed is within approximately 3 mph (5 km/h) of your selected maximum speed (see [Safety on page 356](#)).

Upgrades

View and purchase the latest upgrades available for your vehicle, such as full self-driving.

Service

See [Schedule Service on page 429](#) for information on how to schedule service through the mobile app.

Roadside

View roadside resources and request roadside assistance (where applicable). For more information on Roadside Assistance, see [Contacting Tesla Roadside Assistance on page 502](#).

Granting Access to a Second Driver

Add and remove access permission for an additional driver from the Tesla mobile app.

NOTE: Tesla mobile app version 4.3.1 or higher is required. Additional drivers can either use a previously registered Tesla Account or use the app to create a new Tesla Account.

To add an additional driver, in the Tesla mobile app from the vehicle home screen, go to **Security > Add Driver** and follow the onscreen instructions.

NOTE: The additional driver has access to all app features except purchasing upgrades.

To remove access, use the mobile app and go to **Security > Manage Drivers** and follow the onscreen instructions.



Connecting to Wi-Fi

Wi-Fi is available as a data connection method and is often faster than cellular data networks. Connecting to Wi-Fi is especially useful in areas with limited or no cellular connectivity. To ensure fast, reliable delivery of software and map updates, Tesla recommends leaving Model S/Model X connected to a Wi-Fi network whenever possible (for example, when parked overnight).

To connect to a Wi-Fi network:

1. Touch **Controls** > **Wi-Fi icon** at the top of the touchscreen **Controls** screen. Model S/Model X begins to scan and display detected Wi-Fi networks that are within range.
NOTE: If a known Wi-Fi network does not appear in the list, move Model S/Model X closer to the access point or consider using a range extender.
2. Select the Wi-Fi network you want to use, enter the password (if necessary), then touch **Confirm**.
3. Model S/Model X connects to the Wi-Fi network. Whenever the network is within range, Model S/Model X connects to it automatically.

You can also connect to a hidden network that isn't shown on the list of scanned networks. Just touch **Wi-Fi Settings**, enter the name of the network in the resulting dialog box, select the security setting, then touch **Add Network**.

NOTE: If more than one previously connected network is within range, Model S/Model X connects to the one most recently used.

NOTE: At Tesla Service Centers, Model S/Model X automatically connects to the Tesla Service Wi-Fi network.

Hotspots and Connectivity

You can also use a mobile hotspot or your phone's Internet connection via Wi-Fi tethering (subject to fees and restrictions of your mobile carrier) to access the internet. To remain connected to Wi-Fi when shifting into Drive or Reverse, choose the connection from the Wi-Fi settings screen, then touch **Remain connected in Drive**.

Bluetooth

Bluetooth® Compatibility



You can use various Bluetooth devices in Model S/Model X provided it is paired and within operating range. For example, you can pair your Bluetooth-capable phone so you can use it hands-free. In addition to phones, you can pair other Bluetooth-enabled devices with Model S/Model X. For example, you can pair an iPod Touch, iPad, Android tablet, etc. from which you can play music.

Before using your phone or other Bluetooth device with Model S/Model X, you must pair it. Pairing sets up Model S/Model X to communicate with supported Bluetooth-capable devices. You can pair up to ten Bluetooth phones. Unless you've specified a specific phone as a **Priority Device**, or if the phone specified as **Priority Device** is not within range, Model S/Model X always connects to the last phone that was used (provided it is within range). To connect to a different phone, see [Switching Between Paired Devices on page 732](#).

NOTE: Authenticating your phone to use as a key (see [Keys on page 20](#)) does not allow you to use the phone hands-free, play media from it, etc. You must also pair it as described below.

NOTE: On many phones, Bluetooth turns off if the phone's battery is low.

NOTE: Although Bluetooth typically supports wireless communication over distances of up to approximately 30 feet (nine meters), performance can vary based on the phone, or other device, you are using.

NOTE: Model S/Model X can pair up to twenty Bluetooth devices at a time but only allows two devices to connect simultaneously (such as one phone and one controller or two controllers) to each front and rear touchscreen (if equipped).



CAUTION: Do not leave your paired phone in your vehicle (for example, if you are hiking or at the beach). If you must leave your phone in the vehicle, disable Bluetooth and/or turn the phone off.

Pairing a Phone or Bluetooth Device

Pairing allows you to use your Bluetooth-capable phone hands-free to make and receive phone calls, access your contact list, recent calls, etc. It also allows you to play media files from your phone. Once a phone is paired, Model S/Model X can connect to it whenever the phone is within range.

1. To pair a phone or a Bluetooth device, sit inside Model S/Model X and ensure the touchscreen is on.
2. Unlock your phone and enable Bluetooth (typically in Settings on your phone).

NOTE: On some phones, this may require you to go to Bluetooth Settings for the remainder of the procedure.

3. On the touchscreen, touch **Controls** > **Bluetooth** to automatically start Bluetooth scanning for new devices.
4. Wait for your phone to be listed and touch **Connect**.
5. Check that the number displayed on your phone matches the number on the touchscreen. Then, on your phone, confirm that you want to pair.
6. If prompted on your phone, specify whether you want to allow Model S/Model X to access your personal information, such as calendar, contacts and media files (see [Importing Contacts and Recent Calls on page 732](#)). When paired, Model S/Model X lists your phone under **Controls** > **Bluetooth** > **Paired Devices**.

To change the settings of a paired device, go to **Controls** > **Bluetooth** > **Paired Devices** and expand the dropdown next to the device's name.

If you are experiencing issues importing or connecting to Bluetooth, see [Troubleshooting Bluetooth on page 732](#) for more information.

For vehicles manufactured prior to approximately April 2018: If Bluetooth takes an exceptionally long time to pair, reset Bluetooth functionality by touching **Controls** > **Service** > **Reset Bluetooth**. You may need to wait a few minutes. Once reset, try pairing to Model S/Model X again. After you reset Bluetooth, Model S/Model X may forget previously paired devices.



Importing Contacts and Recent Calls

Once a phone is paired, go to **Controls > Bluetooth > Paired Devices** and expand the dropdown next to the device's name to specify whether you want to allow access to your phone's contacts, recent calls and text messages. If you allow access, you can use the phone app to make calls and send messages to people in your list of contacts and on your recent calls list (see [Phone and Calendar on page 381](#)). Before contacts can be imported, you may need to either set your phone to allow syncing, or respond to a popup on your phone to confirm that you want to sync contacts. This varies depending on the type of phone you are using. For details, refer to the documentation provided with your phone.

If you are having trouble importing contacts or pairing with Bluetooth, see [Troubleshooting Bluetooth on page 732](#) for more information.

Disconnecting or Unpairing a Bluetooth Device

If you want to disconnect your phone or Bluetooth device, but keep it paired, touch **Disconnect** in your phone's Bluetooth settings dropdown on the touchscreen (**Controls > Bluetooth > Paired Devices > Your phone**). If you no longer want to use your device with Model SModel X, touch **Forget Device** and follow the instructions. Once you forget a device, you must pair it again if you want to use it with Model SModel X (see [Pairing a Phone or Bluetooth Device on page 731](#)).

NOTE: Your phone automatically disconnects when you leave Model SModel X.

NOTE: Unpairing the phone has no effect on using the phone as a key. To forget an authenticated phone, see [Managing Keys on page 29](#).

Switching Between Paired Devices

Model SModel X automatically connects to a phone that you designated as **Priority Device**. If you have not set a phone as a priority, Model SModel X connects to the last phone to which it was connected, provided it is within operating range and has Bluetooth turned on. If the last phone is not within range, it attempts to connect with the next phone that it has been paired with.

To connect to a different phone, touch **Controls > Bluetooth > Paired Devices**. Select the phone you want to connect to, then touch **Connect**. If the phone you want to connect to is not listed, you must pair the phone. See [Pairing a Phone or Bluetooth Device on page 731](#).

When connected, the Bluetooth settings screen displays the Bluetooth symbol next to the phone's name to show that Model SModel X is connected to the phone.

Troubleshooting Bluetooth

Your vehicle uses Bluetooth and BLE (Bluetooth Low Energy) to seamlessly connect your smartphone to Model SModel X. Due to several potential factors, Bluetooth or BLE may sometimes disconnect or experience issues in the pairing process. Connecting to Bluetooth allows your vehicle to use phone functions such as audio, phone calls, calendars, text messages, etc.

BLE is used for passive functions like phone key.

NOTE: Do not unpair your vehicle to your phone or remove it as phone key without a working key card nearby.

Try the following to troubleshoot Bluetooth, starting with your smartphone.

Smartphone Troubleshooting

Bluetooth may not connect due to settings and updates on your smartphone:

- Enable Bluetooth on your phone. If already enabled, disable and re-enable Bluetooth again.
- Ensure Airplane Mode is turned off.
- Charge your phone; if your phone battery is too low, it may not support Bluetooth functions.
- Pair your device properly. If already paired, try unpairing and re-pairing again.
- Update your phone to the latest software provided by the manufacturer.
- Check that your vehicle's sound system is selected as the audio output source.
- Ensure your phone's settings allow for Bluetooth (ex: data is turned on or you are connected to Wi-Fi).



- Turn your phone off and on again.
- Ensure location permissions set to "Always On" for the mobile app.

Tesla Mobile App Troubleshooting

Check the Tesla mobile app:

- Confirm the Tesla mobile app is up to date on software.
- Verify you're logged into the Tesla mobile app while using your phone key.
- Ensure the Tesla app is running in the background.
- Double check that you have completely set up your profile in the mobile app and properly configured your settings.

Vehicle Troubleshooting

Your vehicle's settings may affect its ability to pair with your smartphone:

- Charge Model S/Model X: If the vehicle Battery is too low, you may lose Bluetooth function.
- Update vehicle software and make sure it is always up to date. Check for new software updates by navigating to **Controls > Software**.
- Restart the touchscreen. See [Touchscreen Overview on page 15](#).
- Reboot your vehicle.

If Bluetooth still does not work, unpair from your vehicle AND smartphone. Then try re-pairing both again.

For BLE phone key issues, when in the vehicle, navigate to **Controls > Locks** and remove your phone as "Phone as Key". Then set it back up again. But only do this while you are in the vehicle and have a reliable back up key available (such as a key card).

Phone and Calendar

Bluetooth® Compatibility



You can use your Bluetooth-capable phone hands-free in Model SModel X provided your phone is within operating range. Although Bluetooth typically supports wireless communication over distances of up to approximately 30 feet (nine meters), performance can vary based on the phone you are using.

Before using your phone with Model SModel X, you must pair it. Pairing sets up Model SModel X to work with your Bluetooth-capable phone (see [Pairing a Bluetooth Phone on page 381](#)).

NOTE: Authenticating your phone to use as a key (see [Keys on page 20](#)) does not also allow you to use the phone hands-free, play media from it, etc. You must also pair it as described below.

You can pair up to ten Bluetooth phones. Unless you've specified a specific phone as a **Priority Device** or if the phone specified as **Priority Device** is not within range, Model SModel X always connects to the last phone that was used (provided it is within range). To connect to a different phone, see [Bluetooth® Compatibility on page 381](#).

NOTE: On many phones, Bluetooth turns off if the phone's battery is low.

NOTE: In addition to phones, you can pair other Bluetooth-enabled devices with Model SModel X. For example, you can pair an iPod Touch, an iPad, an Android tablet, etc. from which you can play music.

Pairing a Bluetooth Phone

Pairing allows you to use your Bluetooth-capable phone hands-free to make and receive phone calls, access your contact list, recent calls, etc. It also allows you to play media files from your phone. Once a phone is paired, Model SModel X can connect to it whenever the phone is within range.

To pair a phone, follow these steps while sitting inside Model SModel X:

1. Ensure both the touchscreen and the phone are powered on.
2. On your phone, enable Bluetooth and ensure it is discoverable.

NOTE: On some phones, this may require you to go to Bluetooth Settings for the remainder of the procedure.

3. Touch the Bluetooth icon located at the top of the **Controls** screen at the top of the touchscreen.
4. On the touchscreen, touch **Add New Device** > **Start Search**. A list of all available Bluetooth devices within operating distance displays on the Bluetooth settings screen.
5. Choose the phone with which you want to pair. Within a few seconds, the Bluetooth settings screen displays a randomly generated number. Your phone also displays a number.
6. Check that the number displayed on your phone matches the number on the Bluetooth settings screen. Then, on your phone, confirm that you want to pair.
7. If prompted on your phone, specify whether you want to allow Model SModel X to access your personal information, such as calendar, contacts and media files.

When paired, Model SModel X automatically connects to the phone, and the Bluetooth settings screen displays the Bluetooth symbol next to the phone's name to indicate that the connection is active.

You can display the Bluetooth settings screen at any time and change the settings associated with a connected device. For example, you can designate a connected phone as the **Priority Device**. This is useful in situations where you have connected more than one phone, and both phones are frequently used in Model SModel X at the same time. Model SModel X automatically attempts to connect to the priority device before others. If a priority device is not specified, or is not within range, Model SModel X connects to the most recently used phone (if applicable).

For vehicles manufactured prior to approximately April 2018: If Bluetooth takes an exceptionally long time to pair, reset Bluetooth functionality by touching **Controls** > **Service** > **Reset Bluetooth**. You may need to wait a few minutes. Once reset, try pairing to Model SModel X again. After you reset Bluetooth functionality, the vehicle may forget any previously paired devices.

Importing Contacts and Recent Calls

Once paired, use the Bluetooth settings screen to specify whether you want to allow access to your phone's calendar, contacts and recent calls. If you allow access, you can use the phone app to make calls and send messages to people in your list of contacts and on your recent calls list (see [Bluetooth® Compatibility on page 381](#)). Before contacts can be imported, you may need to either set your phone to allow syncing, or respond to a popup on your phone to confirm that you want to sync contacts. This varies depending on the type of phone you are using. For details, refer to the documentation provided with your phone.

NOTE: You can turn access to your contacts and recent calls on or off at any time by displaying the Bluetooth settings screen, choosing the phone, and then changing the associated access settings.

Unpairing a Bluetooth Phone

If you want to disconnect your phone and use it again later, simply touch **Disconnect** on the Bluetooth settings screen. If you no longer want to use your phone with Model SModel X, touch **Forget This Device**. Once you forget a device, you must pair it again if you want to use it with Model SModel X (see [Pairing a Bluetooth Phone on page 381](#)).

NOTE: Your phone automatically disconnects when you leave Model SModel X.

NOTE: Unpairing the phone has no effect on using the phone as a key. To forget an authenticated phone, see [Keys on page 20](#) [Keys and Doors on page 43](#).

Connecting to a Paired Phone

Model SModel X automatically connects to a phone that you designated as **Priority Device** on the Bluetooth settings screen. If you have not set a phone as a priority, Model SModel X connects to the last phone to which it was connected, provided it is within operating range and has Bluetooth turned on. If the last phone is not within range, it attempts to connect with the next phone that it has been paired with.

To connect to a different phone, touch the Bluetooth icon at the top of the touchscreen **Controls** screen. The Bluetooth settings screen displays a list of paired phones. Choose the phone you want to connect to, then touch **Connect**. If the phone you want to connect to is not listed, you must pair the phone. See [Pairing a Bluetooth Phone on page 381](#).

When connected, the Bluetooth settings screen displays the Bluetooth symbol next to the phone's name to show that Model SModel X is connected to the phone.

Using the Phone App



When your phone is connected to Model SModel X using Bluetooth, and you have allowed access to information on your phone (see [Importing Contacts and Recent Calls on page 382](#)), you can use the phone app to display and make a hands-free call to anyone listed on your phone.

- **Calls**- Displays recent calls in chronological order with the most recent call listed first.
- **Messages**- Displays message in chronological order with the most recent message listed first. You can view, send, and receive text messages. Instead of typing a text message, touch the microphone button on the right side of the steering wheel/steering yoke to enter text using your voice.
-  **WARNING:** To minimize distraction and ensure the safety of vehicle occupants as well as other road users, do not view or send text messages when the vehicle is in motion. Pay attention to road and traffic conditions at all times when driving.
- **Contacts**- Contacts are listed in alphabetical order and can be sorted by first name or last name. You can also choose a letter on the right side of the list to quickly scroll to the names that begin with the selected character. When you touch a name on your contacts list, the contact's available number(s) displays on the right pane, along with other available information (such as address). Touch the contact's number to make a call.
- **Favorites**- Displays the contacts from your phone that you have identified as Favorites.
- **Calendar**- Displays calendar entries from your phone (see [Calendar on page 383](#)). If an entry includes a phone number or an address, you can make a phone call, or navigate to a destination, by touching the corresponding information in the calendar entry.

Making a Phone Call

You can make a phone call by:

- Speaking a voice command (see [Voice Commands on page 391](#)). Voice commands are a convenient, hands-free way to call or text your contacts.
- Selecting a contact or recent call from the menu on your right scroll button (see [Using Right Steering Wheel Buttons on page 189](#)).
- Touching a phone number shown in a list in the phone app – Contacts, Calls, or Calendar.
- Using the Model S Model X on-screen dialer in the Phone app's Calls list.

NOTE: If it is safe and legal to do so, you can also initiate a call by dialing the number or selecting the contact directly from your phone.

NOTE: You can also make a phone call by touching a pin on the map and choosing the phone number (if available) on the popup screen.

Receiving a Phone Call

When your phone receives an incoming call, the instrument panel and touchscreen display touchscreen displays the caller's number or name (if the caller is in your phone's contact list and Model S Model X has access to your contacts).

Touch one of the options on the touchscreen to **Answer** or **Ignore** the call. Depending on the phone you are using and what speakers you used for your most recent call, your phone may prompt you to choose which speakers you want to use for the incoming call.

 **WARNING:** Stay focused on the road at all times while driving. Using or programming a phone while driving, even with Bluetooth enabled, can result in serious injury or death.

 **WARNING:** Follow all applicable laws regarding the use of phones while driving, including, but not limited to, laws that prohibit texting and require hands-free operation at all times.

In Call Options

When a call is in progress, you can display the call menu on the instrument panel by pressing the top button on the right side of the steering wheel. Then roll the right scroll button and choose an option (see [Using Right Steering Wheel Buttons on page 189](#)). To adjust the call volume, roll the steering wheel's left scroll button during a call.

In Call Options

When a call is in progress, the call menu displays on the touchscreen. Then roll the right scroll button to choose an option. To adjust the call volume, roll the steering wheelsteering yoke's left scroll button during a call.

Calendar



The calendar displays scheduled events from your phone's (iPhone® or Android™) calendar for the current and next day. The calendar is conveniently integrated with the phone app so you can navigate to, or dial into, your next meeting.

Using the calendar requires that:

- The Tesla mobile app is running, you are logged in, and the mobile app's **Calendar Sync** setting is turned on. The mobile app can then periodically (and automatically) send calendar data from your phone to Model S Model X.

NOTE: To ensure you have access to all of the calendar's features, it is recommended that you use the most recent version of the mobile app.

- Your phone is connected to Model S Model X via Bluetooth (for privacy reasons, Model S Model X displays calendar data only from a connected phone). In situations when your vehicle is not connected to a phone, touch **Connect Phone** on the calendar list.



- Mobile access is turned on (**Controls > Safety > Allow Mobile Access**).
- Both your phone and your vehicle have good connectivity.

If a calendar event includes an address, a navigation arrow displays to indicate that you can touch the address to navigate to the event's location. When an event on your calendar takes place within the next hour and has a uniquely specified address, the touchscreen notifies you if there is a better route due to traffic, even when you're not actively using navigation.

If an event has a uniquely specified address and takes place within two hours of you entering your vehicle and preparing to drive, Model S/Model X automatically routes you to the event's address (see [Automatic Navigation on page 371](#)).

Touch an event's information icon to display all notes associated with the event. If the notes include one or more phone numbers, the information icon shows a phone icon and the calendar displays the first phone number found. Touch to initiate a phone call. You can also initiate a phone call by touching any number in an event's notes popup screen (this is especially useful for conference calls). If notes include a web link, you can touch the link to open it in the Web browser.

HomeLink Universal Transceiver

About HomeLink



If your vehicle is equipped with the HomeLink® Universal Transceiver, you can operate up to three Radio Frequency (RF) devices, including garage doors, gates, lights, and security systems.

NOTE: Depending on date of manufacture, market region, and options selected at time of purchase, some vehicles are not equipped with a HomeLink Universal Transceiver.

 **WARNING:** Do not use the HomeLink Universal Transceiver with a device that does not have safety stop and reverse features. Using a device without these safety features increases the risk of injury or death.

Supported Modes

HomeLink supports three different transmit modes, which is how your vehicle and the RF device communicate. Selecting a transmit mode is determined by your RF device's compatibility:

- **Standard Mode:** Use Standard Mode if your RF device is equipped with a remote control that must be used to operate the device (for example, a remote-controlled garage door). This mode is the most commonly used transmit mode for HomeLink devices.
- **D-Mode or UR-Mode:** Use D-Mode or UR-Mode if the RF device does not have a remote control, and the receiver has a "Learn" button (may also be called "Program" or "Smart"). D-Mode and UR-Mode function similarly in that Model S/Model X communicates directly with the device's receiver as opposed to the remote control.

NOTE: D-Mode is used primarily in North America whereas UR-Mode is popular in Europe, the Middle East, and Asia. To determine the mode your device is compatible with, contact HomeLink (www.homelink.com or call 1-800-355-3515).

Each of your devices can be set to a different mode. For example, your garage door can be set to Standard Mode, your front gate can be set to D-Mode, etc. To change a transmit mode, touch the HomeLink icon at the top of the touchscreen **Controls** screen and select the device you want to change. Then, select **Program** and choose the desired mode for your device. Confirm by touching **Set Mode** and follow the onscreen instructions.

For older vehicles, changing the mode for one device changes the mode for all devices, so be careful when changing transmit modes. Devices not compatible with your selected mode may not work. Touch the HomeLink icon at the top of the touchscreen, then touch **Change Transmit Mode**.

NOTE: Check the product information for your HomeLink device to determine which mode is compatible with your device.

Programming HomeLink

To program HomeLink®:

1. Park Model S/Model X so that the front bumper is in front of the device you want to program.



CAUTION: Your device might open or close during programming. Therefore, before programming, make sure that the device is clear of any people or objects.

2. Check that the device's remote control has a healthy battery. Tesla recommends replacing the battery in the device's remote control before Programming HomeLink.
3. Touch the HomeLink icon at the top of the touchscreen **Controls** screen.
4. Touch **Create HomeLink**.
5. Select the mode you wish to use: Standard, D-Mode, or UR-Mode (see [Supported Modes on page 400](#)).
6. On the touchscreen, enter a name for your device, then and touch **Enter** or **Create HomeLink**.
7. Touch **Start** and follow the onscreen instructions.

NOTE: If you see a screen called "Train the receiver" while programming the device, remember that this is a time-sensitive step. After pressing the Learn/Program/Smart button on the device's remote control, you have only approximately 30 seconds to return to your vehicle and press **Continue**, and then press the trained HomeLink device name twice. Consider having an assistant to ensure you can complete this step within 30 seconds.

8. Once your device is programmed, touch **Save** to complete the programming.
9. Ensure HomeLink works as expected. In some cases, you may need to repeat the programming process multiple times before succeeding.

Once programmed, you can operate the device by touching its corresponding HomeLink icon on the touchscreen. HomeLink remembers the location of your programmed devices. When you approach a known location, the HomeLink control on the touchscreen automatically appears. When you drive away, it disappears.

NOTE: For additional assistance or compatibility questions, contact HomeLink (www.homelink.com or call 1-800-355-3515).

Auto Opening and Closing

To operate a HomeLink device without using the touchscreen, you can automate the device to open as you approach, and close as you drive away:

1. Touch the HomeLink icon at the top of the touchscreen **Controls** screen, then choose the device you want to automate.
2. Select the **Auto-open when arriving** checkbox if you want the device to open as you approach.
3. Touch the arrows to specify the distance you want Model S/Model X to be from the device before it opens.
4. Select the **Auto-close when leaving** checkbox if you want the device to close as you drive away.

As you approach (or drive away from) a device that is set to operate automatically, the HomeLink status icon displays a count-down message to let you know when the device automatically opens or closes. In situations where you don't want the device to automatically open or close, touch **Skip Auto-Open** or **Skip Auto-Close** at any time during the count-down message.

NOTE: Do not rely on HomeLink to ensure the device fully closes.

Resetting the Location of the HomeLink Device

If you experience situations in which you sometimes drive up to your HomeLink device and it doesn't open, or the touchscreen does not display a notification as you approach a programmed device, you may need to reset the device's location. To do so, park as close as possible to the HomeLink device (garage door, gate, etc.) and display the HomeLink settings page by touching the HomeLink icon at the top of the touchscreen **Controls** screen. Touch the name of the device you want to reset, then touch **Reset Location**.

Deleting a Device

To delete a HomeLink device, touch the HomeLink icon at the top of the touchscreen **Controls** screen. Touch the name of the device you want to delete, then touch **Delete**.

NOTE: You can also perform a factory reset to erase your HomeLink settings, along with all other personal data (saved addresses, music favorites, imported contacts, etc.). See [Erasing Personal Data on page 359](#) or [Service on page 357](#).

NOTE: For security reasons, delete your HomeLink devices if you sell your Model S/Model X.

Troubleshooting HomeLink

Standard Mode

In Standard Mode, Model S/Model X records the RF signal from your HomeLink device's remote control. The touchscreen instructs you to stand in front of the vehicle, point the device's remote control at the front bumper, and press and hold the button until the headlights flash. When the headlights flash, Model S/Model X has learned the remote control and you can touch **Continue** on the touchscreen. If the headlights do not flash:

- Check the batteries in the remote control. It is a good idea to replace the batteries before you start programming.
- Ensure you are standing in front of Model S/Model X with the device's remote control positioned within two inches (five cm) of the Tesla emblem.



- Press and hold the button on your device's remote control until the headlights flash. In some cases you must hold the button on the remote control for up to three minutes.

NOTE: Some HomeLink remote controls require multiple short presses (approximately one second each press) instead of one long duration press. If you are unsuccessful after multiple attempts of using long presses, try repeated presses of one second each.

D-Mode and UR-Mode

In D Mode and UR-Mode, the device's receiver learns Model SModel X. The touchscreen instructs you to press the "Learn" button (may also be called "Program" or "Smart") on the device's receiver. If this does not work, refer to the following guidelines:

- Park Model SModel X with its bumper as close as possible to the garage door, gate, etc. that you are trying to program.
- Make sure you are pressing the receiver's Learn/Program/Smart button. For instructions on how to put the receiver into learning mode, refer to the product details provided with your RF device that you are trying to program.
- If you see a screen called "Train the receiver" while programming the device, remember that this is a time-sensitive step. After pressing the Learn/Program/Smart button on the device's remote control or receiver, you only have approximately 30 seconds to return to your vehicle, press **Continue**, then press the trained HomeLink device name twice. Consider having someone assist you with this step.
- Most devices stay in learning mode for only three to five minutes. Immediately after pressing the device's Learn/Program/Smart button, follow the instructions displayed on the vehicle's touchscreen.

For additional assistance or compatibility questions, contact HomeLink (www.homelink.com or call 1-800-355-3515).

Starting and Powering Off

Starting

When you open a door to enter Model SModel X, the touchscreen powers on and you can operate all controls. To shift Model SModel X, press the brake pedal and swipe up for Drive or down for Reverse on the touchscreen's drive mode strip (see [Shifting on page 200](#)).

If **Auto Shift out of Park** is enabled, Model SModel X automatically selects Drive or Reverse based on the detected surroundings. Pressing the brake pedal shifts the vehicle into the selected drive mode displayed on the instrument panel (provided the driver's door is closed and the driver's seat belt is buckled), and pressing the accelerator moves the vehicle in that direction.

NOTE: To turn **Auto Shift out of Park** on or off, touch **Controls > Pedals & Steering > Auto Shift out of Park**.

Before accelerating when **Auto Shift out of Park** is enabled, check the instrument panel to make sure that Model SModel X has shifted into the drive mode you want (Drive or Reverse). If the selection is not correct, or if **Auto Shift out of Park** is not enabled, swipe up for Drive or down for Reverse on the touchscreen's drive mode strip to choose a new drive mode. See [Shifting on page 200](#).

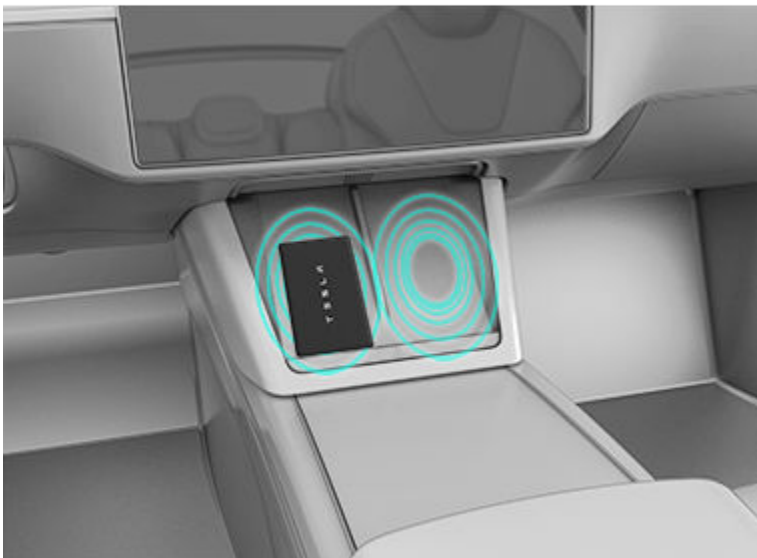
NOTE: If **PIN to Drive** is enabled (see [PIN to Drive on page 394](#)), you must enter a valid PIN on the touchscreen before you can drive Model SModel X.

Everything you need to know when driving Model SModel X displays on the instrument panel.

Drive Disabled - Requires Authentication

If Model SModel X does not detect a key when you press the brake (a phone key is not detected or two minutes have passed since you used the key card), the touchscreen displays a message telling you that driving requires authentication.

If you see this message, place the key card in either phone dock where the RFID transmitter can read it. The two-minute authentication period restarts and you can start Model SModel X by pressing the brake pedal.



A number of factors can affect whether Model SModel X can detect a phone key (for example, the device's battery is low or dead and is no longer able to communicate using Bluetooth).

Always keep your phone key or a key card with you. After driving, your key is needed to restart Model SModel X. And when you leave the vehicle, you must bring your key with you to lock Model SModel X, either manually or automatically.

Powering Off

When you finish driving and shift into Park, simply exit the vehicle. When you leave Model S/Model X with your phone key and key fob, it powers off automatically, turning off the instrument panel and touchscreen.

Model S/Model X also powers off automatically after being in Park for 30 minutes, even if you are sitting in the driver's seat.

Although usually not needed, you can power off Model S/Model X while sitting in the driver's seat, provided the vehicle is not moving. Touch **Controls > Safety > Power Off**. Model S/Model X automatically powers back on after a short period if you press the brake pedal or touch the touchscreen.

NOTE: Model S/Model X automatically shifts into Park whenever it determines that you are exiting the vehicle (for example, the driver's seat belt is unbuckled and the vehicle is almost at a standstill). If you shift into Neutral, your vehicle shifts into Park when you open the door to exit. To keep your vehicle in Neutral, see [Instructions for Transporters on page 517](#).

Power Cycling the Vehicle

You can power cycle Model S/Model X if it demonstrates unusual behavior or displays a nondescript alert.

NOTE: If the touchscreen is unresponsive or demonstrates unusual behavior, reboot it before you power cycle the vehicle (see [#unique_1260 on page](#)).

1. Shift into Park.
2. On the touchscreen, touch **Controls > Safety > Power Off**.
3. Wait for at least two minutes without interacting with the vehicle. Do not open the doors, touch the brake pedal, touch the touchscreen, etc.
4. After two minutes, press the brake pedal or open the door to wake the vehicle.



Shifting

Auto Shift out of Park

NOTE: **Auto Shift out of Park** is a BETA feature and is disabled by default.

When **Auto Shift out of Park** is enabled, Model SModel X is designed to use inputs from various sensors to automatically select Drive or Reverse. The instrument panel displays the selected drive mode when the driver's door is closed and seat belt is buckled.

To override the selection, press the brake pedal and use the drive mode strip on touchscreen to shift into your desired drive mode (Drive, Reverse, Park; see [Shifting Using the Touchscreen on page 200](#)).

Confirm the drive mode selection and follow the instructions on the instrument panel before you press the accelerator.



WARNING: As always, be aware of your vehicle and surroundings before driving. Never rely on Model SModel X to automatically select a suitable drive mode without confirming the selection before you start to drive.

If **Auto Shift out of Park** is unavailable, the instrument panel displays a message.

Model SModel X automatically selects a drive mode when:

- **Auto Shift out of Park** is enabled (touch **Controls** > **Pedals & Steering** > **Auto Shift out of Park**).
- Model SModel X is in Park.
- The driver's seat belt is fastened.
- The brake pedal is pressed.
- All doors and trunks are closed.
- The drive mode selector on the center console is not activated (see [Shift Using the Center Console on page 201](#)).

NOTE: Model SModel X does not automatically select drive modes in Valet Mode.

Auto Shift out of Park is disabled by default. When disabled, use the touchscreen or the center console to manually shift. To enable **Auto Shift out of Park**, touch **Controls** > **Pedals & Steering** > **Auto Shift out of Park**.

Shifting Using the Touchscreen

When you press the brake pedal when parked, the drive mode strip displays on one side of the touchscreen. Use the drive mode strip to shift Model SModel X: swipe up for Drive, swipe down for Reverse or touch the P for Park. The drive mode strip is always available on the touchscreen when you touch **Controls**.



NOTE: To shift from Drive into Reverse or vice versa, the driving speed must be less than 5 mph (8 km/h).

NOTE: The touchscreen's drive mode strip displays the **Park** button only when the brake pedal is pressed and shifting into Park is allowed based on the vehicle's driving speed (less than 5 mph (8 km/h)).

To shift into Neutral, open **Controls** to bring up the drive mode strip, then press and hold **Neutral** until Neutral engages.

NOTE: The touchscreen is the preferred method to manually shift. However, in the unlikely situation in which the touchscreen is unavailable and therefore can't be used, the drive mode selector on the center console automatically activates and must be used to shift (see [Shift Using the Center Console on page 201](#)).

If you try to shift when it is prohibited by the current driving speed, the instrument panel displays an alert, a chime sounds, and the drive mode does not change.

Shift Using the Center Console

In addition to manually shifting on the touchscreen, you can shift by pressing P, R, N or D located on the center console. In most situations, these buttons are not available until you press one of the buttons to activate it. When active, the LEDs associated with each button illuminate and when you select P, R, N or D, the associated LED illuminates amber.

In situations where the touchscreen is unavailable (for example, experiencing a technical issue), or Model S Model X is in Valet or Transport Mode, the drive mode selector on the center console activates automatically and there is no need to touch it.

NOTE: You can also activate the drive mode selector on the center console by simultaneously and *briefly* pressing both scroll buttons on the steering yoke. However, if you press and *hold* both buttons simultaneously, the drive mode selector activates and the touchscreen restarts (see [Restarting the Touchscreen on page 197](#)).

NOTE: The front trunk, rear trunk, and doors must be closed to shift using the center console.



1. Park
2. Reverse
3. Neutral
4. Drive

NOTE: When the touchscreen is available for shifting and you have manually activated the drive mode selector on the center console, the center console automatically deactivates if you don't shift within 10 seconds.

Park

Model S Model X automatically shifts into Park whenever it determines that you are exiting the vehicle. For example, the driver's seat belt is unbuckled and the vehicle is stopped. Model S Model X also automatically shifts into Park when the driver's door is opened or if no action is taken within one minute of shifting.

To manually shift into Park, press the brake pedal and touch the **Park** button on the touchscreen's drive mode strip. If the touchscreen is unavailable, press Park on the drive mode selector located on the center console.

NOTE: The touchscreen's drive mode strip displays the **Park** button only when the brake pedal is pressed and shifting into park is allowed based on the driving speed.

NOTE: You must always press the brake pedal to shift *out of* Park.



CAUTION: Model S Model X will not shift out of Park if a charge cable is plugged in, or if the charge port is unable to determine whether a charging cable is plugged in. In situations when Model S Model X does not shift out of Park, check the instrument panel or touchscreen for instructions on how to proceed.



WARNING: It is the driver's responsibility to always ensure the vehicle is in Park before exiting. Never rely on Model S Model X to automatically shift into Park for you; it may not work in all circumstances.

Drive

To manually shift into Drive, swipe up on the drive mode strip located on the touchscreen or, if the touchscreen is unavailable, press D on the drive mode selector located on the center console. You can shift into Drive when Model S Model X is stopped or moving less than 5 mph (8 km/h) in Reverse.

Reverse

To manually shift into Reverse, swipe down on the drive mode strip located on the touchscreen or, if the touchscreen is unavailable, press R on the drive mode selector located on the center console. You can shift into Reverse when Model S Model X is stopped or moving less than 5 mph (8 km/h) in Drive. You can manually close the park assist view on the touchscreen by touching the **X** in the upper corner.

Neutral

Neutral allows Model S/Model X to roll freely when you are not pressing the brake pedal. To shift into Neutral, do any of the following:

- Open **Controls**, then press and hold the **Neutral** icon on the drive mode strip until Model S/Model X engages Neutral.
- Choose **Neutral** from the drive mode selector on the center console.

NOTE: When Model S/Model X is traveling over 5 mph (8 km/h) and you swipe up or down on the touchscreen's drive mode strip, a **Neutral** icon displays at the bottom of the drive mode strip from which you can also choose to engage Neutral.

NOTE: You must press the brake pedal to shift out of Neutral if Model S/Model X is moving slower than approximately 5 mph (8 km/h).

Model S/Model X automatically shifts into Park when you open the driver's door to exit the vehicle. To stay in Neutral even when you leave Model S/Model X, you must engage Transport Mode (described next).

Keeping Your Vehicle in Neutral (Transport Mode)

Model S/Model X automatically shifts into Park whenever you finish driving and leave Model S/Model X. To keep Model S/Model X in Neutral when you exit, allowing it to roll freely (for example, pulling onto a flatbed truck), you must activate Transport mode:

1. Shift into Park.
2. Press the brake pedal.
3. Touch **Controls** > **Service** > **Towing**. The touchscreen displays a message reminding you how to properly transport Model S/Model X.
4. Press and hold the **Transport Mode** button until it turns blue. Model S/Model X is now free-rolling and can slowly be rolled (no faster than walking speed) for short distances or winched (for example, onto a flatbed truck).

For more information on Transport Mode, see [Activate Transport Mode on page 519](#).

NOTE: In Transport mode, Model S/Model X does not shift into a drive mode. You must first cancel Transport mode by touching **Transport Mode** again. Transport mode also cancels if you use the touchscreen or drive mode selector on the center console to shift into Park or if you manually apply the parking brake by touching **Controls** > **Safety** > **Parking Brake**.

Steering WheelSteering Yoke

Adjusting the Steering WheelSteering Yoke Position

To adjust the steering wheelsteering yoke, touch **Controls** and touch the **Steering** icon.



Use the left scroll button on the steering wheelsteering yoke to move the steering wheelsteering yoke to the desired position:

- To adjust the height/tilt angle of the steering wheelsteering yoke, roll the left scroll button up or down.
- To move the steering wheelsteering yoke closer to you, or further away from you, press the left scroll button to the left or right.

You can also customize what you want the left scroll wheel button to control, such as Climate or Dashcam status.

 **WARNING:** Do not make steering wheelsteering yoke adjustments while driving.

Overview of Buttons

Model SModel X features stalkless driving in which all controls you need when driving are accessible on the steering wheelsteering yoke.



Left buttons:

1. Right turn signal (see [Turn Signals on page 758](#))
2. High beam headlights* (see [Headlights on page 756](#))
3. Multi-functional button (non-functional)
4. Left scroll button (see [Left Scroll Button on page 749](#))
5. Left turn signal (see [Turn Signals on page 758](#))

**Right Buttons:**

1. Cameras (see [Cameras on page 669](#))
2. Wiper* (see [Windshield Wiper and Washers on page 760](#))
3. Right scroll button (see [Right Scroll Button on page 751](#))
4. Voice commands (see [Voice Commands on page 391](#))
5. Cruise control indicator (non-functional)

*The behaviors associated with the buttons for headlight high beams ([Headlights on page 756](#)) and wiper ([Windshield Wiper and Washers on page 760](#)) vary depending on whether you press or press and hold the button.

NOTE: If you are experiencing issues with the touchscreen (such as a missing feed from the front- or rear-facing camera), hold down both the left and right scroll buttons simultaneously while Model S/Model X is parked to restart it (see [Restarting the Touchscreen on page 650](#)).

NOTE: Some controls on the steering wheel are capacitive buttons, meaning they do not have a physical switch, but respond to touch and provide haptic feedback (as a vibration). Do not rest your fingers on them unless intended. Unintentionally touching these buttons can enable or disable them. If a button is mistakenly enabled, remove your fingers from the switches for several seconds to resume normal operation.

Left Scroll Button

Use the left scroll button to adjust the position of the mirrors and steering wheelsteering yoke. The left scroll button also controls the wiper and media player.



- When using media player, push the button to the left to go back to the previous song or station or push it to the right to skip to the next song or station.
- Roll the scroll button up to increase and down to decrease the volume.
NOTE: The scroll button adjusts the volume for media and phone calls based on what is currently in use. As you adjust the volume, the touchscreen displays the volume level and whether you are adjusting volume for media or phone.
- To mute the media volume, or to pause/play an audio file, push the scroll button.
- When adjusting mirrors, push the button to the left/right to move the associated mirror inward/outward and up/down to position the mirror upward or downward (see [Mirrors on page 753](#)).
- When adjusting the position of the steering wheelsteering yoke, roll the button up/down to adjust the tilt/angle and press the button to the left or right to move the steering wheelsteering yoke closer or further (see [Adjusting the Steering WheelSteering Yoke Position on page 747](#)).
- When a menu displays on the touchscreen from which you can choose options (for example, the wiper controls), use the scroll button to choose an option (up, down, left, or right) and push the button to confirm your choice.
- For incoming calls, press the scroll button to answer. During the call, press the scroll button again to hang up.
- Hold down the left scroll button to access the default action set or configure a new default action. Follow the directions on the touchscreen.

Left Scroll Button Customization

Choose from a list to create quick access to a function by touching **Controls > Display > Scroll Wheel Function**. Selecting a function sets the default action when you long press the left scroll button, unless you select **Ask each time**.



Right Scroll Button

Use the right scroll button to control Autopilot features such as Autosteer and Traffic-Aware Cruise Control:



- When driving, push and release the button to engage Autosteer or Traffic-Aware Cruise Control (see [Autopilot Features on page 801](#)). If **Autopilot Activation** is set to **Double Click** (touch **Controls** > **Autopilot Activation** > **Autosteer Activation**), a single push engages Traffic-Aware Cruise Control only and you must push and release the button twice to engage Autosteer. Once Autosteer or Traffic-Aware Cruise Control is active, pushing the button cancels it.
- When Traffic-Aware Cruise Control or Autosteer is engaged, roll the scroll button up to increase or down to decrease the set speed, or push the button to the left or right to adjust the distance you want to maintain from a vehicle traveling ahead of you (see [While Using Autopilot on page 809](#)).

Heated Steering WheelSteering Yoke

To warm up the steering wheelsteering yoke, touch the temperature icon on the touchscreen to display climate controls (see [Operating Climate Controls on page 844](#)), then touch the steering wheelsteering yoke icon. When turned on, radiant heat keeps the steering wheelsteering yoke at a comfortable temperature.

To turn the heated steering wheelsteering yoke off, use the climate controls or the Tesla mobile app (see [Mobile App on page 406](#)).

Horn

To sound the horn, press and hold the center pad on the steering wheelsteering yoke.



Steer-by-Wire

Model S Model X uses steer-by-wire technology, which means that there is no mechanical connection between the steering wheel and the wheels. Instead, sensors in the steering column communicate electronically with the steering racks. As a result, steering Model S Model X feels more responsive and requires less effort from the driver.

Model S Model X also has four-wheel steering. When the driver turns the steering wheel, all four wheels respond. This gives Model S Model X a tighter turning radius.

Emergency Operation

The steer-by-wire system is controlled by multiple redundant sensors and actuators. In the unlikely case that Model S Model X detects an issue, an alert displays on the touchscreen, a chime sounds, and Model S Model X gradually reduces drive torque while informing you to pull over.

NOTE: This alert does not mean that Model S Model X has lost steering, or that the steer-by-wire system has failed. This alert indicates a possible issue with one of the redundant systems.

Once pulled over, you can attempt to recover the system by performing a vehicle power cycle (see [Power Cycling the Vehicle on page 742](#)). If the power cycle attempt is unsuccessful, an override is available for low-speed maneuvering to position the vehicle for transporting on a flatbed truck (see [Instructions for Transporters on page 938](#)).



Mirrors

Adjusting Exterior Mirrors



Adjust the exterior mirrors by touching **Controls > Mirrors**. Press the left scroll button on the steering wheelsteering yoke to choose whether you are adjusting the **Left** or **Right** mirror. Then, use the left scroll button as follows to adjust the selected mirror to its desired position:

- To angle the mirror up or down, roll the left scroll button up or down.
- To angle the mirror inward or outward, press the left scroll button to the left or right.



You can save your side mirror position in your driver profile for your convenience.

Mirror Auto Tilt automatically tilts mirrors downward when backing up. To turn this feature on or off, touch **Controls > Mirrors > Mirror Auto Tilt**. To adjust the auto-tilt position, make mirror adjustments with Model SModel X shifted into Reverse. When you shift out of Reverse, mirrors tilt back to their normal (upward) position. But now that you have adjusted them for backing up, they automatically tilt to the selected downward position whenever you shift into Reverse.

When certain environmental conditions are met, the exterior side mirrors dim automatically (for example, in low light conditions or to reduce glare when driving at night). To enable or disable this feature, touch **Controls > Mirrors > Mirror Auto Dim**.

NOTE: Both exterior mirrors have heaters that can be controlled through **Climate**.

Folding Mirrors

To manually fold and unfold exterior mirrors (for example, if parking in a narrow garage, tight space, etc.), touch **Controls > Fold/Unfold Mirrors**.

Unfold the mirrors by touching **Controls > Unfold Mirrors**. If the mirrors are still folded when you begin driving, they will automatically unfold when your speed reaches 31 mph (50 km/h). You cannot fold a mirror when driving over 31 mph (50 km/h).

To set the mirrors to fold automatically whenever you exit and lock Model SModel X touch **Controls > Mirrors > Mirror Auto Fold**. The mirrors unfold automatically when you unlock Model SModel X.

You can also set mirrors to fold automatically whenever you arrive at a specific location, which saves you from having to manually fold them each time you arrive at a frequented place. To set up, stop at the location you want to save (or drive at less than 3 mph (6 km/h)), and fold the mirrors. Touch **Save Location** when it appears briefly on the **Fold Mirrors** control.

If you no longer want mirrors to fold automatically, touch **Controls > Unfold Mirrors** when they fold at the saved location, then touch **Remove Location**.

When you leave the saved location, the mirrors will unfold automatically when your speed reaches 3 mph (6 km/h) or if you touch **Controls > Unfold Mirrors**.

 **CAUTION:** Mirrors may not automatically fold if you return to a saved location and are driving faster than 3 mph (6 km/h).

NOTE: You can override the automatic folding/unfolding of mirrors at any time (for example, Model S Model X has no power) by pushing the mirror assembly away from you to unfold, or pulling it toward you to fold.

NOTE: If you expect ice to accumulate when Model S Model X is parked, turn off **Mirror Auto Fold**. Accumulation of ice can prevent exterior side mirrors from folding or unfolding. See [Cold Weather Best Practices on page 284](#) for information on how to ensure your mirrors function properly in cold weather.

You can integrate auto-folding mirrors with MyQ (see [HomeLink Universal Transceiver on page 400](#)).

Rear View Mirror



Adjust the rear view mirror manually.

Vanity Mirrors

To expose and illuminate the vanity mirror, fold the sun visor downwards, then use the tab to lower the mirror cover. The tab can stick to the lower portion of the visor to keep it in place. After closing the mirror cover, the light turns off. See [Sun Visors and Vanity Mirrors on page 683](#) for more information.

Lights

Overview

Model S Model X has convenience lights that automatically turn on and off based on what you are doing. For example, interior lights, marker lights, signature lights, door handle lights, and puddle lights turn on when you unlock Model S Model X, when you open a door, and when you shift into Park. They turn off automatically after a minute or two when you shift out of Park, or when you lock your vehicle.

Touch **Controls** > **Lights** to control the lights.

NOTE: You can also access an abbreviated lights menu while driving by touching the headlights button on the steering wheel/steering yoke. A lights menu displays on the touchscreen, providing quick access to headlight controls.

- **Headlights:** Exterior lights (headlights, tail lights, signature lights, side marker lights, parking lights, and license plate lights) are set to **Auto** each time you start Model S Model X. When set to **Auto**, exterior lights automatically turn on when driving in low lighting conditions. If you change to a different setting, lights always revert to **Auto** on your next drive.

Touch one of these options to change the exterior light setting until adjusted again or the next time you drive:

- **Off:** Exterior lights turn off. When driving, daytime running lights may remain on based on regulations in various market regions.
 - **Parking:** Parking lights, side marker lights, the tail light bar, and license plate lights turn on.
 - **On:** Low beam headlights, side marker lights, parking lights, signature lights, and license plate lights turn on.
- **Dome Lights:** Turn the interior dome (map) lights on or off. If set to **Auto** all interior dome lights turn on when you unlock your vehicle, open a door upon exiting, or shift into Park.

Model S Model X is also equipped with a rear dome light on each side of the rear seats, located next to the coat hangers (see [Coat Hangers on page 715](#)).

NOTE: To manually turn an individual dome light on or off, press the lens. If you leave a dome light on, it turns off when Model S Model X powers off. If the vehicle was already powered off when you manually turned the light on, it turns off after 60 minutes.

- **Ambient Lights:** When enabled, interior ambient lights turn on whenever the headlights are on.
- **Accent Lights:** Choose **Off**, **On**, or **Night Only**. When set to **Night Only**, interior accent lights will automatically illuminate when dim conditions are detected outside your vehicle, or when convenience lights are on. Customize the brightness and color of the lights to your preference.
- **Footwell Lights:** When headlights are enabled, footwell lights illuminate the front and rear footwells. Footwell lights will also enable when you unlock your vehicle, open a door upon entry/exit, or shift into Park.
- **Bed Lights:** The lights running on the sides of the truck cargo bed can be set to **Off**, **On**, or **Auto**. When set to **Auto**, the bed lights turn on when Model S Model X is parked and the tonneau cover or tailgate is open. You can also toggle the tailgate button to turn the bed lights on or off for your convenience. See [Cargo Bed on page 720](#) for more information.

 **CAUTION:** Ensure the headlights and tail lights are **On** during low visibility conditions (for example, when it is dark, foggy, snowy, or the road is wet, etc.). The tail lights are off while daytime running lights are on. Failure to do so can cause damage or serious injury.

Headlights

The following indicator lights are visible on the touchscreen to show the status of the headlights. If none of these indicator lights are on, the headlights are off.



Low beam headlights are on.



The headlights are on. Illuminates when headlights are on but the **Auto High Beam** setting is turned off or if the **Auto High Beam** setting is turned on but is temporarily unavailable.



High beams are currently turned on, and **Auto High Beam** is ready to turn off the high beams if light is detected in front of Model S/Model X.



High beams are temporarily turned off because **Auto High Beam** is operating and light is detected in front of Model S/Model X. When light is no longer detected, high beam headlights automatically turn back on.



Use the headlights button on the left side of the steering wheel/steering yoke to control the headlights:

- Press and quickly release to flash headlights.
- Press and hold to turn on headlights – the touchscreen displays a brief timer and you must hold for the duration of the timer to latch the headlights to the on position. When headlights are on, press the button a second time to turn them off.

When you touch or press the headlights button on the left side of the steering wheel/steering yoke, the touchscreen displays an abbreviated lights menu to provide quick access to control headlights, fog lights (if equipped), and the **Auto High Beam** setting. Use the touchscreen to choose options from this menu.



Auto High Beam



Driving

The headlights can automatically switch to low beam when there is light detected in front of Model S/Model X (for example, from an oncoming vehicle). To turn this feature on or off, touch **Controls > Lights > Auto High Beam**. Your chosen setting is retained until you manually change it.

NOTE: **Auto High Beam** is automatically enabled when Autosteer is engaged. To switch to low beam headlights, press the headlights button on the steering wheel/steering yoke. **Auto High Beam** is re-enabled every time Autosteer is activated.

WARNING: **Auto High Beam** is a convenience only feature and is subject to limitations. It is the driver's responsibility to make sure that headlights are always appropriately adjusted for weather conditions and driving circumstances.

Turn Signals

To engage a turn signal, press the corresponding arrow button on the left side of the steering wheel/steering yoke. A turn signal cancels based on the angle of the steering wheel/steering yoke (for example, you finish making a turn). You can also cancel a turn signal by pressing the turn signal button a second time.

If **Controls > Lights > Automatic Turn Signals** is set to **Auto Cancel**, turn signals cancel automatically when Model S/Model X detects completion of a maneuver such as a merge, lane change, or a fork in the roadway. You can override automatic cancellation at any time (for example, you want the turn signal to remain on because you are making more than one lane change). To override, engage the turn signal by pressing and momentarily holding the turn signal button (instead of just pressing). Then, when the first maneuver is complete, the turn signal remains on. If **Automatic Turn Signals** is set to **Off**, you must cancel the turn signal manually by pressing the turn signal button after maneuvers such as a merge, lane change, or fork in the roadway.



When a turn signal is operating, the corresponding indicator lights up on the touchscreen and there is a clicking sound.



Hazard Warning Flashers

To turn on the hazard warning flashers, press the button on the drive mode selector on the overhead console. All turn signals flash. Press again to turn off.



If a severe crash is detected by your vehicle, the hazard lights will automatically turn on and flash quickly to increase visibility. Pressing the hazard lights once will return the lights to its normal cadence. Pressing a second time turns all hazard lights off.

NOTE: Hazard warning flashers operate even without a key nearby.

Headlights After Exit

When you stop driving and park Model S Model X in low lighting conditions, exterior lights temporarily remain illuminated. They automatically turn off after one minute or when you lock Model S Model X, whichever comes first.

To turn this feature on and off, touch **Controls > Lights > Headlights After Exit**. When **Headlights After Exit** is off, the headlights turn off immediately when you engage Park and open a door.

Condensation in Headlights or Tail lights

Due to weather changes, humidity levels, or recent exposure to water (such as a car wash), condensation may occasionally accumulate in your vehicle's headlights or tail lights. This is normal— as the weather gets warmer and humidity decreases, condensation often disappears on its own. If you notice water buildup within the exterior lenses, or if the condensation affects the visibility of the exterior lights, use the mobile app to schedule a service appointment.

Windshield Wiper and Washers

You can access wiper settings by touching the wiper button on the steering wheelsteering yoke or by accessing the app launcher and touching **Wiper**.

You can also drag the **Wiper** control to your **My Apps** area for easier access.

Press and quickly release the wiper button on the steering wheelsteering yoke to wipe the windshield. If the wiper is already operating at a wiper setting and is not set to **Auto**, pressing the wiper button cycles through speeds. Wiper speeds cycle as follows: **I** > **II** > **III** > **IIII** > **III** > **II** > **I**.

Press and hold the wiper button to spray washer fluid onto the windshield. After releasing the button, the wipers perform two additional wipes then, depending on vehicle and environmental conditions, a third wipe a few seconds later. You can also press and hold the wiper button for a continuous spray of washer fluid—the wipers perform the wipes after you release.



Whenever you press the wiper button on the steering wheel, the touchscreen displays the wiper menu, allowing you to adjust wiper settings. Roll the left scroll button on the steering wheelsteering yoke up or down to choose your desired setting.

- Turn the wiper off.
- Choose how you want the wiper to operate:
 - **I** - Intermittent, slow.
 - **II** - Intermittent, fast.
 - **III** - Continuous, slow.
 - **IIII** - Continuous, fast.
 - **Auto** - Model SModel X detects precipitation and adjusts the wiping speed and intensity.

NOTE: Turning on Autopilot features automatically sets wipers to **Auto**.

NOTE: The Auto setting is currently in BETA. If uncertain about using the Auto setting while in the BETA phase, Tesla recommends operating the wipers manually, as necessary.



Choose to heat the wiper blade by touching the windshield icon on the touchscreen.

While driving in the rain, the wiper blade may pause in the horizontal position for approximately 30 seconds before continuing to wipe the windshield. The blade may also move slightly based on vehicle speed to make Model S/Model X more aerodynamic.

Periodically check and clean the edge of the wiper blade. If a blade is damaged, replace it immediately. For details on checking and replacing the wiper blade, see [Windshield Wiper Blade, Jets and Fluid on page 913](#).

NOTE: If you choose **Auto** and the ability to detect liquid on the windshield becomes unavailable, the wiper setting reverts to the most recently used manual setting. If a manual setting cannot be determined, the wiper turns off.

NOTE: You can also adjust the windshield wiper speed and frequency using voice commands (see [Voice Commands on page 391](#)).



CAUTION: To avoid the risk of damaging the wiper, do not leave the wiper set to **Auto** when washing Model S/Model X.



CAUTION: Remove ice from the windshield before turning the wiper on. Ice has sharp edges that can damage the rubber on the wiper blade. In harsh climates, ensure that the wiper blade is not frozen or adhered to the windshield.

Braking and Stopping

Braking Systems

 **WARNING:** Properly functioning braking systems are critical to ensure safety. If you experience a problem with the brake pedal, brake calipers, or any component of a Model S/Model X braking system, contact Tesla immediately.

Model S/Model X has an anti-lock braking system (ABS) that prevents the wheels from locking when you apply brake pressure. This improves steering control during heavy braking in most road conditions because ABS constantly monitors the speed of each wheel and varies the brake pressure according to the grip available.

The alteration of brake pressure can be felt as a pulsing sensation through the brake pedal. This demonstrates that the ABS is operating and is not a cause for concern. Keep firm and steady pressure on the brake pedal while experiencing the pulsing.

ABS

The ABS indicator briefly flashes amber on the touchscreen when you first start Model S/Model X. If this indicator lights up at any other time, an ABS fault has occurred and the ABS is not operating. Contact Tesla. The braking system remains fully operational and is not affected by an ABS failure. However, braking distances may increase. Drive cautiously and avoid heavy braking.

USA:

Canada:



The ABS indicator briefly flashes amber on the touchscreen when you first start Model S/Model X. If this indicator lights up at any other time, an ABS fault has occurred and the ABS is not operating. Contact Tesla. The braking system remains fully operational and is not affected by an ABS failure. However, braking distances may increase. Drive cautiously and avoid heavy braking.

BRAKE

If the touchscreen displays this red brake indicator at any time other than briefly when you first start Model S/Model X, a brake system fault is detected, or the level of the brake fluid is low. Contact Tesla immediately. Apply steady pressure and keep the brake pedal firmly pressed to stop the vehicle when safe to do so.

USA:



If the touchscreen displays this red brake indicator at any time other than briefly when you first start Model S/Model X, a brake system fault is detected, or the level of the brake fluid is low. Contact Tesla immediately. Apply steady pressure and keep the brake pedal firmly pressed to stop the vehicle when safe to do so.

Canada:

BRAKE

The touchscreen displays this amber brake indicator if a brake booster fault is detected. Apply steady pressure and keep the brake pedal firmly pressed to stop the vehicle when safe to do so. Hydraulic Boost Compensation will be active (see [Hydraulic Boost Compensation on page 763](#)).

USA:



The touchscreen displays this amber brake indicator if a brake booster fault is detected. Apply steady pressure and keep the brake pedal firmly pressed to stop the vehicle when safe to do so. Hydraulic Boost Compensation will be active (see [Hydraulic Boost Compensation on page 763](#)).

Canada:

Emergency Braking

In an emergency, fully press the brake pedal and maintain firm pressure, even on low traction surfaces. The ABS varies the braking pressure to each wheel depending on the amount of traction available. This prevents wheels from locking and ensures that you stop as safely as possible.

If an alternative method is needed to bring the vehicle to a stop, press and hold the Park button on the touchscreen's drive mode strip to apply the brakes and remove drive torque while the button is held. Touch **Controls** or press the brake pedal to display the drive mode strip.



-  **WARNING:** Do not pump the brake pedal. Doing so interrupts operation of the ABS and can increase braking distance.
-  **WARNING:** Always maintain a safe distance from the vehicle in front of you and be aware of hazardous driving conditions. While the ABS can improve stopping distance, it cannot overcome the laws of physics. It also does not prevent the danger of hydroplaning (where a layer of water prevents direct contact between the tires and the road).
-  **CAUTION:** Automatic Emergency Braking (see [Automatic Emergency Braking on page 342](#)) may intervene to automatically brake in situations where a collision is considered imminent. Automatic Emergency Braking is not designed to prevent a collision. It is designed to minimize the impact of a frontal collision by attempting to reduce your driving speed. Depending on Automatic Emergency Braking to avoid a collision can result in serious injury or death.
-  **CAUTION:** In emergency situations, if the brakes are not functioning properly, press and hold the Park button on the overhead console or touchscreen to bring Model SModel X to a stop. Do not use this method to stop the vehicle unless absolutely necessary.

Brake Disc Wiping

When cold and wet weather is detected, brake disc wiping repeatedly applies an imperceptible amount of brake force to remove water from the surface of the brake discs.

Hydraulic Boost Compensation

Model SModel X is equipped with a brake booster that activates the brakes when the brake pedal is pressed. Hydraulic boost compensation provides mechanical assistance if the brake booster fails. If a brake booster failure is detected, the brake pedal feels stiffer to press and you may hear a sound when you press the brake pedal. To stop Model SModel X, apply steady force to the brake pedal without releasing or pumping. Drive cautiously and maintain a safe distance from other road users—brake pedal responsiveness and braking performance may be degraded.

Hydraulic Fade Compensation

Hydraulic fade compensation assists in monitoring brake system pressure and ABS activity for instances of reduced brake performance. If reduced brake performance is detected (for example, as a result of brake fade, or cold or wet conditions), you may hear a sound, feel the brake pedal pull away from your foot, and notice a strong increase in braking. Brake as you normally would and continue to press the brake pedal without releasing or pumping the brakes.

-  **WARNING:** Always maintain a safe driving distance from the vehicle in front of you and exercise caution when driving conditions are hazardous. Brake disc wiping and hydraulic fade compensation are NOT substitutes for adequately applying the brakes.

Regenerative Braking

Whenever Model SModel X is moving and your foot is off the accelerator, regenerative braking slows down the vehicle and feeds any surplus power back to the Battery. By anticipating your stops and reducing or relieving pressure from the accelerator pedal to slow down, you can take advantage of regenerative braking to increase driving range.

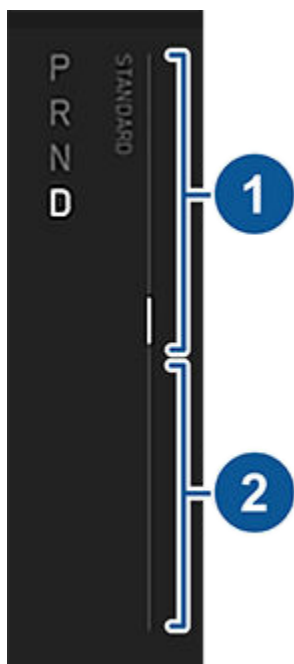
Vehicle deceleration due to regenerative braking may vary depending on the current state of the Battery. For example, regenerative braking may be limited if the Battery is cold or is already fully charged.

To experience the same amount of deceleration whenever you release the accelerator pedal, regardless of the state of the Battery, you can choose to have the regular braking system automatically engage whenever regenerative braking is limited. Touch **Controls > Dynamics > Apply Brakes When Regenerative Braking is Limited**. When enabled, the brake pedal may move or feel stiffer when pressed. This is expected and does not change your ability to slow down Model SModel X.

NOTE: Apply Brakes When Regenerative Braking is Limited may not operate if the brakes are extremely hot.

NOTE: Apply Brakes When Regenerative Braking is Limited is not available when **Trailer Mode** is engaged (see [Towing a Trailer on page 784](#)).

The power meter (a thin vertical line next to the drive mode strip) displays real-time power usage:



1. Shows power being output by the Battery, such as that used to accelerate the vehicle or to cool the cabin. When you press the accelerator pedal, the top half of the power meter fills with black (or white if the display is dark).
2. Represents power generated from regenerative braking, or power that captured from slowing down the vehicle. Power being fed back to the Battery displays in green whereas power used by the regular braking system displays in gray.

NOTE: Installing winter tires with aggressive compound and tread design may result in temporarily-reduced regenerative braking power. However, your vehicle is designed to continuously recalibrate itself, and after changing tires it will increasingly restore regenerative braking power after some straight-line accelerations. For most drivers this occurs after a short period of normal driving, but drivers who normally accelerate lightly may need to use slightly harder accelerations while the recalibration is in progress.

NOTE: If regenerative braking is aggressively slowing Model SModel X (such as when your foot is completely off the accelerator pedal at highway speeds), the exterior brake lights turn on to alert others that you are slowing down.

WARNING: In snowy or icy conditions, Model SModel X may experience loss of traction during regenerative braking.

Vehicle Hold

When Model SModel X is stopped, Vehicle Hold can continue to apply the brakes even after you remove your foot from the brake pedal and is automatically enabled any time the vehicle comes to a complete stop.



This indicator displays on the touchscreen whenever Vehicle Hold is actively holding Model SModel X while stopped.

To disengage Vehicle Hold, press the accelerator or brake pedal, or shift into Neutral.

NOTE: After actively braking Model SModel X for approximately ten minutes, Model SModel X shifts into Park and Vehicle Hold cancels. The parking brake is still applied. Model SModel X also shifts into Park if it detects that the driver has left the vehicle.

Parking Brake

The parking brake is automatically engaged when in Park, and automatically disengages when shifted out of Park.

To manually engage the parking brake, touch **Controls > Safety > Parking Brake**. Follow the onscreen instructions. Manually disengage the parking brake by selecting **Parking Brake** again.



When you manually apply the parking brake using the touchscreen, the red parking brake indicator lights up on the touchscreen.

USA:



When you manually apply the parking brake using the touchscreen, the red parking brake indicator lights up on the touchscreen.

Canada:

If the parking brake experiences an electrical issue, the amber parking brake indicator lights up and a fault message displays on the touchscreen.

USA:



If the parking brake experiences an electrical issue, the amber parking brake indicator lights up and a fault message displays on the touchscreen.

Canada:

NOTE: The parking brake operates on the rear wheels only, and is independent of the pedal-operated brake system.



CAUTION: In the unlikely event that Model SModel X loses electrical power, you cannot access the touchscreen and are therefore unable to release the parking brake without first jump starting (see [Jump Starting on page 948](#)).



WARNING: In snowy or icy conditions the rear wheels may not have sufficient traction to prevent Model SModel X from sliding down a slope, particularly if not using winter tires. Avoid parking on hills in snowy or icy conditions. You are always responsible for parking safely.



WARNING: Your Model SModel X may display an alert if the road is too steep to safely park, or if the parking brakes are not properly engaged. These alerts are for guidance purposes only and are not a substitute for the driver's judgment of safe parking conditions, including specific road or weather conditions. Do not depend on these alerts to determine whether or not it is safe to park at any location. You are always responsible for parking safely.

Brake Wear

Model SModel X brake pads are equipped with wear indicators. A wear indicator is a thin metal strip attached to the brake pad that squeals as it rubs against the rotor when the pad wears down. This squealing sound indicates that the brake pads have reached the end of their service life and require replacement.

Brakes must be periodically inspected visually by removing the tire and wheel. For detailed specifications and service limits for rotors and brake pads, see [Subsystems on page 936](#). Additionally, Tesla recommends cleaning and lubricating the brake calipers every year or 12,500 miles (20,000 km) if in an area where roads are salted during winter months.



WARNING: Neglecting to replace worn brake pads damages the braking system and can result in a braking hazard.

Traction Control

How It Works

The traction control system constantly monitors the speed of the front and rear wheels. If Model S/Model X experiences a loss of traction, your vehicle minimizes wheel spin by controlling brake pressure and motor power. By default, the traction control system is on. Under normal conditions, it should remain on to ensure maximum safety.

NOTE: When Model S/Model X is in an Off-Road Drive Mode, the traction control system may be disabled or operate differently. For more information about customizing the traction control system while driving off road, see [Off-Road Driving on page 775](#).



This yellow indicator flashes on the touchscreen whenever the traction control system is actively controlling brake pressure and motor power to minimize wheel spin. If the indicator stays on, a fault is detected with the traction control system. Use the mobile app to schedule a service appointment.

 **WARNING:** Traction control cannot prevent collisions caused by driving dangerously or turning too sharply at high speeds.

Slippery Surfaces

Your vehicle can distribute traction evenly across all tires to provide more traction and stability during slippery conditions, such as rain, snow, or ice. To enable, go to **Controls > Dynamics > Slippery Surface**.

NOTE: Even when this setting is Off, Cybertruck continuously detects characteristics of the current driving surface and automatically adapts Traction Control.

Suspension

Model SModel X is equipped with adaptive air suspension that offers superior ride quality, balances comfort with range and performance, and maintains a level height between the front and rear axles.

You can manually adjust the ride height to suit your circumstances. For example, you can raise Model SModel X when you need extra ground clearance (such as when driving on a steep driveway or ramp, in deep snow, over large speed bumps, parking curbs, etc.) or temporarily lower Model SModel X when you need extra space above the vehicle (such as in a parking garage) or to increase handling and range.

NOTE: When Model SModel X starts, you may hear the sound of the compressor as the air suspension system's reservoir fills with air.



CAUTION: Before adjusting the ride height, ensure Model SModel X is clear of all obstacles, above and below.

You can adjust the ride height by touching **Controls**. The available ride height settings depend on your driving speed and other conditions, such as the current drive mode. You can also adjust the ride height by touching **Ride Height** on the exterior view of Model SModel X in the vehicle status area of the touchscreen when Model SModel X is parked.

NOTE: When you change the ride height from **Controls**, it will automatically lower or raise to the preferred ride height again once your driving speed exceeds 25 mph (40 km/h).



If a fault is detected that reduces the performance of the adaptive air suspension system, a yellow indicator lights up on the touchscreen. If the problem persists, use the mobile app to schedule a service appointment.



If a fault is detected that disables the adaptive air suspension system, a red indicator lights up on the touchscreen. Use the mobile app to schedule a service appointment.

Ride Height Settings - On-Road

The following ride height settings are meant for day-to-day driving when Model SModel X is in an on-road drive mode. For more information on customizing the preferred ride height, see [On-Road Modes on page 769](#).

NOTE: Each ride height is shown in relation to **Medium**, which is considered to be 0 in. (0 mm).

Setting	Change in Height	Description
High	2.4 in. (6 cm) above Medium	When the ride height is set to High , it automatically returns to the preferred ride height* after driving approximately 100 ft. (30 meters) or when your driving speed reaches 25 mph (40 km/h).
Low	1.6 in. (4 cm) below Medium	When the ride height is set to Low , it automatically returns to the preferred ride height* after driving approximately 100 ft. (30 meters) or when your driving speed reaches 25 mph (40 km/h).
Entry	2.2 in. (5.5 cm) below Medium	When the ride height is set to Entry, it automatically returns to the preferred ride height* once your driving speed exceeds 10 mph (16 km/h). When Auto Lower is enabled, Cybertruck lowers to the Entry setting when in Park to make it easier to enter or exit the vehicle (see Auto Lower on page 768).

* To change the preferred ride height, touch **Controls** > **Dynamics** > **Preferred Ride Height**. For more information, see [On-Road Modes on page 769](#).

Ride Height Settings - Off-Road

The following ride height settings are available when Model S/Model X is in an off-road drive mode. For more information about driving off-road, see [Off-Road Driving on page 775](#).

NOTE: Each ride height is shown in relation to **Medium**, which is considered to be 0 in. (0 mm).

Setting	Change in Height	Description
Extract	5.9 in. (15 cm) above Medium	Extract is the maximum ride height, designed for use when Model S/Model X is stuck on an underbody obstacle. This is only available in certain off-road modes. When the ride height is set to Extract, vehicle speed is limited to 10 mph (16 km/h), and torque may be limited. The ride height automatically resets to Very High once your driving speed exceeds 10 mph (16 km/h).
Very High	3.9 in. (10 cm) above Medium	Very High increases ground clearance and improves approach, breakover, and departure angles while off-road driving. When the ride height is set to Very High, vehicle speed is limited to 25 mph (40 km/h). The ride height automatically resets to High when your driving speed exceeds 25 mph (40 km/h).
High	2.4 in. (6 cm) above Medium	High increases ground clearance to suit general off-road driving at both low and high speeds.

Auto Lower

To make it easier to get into Model S/Model X, enable **Auto Lower** (**Controls > Dynamics > Auto Lower**). Once enabled, your vehicle automatically adjusts to the **Entry** ride height whenever your vehicle shifts into Park.

The suspension automatically raises back to your preferred ride height when you resume driving.

 **CAUTION:** When **Auto Lower** is enabled and you are parking Model S/Model X, ensure that there are no obstacles underneath the vehicle that may contact the underbody when the suspension lowers.

NOTE: **Auto Lower** is not available while in Off-Road Mode.

NOTE: You can also make it easier to enter and exit Model S/Model X by enabling Easy Entry. When Easy Entry is enabled, the steering wheel/steering yoke and driver's seat adjust automatically when the vehicle is in Park to allow more room for entering or exiting the vehicle (see [Easy Entry on page 182](#)).

Self-Leveling

To prevent damage when jacking or lifting the vehicle, you must activate **Jack Mode** to disable self-leveling. For more details, see [Jack Mode on page 463](#).

Auto-Raising Locations

Whenever you raise the suspension, your vehicle saves the suspension setting based on the location. By saving the location, you do not need to manually raise the suspension every time you arrive at a frequently-used location where you have previously raised the suspension. When you return to the saved location, Model S/Model X raises the suspension and the touchscreen displays a message indicating that the suspension is adjusting.

When returning to a saved location and driving faster than the suspension settings allow, the suspension does not adjust until the vehicle slows down. For example, if you set the suspension to always raise on a particular street to account for speed bumps, but you are traveling at more than 25 mph (40 km/h) when you reach that location, the ride height is not raised until your speed falls below 25 mph (40 km/h).

If Model SModel X reaches a saved location and the existing suspension setting is already higher than the level that has been saved for that location, the ride height is not adjusted. After leaving a saved location, the suspension automatically lowers to the preferred ride height. However, it may not lower until your vehicle meets the speed and distance threshold at which the suspension lowers.

NOTE: Model SModel X may not raise the suspension in a saved location where connectivity is poor (for example, in an underground parking garage).

To remove an auto-raising location

If no longer want the suspension to automatically raise at a location, touch to deselect **Always raise at this location** in the popup that appears when you arrive at a saved location.

On-Road Modes

To choose how Model SModel X accelerates and handles for day-to-day driving on public roads, touch **Controls > Dynamics**.

Choose between three Drive Modes. **Comfort** and **Sport** automatically set the **Acceleration**, **Ride & Handling**, and **Preferred Ride Height** to balance ride comfort, handling, and range. **Custom** allows you to customize these options as you see fit.

To access additional performance and acceleration, select **Beast** (if equipped) and follow the on-screen prompts.

In addition, you can choose to enable **Auto Shift out of Park** (see [Shifting on page 200](#)) or **Auto Lower** (see [Suspension on page 767](#)).

Customization Options

Setting	Options	Description
Acceleration	Chill	Limits acceleration for a smooth and gentle ride. When Chill is selected, Chill displays on the touchscreen above the driving speed.
	Standard	Provides the normal level of acceleration.
Ride & Handling	Relaxed	Prioritizes comfort over dynamic handling response. Model SModel X will feel smoother and more comfortable, especially on rough or uneven roads.
	Focused	Provides higher damping for more dynamic driving. Model SModel X will feel more responsive and connected to the road.
Preferred Ride Height	Lower	Sets the Preferred Ride Height to Lower . The ride height remains at Low on and off the highway by default, optimizing handling and range (see Suspension on page 767).
	Higher	Sets the Preferred Ride Height to Higher . When set to Higher , the ride height automatically adjusts between Medium and Low to balance ride comfort with handling and range. On highways or while driving at highway speeds, ride height adjusts to Low (see Suspension on page 767).

 **CAUTION:** Do not use off-road locking differentials while driving on high-traction surfaces, such as asphalt. Using locking differentials in inappropriate situations can cause significant damage to the vehicle. Damage to the vehicle due to improper use of locking differentials is not covered by the warranty.

Driver Profiles

Creating a Driver Profile

When you first adjust the driver's seat, steering wheelsteering yoke position, or exterior side mirrors, the touchscreen prompts you to create a driver profile to save these adjustments. Your profile also saves various preferences you make while customizing Model SModel X.



To add a new driver profile, touch the driver profile icon at the top of the touchscreen **Controls** screen. Then touch **Driver Profile Settings** > **Add New Driver**, type the driver's name and touch **Create Profile**. Follow the onscreen instructions to save mirror and steering wheel position to the driver profile. Check the **Use Easy Entry** checkbox if you want to save (or use existing) **Easy Entry** settings in which the driver's seat and the steering wheelsteering yoke are automatically adjusted to make it easy to enter and exit Model SModel X.

If you change the position of the driver's seat, steering wheelsteering yoke, or exterior side mirrors after you have saved or chosen a driver profile, the touchscreen prompts you to **Save** the new position or **Restore** the previously saved position (other settings are automatically saved). To change a setting without saving or restoring, just ignore the prompt.

NOTE: Valet mode is a built-in driver profile that limits speed and restricts access to some Model SModel X features (see [Valet Mode on page 183](#)).

NOTE: Depending on date of manufacture and options selected at time of purchase, some Model S vehicles are not equipped with the driver profile feature. Also, in cases where the vehicle is equipped with driver profiles, some features may not be automatically saved and adjusted based on the driver profile (for example, mirror position).

NOTE: To stop automatic adjustments that are in process based on a driver's profile, touch **Stop** on the Driver Profile dropdown menu. Automatic adjustments also stop if you manually adjust a seat, mirror, or the steering wheelsteering yoke.

Easy Entry

You can define an Easy Entry setting that moves the steering wheelsteering yoke and driver's seat to make it easy to enter and exit Model SModel X. Any driver can use the Easy Entry setting by associating it with their driver's profile. When the Easy Entry setting is associated with a driver's profile, the steering wheelsteering yoke and driver's seat automatically adjust when in Park and the driver's seat belt is unbuckled, allowing an easy exit from Model SModel X. When returning to the vehicle and stepping on the brake pedal, settings automatically adjust back to the settings used by the most recent driver profile (or based on the key if it's linked to a driver profile).

To use **Easy Entry** with a driver profile, ensure the **Use Easy Entry** box is checked.



WARNING: Never use Easy Entry to move the driver's seat to the full rearward position when a child safety seat is installed on a rear seat located behind the driver's seat. With reduced clearance, the movement of the seat may impact a child's legs, cause injury, or dislodge the seat.

Selecting Between Driver Profiles



To adjust Model SModel X based on a driver's profile, touch the driver profile icon at the top of the touchscreen **Controls** screen. Then choose the driver, and Model SModel X is adjusted based on the settings that have been saved to the chosen driver profile.

Saved Settings

A subset of the settings that you choose to customize your Model SModel X are automatically saved to your driver's profile. Once saved, a green check mark appears next to the driver profile icon on the touchscreen. Examples of automatically saved driver profile settings are:

- Navigation, temperature, lights and display settings.
- Autopilot and driving preferences.

NOTE: The settings that are associated with driver profiles vary depending on the vehicle's date of manufacture and version of software installed.

Linking a Driver Profile to a Key Fob

You can link a driver profile to a specific key fob to allow Model SModel X to automatically select the correct driver profile when the linked key fob is detected as you approach the vehicle and open the driver's door. To link a driver profile to a key fob, enter Model SModel X with the key fob and touch the driver profile icon at the top of the touchscreen. Select the driver profile you would like to link to the key fob, then touch **Link to Key Fob**.

NOTE: Model SModel X detects only one key fob at a time. The driver profile is linked to the key fob that is detected by the vehicle at that time. Therefore, if you want to link driver profiles to multiple key fobs, ensure that only the key fob that you would like to link the driver profile to is within detection range while performing the linking procedure. Move all other key fobs outside of the detection range (at least three feet (one meter) away from Model SModel X).

NOTE: Model SModel X can support up to threeseight linked key fobs. However, a driver profile can only be linked to one key fob.

To remove the link between a driver profile and key fob, touch the driver profile icon at the top of the touchscreen. Select the driver profile, then touch the **X** next to **Linked to Key Fob**.

Linking a Driver Profile to a Key

You can link a driver profile to a key (or keys) to allow Model SModel X to automatically select the correct driver profile when the linked key is detected as you approach the vehicle and open the driver's door. To link a driver profile to a key, first ensure you are using your desired driver profile. Touch the driver profile icon at the top of the **Controls** screen. Follow the onscreen instructions to add a phone key, key card, or key fob (see [Adding and Removing Keys on page 29](#)). When finished, touch the driver icon to link the key to the desired driver profile. The name of the driver profile appears under the key to show that it is linked.

NOTE: Model SModel X supports up to 10 driver profiles. You can link multiple keys to a driver profile, but you cannot link multiple driver profiles to a single key.

Valet Mode

When Model SModel X is in Valet mode, the following restrictions apply:

- Speed is limited to 70 mph (113 km/h).
- Maximum acceleration and power are limited.
- Front trunk and glovebox are locked.
- Home and Work locations are not available in the navigation system.
- Voice commands are disabled.
- Cruise control is disabled.
- Autopilot convenience features are disabled.
- The Allow Mobile Access setting cannot be changed
- HomeLink (if applicable in your market region) is not accessible.
- Driver Profiles are not accessible.
- Wi-Fi and Bluetooth are disabled. When Model SModel X is in Valet mode, you cannot pair new Bluetooth devices or view or delete existing paired devices. However, if a Bluetooth-paired device or a known Wi-Fi network is within range, Model SModel X connects to it.

NOTE: Model SModel X does not automatically shift when in Valet Mode.

Starting Valet Mode

With Model SModel X in Park, touch the driver profile icon at the top of the touchscreen**Controls** screen, then touch **Valet Mode**.

The first time you enter Valet mode, the touchscreen prompts you to create a 4-digit PIN you will use to cancel Valet mode.

When Valet mode is active, the instrument panel displays the word **Valet** and the Valet mode driver profile displays on the touchscreen.

You can also use the mobile app to start and cancel Valet mode (provided Model S/Model X is in Park). When using the mobile app, you do not need to enter a PIN because you are already required to log into the app using your Tesla Account credentials.

NOTE: If the **PIN to Drive** setting is enabled (see [PIN to Drive on page 394](#)), you must enter the driving PIN before you can define or enter a Valet PIN. Once in Valet mode, Model S/Model X can be driven without the valet needing to enter the driving PIN.

NOTE: The **PIN to Drive** setting is not available when Valet mode is active.

If you forget your valet PIN, reset it from inside Model S/Model X by entering your Tesla Account credentials (which also cancels Valet mode). You can also reset your PIN using the mobile app.

 **WARNING:** Do not use Valet mode when towing a trailer. The torque limitations of Valet mode can make it difficult for Model S/Model X to pull a trailer up a hill.

Canceling Valet Mode

With Model S/Model X in Park, touch the **Valet Mode** driver profile icon at the top of the touchscreen **Controls** screen, and enter your 4-digit PIN.

When you cancel Valet mode, all settings associated with the most recently used driver profile and climate control settings are restored, and all features are available.

NOTE: You do not need to enter a PIN to cancel Valet mode from the mobile app.



Trip Information

Displaying Trip Information

Trip information displays on the touchscreen when you touch **Controls > Trips**. For the current trip, you can display distance, duration and average energy usage. You can also show distance and total and average energy used since your last charge and for additional trips.

To name or rename a trip, touch the trip's name, enter a new name for the trip, then press **Save**. To reset a particular trip meter, touch its associated **Reset** button.

You can display information for up to three trips on the instrument panel. Use the checkboxes to specify the trip(s) you want to display. Then use the scroll bar on the steering wheel to display the chosen trip(s) (see [Using Left Steering Wheel Buttons on page 188](#) or [Using Right Steering Wheel Buttons on page 189](#)).

Odometer

To display the odometer, touch **Controls > Software** or open the mobile app. The odometer is also displayed on the instrument panel.



Pedestrian Warning System

The Pedestrian Warning System causes Model SModel X to emit sound when driving below 19 mph (32 km/h) or while driving in reverse. Electric vehicles operate quietly and this sound helps to alert pedestrians of your oncoming vehicle. The sound, which activates whenever Model SModel X is shifted out of Park, gets louder as speed increases.

NOTE: The Pedestrian Warning System is not available in vehicles manufactured prior to September 1, 2020.

 **WARNING:** If sound cannot be heard, pedestrians may not be aware of your oncoming vehicle, which may increase the likelihood of a collision resulting in serious injury or death. If the Pedestrian Warning System is not operating, immediately contact Tesla.



Off-Road Driving

Off-road driving is driving your vehicle on an unpaved surface such as sand, silt, dirt, or mud, or on rocky or snow-covered surfaces. When Model S Model X is in Off-Road Mode, you have access to settings and drive modes that allow you to manage steep ascents, descents, uneven terrain, shallow creeks, and other obstacles you may encounter.

The Off-Road app provides greater control over traction, stability, acceleration, and braking. Various modes and settings also allow you to quickly adjust the ride height of Model S Model X (see [Suspension on page 767](#)).



CAUTION: Carefully read all cautions and warnings before driving Model S Model X off road (see [Limitations and Warnings on page 782](#)). Always pay close attention and monitor the area to the front, rear, and sides of Model S Model X for obstacles while off-road driving.



CAUTION: Any damage caused by off-road driving is not covered by the warranty.

Off-Road Modes and settings include the following:

- **Overland:** Maximizes traction on various terrains at low speeds. See [Overland on page 777](#).
- **Baja:** Optimizes the suspension and traction control of Model S Model X for high speed driving on dirt roads or desert environments. See [Baja on page 777](#).
- **Wade Mode:** Raises the suspension and pressurizes the high voltage Battery to protect your vehicle from water and debris while navigating shallow bodies of water. See [Wade Mode on page 778](#).
- **Trail Assist:** Allows you to maintain your speed while driving on a trail. See [Trail Assist on page 779](#).
- **Locking Differentials:** Engage for more traction while off-roading. See [Locking Differentials on page 779](#).

Using the Off-Road App



WARNING: Only use Off-Road mode in off-road driving scenarios. Off-Road modes change how Model S Model X handles, accelerates, and decelerates, and is not appropriate for public roads.



Use the Off-Road app, located in the app tray, to conveniently customize and monitor your off-road settings. After carefully reading the pop-up window, touch **Confirm**.

In the Off-Road app, customize options such as:

- **Off-Road Mode:** Choose between **Overland** and **Baja** and customize your preferences. See [Overland on page 777](#) and [Baja on page 777](#) for more information.
- **Locking Differentials:** Engage or disengage locking differentials. See [Locking Differentials on page 779](#).
- **Pitch, Roll:** These angles determine how capable the vehicle is of climbing over an obstacle or up an incline.
NOTE: If you are approaching a large obstacle or change in incline, you can set the right ride height to **Extract** by touching **Controls > Ride Height > Extract**. When the ride height is set to **Extract**, Model S Model X has increased approach, breakover, and departure angles.
- **Wade Mode**
- **Rear Steer:** You can set **Rear Steer** to **Off** or **Auto**. **Auto** allows for a tighter turn radius while driving.
- **Light Bar:** Enable or disable the light bar, if installed.
- **Ride Height:** Customize your vehicle's ride height based on terrain and other drive settings. See [Suspension on page 767](#).

NOTE: Model S Model X must be in Park to change the off-road drive modes and settings.

NOTE: Your off-road settings remain for approximately 15 minutes after you exit the vehicle. Always double check to ensure your off-road settings are as intended prior to driving.



Off-Road

CAUTION: The TPMS warning thresholds may be lowered to accommodate different off-road needs. Do not rely solely on the TPMS warning indicator when in an Off-Road mode or setting, as these thresholds do not comply with Federal TPMS standards. It is your responsibility to ensure tires are adequately inflated at all times and are inflated back to normal levels before regular driving on roads.

Before Off-Road Driving

1. **Plan your route:** Carefully consult maps and weather reports before beginning an off-road expedition and familiarize yourself with the different types of terrain you may encounter (gravel, sand, mud, snow, etc.). Research trails before setting out and be aware that weather and environmental conditions can change quickly and unexpectedly. Ensure your vehicle has ample range for your planned route.
2. **Secure passengers and cargo:** Wearing a seat belt is required by law. Ensure that all passengers are wearing their seat belts properly (see [Seat Belts on page 689](#)). Make sure that loose items in the cabin are stowed or secured, and ensure that the cargo bed is free of cargo, or that cargo is tightly secured. The tonneau cover can be open or closed while driving off road.
3. **Evenly distribute vehicle load:** While off-road driving, Model SModel X performs best when the weight of passengers and cargo is distributed evenly across the front and rear axles (see [Vehicle Loading on page 928](#)). Detach large or heavily loaded trailers before driving off road.
4. **Lower tire pressure:** Lower tire pressure to increase traction on softer surfaces such as sand or gravel, and on rocky surfaces. Reducing tire pressure allows tires to make more contact with the terrain, increasing grip and decreasing the risk of punctures.



WARNING: Avoid making hard turns and other sudden maneuvers when tires are inflated under the recommended cold tire pressure. Before driving on public roads again, make sure to fill all tires to the recommended cold tire pressure (see [Tire Pressures on page 897](#)).

5. **Be prepared:** Equip your Model SModel X with supplies in case of emergency, such as a spare tire, a jack, an air compressor, a portable jump starter, and a flashlight.
6. **Remove wheel fairings:** Model SModel X has pieces of plastic trim that descend in front of the wheels from the rocker panels on either side of the vehicle. These are the wheel fairings. The wheel fairings increase aerodynamic performance and range, but may be damaged while driving off-road over rough, uneven surfaces, rocks, or obstacles. To prevent damage, remove the front wheel fairings before off-road driving. For more information and instructions for removing the wheel fairings, refer to the Do It Yourself Guide (see [Do It Yourself Maintenance on page 925](#)).
7. **Remove wheel covers:** To prevent damage, remove the wheel covers before driving off-road. For more information, see [Removing and Installing Wheel Covers on page 904](#).

While Off-Road Driving

Quickly access off-road settings and vitals from Model SModel X in the vehicle status area on the touchscreen. You can also keep the Off-Road app open while driving to quickly change settings and preferences based on your driving situation. See quick stats such as:

- Off-Road Status icons
- Tire Pressures
- Locking Differential status
- Battery and motor temperatures
- Ride Height

NOTE: When the ride height is set to **Extract**, vehicle speed is limited to 10 mph (16 km/h), and torque may be limited. The ride height automatically resets to **Very High** once your driving speed exceeds 10 mph (16 km/h).

If your vehicle is covered in mud after off-roading, rinse the entire exterior of the vehicle with water. It is important to regularly clean Cybertruck after off-roading because mud and debris can quickly build up and limit some vehicle functions. See [#unique_1308 on page](#) for more information.

Off-Road Modes

Overland

Overland maximizes traction on various terrains at low speeds. By selecting **Overland**, you can customize the following settings:

Setting	Options	Description
Surface	All Purpose	Automatically adjusts tire slip based on the amount of available traction and sets the Preferred Ride Height to High . All Purpose is best suited for mixed terrain driving.
	Sand	Allows for high amounts of tire slip to provide optimal traction on soft, deformable surfaces like sand and sets the Preferred Ride Height to High .
	Gravel/Deep Snow	Allows for medium amounts of tire slip to provide optimal traction on gravel or deep snow, and sets the Preferred Ride Height to High .
	Rock	Tightly manages tire slip to maximize grip in rock crawl conditions and sets the Preferred Ride Height to Very High . When the ride height is Very High , the suspension system pneumatically connects the springs on the front and rear axles, increasing suspension articulation for maximum traction.
Stopping Mode	Hold	Applies the brakes automatically when Model SModel X stops, without you having to put your foot on the brake pedal. Whether stopped on a flat surface or a hill, Vehicle Hold keeps the brake applied, provided your foot remains off the accelerator and brake pedals.  WARNING: Never rely on Hold to adequately decelerate or fully stop your vehicle. Many factors can contribute to a longer stopping distance, including downward slopes, and reduced or limited regenerative braking (see Regenerative Braking on page 763). Always be prepared to use the brake pedal to adequately decelerate or stop.
	Roll	Allows Model SModel X to roll freely when close to, or at, a complete stop, like a vehicle in Neutral. Therefore, if stopped on a slope, Model SModel X will roll downward. The brake does not engage, and the motors do not apply torque (until the accelerator pedal is pressed).

Baja

When Model SModel X is in **Baja**, the ride height raises and adaptive damping dynamically adjusts based on your **Terrain** selection to optimize performance on various off-road scenarios. The electronic stability control system also allows more tire slip on low-traction surfaces. This is especially useful in high speed driving situations, such as desert or sand driving.

You can customize the following settings:

Setting	Options	Description
Handling Balance	Left	Adjusts the vehicle balance such that behaves more like a <i>front-wheel-drive</i> vehicle. When you move the slider to the left, is more stable and is more susceptible to understeer (when you turn the wheel and turns <i>less</i> than normal).
	Right	Adjusts the vehicle balance such that behaves more like a <i>rear-wheel-drive</i> vehicle. When you move the slider to the right, moves with more agility but less stability, and is susceptible to oversteer (when you turn the wheel and turns <i>more</i> than normal).
Stability Assist	Standard	Provides the maximum amount of stability control intervention*.
	Reduced	Reduces the amount of stability control intervention.
	Minimal	Provides a minimal amount of stability control intervention.  WARNING: Drive with caution when customizing Stability Assist . If you lose control of Model SModel X, less stability control intervention will be applied and the vehicle may not stabilize itself. Use only if you have advanced experience driving beyond grip limits.
Terrain	Smooth	Sets ride height to Medium and increases damping for greater body control and responsive handling. Best for drifting or high-speed driving on smooth or flat terrains (see Suspension on page 767).
	Rugged	Sets ride height to High with damping optimized for rough terrain, medium-sized obstacles, and whoops.
	Clearance	Sets ride height to Very High for traversing large obstacles.



Off-Roading

Setting	Options	Description
Deceleration Mode	High	Increases the amount of regenerative braking so Model SModel X slows down more dramatically when you remove your foot from the accelerator pedal, allowing for more dynamic one-pedal driving.  WARNING: Setting the Deceleration Mode to High (located in Dynamics) may cause some loss of traction on loose surfaces (such as snow).
	Standard	Provides the normal level of regenerative braking, allowing Model SModel X to maintain traction on loose, low-traction surfaces (such as sand, dirt, and gravel).

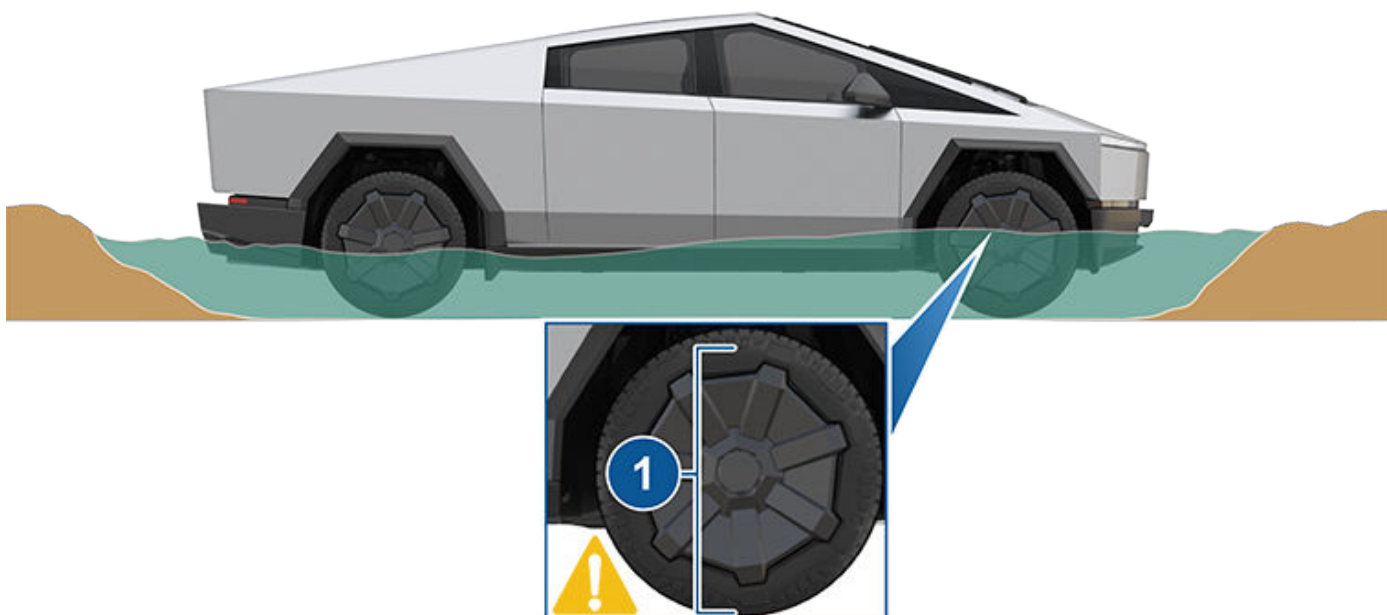
* Stability control intervention modifies motor torque and selectively applies the brakes to each wheel to make more stable and help the driver maintain control of the vehicle. In this setting, stability control is reduced compared to on-road driving.

Wade Mode

Wade Mode allows Model SModel X to enter and drive through bodies of water, such as rivers or creeks.

 **CAUTION:** It is your responsibility to gauge the depth of any body of water before entering. Damage or water ingress to Model SModel X as a result of driving in water is not covered by the warranty.

 **CAUTION:** Always inspect underwater conditions (such as debris, etc.) before entering and use your best judgment. Take care to drive slowly and safely. If the water is too deep, return to more shallow water or dry land.



1. The maximum wade depth is approximately 32 in. (815 mm) measuring from the bottom of the tire.

Wade Mode must be used any time you are driving Model SModel X through a shallow body of water, such as a river. To enable Wade Mode:

1. Ensure all doors and windows are fully closed, and your vehicle speed is less than 20 mph (32 km/h).
2. Access the Off-Road App.
3. Select **Wade**.



When enabled, the Wade Mode icon appears on the touchscreen and starts a countdown for how long Wade Mode is active. Wade Mode duration is limited to 30 minutes.

Wade Mode defaults the vehicle's ride height to **Very High** and protects Model S/Model X for up to approximately 32 in (815 mm) of water, driving at slow speeds (1-3 mph (2-5 km/h)). As water depth changes, reduce your vehicle speed accordingly. Do not disable Wade Mode until your vehicle is fully out of water.

In addition, the vehicle's high voltage Battery automatically pressurizes to protect the Battery from water and debris.

Muddy waters can reduce the cooling system effectiveness by adhering to the radiator. See [#unique_1308 on page](#) for information on how to clean your vehicle after a muddy excursion. Wash your vehicle immediately after wading to reduce chances of bacteria buildup and mud hardening after drying. Vehicles driving in waters should be regularly inspected for signs of water ingress or damage to components including (but not limited to) the brakes, horn, lights, etc.



CAUTION: On soft or muddy underwater surfaces, Model S/Model X may sink in, effectively increasing the water level on the vehicle. Take this possibility into account and prepare accordingly.



WARNING: Never stop or place the vehicle in Park when crossing water. Do not drive in water next to, or immediately after, another vehicle. Currents created by other vehicles can lead to damage.



WARNING: Do not drive in deep, fast-flowing bodies of water (such as strong currents or rapids). Doing so can result in damage, serious injury, or death.

Trail Assist



Trail Assist is available when Model S/Model X is in **Overland**. It maintains the speed of the vehicle to provide greater control during steep ascents and descents.

To enable, touch **Controls > Dynamics > Off-Road > Trail Assist**. Then you can quickly activate or deactivate Trail Assist when needed by single-clicking the right scroll wheel button. You can set the Trail Assist speed between 1 mph (2 km/h) and 25 mph (40 km/h). When active, you can change the set speed by swiping on the right scroll wheel. Small swipes increase the speed in smaller increments, whereas large swipes increase the speed in larger increments.

You can also press the accelerator or brake pedal to temporarily increase or decrease your speed. Once you remove your foot from the pedal, the vehicle returns to your set speed. If you simultaneously brake to a lower speed and swipe down on the right scroll wheel, or accelerate and swipe up, the set speed will automatically snap to the current speed.

NOTE: Unlike other features that allow you to set a cruising speed (such as Traffic-Aware Cruise Control), pressing the brake pedal does **not** disable Trail Assist. However, pressing and holding the brake pedal firmly while at a standstill disables Trail Assist.

NOTE: Trail Assist disengages and returns to your normal driving settings if you accelerate above 30 mph (48 km/h). It re-activates when you drive below 30 mph (48 km/h).



CAUTION: Trail Assist does not detect objects in front of the vehicle. It is your responsibility to always monitor your vehicle's surroundings and be prepared to brake or steer for unanticipated circumstances.

Locking Differentials



CAUTION: Do not use off-road locking differentials while driving on high-traction surfaces, such as asphalt. Using locking differentials in inappropriate situations can cause significant damage to the vehicle. Damage to the vehicle due to improper use of locking differentials is not covered by the warranty.



Open Differentials

Most passenger vehicles are equipped with open differentials on the drive axles. When a vehicle with open differentials turns on a corner or paved road, the wheels on the outside of the curve rotate more quickly than the wheels on the inside of the curve to prevent wheel hop and reduce vehicle instability. However, in low-traction scenarios (such as off-roading or driving in snow), additional torque can get directed towards the wheel(s) with less traction, which may lead to the vehicle getting stuck.

Locking Differentials

Model SModel X is equipped with locking differentials for increased traction during certain low traction and off-road conditions.

Locking differentials lock both wheels of an axle together, which forces the wheels to rotate at the same speed. This distributes the torque across the same axle based on the available traction in each wheel. When one of the locked wheels has significantly reduced traction (on sand, ice, etc.) more torque is applied to the wheel with greater traction. This distribution of torque helps the vehicle continue moving in low traction environments.

Dual Motor Variants: are equipped with mechanical front and rear locking differentials.

Tri-Motor (Cyberbeast) Variants: are equipped with a mechanical front locking differential, and a virtual rear locking differential to provide sufficient torque in each rear wheel. The rear locking differential automatically engages in certain drive modes and speeds, and cannot be manually engaged or disengaged.



CAUTION: Loading Model SModel X to the Gross Vehicle Weight Rating (GVWR) and engaging the locking differentials may result in damage to the drivetrain (see [Vehicle Loading on page 928](#)).



WARNING: Do not expect the locking differentials to provide sufficient traction if the vehicle does not have appropriate tires for the conditions, or Model SModel X is in a situation where all four wheels are spinning.

Engaging Locking Differentials On Road



WARNING: Your vehicle's turning radius increases when locking differentials are engaged. It is your responsibility to be aware of your surroundings and drive carefully.

Engaging locking differentials while driving on roads is intended for specific situations where you temporarily need extra grip on loose or uneven terrain, such as getting un-stuck from a snow bank. Do not engage locking differentials unless it is needed for the road conditions. Navigate to **Controls > Dynamics > Engage Rear Locking Differential**. When enabled, **Slippery Surface** also enables (see [Slippery Surfaces on page 766](#)). **Engage Rear Locking Differential** should not be used for regular driving on slick surfaces.

When you engage locking differentials while driving on roads, your speed is limited to 35 mph (56 km/h). The stability control icon may appear momentarily while the locking differentials disengage (see [Vehicle Status on page 654](#)).

NOTE: This option is not available on Tri-Motor (Cyberbeast) vehicles.

Engaging Locking Differentials Off Road

Before you engage locking differentials, consider your driving situation (such as the terrain, weather, etc.). The rear locking differentials are ideal for off-roading uphill or on level surfaces. Front locking differentials are typically used when you need more traction at the front of the vehicle, like rock crawling. To engage:

1. Access the Off-Road app.
2. Select the locking differentials you want to enable.

For dual motor variants:

- **All On**
- **Rear Only**
- **Off**

For Tri-Motor (Cyberbeast) variants:

- **Front Only**
- **Off**

Or touch the associated locking differential icon in the vehicle status area and select which locking differential(s) you want to engage:



Gray: Locking differential is disengaged.



Orange: Locking differential is engaged. This icon may blink orange while the locking differential is engaging or disengaging.



Orange question mark (?): Unknown locker position.



Red exclamation point (!): System fault or locking differential unavailable (see [Troubleshooting on page 781](#)).

You may need to drive a short distance to engage or disengage once enabled.

Once the locking differentials are fully engaged, the vehicle may slightly rock side to side when turning at low speeds. This is normal behavior when the touchscreen indicates a fully engaged locker (solid orange icon).

The locking differentials may cancel or delay engaging in various cases. If the locking differentials are unable to engage, a chime sounds and a message displays on the touchscreen. See [Troubleshooting on page 781](#) for more information.

 **WARNING:** Driving with locked differentials may reduce vehicle responsiveness to steering. Always monitor your vehicle's behavior and the surroundings. Failure to do so may result in damage or serious injury.

Disengaging Locking Differentials

To disengage, touch the differential icon on the touchscreen and select **Off**. You may need to drive a short distance to disengage. The locking differentials also automatically attempt to disengage whenever the vehicle shifts out of Drive, or when a different drive mode is selected.

When you disengage the locking differentials, the icon may blink orange before disappearing from the touchscreen. Ensure the locking differentials are disengaged before you drive on paved roads or at speeds higher than 35 mph (56 km/h). Check the vehicle wheels are not skipping when turning.

Troubleshooting

Behavior	Action(s)
Locking differential(s) are not engaging.	Creep forward.
	Wait for excessive wheel slip to reduce.
	Turn the steering wheel to completely to the left and right, and back again, several times while stationary.
Locking differential takes a long time to disengage.	Creep forward.
	Turn the steering wheel to the left and right while creeping forward.
	Check tires on the axle for uneven wear.



Behavior	Action(s)
Locking differential cannot disengage after the first engagement.	This may occur if your vehicle has not been driven long enough with the locking differential engaged. After the first engagement, drive Cybertruck (at least 100 ft) while wriggling the steering wheel from left to right to calibrate. During this time, any attempt to disengage is ignored until calibration is complete or times out.
Popping sound while engaging/disengaging.	This is normal. The noise while engaging/disengaging can occur while the mechanism is engaging or releasing.
Locking differential icon stays blinking.	Try performing a U-turn (where it is safe and legal to do so) when lockers are fully disengaged.
Solid orange with an exclamation point appears.	Try shifting into Park, then shift into Drive and try again.
	Use the mobile app to schedule a service appointment.
Locking differentials cancel or delay engagement.	The vehicle doesn't detect a difference in wheel spin between two wheels on the same axle. Continue driving and wait before trying to re-engage.
	The vehicle detects a very high difference in wheel spin between two wheels on the same axle. Continue driving and wait before trying to re-engage.

Troubleshooting

Off-Road Troubleshooting

You may need to increase traction while off-roading (such as for getting unstuck or overcoming an obstacle). Follow these general guidelines to provide more traction to Model SModel X:

1. Engage **Overland** (see [Overland on page 777](#) for more information).
2. Adjust the suspension height. Raise the suspension until the vehicle is no longer obstructed. Avoid lowering the suspension to prevent damage (see [Suspension on page 767](#)).
3. Customize **Terrain** based on the current surface conditions. For high traction terrains, select **Rock**. For looser terrains, select **Sand**.
4. Engage the front and/or rear locking differentials (see [Locking Differentials on page 779](#)).
5. For softer terrain or steep inclines, engage **Trail Assist** for a steady progression through complex terrain (see [Trail Assist on page 779](#)).

If you still need more traction, perform the following:

1. Decrease tire pressure to 36 PSI. This increases tire contact with the surface, which can help provide more traction.



CAUTION: The TPMS warning thresholds may be lowered to accommodate different off-road needs. Do not rely solely on the TPMS warning indicator when in an Off-Road mode or setting, as these thresholds do not comply with Federal TPMS standards. It is your responsibility to ensure tires are adequately inflated at all times and are inflated back to normal levels before regular driving on roads.

2. Use traction aids, such as traction boards.
3. Tow your vehicle. See [Instructions for Transporters on page 938](#) for more information on towing Model SModel X.

Limitations and Warnings

Off-road driving depends on the performance of the air suspension system, brakes, power steering, and other vehicle systems. If there is a condition affecting the performance of any dependent system, a message displays on the touchscreen and off-road driving modes are unavailable.



WARNING: Before driving off road, carefully survey the terrain and be aware of the weather forecast and other environmental conditions. Exercise extreme caution when approaching steep ascents and descents. While driving off road, always be aware of your surroundings and survey the terrain as necessary. Tesla is not liable for any damage to Model SModel X resulting from off-road driving.



-  **WARNING:** Never depend on the driving visualization to show you obstacles in front of, behind, or to the sides of Model SModel X. Always use caution while driving off road and perform visual checks when necessary. The visualization relies on the cameras mounted on Model SModel X (see [Cameras on page 669](#)). External factors (such as a dirty or obscured lens) may affect the performance of a camera, and the cameras may not detect objects or barriers that can potentially cause damage or injury.
-  **WARNING:** Visibility may be limited by sharp crests and uneven terrain. Always check what is at the top of a hill and over the crest before driving over it, and be aware of steep descents or other obstacles.
-  **WARNING:** Before approaching an obstacle, ensure that Model SModel X has enough ground clearance to clear it. If the bottom of Model SModel X is contacting the ground even with the ride height at the highest setting, reduce your speed or avoid the obstacle altogether.
-  **WARNING:** Exercise extra caution when the terrain surface is wet, sandy, or slippery. Loose gravel, sand, and other environmental conditions may affect the performance of Off-Road Modes.
-  **WARNING:** Before driving off road, make sure that loose items in the cabin are stowed or secured and ensure that the cargo bed is free of cargo, or that cargo is tightly secured.

Towing a Trailer

NOTE: You cannot enable **Off-Road Modes** and **Trailer Mode** at the same time.

NOTE: If the towing capacity on the hitch label conflicts with the information provided in this owner's manual, this owner's manual takes precedence.

Towing Guidelines

Towing a trailer puts additional load on the motors, drive train, brakes, tires, and suspension and significantly decreases range. If you tow a trailer, follow these general guidelines:

- Reduce your driving speed and avoid sudden maneuvers. Keep in mind that when towing a trailer, steering, stability, turning radius, stopping distances, and braking performance are different when compared to driving without a trailer.
- Increase your following distance by maintaining at least twice the typical distance from the vehicle ahead. This helps avoid situations that require heavy braking. Sudden braking may result in skidding or jack-knifing, and loss of control.
- Avoid sharp turns. Sharp turns can cause the trailer to contact Model S Model X and cause damage. Make wider turns to prevent the trailer from hitting curbs, road signs, trees, or other objects.
- Periodically check the trailer lights and turn signals to confirm that bulbs are still working (see [Trailer Light Test on page 787](#)). When towing a trailer, the turn signal arrows on the touchscreen flash as normal, even if the bulbs on the trailer are burnt out.
- Periodically confirm the cargo is secure.
- Periodically confirm the trailer brakes are working (see [Trailer Brakes on page 786](#)).
- Avoid parking on a grade (see [Parking with a Trailer on page 789](#)).
- Regularly confirm that all towing components are secured.

Before Towing a Trailer

Before towing a trailer, you must do the following:

1. Review all regulations and legal requirements in your state/region that apply to towing a trailer. Failure to comply with regulations can compromise your safety.
2. Inflate tires to the cold tire inflation pressure specified in [Tire Pressures when Towing on page 785](#).
3. Set the suspension height to match the trailer height. Tesla recommends **Low (Controls > Suspension > Low)**. You must choose a ball mount suitable for your towing needs. See [Ball Mount Specifications on page 790](#) for more information.
4. Adjust all mirrors to provide a clear rearward view without a significant blind spot.

NOTE: Use towing mirrors for larger trailers.

5. Confirm the trailer load is evenly distributed such that the trailer tongue weight is approximately 10% of the total trailer weight, without exceeding the maximum tongue weights provided in [Towing Capacity on page 785](#).
6. Engage Trailer Mode (see [Trailer Mode on page 786](#)).
7. Calibrate the trailer brakes (see [Trailer Brakes on page 786](#)).

Then, confirm the following:

1. Model S Model X rests horizontally with the trailer attached. If the vehicle is tipped up at the front, and down at the rear, check that you are not exceeding the maximum towing capacity and tongue weights provided in [Towing Capacity on page 785](#).
2. All trailer hitch parts and attachments, safety chains, and electrical connectors are in good condition and properly connected. If any problems are apparent, do not tow the trailer.
3. Trailer lights (brake lights, turn signal lights, marker lights, etc.) are working properly.
4. The trailer tongue is securely connected to the hitch ball.

5. Safety chains are properly connected between the trailer and the vehicle. Cross the safety chains under the tongue of the trailer to help prevent the tongue from contacting the road if it separates from the hitch. Leave enough slack in the safety chains to allow for turns and ensure that the chains can never drag on the ground.
6. Wheel chocks are available and easy to access.
7. All cargo is secured.

NOTE: For general information about trailer safety provided by the National Highway Traffic Safety Administration, go to <https://one.nhtsa.gov/cars/problems/equipment/towing/index.htm>.

 **WARNING:** The trailer tongue weight must be approximately 10% of the total trailer weight without exceeding the maximum tongue weights provided in [Towing Capacity on page 785](#). Loads that are balanced over the wheels or heavier in the rear can cause trailer sway, resulting in loss of vehicle control.

 **WARNING:** Always ensure that cargo is secured in the trailer and will not shift. Dynamic load shifts can cause loss of vehicle control, resulting in serious injury or death.

Towing Capacity

The total trailer weight (including all cargo and additional equipment), and the trailer tongue weight, must never exceed the following:

Wheel Size	Maximum Towing Capacity	Maximum Tongue Weight*
20" x 9J	11,000 lb (4,990 kg)	1,110 lb (499 kg)

*The tongue weight is the downward force that the weight of the trailer exerts on the hitch. **It must not exceed 10% of the maximum towing capacity.** Carrying a significant amount of equipment, passengers, or cargo in the tow vehicle can reduce the tongue weight it can handle, which also reduces the maximum towing capacity. Maximum towing capacity is calculated assuming the GVWR (Gross Vehicle Weight Rating) is not exceeded. For GVWR, see [Vehicle Loading on page 928](#).

 **CAUTION:** Tesla assumes no responsibility for damage or injuries resulting from towing a trailer, for any errors or omissions in the instructions accompanying towing equipment, or for your failure to follow the proper instructions. Damage caused by towing a trailer is not covered by the warranty.

 **WARNING:** Do not overload the vehicle or trailer. Doing so can cause poor performance, vehicle damage and loss of vehicle control, resulting in serious injury.

 **WARNING:** Do not use the trailer hitch to tow/transport Model S Model X.

 **WARNING:** Never operate a trailer with a negative tongue weight, where the trailer tongue pulls upward on the trailer hitch. Negative tongue weights can significantly increase the risk of trailer sway or loss of stability.

Tire Pressures when Towing

When towing a trailer, tire pressures must be adjusted to accommodate the additional load. Keep tires inflated to the pressures shown below (these pressures override the pressures that are provided on the Tire and Loading information label – see [Vehicle Loading on page 928](#)):

Tires	Cold Tire Inflation Pressure
20" All Season	50 psi
20" All Terrain	65 psi

 **WARNING:** Check tire pressures using an accurate pressure gauge when tires are cold (see [Tire Pressures on page 897](#)). Driving one mile (1.6 km) warms the tires sufficiently to affect tire pressures. Parking the vehicle in direct sunlight or in hot weather can also affect tire pressures. If you must check warm tires, expect increased pressures. Do not let air out of warm tires in an attempt to match recommended cold tire pressures. A hot tire at or below the recommended cold tire inflation pressure is dangerously under-inflated.

 **WARNING:** Never attempt to tow a trailer when a tire is faulty or has been inflated using a tire repair kit. A temporarily repaired tire is not designed to sustain the towing load. Towing using a faulty or temporarily repaired tire can result in tire failure and loss of vehicle stability.

Trailer Mode

Trailer Mode must always be active when towing a trailer. When you connect a trailer's electrical connection (see [Electrical Connections on page 790](#)), Model SModel X automatically engages Trailer Mode. Trailer Mode disengages when you disconnect the trailer's electrical connection. To engage or exit Trailer Mode manually, touch **Controls > Towing & Hauling > Trailer Mode** on the touchscreen. One of the following indicators displays on the touchscreen:

Trailer Mode is active.



Model SModel X detects a connection for trailer lights but Trailer Mode is disabled. It is likely that a carrying accessory has been connected.



Model SModel X detects a faulty electrical connection for the trailer lights. Some, or all, trailer lights may not be functioning. Pull over as soon as safety permits and inspect the trailer lights for faulty cabling or connections. If the issue is resolved and the red icon persists, manually turn Trailer Mode off and on again.



Some Autopilot features, and any feature that requires the use of the rear camera, may be unavailable when Trailer Mode is enabled. In addition, some features may operate differently. For example:

- Autosteer (if equipped) is unavailable. Therefore, for Traffic-Aware Cruise Control availability, touch **Controls > Autopilot > Autopilot Activation > Double Click**. This allows you to engage Traffic-Aware Cruise Control with a single click of the right scroll button on the steering wheelsteering yoke.
- Traffic-Aware Cruise Control increases the following distance from the car in front of you.
- The air suspension system will not make speed-based adjustments from **Medium** to **Low** and does not automatically raise ride height based on saved locations.
- Side collision warnings are active but automatic steering interventions are disabled.
- The braking force provided by Automatic Emergency Braking (see [Collision Avoidance Assist on page 340](#)) is significantly limited.

NOTE: Trailer brakes are only available when Trailer Mode is engaged.

 **WARNING:** Do not rely on Model SModel X to automatically detect a trailer in all cases. Always check that Trailer Mode is engaged before towing a trailer.

 **WARNING:** Remaining in Trailer Mode will help ensure Model SModel X remains stable in adverse conditions while towing. Do not exit Trailer Mode while towing a trailer. Exiting Trailer Mode could result in loss of vehicle stability.

Trailer Alarm



When enabled, Cybertruck sounds an alarm if the vehicle detects the trailer is being unplugged while **Trailer Mode** is active and the vehicle is locked.

Trailer Brakes

Model SModel X is equipped with a trailer brake controller which automatically applies the trailer brakes when you decelerate. To update your trailer brake preferences, navigate to **Controls > Towing & Hauling** where you can:

- Enable/disable [Trailer Mode on page 786](#).
- Customize [Trailer Brake Gain on page 787](#).

NOTE: Tesla recommends always enabling the trailer brakes, otherwise stopping distance may be increased. To disable the trailer brakes, first disable Trailer Mode or set the Trailer Brake Gain to 0.

- Choose how to manually apply the trailer brakes (either with the touchscreen or right scroll button). The trailer brake activation button is unaffected.
- Adjust [Trailer Brake Boost on page 787](#).
- Toggle [Adaptive Regenerative Braking on page 787](#).
- Perform the [Trailer Light Test on page 787](#).

You can also set up a shortcut for **Towing & Hauling** by adding it to your vehicle "Cards" area, near the bottom of the touchscreen.

Trailer Brake Gain

The Trailer Brake Gain slider is a scale between 0 and 10 that calibrates the degree of trailer braking applied when you press the brake pedal normally. 0 applies no trailer brakes, whereas 10 applies the full trailer brakes.

Set this up each time you connect a trailer to ensure your trailer brakes do not lock up:

1. Ensure the trailer is securely attached to the Model S/Model X hitch assembly.
2. Drive Model S/Model X in a safe, open area at low speeds (10–15mph or 15–25 km/h).
3. Use the right scroll button on the steering wheel/steering yoke or Trailer Brake Activation (set your preference in **Towing & Hauling**) to apply the trailer brakes while moving. Adjust the Trailer Brake Gain as needed to ensure the trailer brakes do not lock up when they are applied. If the wheels do lock up, decrease the amount of gain slightly and repeat this process.

The ideal Trailer Brake Gain varies depending on your trailer load, number of axles, and surface conditions. You must adjust as needed while conditions change.

Trailer Brake Boost

Tesla recommends initially setting your Trailer Brake Boost to **Low**. Once Trailer Brake Gain is calibrated, adjust based on your preferences by driving around in a safe, open area and applying the brakes as you would in normal traffic. Increasing will make your brakes react more quickly, although the braking feels more harsh to passengers.

Adaptive Regenerative Braking

At the start of every drive, Model S/Model X estimates the load to determine the proper level of regenerative braking. Regenerative braking will start at the standard level and increase as the vehicle learns your trailer/cargo weight.

NOTE: Weight estimation works best when driving in a straight line on a flat, smooth surface.

-  **WARNING:** It is your responsibility to determine when to enable Adaptive Regenerative Braking. Always drive safely and avoid situations that could require heavy braking.
-  **WARNING:** Towing increases your stopping distance. When towing, increase your following distance and avoid situations that could potentially cause heavy braking. Failure to do so can result in a collision.
-  **WARNING:** Observe all regulations and legal requirements in your regional and national jurisdictions that apply specifically to trailer towing and brake requirements. Many regions require a breakaway switch, located on the tongue of the trailer, to activate the trailer brakes if the trailer separates from the vehicle. Failure to comply with regulations can compromise your safety.

Trailer Light Test

Before towing, and periodically during towing, use **Trailer Light Test** to confirm the trailer lights are working as expected.

-  **WARNING:** Do not tow a trailer if the trailer lights or trailer brakes are not working properly.

Trailer Brake Controller Limitations

⚠ WARNING: It is your responsibility to understand your towing needs, proper towing procedures, trailer brakes (such as their use and limitations), and the risks and limitations of towing. Do not tow with Model SModel X if you do not have towing knowledge and experience; doing so may result in damage, injury or death. Damage as a result of improper towing is not covered by the warranty.

Keep in mind the following brake controller limitations:

- Properly maintain and use trailer brakes as intended to prevent damage.
- The trailer brake controller and auxiliary output is 12V.
- Abusive or extensively long manual activations of the trailer brake controller may cause overheating with some trailer brake loads.
- Maximum power draw - The onboard trailer controller is designed to support most trailer power applications. The power allocations are:

Standard trailer brakes (when braking power is derived from brake output, e.g. non-EOH Electric Drum brakes)	Lights: Max. 220 Watts total for all light outputs combined.
	Auxiliary power (AUX 12V+ Charging): Max. 270 Watts (20 Amps).
	Trailer brakes: Max. 331 Watts
Electric over Hydraulic trailer brakes (braking power is derived from auxiliary power output, e.g. EOH, Hydraulic disk brakes, see Electric Over Hydraulic (EOH) Brakes on page 788)	Lights: Max. 220 Watts total for all light outputs combined.
	Auxiliary power (AUX 12V+ Charging): Max. 405 Watts (30 Amps).
	Trailer brakes: Max. 48 Watts (Current draw must be less than 3 Amps).
Model SModel X switches to the standard brakes if a 3A or higher load on the trailer brake connections is detected.	

Electric Over Hydraulic (EOH) Brakes

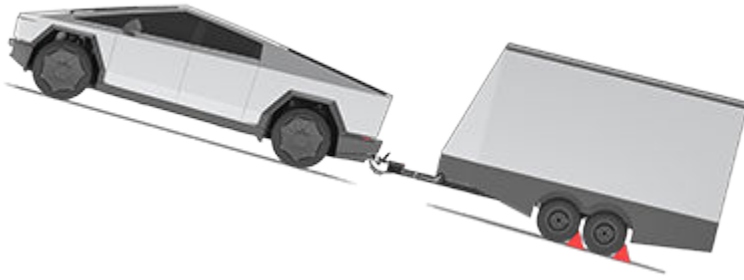
Model SModel X supports standard electric brakes and Electric over Hydraulic (EOH) brakes. If using EOH brakes, Tesla recommends connecting a battery in parallel with the auxiliary power output to the EOH unit.

The auxiliary output is capable of supplying up to 30 Amps when supporting an EOH trailer brake unit. You are responsible for understanding the power needs of your EOH trailer brake unit. Using an EOH trailer brake controller that draws more than 30 Amps may result in a loss of power to the trailer brakes while braking.

The usage of only an EOH unit with the auxiliary power port is supported for maximum braking availability. A battery in parallel is recommended. The battery must be in good health and is expected to already be present in most states per DOT regulations.

⚠ CAUTION: Tesla does not recommend using EOH trailer brakes simultaneously with other auxiliary power loads. Doing so could lead to complications or loss of power to the EOH trailer brakes unit.

Parking with a Trailer



Whenever possible, avoid parking on a grade. However, if parking on a grade is absolutely necessary, place wheel chocks under the trailer wheels:

1. One person presses and holds the brake pedal.
2. A second person places the wheel chocks under the wheels on the downgrade side of the trailer's tires.
3. When the chocks are in place, slowly release the brake pedal and ensure the chocks hold the weight of the vehicle and trailer.

NOTE: When testing chocks, ensure that Vehicle Hold (see [Vehicle Hold on page 764](#)) is engaged. If Vehicle Hold is braking Model S Model X, the associated indicator light appears on the touchscreen. To disengage Vehicle Hold, press and release the brake pedal.

4. Place the vehicle in Park.



WARNING: If parking on a grade is necessary, ensure that all trailer wheels have been securely chocked. Failure to do so can result in serious damage, injury, or death.

Trailer Sway Mitigation

When trailer sway is detected, your vehicle's electronic stability control system attempts to apply the appropriate amount of braking to minimize trailer sway. The touchscreen briefly displays the traction control system indicator. Manually applying the brakes (via right scroll button on the steering wheelsteering yoke or the Trailer Brake setting) when the system is actively braking to mitigate trailer sway does not cancel this automatic braking. However, it is still your responsibility to drive carefully and brake when needed, taking into consideration possible trailer sway.

Accessing the Trailer Hitch Assembly

The Model S Model X trailer hitch assembly is located behind the rear fascia of the vehicle, under the tailgate. Your vehicle is not equipped with a ball mount, which must be purchased separately based on your towing needs.



The trailer hitch cover is attached to the body of the vehicle with three turn clips. Use a flat trim tool or non-marring screwdriver to partially turn and unlock the clips, then remove the trailer hitch cover and place it in a secure, dry place. Once removed, you can see where the ball mount can be installed.



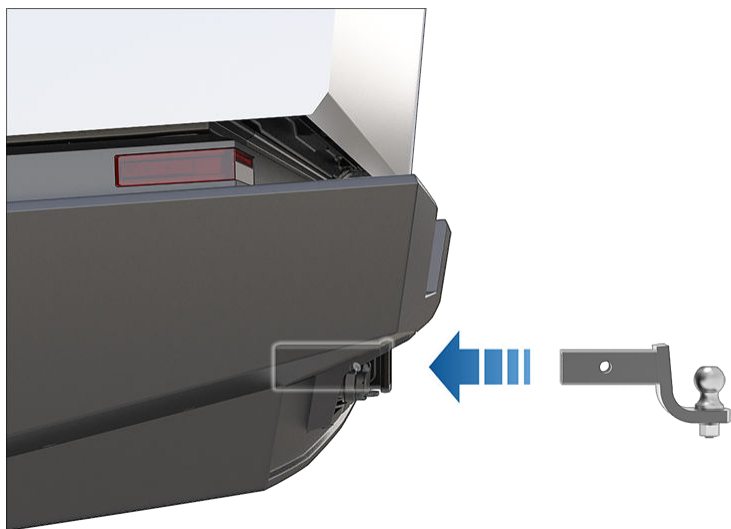
When not actively towing, keep the cover installed to prevent dirt and debris from entering.

NOTE: The maximum permissible rear overhang for the coupling point is 49 in (1.25 m), measuring from the center of the rear tire toward the hitch receiver.

NOTE: Always attach safety chains when towing. See your vehicle Owner's Manual for more information.

Ball Mount Specifications

A ball mount must be purchased separately based on your towing needs. The Cybertruck hitch receiver supports a 2 in (5 cm) ball mount. Follow the ball mount manufacturer's instructions for more information.



NOTE: Refer to the manufacturer's instructions to properly maintain the ball mount.

Electrical Connections

Model SModel X is equipped with a combination electrical outlet, located near the hitch assembly, that supports two types of commonly-used trailer plugs without needing an adapter:

- **7-PIN - SAE J2863** - for heavier trailer loads requiring their own braking system.
- **4-PIN - SAE J1239** - for light trailer loads requiring lights only.



Regulations require that all trailers, at a minimum, are equipped with taillights and turn signals. These are provided on the 4-pin connector, which is adequate when pulling a light load. For heavier loads, the trailer must also be equipped with brakes, available on the 7-pin connector.

Plugging a trailer's wiring into either electrical outlet automatically engages Trailer Mode (see [Trailer Mode on page 786](#)).

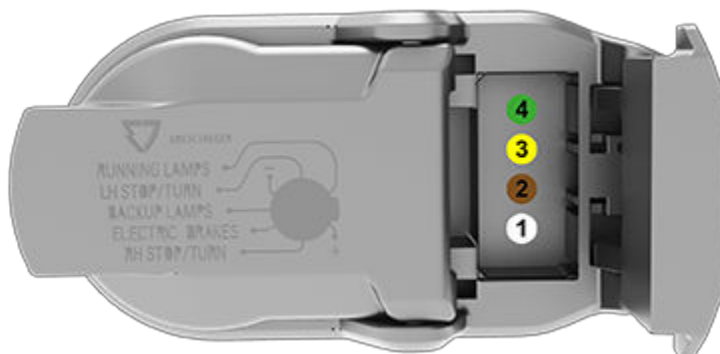
NOTE: Use one outlet only according to your trailering needs. The covers prevent you from opening both outlets simultaneously.

7-PIN Connector



1. Left Turn/Stop Light (Yellow)
2. "-" Ground (White)
3. Trailer Brake Output (Blue)
4. Right Turn/Stop Light (Green)
5. +12V Auxiliary Power (Orange)
6. Running (or Side Marker) Lights (Brown)
7. Reverse Lights (Gray)

4-PIN Connector



1. Ground (White)
2. Tail and License Plate lights (Brown)
3. Left Turn/Stop Light (Yellow)
4. Right Turn/Stop Light (Green)

Loss of trailer lights when towing may be the result of a fault in the trailer wiring or excessive power consumption by the lights connected to the trailer output(s). When this occurs, the touchscreen displays a red Trailer Mode icon. Fix any issues with the wiring and/or reduce the number of lights connected to the trailer output(s), then turn Trailer Mode off and on to try again.

-  **CAUTION:** Always ensure that the trailer's electrical cable does not contact or drag on the ground and there is enough slack in the cable to allow for turns.
-  **WARNING:** Before towing, it is the driver's responsibility to ensure that all electrical connections are working, all trailer lights are operating as expected, and the braking system is fully functioning. Model S Model X does not detect faulty electrical connections. You must perform manual checks. Failure to do so can result in property damage, personal injury, or death.
-  **WARNING:** Use only the electrical connection designed by Tesla. Do not attempt to directly splice or attempt to connect trailer electrical wiring using any other method. Doing so can damage the vehicle electrical system and cause malfunctions.

Impact on Range

Towing a trailer and carrying accessories increases vehicle weight and drag. As a result, driving range can decrease significantly. Although Trip Planner attempts to adjust estimates based on Trailer Mode, actual energy consumption may vary. Plan trip length and charging destinations accordingly.

Carrying Accessories and Crossbars

-  **WARNING:** Tesla assumes no responsibility for damage or injuries resulting from installing and using a carrier or crossbars, for any omissions in the instructions accompanying a carrier or crossbar, or for your failure to follow the instructions. Damage caused by using a carrier or crossbars is not covered by the warranty.

Carrying Accessories

-  **CAUTION:** The hitch assembly is designed to support vertical loads up to 160 lb (72 kg). Exceeding this maximum weight can cause damage.

The hitch receiver is designed to support vertical loads up to 160 lb (72 kg). When carrying bicycles, skis, or other items on the Cybertruck's hitch, always check to ensure that the maximum weight is not exceeded. When the carrier weighs 40 lbs (18 kg), the weight threshold is sufficient for carrying two bicycles weighing approximately 60 lb (27 kg) each, or four items weighing approximately 30 lbs (14 kg) each.

-  **CAUTION:** An accessory carrier attached to the rear of Model S Model X may obscure your view from the rear view mirror and the rear camera.

Follow the instructions provided with your accessory carrier to install onto Model S Model X. Observe all regulations and legal requirements in your state/region that apply to carrying accessories.

Model S Model X includes the wiring necessary for using an accessory carrier equipped with lights (see [Electrical Connections on page 790](#)). Model S Model X also includes Trailer Mode software (see [Trailer Mode on page 786](#)).



When you connect an accessory carrier's wiring harness, Model S Model X detects a connection for trailer lights and displays this indicator on the touchscreen to indicate that Trailer Mode is disabled.

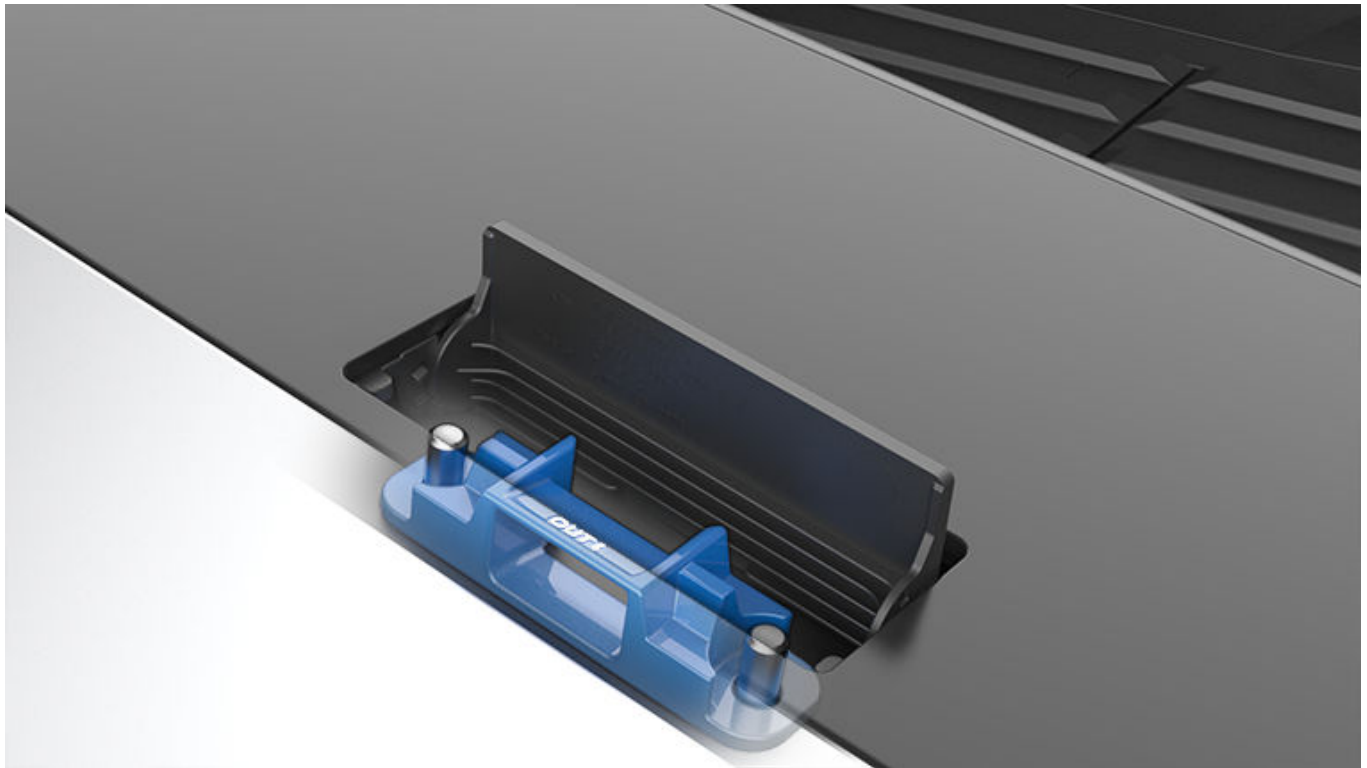
When carrying accessories, periodically confirm that the accessory carrier and its cargo remain secure at all times, and if applicable, that the lights on the accessory carrier are working.

Installing Brackets onto the Appliques

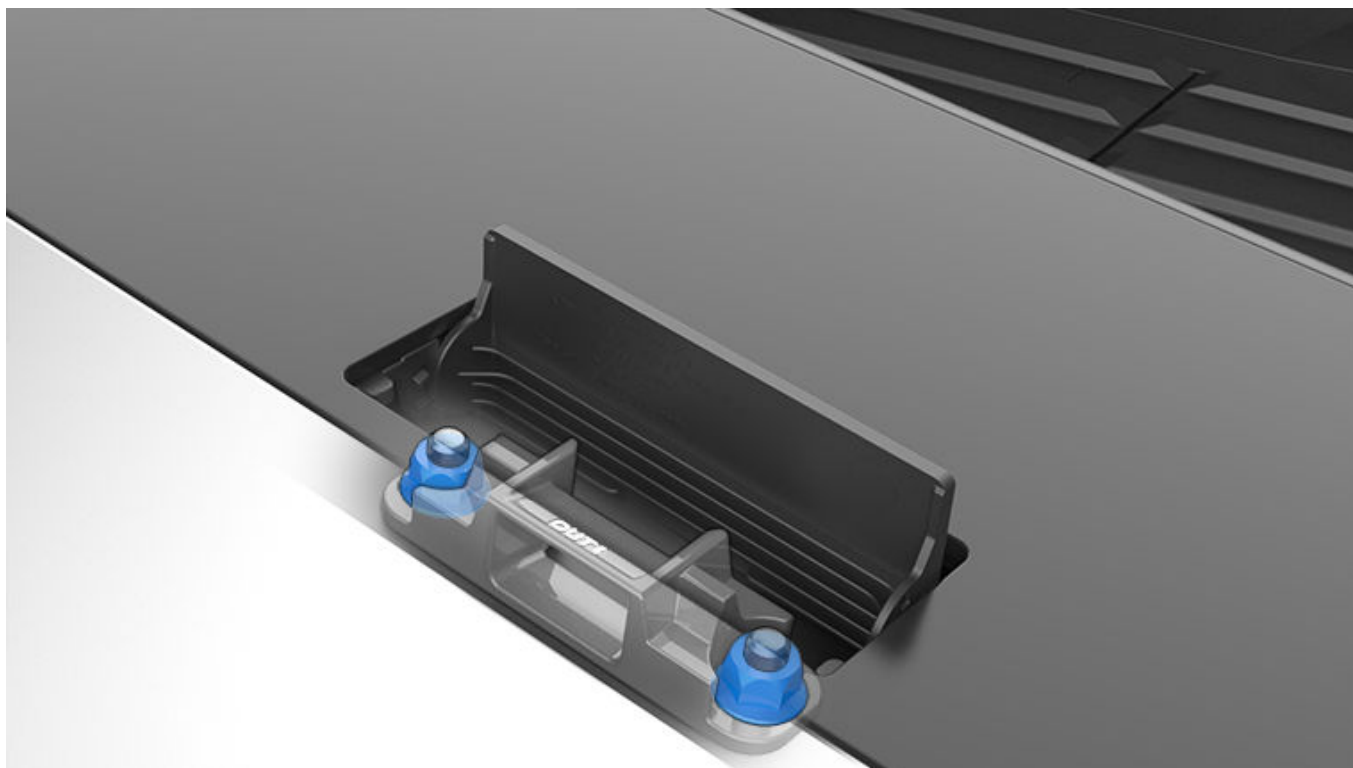
1. Open all 8 applique doors.



2. Use the provided torque wrench to loosen and remove the nuts that are fastened to the threaded studs located within the applique doors.
3. Install a bracket by positioning the bracket so that the raised arrow on it is directed outward, away from the vehicle. Align it with the threaded studs and set it in place.



4. Use the nuts that were removed in step 2 and tighten them back onto the threaded studs with the provided torque wrench.



5. Repeat steps 2-4 for the remaining applique doors.

NOTE: After installing the brackets once, you can leave them installed for future use, unless you want to move the crossbars to different locations on the vehicle.

Installing Crossbars

NOTE: Installing the crossbars requires two people.



CAUTION: Crossbars must be installed in tandem. Failure to do so may cause damage.



CAUTION: It is your responsibility to ensure your accessories are secured to the crossbars. Periodically check to ensure your accessories have not moved or loosened throughout your driving. See the in-box instructions that come with the crossbars for more information.



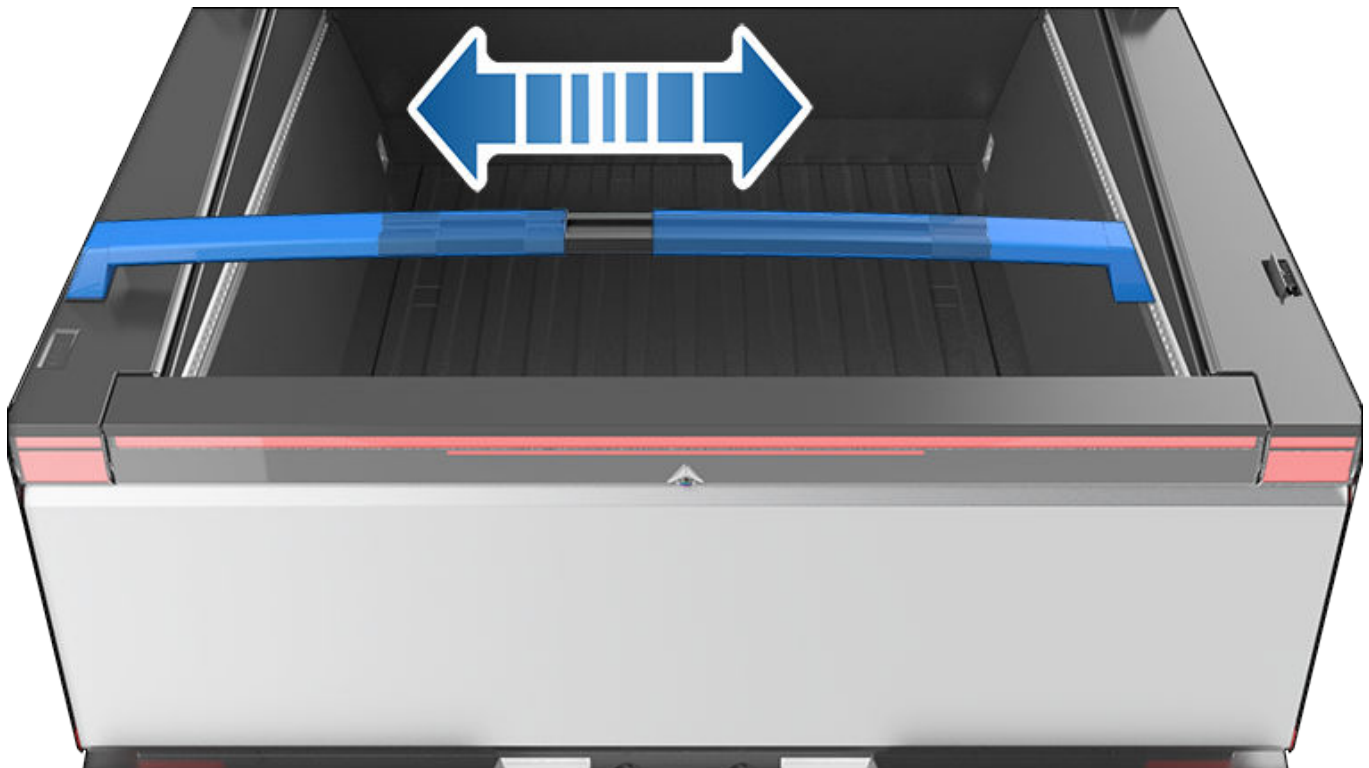
CAUTION: If installing a crossbar on the front-most applique doors, make sure that the power feed harness on the passenger side applique is not pinched during installation. If necessary, use a trim tool to release the applique and maneuver the harness away from the studs.

To install the crossbars:

1. Locate the FRONT arrow embossed on the bottom of the crossbar. The arrow should point toward the front of the vehicle.



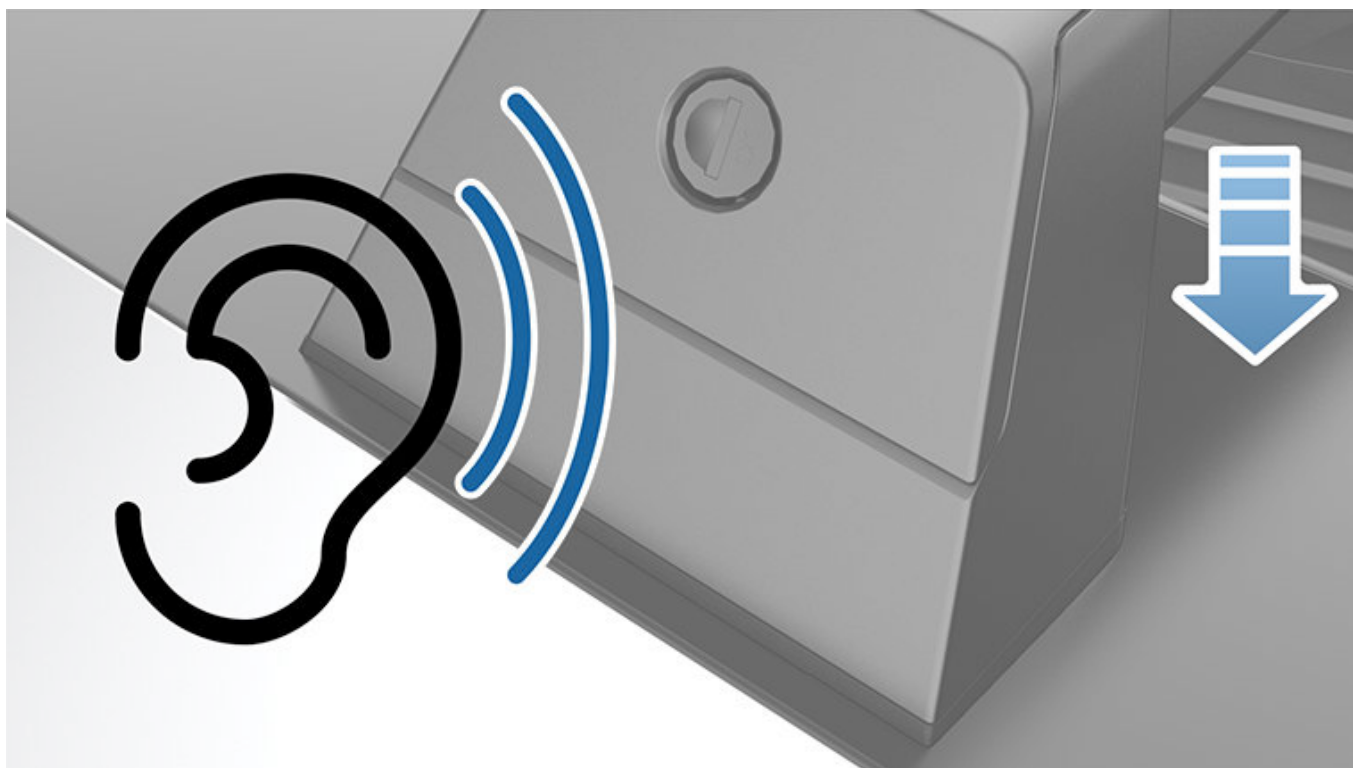
2. Lower one tower (edge of the crossbar) onto the bracket and extend the crossbar so that the other tower aligns with the bracket on the opposite side.



3. Use the key to open the tower doors. Push down to seat both towers.



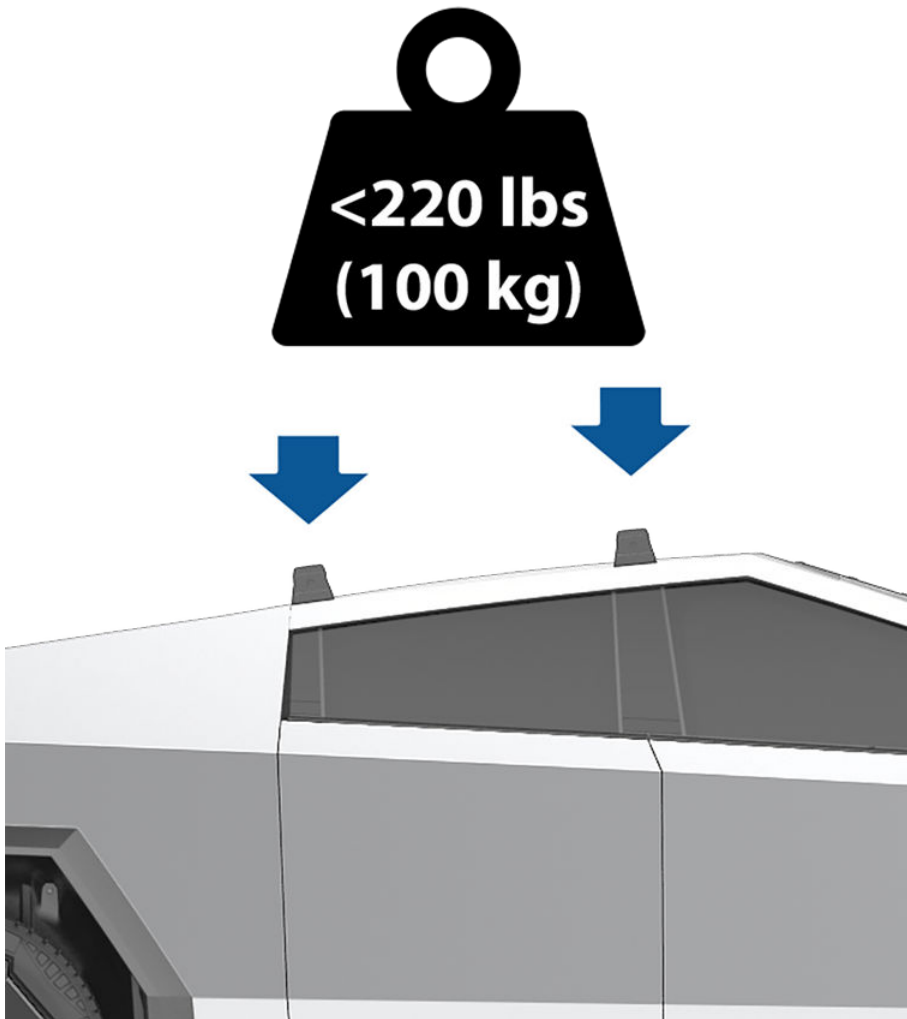
4. Once the towers are completely seated, close the tower doors securely using the key. You will hear and feel a “click” when the tower door is closed completely. If there is resistance to closing or if the door physically cannot be closed, the tower door is not seated properly. Turn the key to open the door, re-position, and use the key to close to door again.



5. Repeat this on the other side of the crossbar.
6. Repeat steps 1-5 to install your second crossbar directly in front of or behind the first one.
7. To test the secure installation of the crossbars, push and pull them in all directions. If any movement is observed at any of the four towers, re-seat the affected crossbars, then retest the installation.

NOTE: Keep the key in a dry, safe area for future use.

Weight limits



The crossbars are capable of supporting up to 220 lbs per crossbar set. See the in-box instructions that come with the crossbars for more information.

About Autopilot

Autopilot is a suite of advanced driver assistance features that are intended to make driving safer and less stressful. None of these features make Model S/Model X fully autonomous or replace you as the driver. Autopilot features come standard with all new Tesla vehicles.

Basic Autopilot includes Traffic-Aware Cruise Control and Autosteer.

- **Traffic-Aware Cruise Control:** Maintains your speed and an adjustable following distance from the vehicle in front of you, if there is one (see [Traffic-Aware Cruise Control on page 802](#)[Traffic-Aware Cruise Control on page 299](#)).
- **Autosteer:** Maintains your speed and distance from a leading vehicle while also intelligently keeping Model S/Model X in its lane (see [Autosteer on page 802](#)[Autosteer on page 310](#)).

 **WARNING:** Basic Autopilot is a hands-on feature. Keep your hands on the steering wheel/steering yoke at all times and be mindful of road conditions, surrounding traffic, and other road users (such as pedestrians and cyclists). Always be prepared to take immediate action. Failure to follow these instructions could cause damage, serious injury, or death.

Enhanced Autopilot includes additional features. Enhanced Autopilot Features are designed to further reduce driver workload and make common actions, such as changing lanes or parking, easier.

- **Auto Lane Change:** Moves Model S/Model X into an adjacent lane when you engage the turn signal and Autosteer is active (see [Auto Lane Change on page 804](#)[Auto Lane Change on page 313](#)).
- **Navigate on Autopilot:** Actively guides Model S/Model X from a highway's on-ramp to off-ramp, including performing lane changes, navigating interchanges, automatically engaging the turn signal, and taking the correct exit (see [Navigate on Autopilot on page 805](#)[Navigate on Autopilot on page 316](#)).
- **Autopark:** Parks Model S/Model X, either parallel or perpendicularly (see [#unique_1348 on page Autopark on page 327](#)).
- **Summon:** Moves Model S/Model X forward or backward, even while you're outside the vehicle. This is useful for parking in tight parking spots (see [#unique_1349 on page Summon on page 330](#)).
- **Smart Summon:** Moves Model S/Model X out of a parking space and through more complex environments, maneuvering around obstacles and other vehicles, to meet you or go to a predetermined target (see [#unique_1350 on page Smart Summon on page 333](#)).

 **WARNING:** Enhanced Autopilot is a hands-on feature. Keep your hands on the steering wheel at all times and be mindful of road conditions, surrounding traffic, and other road users (such as pedestrians and cyclists). Always be prepared to take immediate action. Failure to follow these instructions could cause damage, serious injury or death.

Full Self-Driving Capability includes:

- **Traffic Light & Stop Sign Control:** Maintains your speed, keeps a following distance, and keeps Model S/Model X in its lane while also slowing down and stopping for traffic lights and stop signs (see [Traffic Light and Stop Sign Control on page 320](#)).
- **Autosteer on City Streets (Full Self-Driving (Supervised)):** Attempts to drive to your destination by following curves in the road; stopping at and negotiating intersections, stop signs, and roundabouts; making left and right turns; and entering/exiting highways (see [#unique_1351 on page Full Self-Driving \(Supervised\) on page 293](#)).

 **WARNING:** Full Self-Driving Capability is a hands-on feature. Keep your hands on the steering wheel at all times and be mindful of road conditions, surrounding traffic, and other road users (such as pedestrians and cyclists). Pay attention to the road at all times and always be prepared to take immediate action. Failure to follow these instructions could cause damage, serious injury or death.

Autopilot uses the cameras on Model S/Model X, which monitor the surrounding area and detect other vehicles, pedestrians, road markings, and obstacles such as barriers and curbs. There are cameras mounted on the front, rear, left, and right sides of Model S/Model X (see [Cameras on page](#)).

Model S/Model X may also be equipped with a cabin camera, mounted in the rear-view mirror, that monitors driver attentiveness. It is your responsibility to keep your hands on the wheel, pay attention to the road, and be ready to take immediate action at any time.

When Autopilot is engaged, Model SModel X shows a series of escalating warnings reminding you to keep your hands on the wheel and pay attention to the road. If there is no response, Autopilot disengages and is unavailable for the remainder of the drive.



WARNING: Autopilot is designed for your driving comfort and convenience and is not a collision warning or avoidance system. It is your responsibility to stay alert, drive safely, and be in control of the vehicle at all times. Never depend on Autopilot to adequately slow down Model SModel X. Always watch the road in front of you and be prepared to take corrective action at all times. Failure to do so can result in serious injury or death.

It is your responsibility to familiarize yourself with the limitations of Autopilot and be ready to take control at all times. For more limitations, cautions, and warnings, see [Limitations and Warnings on page 820](#).

Autopilot Conditions

Ensure all cameras are clean and free of obstructions before each drive and before using Autopilot features (see [Cleaning a Camera on page 446](#)). Dirty cameras and sensors (if equipped), as well as environmental conditions such as rain and faded lane markings, can affect Autopilot performance. If a camera is obstructed or blinded, Model SModel X displays a message on the instrument cluster and Autopilot features may not be available. For more information on specific alerts, see [Troubleshooting Alerts on page 543](#)[Troubleshooting Alerts on page 576](#).

Before you can use Autopilot features, and after some Service visits, you must drive a short distance to calibrate cameras. For more information, see [#unique_484 on page .](#)

In addition, these features may not work as intended when:

- The road has sharp curves or significant changes in elevation.
- Road signs and signals are unclear, ambiguous, or poorly maintained.
- Visibility is poor (due to heavy rain, snow, hail, etc. or poorly lit roadways at night)
- You are driving in a tunnel or next to a highway divider that interferes with the view of the camera(s)
- Bright light (such as from oncoming headlights or direct sunlight) interferes with the view of the camera(s).

The list above does not represent an exhaustive list of situations that may interfere with proper operation of Autopilot features. For more information, see [Limitations and Warnings on page 820](#).

Autopilot Feature	Available When
Traffic-Aware Cruise Control	• You are driving between 18 mph (30 km/h) and 90 mph (150 km/h)85 mph (140 km/h) NOTE: You can activate Traffic-Aware Cruise Control at lower speeds if there is a vehicle detected at least 5 feet (1.5 meters) ahead of Model SModel X.
Autosteer	• You are driving between 18 mph (30 km/h) and 90 mph (150 km/h)85 mph (140 km/h) NOTE: You can activate Autosteer at lower speeds if there is a vehicle detected at least 5 feet (1.5 meters) ahead of Model SModel X. NOTE: On a residential road, a road without a center divider, or a road that is not controlled access, the maximum allowed cruising speed is limited and the instrument panel displays a message. The restricted speed will be the speed limit of the road plus 5 mph (10 km/h). • Headlights are set to On or Auto. Although Autopilot is available both during the day and in low light conditions (dusk or dark), Autosteer aborts or is unavailable if headlights are set to Off. When Autosteer is engaged, Auto High Beam is automatically enabled (see High Beam Headlights on page 205High Beam Headlights on page 207) and wipers are set to Auto.
Navigate on Autopilot	• You are driving between 18 mph (30 km/h) and 90 mph (150 km/h)85 mph (140 km/h). NOTE: You can activate Navigate on Autopilot at lower speeds if there is a vehicle detected at least 5 feet (1.5 meters) ahead of Model SModel X. • You are driving on a controlled-access highway. When you leave a controlled-access highway, Navigate on Autopilot reverts to Autosteer.
Full Self-Driving (Supervised)	• You are driving less than 85 mph (150 km/h).

Autopilot Feature	Available When
	NOTE: You can activate Full Self-Driving (Supervised) at lower speeds, including when Model SModel X is at a standstill, whether or not there is a vehicle detected in front of Model SModel X. Headlights are set to On or Auto. Although Full Self-Driving (Supervised) is available both during the day and in low light conditions (dusk or dark), it aborts or is unavailable if headlights are set to Off. When Full Self-Driving (Supervised) is engaged, Auto High Beam is automatically enabled (see High Beam Headlights on page 205) and wipers are set to Auto.

Autopilot Features

This topic describes how to enable and use the following driver assistance features.

- **Traffic-Aware Cruise Control:** Like traditional cruise control, Traffic-Aware Cruise Control maintains a set driving speed. However, Traffic-Aware Cruise Control also slows down or accelerates Model SModel X as needed to maintain the following distance from the vehicle in front of you. While Traffic-Aware Cruise Control is engaged, you are still responsible for steering Model SModel X (see [Traffic-Aware Cruise Control on page 802](#)).
- **Autosteer:** Like Traffic-Aware Cruise Control, Autosteer maintains a set speed (if there is not a vehicle in front of you) or a set following distance (if there is a vehicle in front of you). In addition, Autosteer detects lane markings, road edges, and the presence of vehicles and objects to intelligently keep Model SModel X in its driving lane (see [Autosteer on page 802](#)).

NOTE: Autosteer is a BETA feature.

- **Auto Lane Change:** When you engage a turn signal while Autosteer is active, Auto Lane Change moves Model SModel X into the adjacent lane in the direction indicated by the turn signal (see [Auto Lane Change on page 804](#)).
- **Navigate on Autopilot:** Navigate on Autopilot builds on the features of Traffic-Aware Cruise Control and Autosteer. While Autosteer is active, Navigate on Autopilot allows Model SModel X to suggest and, if configured, automatically change lanes to pass other vehicles and follow the navigation route (see [Navigate on Autopilot on page 805](#)).

NOTE: Navigate on Autopilot is a BETA feature.

Traffic-Aware Cruise Control and Autosteer use information from the cameras on Model SModel X to detect lane markings, road edges, and other vehicles and road users around Model SModel X.

 **CAUTION:** Ensure all cameras are clean and free of obstructions before each drive and before using Autopilot features (see [Cleaning a Camera on page 446](#)). Dirty cameras and sensors (if equipped), as well as environmental conditions such as rain and faded lane markings, can affect Autopilot performance. If a camera is obstructed or blinded, Model SModel X displays a message on the instrument cluster and Autopilot features may not be available. For more information on specific alerts, see [Troubleshooting Alerts on page 543](#)[Troubleshooting Alerts on page 576](#).

 **CAUTION:** It is your responsibility to familiarize yourself with the limitations of Autopilot and the situations in which driver intervention may be needed. For more information, see [Limitations and Warnings on page 820](#).

Autopilot Settings

Before you use Autopilot features, customize how they work by touching **Controls > Autopilot**.

- **Set Speed:** Choose whether Autopilot engages at the currently detected speed limit or your current driving speed. Touch **Controls > Autopilot > Set Speed** and choose either **Speed Limit** or **Current Speed**.
- **Offset:** If you choose **Speed Limit**, you can specify an offset by touching **Set Speed Offset**. You can choose **Fixed** (the cruising speed adjusts by a specific amount on all roads) or **Percentage** (the cruising speed is adjusted as a percentage of the road's detected speed limit).
- **Autopilot Activation:** Choose how to activate Autosteer. If set to **Single Click**, both Traffic-Aware Cruise Control and Autosteer engage when you single-press the right scroll wheel. If set to **Double Click**, you must double-press the right scroll wheel to engage Autosteer.

NOTE: **Autopilot Activation** must be set to **Double Click** if you want to use Traffic-Aware Cruise Control independently of Autosteer.

- **Green Traffic Light Chime:** In Canada and U.S.: If on, a chime will sound when you are waiting at a red traffic light and the light turns green. If you are not actively using Traffic-Aware Cruise Control and are waiting at a red light with a car in front of you, the chime sounds when the car ahead of you advances.

Traffic-Aware Cruise Control

Traffic-Aware Cruise Control is always enabled.

40
MAX

When Traffic-Aware Cruise Control is available but not engaged, the instrument cluster displays the cruising speed in gray. The number shown represents the speed that will be set when you engage Traffic-Aware Cruise Control.

40
MAX

When Traffic-Aware Cruise Control is actively cruising at a set speed, the speed is highlighted with blue text.

To engage Traffic-Aware Cruise Control, press the right scroll wheel, then release the accelerator pedal to allow Traffic-Aware Cruise Control to maintain the cruising speed. You can apply the accelerator at any time to temporarily override the set cruising speed.

NOTE: If **Autopilot Activation** is set to **Single Click**, pressing the right scroll wheel once also activates Autosteer (which includes Traffic-Aware Cruise Control). Touch **Controls > Autopilot > Autopilot Activation** and choose **Double Click** to use Traffic-Aware Cruise Control independently of Autosteer when you single-press the right scroll wheel.

If you want a chime to sound when you engage or cancel Traffic-Aware Cruise Control, touch **Controls > Autopilot > Traffic-Aware Cruise Control Chime**.

 **WARNING:** Traffic-Aware Cruise Control is designed for your driving comfort and convenience and is not a collision warning or avoidance system. It is your responsibility to stay alert, drive safely, and be in control of the vehicle at all times. Never depend on Traffic-Aware Cruise Control to adequately slow down Model SModel X. Always watch the road in front of you and be prepared to take corrective action at all times. Failure to do so can result in serious injury or death. For more information, see [Limitations and Warnings on page 820](#).

Autosteer

To enable Autosteer:

1. Touch **Controls > Autopilot > Autopilot Features > Autosteer (Beta)**.
2. After carefully reading and understanding the popup window, touch **Yes**.



To indicate that Autosteer is available (but not actively steering Model SModel X), the instrument panel displays a gray Autosteer icon. In situations where Autosteer is temporarily unavailable, the Autosteer icon disappears. (For example, if your driving speed is not within the speed required for Autosteer to operate.)

To initiate Autosteer, press the right scroll wheel.

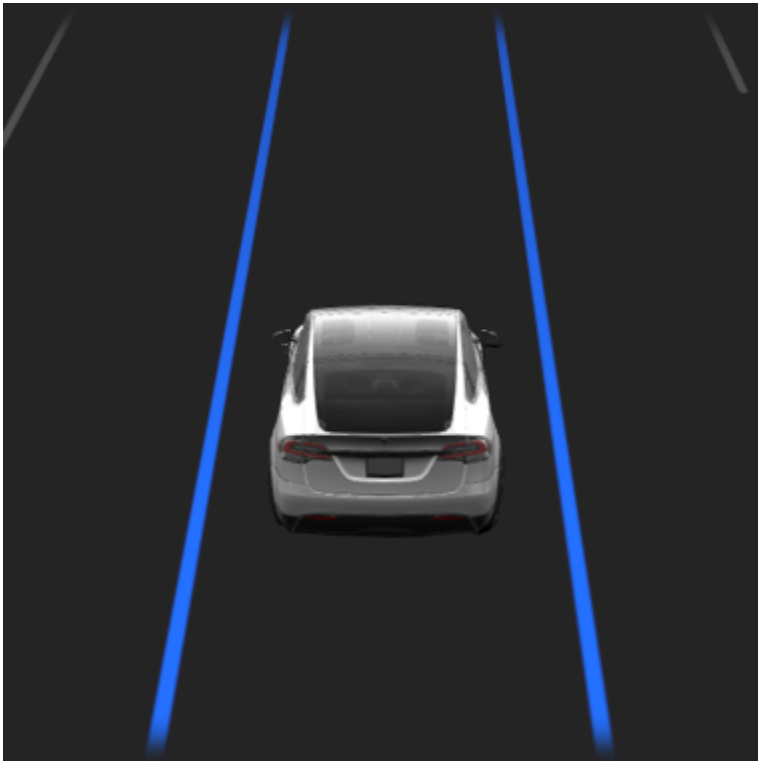
NOTE: If the setting for **Autopilot Activation** is set to **Double Click**, you must double-press the right scroll wheel to engage Autosteer (see [Autopilot Settings on page 801](#)).

Autosteer confirms activation with an audible chime and briefly displays a message on the instrument cluster reminding you to pay attention to the road and be ready to take over at any time.



To indicate that Autosteer is now active, the instrument cluster displays the Autosteer icon in blue.

When Autosteer is able to detect lane markings, it displays the edges of the driving lane in blue on the instrument cluster.



Whenever Autosteer is active, Traffic-Aware Cruise Control is active as well.

In situations where the speed limit cannot be detected when Autosteer is engaged, Autosteer reduces your driving speed and limits the set cruising speed to 45 mph (70 km/h). Although you can manually accelerate to exceed the limited speed, Model S/Model X will not brake for detected obstacles as long as you are applying the accelerator pedal. Autosteer slows down to the limited speed when you release the accelerator pedal. When you leave the road or disengage Autosteer by using the steering wheel/steering yoke, you can increase your set speed again, if desired.



- WARNING:** Steering is limited when Autosteer is enabled. Therefore, Model S/Model X may not be able to handle tight turns. Be prepared to take control of the vehicle at all times.
- WARNING:** Autosteer is a hands-on assistance feature. Keep your hands on the steering wheel/steering yoke at all times, be mindful of road conditions and surrounding traffic, and always be prepared to take immediate action. Failure to follow these instructions could cause damage, serious injury or death. It is your responsibility to familiarize yourself with the limitations of Autosteer and the situations in which it may not work as expected. For more information, see [Limitations and Warnings](#) on page 820.

Auto Lane Change

If you engage a turn signal while Autosteer is active, Model S/Model X moves into the adjacent lane in the direction indicated by the turn signal, provided the following conditions are met:

- The turn signal is engaged.
- Lane markings indicate that a lane change is permitted.
- Midway through the lane change, Model S/Model X must detect the target lane's outside lane marking. If this lane marking is not detected, the lane change is aborted and Model S/Model X returns to its original driving lane.
- The view of the camera(s) is not obstructed.
- Model S/Model X does not detect a vehicle in its blind spot, or a vehicle or obstacle up to the center of the target lane. If a vehicle or other obstacle is detected in the target lane, it is shown in red in the visualization on the instrument cluster and Model S/Model X does not complete the lane change until it is safe to do so.





NOTE: Auto Lane Change cancels if the lane change cannot be completed in 5 seconds.

 **WARNING:** Although Autopilot is designed to detect vehicles and obstacles in adjacent lanes, it is your responsibility to always perform visual checks to make sure it is safe and appropriate to move into the target lane. If Autopilot cannot change lanes due to inadequate data, the instrument cluster displays a series of warnings. Therefore, when using Auto Lane Change, always pay attention to the instrument cluster and be prepared to manually steer Model S/Model X.

The minimum speed at which Autopilot changes lanes may vary depending on region, adjacent lane speeds, and other factors. Always be ready to manually steer and change lanes as necessary. When an automatic lane change is in progress, Overtake Acceleration is activated, allowing Model S/Model X to accelerate closer to a vehicle in front (see [Overtake Acceleration on page 811](#)).

When you engage a turn signal, Autopilot moves Model S/Model X one lane at a time. Moving into an additional lane requires you to engage the turn signal a second time after the first lane change is complete.

As Model S/Model X changes lanes, it is important to monitor its performance by watching the driving path in front of you and the surrounding area. Stay prepared to take over steering at any time. As you are crossing over into the adjacent lane, the instrument cluster displays the location in the lane that Model S/Model X is moving into.



Navigate on Autopilot

To enable Navigate on Autopilot, touch **Controls > Autopilot > Navigate on Autopilot (Beta)**. Then, to customize how you want Navigate on Autopilot to operate, touch **Customize Navigate on Autopilot**:

- **Enable at Start of Every Trip:** Choose whether to automatically enable Navigate on Autopilot for every navigation route. When enabled, the Navigate on Autopilot button on the turn-by-turn direction list is already enabled at the start of every trip.
- **Speed Based Lane Changes:** Navigate on Autopilot is designed to perform both route-based and speed-based lane changes. Speed-based lane changes are optional. You can use this setting to disable speed-based lane changes or to specify how assertively you want Navigate on Autopilot to change lanes to achieve the set cruising speed (**Mild**, **Average**, or **Mad Max**).
- **Exit Passing Lane:** Choose whether you want Navigate on Autopilot to maneuver out of a passing lane when navigating to a destination. In addition to route-based and speed-based lane changes, Navigate on Autopilot requests a lane change out of a passing lane as a reminder to stay in a slower lane when you are not passing other vehicles. Choose **No** to disable this and keep Model S/Model X in a passing lane except when needed to stay on the navigation route.
- **Require Lane Change Confirmation:** By default, Navigate on Autopilot requires your confirmation before proceeding with a lane change by pressing the appropriate turn signal. If you do not confirm the lane change within 3 seconds, a chime sounds to remind you that Navigate on Autopilot requires your confirmation to change lanes.
- **Lane Change Notification:** You can specify if or how you want to be notified of lane changes (**Off**, **Chime**, **Vibrate**, or **Both**).

If **Enable at Start of Every Trip** is turned on, Navigate on Autopilot engages automatically when:

- Autosteer is active.
- You are navigating to a destination.
- You are on a controlled-access highway.

Once enabled, the Navigate on Autopilot button appears on the map's turn-by-turn direction list whenever a navigation route is active and the route includes at least one controlled-access highway.

If **Enable at Start of Every Trip** is turned off, touch the **Navigate on Autopilot** button above the turn-by-turn directions to enable it. Once the Navigate on Autopilot is selected, it will engage whenever you engage Autosteer.

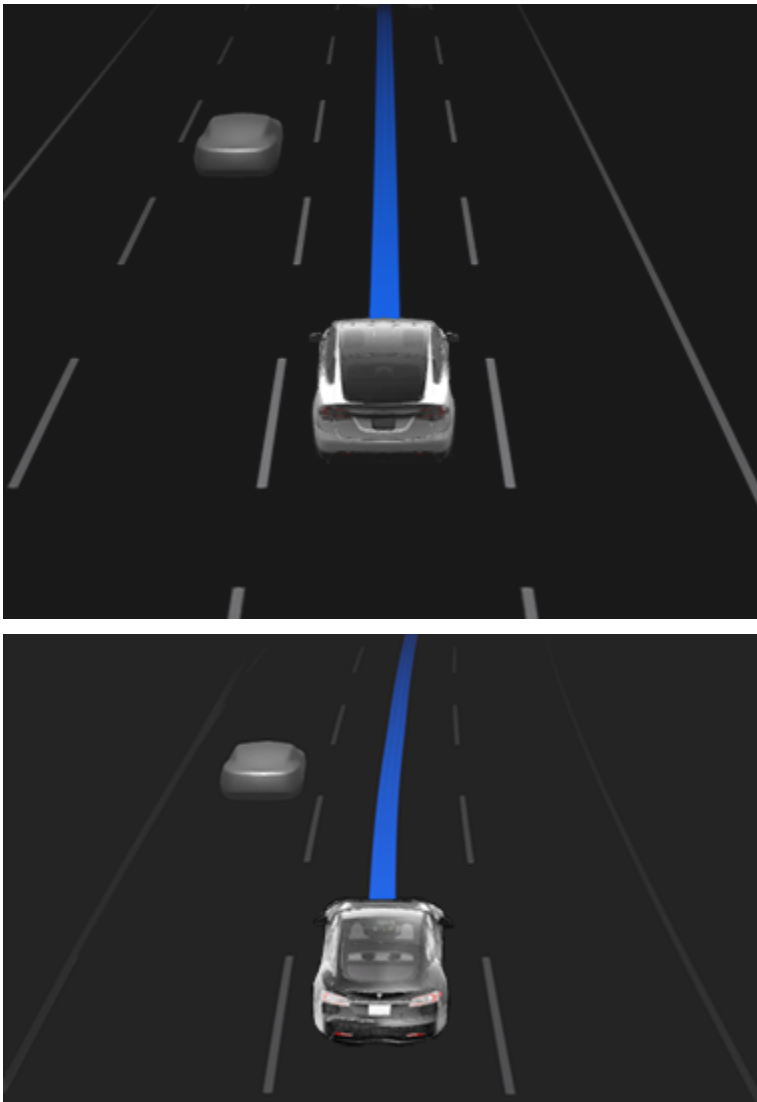


The Navigate on Autopilot icon shows in the turn-by-turn direction list when you are navigating to a destination and Navigate on Autopilot is available but not active.



If Navigate on Autopilot is active, the icon is blue. If **Enable at Start of Every Trip** is turned on, the Navigate on Autopilot icon is selected whenever you start navigation. Touch the icon to cancel Navigate on Autopilot and revert to Autosteer.

Whenever Navigate on Autopilot is active, the Navigate on Autopilot button is blue and the instrument cluster displays the driving lane as a single blue line in front of Model S/Model X:



The turn-by-turn directions display the Autosteer icon next to the maneuvers (such as off-ramps) that Navigate on Autopilot will handle.

When Navigate on Autopilot is engaged Model S/Model X automatically makes both speed-based and route-based lane changes after driver confirmation.

- **Speed Based Lane Changes:** Navigate on Autopilot changes lanes to reduce driving time to your destination. For example, if Model S/Model X is behind a vehicle going below the set cruising speed, Navigate on Autopilot will move into the passing lane to pass it. Speed-based lane changes are optional.
- **Route Based Lane Changes:** Navigate on Autopilot changes lanes to route you to your destination. For example, Navigate on Autopilot will move into the exit lane as Model S/Model X approaches the off-ramp specified by the navigation route.

When the instrument cluster displays a message asking you to confirm the lane change, engage the appropriate turn signal. If you do not confirm the lane change within 3 seconds, a chime sounds to remind you that Navigate on Autopilot requires your confirmation to change lanes. Auto Lane Change cancels if the lane change cannot be completed in 5 seconds.

If you ignore a route-based lane change suggestion (for example, you are driving in the left lane while approaching an off-ramp on the right side of the highway), Navigate on Autopilot is unable to maneuver onto the off-ramp and as a result, you are re-routed to your destination.

NOTE: When determining navigation routes, and maneuvers at interchanges, Navigate on Autopilot considers whether or not you want to use High Occupancy Vehicle (HOV) lanes. Therefore, ensure the **Use HOV Lanes** setting is appropriate for your circumstances (see [Maps and Navigation on page 368](#)). If the setting is off, Navigate on Autopilot never uses a HOV lane, regardless of time of day. If the setting is on, Navigate on Autopilot uses HOV lanes, whenever applicable.



CAUTION: Navigate on Autopilot may not always attempt to exit at an off-ramp or change lanes, even when an exit or lane change is determined by the navigation route. Always remain alert and be prepared to manually steer onto an off-ramp, or make a lane change to prepare for, or to exit at, an off-ramp or interchange.

Navigate on Autopilot activates and deactivates based on the type of road you are driving on. When Navigate on Autopilot is active and you approach an off-ramp or interchange along your navigation route, the appropriate turn signal engages and Autosteer maneuvers Model S/Model X onto the off-ramp or interchange.

When you leave a controlled-access highway Navigate on Autopilot reverts to Autosteer—a chime sounds and the instrument cluster displays the driving lane lines in blue (instead of the single blue line in front of Model S/Model X). When Navigate on Autopilot deactivates, Autosteer remains active. Always be prepared to take appropriate action.

WARNING: Navigate on Autopilot is a hands-on feature. Keep your hands on the steering wheel/steering yoke at all times, be mindful of road conditions and surrounding traffic, and always be prepared to take immediate action. Failure to follow these instructions could cause damage, serious injury or death. It is your responsibility to familiarize yourself with the limitations of Navigate on Autopilot and the situations in which it may not work as expected. For more information, see [Limitations and Warnings on page 820](#).

Canceling Autopilot

Traffic-Aware Cruise Control cancels when:

- You press the right scroll wheel on the steering wheel/steering yoke.
- You press the brake pedal.
- You exceed 90 mph (150 km/h).
- You shift into Reverse, Park, or Neutral.
- A door is opened.
- An Automatic Emergency Braking event occurs (see [Collision Avoidance Assist on page 340](#)).
- The driver's seatbelt is released, and/or the driver gets out of their seat.

When Traffic-Aware Cruise Control cancels, the cruising speed icon on the instrument cluster turns gray to indicate that Traffic-Aware Cruise Control is no longer active.

Autosteer cancels when any of the above actions are taken. In addition, Autosteer cancels when:

- You exceed 85 mph (140 km/h).
- You take over steering manually. You apply rotational force to the steering wheel/steering yoke (even a slight amount).

WARNING: If **Autopilot Activation** is set to **Double Click** and Autosteer cancels because you started steering manually applied rotational force to the steering wheel/steering yoke, Traffic-Aware Cruise Control remains active. If **Autopilot Activation** is set to **Single Click** and Autosteer cancels because you started steering manually applied rotational force to the steering wheel/steering yoke, Traffic-Aware Cruise Control also cancels.

- You do not respond to repeated reminders to keep your hands on the wheel and subsequent messages on the instrument cluster (see [Driver Attentiveness on page 811](#)).

When Autosteer cancels, a chime sounds and the Autosteer icon either turns gray to indicate that Autosteer is no longer active, or disappears to indicate that it is not currently available.

Navigate on Autopilot cancels when Autosteer cancels, as described above. In addition, Navigate on Autopilot cancels when:

- You touch the Navigate on Autopilot button on the map's turn-by-turn direction list. In this case, Autosteer is still active.
- You leave a controlled-access highway. When this happens, Autosteer is still active.

When Navigate on Autopilot cancels but Autosteer remains active, a chime sounds and the visualization goes from a single blue line in the driving lane to two blue lines on either side of the lane.

When Traffic-Aware Cruise Control or Autosteer cancels, Model S/Model X does not coast. Instead, regenerative braking slows down Model S/Model X in the same way as when you move your foot off the accelerator when driving without Traffic-Aware Cruise Control (see [Regenerative Braking on page 233](#)).

While Using Autopilot

When Traffic-Aware Cruise Control is active and Autopilot is maintaining a set speed, the speed is highlighted with blue text on the instrument cluster.

When Autosteer is active, the steering wheelsteering yoke icon is blue and the lane markings are highlighted in blue on the visualization. If Navigate on Autopilot is also active, the Navigate on Autopilot button is blue and the instrument cluster displays the driving lane as a single blue line in front of Model SModel X.

To display more details about the roadway and its surroundings, such as road markings, stop lights, and objects (such as trash cans and poles), touch **Controls > Autopilot > Full Self-Driving Visualization Preview**.

If unable to detect lane markings, Autosteer may determine the driving lane based on a vehicle you are following. In most cases, Autosteer attempts to center Model SModel X in the driving lane. However, there may be situations in which Autosteer follows a driving path that is offset from the center of the lane (for example, if guard rails are detected).

Maintaining the Set Speed

When Autopilot is active, Model SModel X maintains your set cruising speed whenever a vehicle is not detected in front of it. When cruising behind a vehicle, Model SModel X accelerates and decelerates as needed to maintain a chosen following distance (see [Adjusting the Following Distance on page 809](#)), up to the set speed.

You can manually accelerate at any time by pressing the accelerator pedal, but when you release the pedal Model SModel X resumes cruising at the set speed.

Model SModel X also adjusts the cruising speed when entering and exiting curves.

When Model SModel X is actively slowing down to maintain the selected distance from the vehicle ahead, brake lights turn on. You may notice slight movement of the brake pedal. However, when Model SModel X is accelerating, the accelerator pedal does not move.

Changing the Set Speed

Roll the right scroll wheel up to increase, or down to decrease, the set speed.



It may take a few seconds for Model SModel X to reach the new cruising speed.

Adjusting the Following Distance

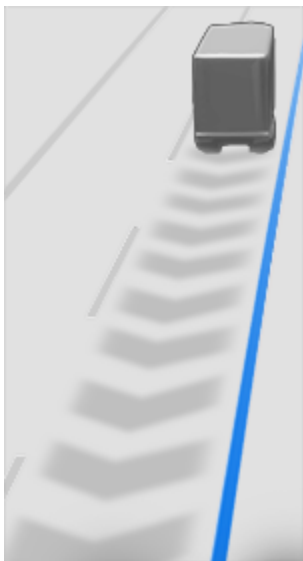
To adjust the following distance you want to maintain between Model SModel X and a vehicle traveling ahead of you, touch **Controls > Autopilot > Cruise Follow Distance**.

The closest following distance is 2. The closest following distance is 1.

Each setting corresponds to a time-based distance that represents how long it takes for Model SModel X, from its current location, to reach the location of the rear bumper of the vehicle ahead of you. Autopilot retains your setting until you change it again.

Stopping and Slowdowns

When moving significantly faster than vehicles in adjacent lanes, Model S/Model X automatically reduces the driving speed. This is especially helpful in heavy traffic situations or when vehicles are constantly merging into different lanes. When Model S/Model X detects other vehicles driving significantly slower, the instrument cluster highlights the adjacent lanes with arrows and detected vehicles in gray, and Model S/Model X reduces the driving speed as appropriate. To temporarily override this feature, press the accelerator pedal.



When following a vehicle, Autopilot remains active at low speeds, even when Model S/Model X comes to a full stop. For example, Autopilot remains active even if Model S/Model X slows down to a complete or near-complete stop in heavy, stop-and-go traffic on a highway. When traffic starts moving more rapidly, Autopilot again accelerates up to the set speed.

Sometimes when Model S/Model X is at a full stop, Autopilot goes into a HOLD state. If this happens, briefly press the accelerator pedal to resume cruising.



When the HOLD status is active, the instrument cluster displays the HOLD icon and a message that indicates that you need to resume cruise control.

Model S/Model X goes into HOLD state while Autopilot is active in the following circumstances:

- Model S/Model X has been at a standstill for 5 minutes.
- Model S/Model X detects a pedestrian (the HOLD state may clear when the pedestrian is no longer detected).
- Model S/Model X suddenly loses visibility of the vehicle in front of you.
- An obstacle is detected in front of Model S/Model X.

Cruising Near or On Exits

When you are cruising near an exit on a controlled-access highway and engage the turn signal toward the off-ramp, Autopilot assumes you are exiting and begins to slow down Model S/Model X. If you do not drive onto the off-ramp, Autopilot resumes cruising at the set speed.

In a region with right hand traffic, this occurs only when you engage the right turn signal when driving in the right-most lane within 164 ft. (50 meters) of an exit. Likewise in regions with left hand traffic, this occurs when engaging the left turn signal when driving in the left-most lane within 164 ft. (50 meters) of an exit.

NOTE: If Navigate on Autopilot is active, Model S/Model X will perform a route-based lane change to enter the exit lane and take the off-ramp as necessary to follow the navigation route.

When enabled while on a highway interchange or off-ramp, Traffic-Aware Cruise Control may reduce your set speed in 5 mph (5 km/h) increments – to as slow as 25 mph (40 km/h) – to better match the reported speeds of other Tesla vehicles that have driven at that specific location. To override this and continue cruising at your set speed, tap the accelerator pedal. The new set speed is maintained for the duration of the interchange or off-ramp (unless you override it or cancel Autopilot). After the interchange or off-ramp, the set speed may revert or change as necessary based on the new location. For example, if you merged onto a different highway, the set cruising speed reverts to what it was before driving on the interchange.

 **WARNING:** In some cases (such as having insufficient data), Traffic-Aware Cruise Control may not automatically reduce the set speed on the highway interchange or off-ramp. Do not rely on Traffic-Aware Cruise Control to determine an appropriate driving speed. Tesla recommends driving at a speed that is safe for road conditions and within posted speed limits.

When cruising onto an on-ramp to a controlled-access highway, Autopilot automatically adjusts the set cruising speed to the speed limit of the highway, plus any offset you have specified. If Navigate on Autopilot is engaged, it disengages as you leave the controlled-access highway (see [Canceling Autopilot on page 808](#)). In this case, Autosteer remains active.

Overtake Acceleration

Engage the turn signal momentarily to accelerate Model S/Model X towards the vehicle ahead of it. By momentarily holding the turn signal, you can quickly accelerate up to your set speed without having to press the accelerator pedal as long as:

- Traffic-Aware Cruise Control is operating and detects a vehicle in front of you.
- No obstacles or vehicles are detected in the target lane.
- Model S/Model X is traveling below the set speed, but over 45 mph (72 km/h).

NOTE: If Autosteer is active and you fully engage the turn signal, Model S/Model X will change lanes automatically (see [Auto Lane Change on page 804](#)).

Model S/Model X stops accelerating when you reach your set cruising speed, if changing lanes takes too long, or if Model S/Model X gets too close to the vehicle ahead. Model S/Model X also stops accelerating if you disengage the turn signal.

Stop Light and Stop Sign Warning

While Autopilot is in use, Model S/Model X displays a warning on the instrument cluster and sounds a chime if it detects that you are likely to run through a red stop light or stop sign. If this happens, **TAKE IMMEDIATE CORRECTIVE ACTION!**

The visual and audible warnings cancel after a few seconds or when you press the brake pedal, whichever comes first.

Stop Light and Stop Sign Warning provides warnings only. It does not slow down or stop Model S/Model X at red traffic lights, stop signs, road markings, etc. If equipped with Traffic Light and Stop Sign Control, you can enable this feature to automatically stop Model S/Model X at traffic lights and stop signs (see [Traffic Light and Stop Sign Control on page 320](#)).

Emergency Vehicles

Model S/Model X automatically reduces driving speed when lights from an emergency vehicle are detected when using Autosteer at night on a high speed road. When this happens, the instrument cluster displays a message informing you of the slowdown. You will also hear a chime, and see a reminder to keep your hands on the steering wheel/steering yoke. When the light detections pass by or cease to appear, Autopilot resumes your cruising speed. Alternatively, you may tap the accelerator to resume your cruising speed.

Never depend on Autopilot features to determine the presence of emergency vehicles. Model S/Model X may not detect lights from emergency vehicles. Keep your eyes on your driving path and always be prepared to take immediate action.

Driver Attentiveness

Autosteer determines how best to steer Model S/Model X. When active, Autosteer requires you to hold the steering wheel. If it does not detect your hands on the steering wheel for a period of time, a flashing blue light appears at the top of the vehicle status section of the instrument cluster and the following message displays:

Steering yoke alert:



Apply slight turning force to steering yoke

Steering wheel alert:



Apply slight turning force to steering wheel

When your hands are detected, the message disappears and Autosteer resumes normal operation. Autosteer detects your hands by recognizing slight resistance as the steering wheel turns, or from you manually turning the steering wheel very lightly (without enough force to take over steering). Autosteer also qualifies your hands as being detected if you engage a turn signal or use a button or scroll wheel on the steering wheel.

Autosteer requires that you pay attention to your surroundings and remain prepared to take control at any time. If Autosteer still does not detect your hands on the steering wheel, the flashing light on the vehicle status section of the instrument cluster increases in frequency and a chime sounds.

If you repeatedly ignore Autosteer's prompts to apply slight force to the steering wheel, Autosteer disables for the rest of the drive and displays the following message requesting you to drive manually.



Autosteer unavailable for the rest of this drive. Hold steering wheelsteering yoke to drive manually.

For the rest of the drive, you must steer manually. Autosteer is available again on your next drive (after you stop and shift Model SModel X into Park).

If you don't resume manual steering, Autosteer sounds a continuous chime, turns on the warning flashers, and slows the vehicle to a complete stop.

Autosteer Suspension

Use of Autosteer will be suspended if improper usage is detected.

When you or another driver of your vehicle receives five forced Autopilot disengagements, use of Autosteer is suspended for a week. A forced disengagement is when the Autopilot system disengages for the remainder of a trip after the driver receives several audio and visual warnings for inattentiveness. Driver-initiated disengagements do not count as improper usage.

You can see how many disengagements are remaining before Autosteer access is suspended by touching **Controls > Autopilot**.

A disengagement is forgiven after 7 days, as long as you don't receive another forced disengagement in that time.

NOTE: If your access to Autosteer is suspended, you are still able to use Traffic-Aware Cruise Control and all active safety features are still enabled.

Take Over Steering Immediately

In situations where Autosteer is unable to steer Model SModel X, Autosteer sounds a warning chime and displays the following message on the instrument panel.



Take over immediately

When you see this message, **TAKE OVER STEERING IMMEDIATELY.**

Traffic Light and Stop Sign Control

NOTE: *Traffic Light and Stop Sign Control is a BETA feature and works best on roads that are frequently driven by Tesla vehicles. Traffic Light and Stop Sign Control attempts to stop at all traffic lights and may also stop at green lights.*

Traffic Light and Stop Sign Control is designed to recognize and respond to traffic lights and stop signs, slowing Model S/Model X to a stop when using Traffic-Aware cruise control or Autosteer. This feature uses the vehicle's forward-facing cameras, in addition to GPS data, and slows the car for all detected traffic lights, including green, blinking yellow, and off lights in addition to stop signs and some road markings. As Model S/Model X approaches an intersection, the instrument cluster displays a notification indicating the intention to slow down. You must confirm that you want to continue or Model S/Model X stops at the red line displayed on the instrument cluster's driving visualization.

 **WARNING: NEVER** make assumptions and predict when and where Traffic Light and Stop Sign Control will stop or continue through an intersection or road marking. From a driver's perspective, the behavior of Traffic Light and Stop Sign Control may appear inconsistent. Always pay attention to the roadway and be prepared to take immediate action. It is the driver's responsibility to determine whether to stop or continue through an intersection. Never depend on Traffic Light and Stop Sign Control to determine when it is safe and/or appropriate to stop or continue through an intersection.

Before Using

Before using Traffic Light and Stop Sign Control, you must:

- Ensure that forward-facing cameras are unobstructed (see [Cleaning a Camera on page 446](#)) and calibrated (see [#unique_484 on page](#)). Traffic Light and Stop Sign Control depends on the ability of the cameras to detect traffic lights, stop signs, and road markings.
- Ensure that the latest version of maps has been downloaded to Model S/Model X. Although Traffic Light and Stop Sign Control primarily uses visual data received from the vehicle's cameras, greater accuracy is achieved when using the most recent map data. To check which version of maps is currently downloaded, touch **Controls** > **Software**. You must connect to a Wi-Fi network to receive updated maps (see [Map Updates on page 374](#)).
- Enable the feature. With the vehicle in Park, touch **Controls** > **Autopilot** > **Traffic Light and Stop Sign Control**. Once enabled, Traffic Light and Stop Sign Control operates whenever Traffic-Aware Cruise Control or Autosteer is active.

How it Works

When Traffic Light and Stop Sign Control is enabled and you are using Autosteer, Traffic-Aware Cruise Control, or Full Self-Driving (Supervised), the instrument cluster displays a popup message to inform you that an upcoming traffic light, stop sign, or road marking has been detected. As it approaches the stop location, **even at an intersection where the traffic light is green**, Model S/Model X slows down and displays a red line to indicate where Model S/Model X will stop. To continue through the intersection—even if the traffic light is green—you must pull the Autopilot stalk toward you or briefly press the accelerator pedal to give the vehicle permission to proceed. When you've confirmed that you want to proceed, the red stop line turns gray and Model S/Model X continues through the intersection and resumes your set cruising speed.

NOTE: If Model S/Model X is approaching a green light and detects that a vehicle in front of you is continuing through the intersection, Model S/Model X continues through the intersection without requiring your confirmation, provided you are not in a turning lane and the vehicle can detect that your hands are on the steering wheel/steering yoke.

NOTE: If, after you pull the Autopilot stalk toward you or briefly press the accelerator pedal to confirm that you want to continue through the intersection, the traffic signal changes before you enter the intersection (for example, the light changes from green to yellow or from yellow to red), Model S/Model X may determine that it is not appropriate to proceed. Therefore, Model S/Model X stops and you must press the accelerator to proceed. At all times, it is your responsibility to ensure the vehicle stops or accelerates appropriately and safely.

 **WARNING:** Traffic Light and Stop Sign Control DOES NOT turn Model S/Model X through an intersection unless Full Self-Driving (Supervised) is engaged. When in a turning lane, Model S/Model X stops at the red stop line. To proceed, pull the Autopilot stalk toward you or briefly press the accelerator pedal—Model S/Model X continues *straight* through the intersection (even when in a turning lane), so you MUST manually steer Model S/Model X through the intersection (which cancels Autosteer).

Traffic Light and Stop Sign Control is designed to operate as described only when the following conditions are met:

- Autosteer, Full Self-Driving (Supervised), or Traffic-Aware Cruise Control is engaged.

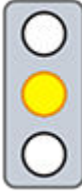
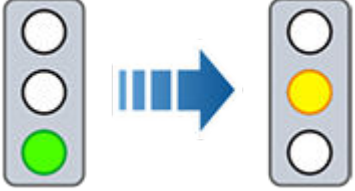
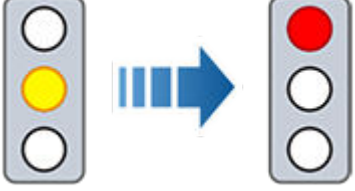


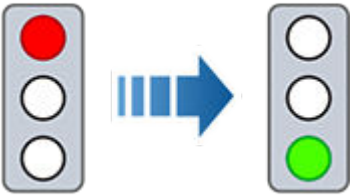
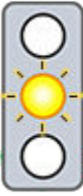
- The cameras can detect an upcoming traffic light, stop sign or road marking (for example, cameras are unobstructed and have a clear line-of-sight to the traffic light, stop sign, or road marking).
- The instrument cluster on Model SModel X is displaying an upcoming traffic light in "bold" format. Model SModel X does not acknowledge traffic lights that the instrument cluster shows as faded. If a traffic light is not directly ahead of the camera (for example, it is located at an angle of the camera's view, or located in an adjacent lane) the instrument cluster displays it as faded and Model SModel X does not slow down and stop for it.

-  **WARNING:** If the instrument cluster is not displaying a red stop line at an upcoming intersection, Model SModel X does not slow down or stop. It is the driver's responsibility to pay attention to upcoming intersections and monitor traffic conditions to determine when and if the vehicle should stop and then to take appropriate action as needed.
-  **WARNING:** Never depend on Traffic Light and Stop Sign Control to determine whether to stop at, or proceed through, an intersection. Drive attentively by watching the road and paying attention to the roadway, upcoming intersections, traffic conditions, crosswalks, and other road users. It is always the driver's responsibility to determine whether to stop or proceed. Be prepared to take immediate action. Failure to do so can result in injury or death.
-  **WARNING:** In some situations, Traffic Light and Stop Sign Control may inaccurately detect a traffic light or stop sign, causing Model SModel X to slow down unexpectedly. Be prepared to take immediate action at all times.
-  **WARNING:** You must pull the Autopilot stalk toward you or briefly press the accelerator pedal to confirm that you want to proceed through an intersection, regardless of the status of the traffic light. If you do not confirm, Model SModel X stops at the red stop line displayed on the instrument cluster, even if stopping may be inappropriate. Stopping at a green light may confuse other drivers and may result in a collision, injury or death. Therefore, always pay attention to upcoming intersections and be prepared to manually brake or accelerate in response to surroundings.
-  **WARNING:** Never assume that your ability to see a traffic light, stop sign, or road marking (especially at a complex intersection, or an intersection in which a traffic light or sign is partially obstructed, etc.) means that Model SModel X can also see it and respond appropriately.
-  **WARNING:** Even the most recent map data does not include all traffic lights and stop signs. Therefore, Traffic Light and Stop Sign Control relies heavily on the ability of the cameras to detect traffic lights, stop signs, road markings, etc. As a result, Model SModel X may ignore an intersection that is blocked from the camera's view (for example, obstructed by a tree or a large vehicle or object, or located near a steep hill or sharp curve).
-  **WARNING:** Traffic Light and Stop Sign Control is not a substitute for attentive driving and sound judgment.

Traffic Lights

When driving with Autosteer or Traffic-Aware Cruise Control engaged, and Traffic Light and Stop Sign Control enabled, Model SModel X is designed to respond as follows when approaching intersections controlled by a traffic light:

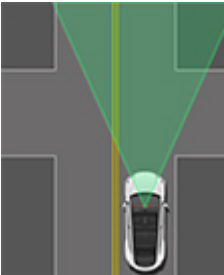
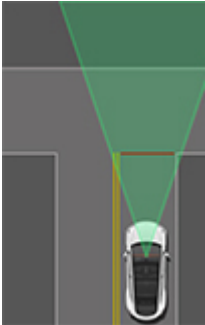
Type of Traffic Light	Vehicle Intended Response
 	At a solid green traffic light, or at a traffic light that is currently off (not illuminated), Model SModel X slows down. If you are following a car in front of you that continues through the intersection, the instrument cluster displays a green stop line and provided your hands are detected on the steering wheelsteering yoke, Model SModel X also continues. If a car is not in front of you, the instrument cluster displays a red stop line and you must confirm that you want to continue through the intersection by pulling the Autopilot stalk toward you or briefly pressing the accelerator pedal. If you don't confirm, Model SModel X stops at the red stop line. NOTE: Model SModel X resumes the set cruising speed when it continues through the intersection, taking into consideration the speed of a vehicle in front of you.
 	Model SModel X slows down and comes to a complete stop at the red stop line displayed on the instrument cluster. When you want to continue through the intersection (for example, the light turns green again, or once Model SModel X has come to a complete stop), you must pull the Autopilot stalk toward you or briefly press the accelerator pedal.
 	Model SModel X slows down and comes to a complete stop at the red stop line displayed on the instrument cluster. When you want to proceed through the intersection (for example, the light turns green again), you must pull the Autopilot stalk toward you or briefly press the accelerator pedal. NOTE: If the traffic light changes <i>after</i> you've confirmed that you want to proceed (for example, a green traffic light turns yellow), Model SModel X may stop instead of continuing, especially if Model SModel X determines that it can safely stop before entering the intersection. NOTE: Model SModel X is not designed to proceed through an intersection when the traffic light is red or if the light turns yellow in situations when there is adequate distance to safely stop before entering the intersection. NOTE: You can take over driving at any time by manually braking to cancel Autosteer or Traffic-Aware Cruise Control.

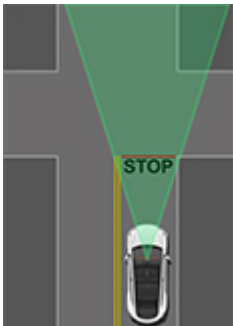
Type of Traffic Light	Vehicle Intended Response
	
 	Model SModel X slows down. To proceed, you must pull the Autopilot stalk toward you or briefly press the accelerator pedal. If you don't, Model SModel X stops at the red stop line displayed on the instrument cluster. NOTE: To prevent Model SModel X from stopping, and to minimize how much it slows down as it approaches, you can confirm that you want to proceed by pulling the Autopilot stalk toward you or briefly pressing the accelerator pedal at any time after the instrument cluster displays the red stop line. Model SModel X resumes your set cruising speed immediately after you confirm (taking into consideration the speed of a vehicle in front of you).  WARNING: Approach attentively and be prepared to press the brake pedal to slow down or stop.
	Model SModel X slows down and comes to a complete stop at the red stop line displayed on the instrument cluster. When you want to proceed through the intersection (for example, traffic laws and conditions indicate it is safe and legal to proceed), you must pull the Autopilot stalk toward you or briefly press the accelerator pedal.



Stop Signs and Road Markings

When driving with Autosteer or Traffic-Aware Cruise Control engaged, and Traffic Light and Stop Sign Control enabled, Model SModel X is designed to respond as follows when approaching intersections controlled by stop signs, stop lines, or road markings:

Type of Intersection	Vehicle Intended Response
 No Traffic Control  Arm of T-junction	Model SModel X assumes the right of way and continues straight without slowing down or stopping.
 End of T-junction	If Model SModel X detects a T-junction based on the map data, Model SModel X slows down and comes to a complete stop at the red stop line displayed on the instrument cluster. When you want to proceed, you must take over steering and acceleration.  WARNING: Model SModel X may not stop at a T-junction that does not have a stop sign or stop line, or if the T-junction is not included in the map data. Drive attentively and be prepared to stop (when necessary and/or appropriate).
 Stop Sign	Model SModel X slows down and comes to a complete stop at the red stop line displayed on the instrument cluster. When you want to proceed through the intersection, you must pull the Autopilot stalk toward you or briefly press the accelerator pedal. NOTE: If you confirm that you want to proceed through an intersection controlled by a stop sign by pulling the Autopilot stalk toward you or briefly pressing the accelerator pedal before Model SModel X has stopped, your confirmation is ignored. Model SModel X is not designed to proceed through a stop sign without stopping. NOTE: Even when using Autosteer, and even if you have engaged a turn signal, you must turn the steering wheelsteering yoke yourself (which cancels Autosteer) to complete a turn at an intersection.

Type of Intersection	Vehicle Intended Response
 Stop Sign and Road Marking  Road Marking	

-  **WARNING:** Model SModel X also slows down and stops at a roundabout. You must take over steering (which cancels Autosteer) and pull the Autopilot stalk toward you or briefly press the accelerator pedal to confirm that you want to continue through the roundabout.
-  **WARNING:** At crosswalks, Model SModel X may slow down and may stop, depending on whether the crosswalk is controlled by a traffic light and whether the cameras detect pedestrians, bicyclists, etc. in the crosswalk. Pay particular attention at crosswalks and be prepared to take over at any time. Failure to do so can result in injury or death.

Limitations

Depending on many different circumstances and environmental conditions, Traffic Light and Stop Sign Control *may or may not* stop at:

- Railroad crossings.
- Keep-out zones.
- Toll booths.
- Crosswalk systems.
- Yield signs or temporary traffic lights and stop signs (such as at construction areas).
- Miscellaneous traffic U-turn lights, bicycle and pedestrian crossing lights, lane availability lights, etc.

In addition, Traffic Light and Stop Sign Control is particularly unlikely to operate as intended, can disengage, or may not operate, when one or more of the following conditions are present:

- Driving through consecutive light-controlled intersections that are very close to each other.
- Visibility is poor (heavy rain, snow, fog, etc.) or weather conditions are interfering with camera or sensor operation.
- Bright light (such as direct sunlight) is interfering with the view of the camera(s).
- A camera is obstructed, covered, damaged, or not properly calibrated.

- Driving on a hill or on a road that has sharp curves on which the cameras are unable to see upcoming traffic lights or stop signs.
- A traffic light, stop sign, or road marking is obstructed (for example, a tree, a large vehicle, etc.).
- Model SModel X is being driven very close to a vehicle in front of it, which is blocking the view of a camera.

 **WARNING:** The limitations listed above are not an exhaustive list of reasons why Model SModel X may not operate as expected. Many unforeseen circumstances can adversely impact the accurate operation of Traffic Light and Stop Sign Control. Using this feature does not reduce or eliminate the need to drive attentively and responsibly. You must be prepared to take appropriate and immediate action at all times.

Limitations and Warnings

This topic includes warnings, cautions, and limitations pertaining to the following Autopilot features.

- [Traffic-Aware Cruise Control on page 802](#)[Traffic-Aware Cruise Control on page 299](#)
- [Autosteer on page 802](#)[Autosteer on page 310](#)
- [Navigate on Autopilot on page 822](#)[Navigate on Autopilot on page 316](#)
- [Autosteer on City Streets \(Full Self-Driving \(Supervised\)\) on page 823](#)
- [Autopark on page 824](#)[Autopark on page 327](#)
- [Summon on page 824](#)[Summon on page 330](#)
- [Smart Summon on page 825](#)[Smart Summon on page 333](#)

 **WARNING:** Read the following warnings and limitations carefully before using Autopilot. Failure to follow all warnings and instructions can result in property damage, serious injury, or death.

NOTE: Ensure all cameras are clean and free of obstructions before each drive and before using Autopilot features (see [Cleaning a Camera on page 446](#)). Dirty cameras and sensors (if equipped), as well as environmental conditions such as rain and faded lane markings, can affect Autopilot performance. If a camera is obstructed or blinded, Model SModel X displays a message on the instrument cluster and Autopilot features may not be available. For more information on specific alerts, see [Troubleshooting Alerts on page 543](#)[Troubleshooting Alerts on page 576](#).

Traffic-Aware Cruise Control

While using Traffic-Aware Cruise Control, **it is the driver's responsibility to stay alert, drive safely, and be in control of the vehicle at all times.** Always keep your eyes on the road when driving and be prepared to take corrective action as needed.

In addition, it is the driver's responsibility to cruise at a safe speed and maintain a safe following distance based on road conditions and applicable speed limits. Be aware of the following limitations while Traffic-Aware Cruise Control is active.

- There may be situations where the cruising speed may not change when the speed limit changes.
- Traffic-Aware Cruise Control does not adapt driving speed based on road and driving conditions. Do not use Traffic-Aware Cruise Control on winding roads with sharp curves, on icy or slippery road surfaces, or when weather conditions (such as heavy rain, snow, fog, etc.) make it inappropriate to drive at a consistent speed.
- Do not rely on Traffic-Aware Cruise Control to maintain an accurate or appropriate following distance.
- Traffic-Aware Cruise Control may be unable to provide adequate speed control because of limited braking capability and hills. It can also misjudge the distance from a vehicle ahead. Driving downhill can increase driving speed, causing Model SModel X to exceed your set speed (and potentially the road's speed limit).
- Traffic-Aware Cruise Control may occasionally cause Model SModel X to brake when not required or when you are not expecting it. This can be caused by closely following a vehicle ahead, detecting vehicles or objects in adjacent lanes (especially on curves), etc.
- Due to limitations inherent in the onboard GPS (Global Positioning System), you may experience situations in which Model SModel X slows down, especially near exits or off-ramps where a curve is detected and/or you are navigating to a destination and not following the route.
- In some cases (such as having insufficient data), Traffic-Aware Cruise Control may not automatically reduce the set speed on the highway interchange or off-ramp.

- Traffic-Aware Cruise Control may not detect all objects and, especially when cruising over 50 mph (80 km/h), may not brake/decelerate when a vehicle or object is only partially in the driving lane or when a vehicle you are following moves out of your driving path and a stationary or slow-moving vehicle or object is in front of you.
- Traffic-Aware Cruise Control may react to vehicles or objects that either do not exist, or are not in your lane of travel, causing Model S/Model X to slow down unnecessarily or inappropriately.

 **WARNING:** Traffic-Aware Cruise Control is particularly unlikely to operate as intended in the following types of situations:

- The road has sharp curves or significant changes in elevation.
- Road signs and signals are unclear, ambiguous, or poorly maintained.
- Visibility is poor (due to heavy rain, snow, hail, etc. or poorly lit roadways at night)
- You are driving in a tunnel or next to a highway divider that interferes with the view of the camera(s)
- Bright light (such as from oncoming headlights or direct sunlight) interferes with the view of the camera(s).

 **WARNING:** The list above does not represent an exhaustive list of situations that may interfere with proper operation of Traffic-Aware Cruise Control. Traffic-Aware Cruise Control can cancel unexpectedly at any time for unforeseen reasons. Always watch the road in front of you and stay prepared to take appropriate action. It is the driver's responsibility to be in control of Model S/Model X at all times.

 **WARNING:** Traffic-Aware Cruise Control is designed for your driving comfort and convenience and is not a collision warning or avoidance system. Never depend on Traffic-Aware Cruise Control to adequately slow down Model S/Model X. Always watch the road in front of you and be prepared to take corrective action at all times. Failure to do so can result in serious injury or death.

 **WARNING:** Although Traffic-Aware Cruise Control is capable of detecting pedestrians and cyclists, never depend on Traffic-Aware Cruise Control to adequately slow Model S/Model X down for them. Failure to do so can result in serious injury or death.

Autosteer

 **WARNING:** Autosteer is a hands-on feature. Keep your hands on the steering wheel at all times, be mindful of road conditions and surrounding traffic, and always be prepared to take immediate action. Failure to follow these instructions could cause damage, serious injury or death.

 **WARNING:** Autosteer is intended for use on controlled-access highways with a fully attentive driver. Do not use Autosteer in construction zones, or in areas where bicyclists or pedestrians may be present.

 **WARNING:** Never depend on Autosteer to determine an appropriate driving path.

 **CAUTION:** Autosteer and its associated functions are particularly unlikely to operate as intended when:

- Autosteer is unable to accurately determine lane markings. For example, lane markings are excessively worn, have visible previous markings, have been adjusted due to road construction, are changing quickly (lanes branching off, crossing over, or merging), objects or landscape features are casting strong shadows on the lane markings, or the road surface contains pavement seams or other high-contrast lines.
- Visibility is poor (heavy rain, snow, fog, etc.) or weather conditions are interfering with sensor operation.
- A camera(s) or sensor(s) is obstructed, covered, or damaged.
- Driving on hills.
- Approaching a toll booth.
- Driving on a road that has sharp curves or is excessively rough.
- Bright light (such as direct sunlight) is interfering with the view of the camera(s).
- The sensors (if equipped) are affected by other electrical equipment or devices that generate ultrasonic waves.
- A vehicle is detected in your blind spot when you engage the turn signal.
- Model S/Model X is being driven very close to a vehicle in front of it, which is blocking the view of the camera(s).



 **WARNING:** Many unforeseen circumstances can impair the operation of Autosteer. Always keep this in mind and remember that as a result, Autosteer may not steer Model S/Model X appropriately. Always drive attentively and be prepared to take immediate action.

 **WARNING:** Autosteer is not designed to, and will not, steer Model S/Model X around objects partially in a driving lane and in some cases, may not stop for objects that are completely blocking the driving lane. Always watch the road in front of you and stay prepared to take immediate action. It is the driver's responsibility to be in control of Model S/Model X at all times.

Auto Lane Change

 **CAUTION:** When changing lanes using Auto Lane Change, It is the driver's responsibility to determine whether a lane change is safe and appropriate. Therefore, before initiating a lane change, always check blind spots, lane markings, and the surrounding roadway to confirm it is safe and appropriate to move into the target lane.

 **CAUTION:** Be aware of the following limitations while using Auto Lane Change.

- Never depend on Auto Lane Change to determine an appropriate driving path. Drive attentively by watching the road and traffic ahead of you, checking the surrounding area, and monitoring the touchscreen for warnings. Always be prepared to take immediate action.
- Do not use Auto Lane Change on roads where traffic conditions are constantly changing and where bicycles and pedestrians are present.
- The performance of Auto Lane Change depends on the ability of the camera(s) to recognize lane markings.
- Do not use Auto Lane Change on winding roads with sharp curves, on icy or slippery roads, or when weather conditions (such as heavy rain, snow, fog, etc.) may be obstructing the view from the camera(s) or sensors (if equipped).
- Overtake Acceleration can cancel for many unforeseen reasons in addition to those listed above (for example, lack of GPS data). Stay alert and never depend on Overtake Acceleration to increase your driving speed.
- Overtake Acceleration increases your driving speed whenever the appropriate turn signal is engaged, and accelerates Model S/Model X closer to the vehicle ahead. Although Traffic-Aware Cruise Control continues to maintain distance from the vehicle ahead, it is important to be aware that your selected following distance is reduced when Overtake Acceleration is active, particularly in cases where it may not be your intention to overtake the vehicle you are following.

Stop Light and Stop Sign Warning

 **WARNING:** Stop Light and Stop Sign Warning requires on-board maps to know that a particular stop light or stop sign exists at a location. In some cases, map data is inaccurate or outdated and may not include all stop lights or stop signs. Therefore, Stop Light and Stop Sign Warning may not detect all stop lights and stop signs.

 **WARNING:** The Stop Light and Stop Sign Warning feature does not apply the brakes or decelerate Model S/Model X and may not detect all stop lights and stop signs. Stop Light and Stop Sign Warning is designed for guidance purposes only and is not a substitute for attentive driving and sound judgment. Keep your eyes on the road when driving and never depend on Stop Light and Stop Sign Warning to warn you of a stop light or stop sign.

 **WARNING:** Stop Light and Stop Sign Warning is designed to warn you only when approaching a visible red stop sign, solid red or later portion of a yellow traffic light. It may not warn you of intersections with flashing lights and it does not warn you of yield signs or temporary stop and yield signs (such as those used in construction areas). Additionally, Stop Light and Stop Sign Warning does not warn you of approaching stop lights or stop signs when you are pressing the accelerator pedal or brake pedal (which disables Autosteer).

Navigate on Autopilot

 **WARNING:** Never depend on Navigate on Autopilot to determine an appropriate lane at an off-ramp. Stay alert and perform visual checks to ensure that the driving lane is safe and appropriate.

 **WARNING:** If you turn off **Require Lane Change Confirmation**, Navigate on Autopilot notifies you of upcoming lane changes and off-ramps, but it remains your responsibility to monitor the environment and maintain control of Model S/Model X at all times. Lane changes can occur quickly and suddenly. Always keep your hands on the wheel and your eyes on the driving path in front of you.

 **WARNING:** Navigate on Autopilot does not make driving autonomous. You must pay attention to the road, keep your hands on the steering wheel at all times, and remain aware of your navigation route.

-  **WARNING:** As is the case with normal driving, be extra careful around blind corners, interchanges, and on-ramps and off-ramps - obstacles can appear quickly and at any time.
-  **WARNING:** Navigate on Autopilot may not recognize or detect oncoming vehicles, stationary objects, and special-use lanes such as those used exclusively for bikes, carpools, emergency vehicles, etc. Remain alert at all times and be prepared to take immediate action. Failure to do so can cause damage, injury or death.

Autosteer on City Streets (Full Self-Driving (Supervised))

-  **WARNING:** Always remember that Full Self-Driving (Supervised) (also known as Autosteer on City Streets) does not make Model SModel X autonomous and requires a fully attentive driver who is ready to take immediate action at all times.
-  **WARNING:** Full Self-Driving (Supervised) is a hands-on feature. Keep your hands on the steering wheelsteering yoke at all times, be mindful of road conditions and surrounding traffic, and always be prepared to take immediate action. Failure to follow these instructions could cause damage, serious injury or death. It is your responsibility to familiarize yourself with the limitations of Full Self-Driving (Supervised) and the situations in which it may not work as expected.
-  **WARNING:** Failure to follow all warnings and instructions can result in property damage, serious injury or death.
-  **CAUTION:** Full Self-Driving (Supervised) and its associated functions may not operate as intended and there are numerous situations in which driver intervention may be needed. Examples include (but are not limited to):
 - Interactions with pedestrians, bicyclists, and other road users.
 - Unprotected turns with high-speed cross traffic.
 - Multi-lane turns.
 - Simultaneous lane changes.
 - Narrow roads with oncoming cars or double-parked vehicles.
 - Rare objects such as trailers, ramps, cargo, open doors, etc. protruding from vehicles.
 - Merges onto high-traffic, high-speed roads.
 - Debris in the road.
 - Construction zones.
 - High curvature roads, particularly at fast driving speeds.

Visibility is critical for Full Self-Driving (Supervised) to operate. Low visibility, such as low light or poor weather conditions (rain, snow, direct sun, fog, etc.) can significantly degrade performance.

-  **WARNING:** Model SModel X may quickly and suddenly make unexpected maneuvers or mistakes that require immediate driver intervention.

The list above represents only a fraction of the possible scenarios that can cause Full Self-Driving (Supervised) to make sudden maneuvers and behave unexpectedly. In fact, Model SModel X can suddenly swerve even when driving conditions appear normal and straight-forward. Stay alert and always pay attention to the roadway so you can anticipate the need to take corrective action as early as possible. Remember that this is an early access feature that must be used with extra caution.

-  **CAUTION:** As Full Self-Driving (Supervised) deployment expands, Tesla will gradually make it available to eligible customers in select countries outside the United States. Because every country contains unique infrastructure, driving behaviors, and traffic patterns that Full Self-Driving (Supervised) must adapt to over time, it is essential for drivers using Full Self-Driving (Supervised) in newly eligible countries to be extra attentive and overly cautious. You must be ready to take over safely at any time.



Autopark

 **CAUTION:** Autopark's performance depends on the ability of the cameras and sensors (if equipped) to determine the vehicle's proximity to curbs, objects, and other vehicles. Be aware of the following warnings before and while using Autopark:

- Do not use Autopark if anything, such as a ball hitch, bike rack, or trailer, is attached to the tow hitch. Autopark may not stop for hitches when parking between or in front of other vehicles.
- Never depend on Autopark to find a parking space that is legal, suitable, and safe. Autopark may not always detect objects in the parking space. Always perform visual checks to confirm that a parking space is appropriate and safe.
- When Autopark is actively steering Model SModel X, the steering wheel moves in accordance with Autopark's adjustments. Do not interfere with the movement of the steering wheel. Doing so cancels Autopark.
- During the parking sequence, continually check your surroundings. Be prepared to apply the brakes to avoid vehicles, pedestrians, or objects.
- When Autopark is active, monitor the touchscreen to ensure that you are aware of the instructions that Autopark is providing.

 **CAUTION:**

Autopark is particularly unlikely to operate as intended in these situations:

- The road is sloped. Autopark is designed to operate on flat roads only.
- Visibility is poor (due to heavy rain, snow, fog, etc.).
- The curb is constructed of material other than stone, or the curb cannot be detected.
- The target parking space is directly adjacent to a wall or pillar (for example, the last parking space of a row in an underground parking structure).
- One or more of the sensors (if equipped) or cameras is damaged, dirty, or obstructed (such as by mud, ice, or snow, or by a vehicle bra, excessive paint, or adhesive products such as wraps, stickers, rubber coating, etc.).
- Weather conditions (heavy rain, snow, fog, or extremely hot or cold temperatures) are interfering with sensor (if equipped) operation.
- The sensors (if equipped) are affected by other electrical equipment or electrical interference.

 **WARNING:** Many unforeseen circumstances can impair Autopark's ability to park Model SModel X. Keep this in mind and remember that as a result, Autopark may not steer Model SModel X appropriately. Pay attention when parking Model SModel X and stay prepared to immediately take control.

Summon

 **CAUTION:** Summon's performance depends on the ability of the cameras and sensors (if equipped) to determine the vehicle's proximity to objects, people, animals, and other vehicles. Summon is unlikely to operate as intended in the following types of situations:

- The driving path is sloped. Summon is designed to operate on flat roads only (up to 10% grade).
- A raised concrete edge is detected. Summon does not move Model SModel X over an edge that is higher than approximately 1 in (2.5 cm).
- One or more of the sensors (if equipped) or cameras is damaged, dirty, or obstructed (such as by mud, ice, or snow, or by a vehicle bra, excessive paint, or adhesive products such as wraps, stickers, rubber coating, etc.).
- Weather conditions (heavy rain, snow, fog, or extremely hot or cold temperatures) are interfering with sensor operation.
- The sensors (if equipped) are affected by other electrical equipment or devices that generate ultrasonic waves.
- Model SModel X is in Trailer Mode or an accessory is attached.

 **WARNING:** The list above does not represent an exhaustive list of situations that may interfere with proper operation of Summon. It is the driver's responsibility to remain in control of Model S/Model X at all times. Pay close attention whenever Summon is actively moving Model S/Model X and stay prepared to take immediate action. Failure to do so can result in serious property damage, injury or death.

 **WARNING:** Model S/Model X cannot detect obstacles that are located lower than the bumper, are very narrow, or are hanging from a ceiling (for example, bicycles). In addition, many unforeseen circumstances can impair Summon's ability to move in or out of a parking space and, as a result, Summon may not move Model S/Model X appropriately. Therefore, you must continually monitor the vehicle's movement and its surroundings and remain prepared to stop Model S/Model X at any time.

Smart Summon

 **CAUTION:** Smart Summon is a BETA feature. You must continually monitor the vehicle and its surroundings and stay prepared to take immediate action at any time. It is the driver's responsibility to use Smart Summon safely, responsibly, and as intended.

 **CAUTION:** Smart Summon is designed and intended for use only on parking lots and driveways located on private property where the surrounding area is familiar and predictable. Do not use Smart Summon on public roads.

NOTE: Smart Summon is disabled if Model S/Model X is in Valet mode (see [Valet Mode on page 183](#)).

 **CAUTION:**

Smart Summon is unlikely to operate as intended in the following types of situations:

- GPS data is unavailable due to poor cellular coverage.
- The driving path is sloped. Smart Summon is designed to operate on flat roads only (up to 10% grade).
- A raised concrete edge is detected. Depending on the height of the concrete edge, Smart Summon may not move Model S/Model X over it.
- One or more of the sensors (if equipped) or cameras is damaged, dirty, or obstructed (such as by mud, ice, or snow, or by a vehicle bra, excessive paint, or adhesive products such as wraps, stickers, rubber coating, etc.).
- Weather conditions (heavy rain, snow, fog, or extremely hot or cold temperatures) are interfering with sensor (if equipped) or camera operation.
- The sensors (if equipped) are affected by other electrical equipment or devices that generate ultrasonic waves.
- Model S/Model X is in Trailer Mode or an accessory is attached

 **WARNING:** The list above does not represent an exhaustive list of situations that may interfere with proper operation of Smart Summon. It is the driver's responsibility to remain in control of Model S/Model X at all times. Pay close attention whenever Smart Summon is actively moving Model S/Model X and stay prepared to take immediate action. Failure to do so can result in serious property damage, injury or death.

 **WARNING:** Smart Summon must only be used on paved surfaces.

 **WARNING:** Smart Summon may not stop for all objects (especially very low objects such as some curbs, or very high objects such as a shelf) and may not react to all traffic. Smart Summon does not recognize the direction of traffic, does not navigate around empty parking spaces, and may not anticipate crossing traffic.

 **WARNING:** When using Smart Summon, you must maintain a clear line of sight between you and Model S/Model X and stay prepared to stop the vehicle at any time by releasing the button on the mobile app.

 **WARNING:** When you release the button to stop Model S/Model X, a slight delay occurs before the vehicle stops. Therefore, it is critical that you pay close attention to the vehicle's driving path at all times and proactively anticipate obstacles that the vehicle may be unable to detect.

 **WARNING:** Use extreme caution when using Smart Summon in environments where movement of obstacles can be unpredictable. For example, where people, children or animals are present.

 **WARNING:** Smart Summon may not stop for all objects (especially very low objects such as some curbs, or very high objects such as a shelf) and may not react to all oncoming or side traffic. Pay attention and be ready to stop Model S/Model X at all times by releasing the button on the mobile app.

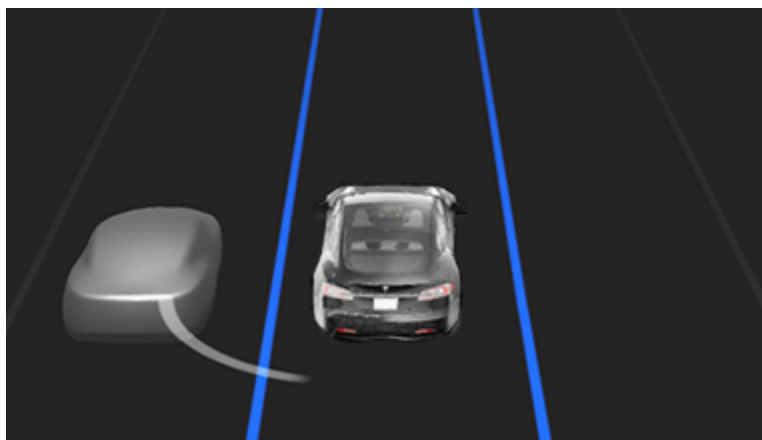


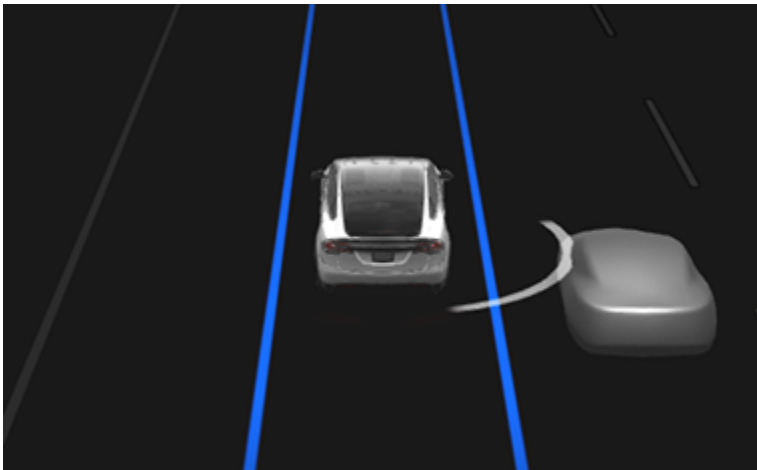
Active Safety Features

Lane Assist

Model S/Model X monitors the markers on the lane you are driving in as well as the surrounding areas for the presence of vehicles or other objects.

When an object is detected in your blind spot or near the side of Model S/Model X (such as a vehicle, guard rail, etc.), the instrument panel displays colored lines radiating from the image of your vehicle. The location of the lines correspond to the location of the detected object. The color of the lines (white, yellow, orange, or red) represent the object's proximity to Model S/Model X, with white being the farthest and red being the closest and requiring your immediate attention. These colored lines only display when driving between approximately 7 and 85 mph (12 and 140 km/h). When Autosteer is active, these colored lines also display if driving slower than 7 mph (12 km/h). However, the colored lines do not display if Model S/Model X is at a standstill (for example, in heavy traffic).





-  **CAUTION:** Ensure all cameras and sensors are clean. Dirty cameras and sensors, as well as environmental conditions such as rain and faded lane markings, can affect Autopilot performance.
-  **WARNING:** Lane Assist features are for guidance purposes only and is not intended to replace your own direct visual checks. Before changing lanes, always use side mirrors and perform the appropriate shoulder checks to visually determine if it is safe and appropriate to change lanes.
-  **WARNING:** Never depend on Lane Assist to inform you if you unintentionally drive outside of the driving lane, or to inform you that there is a vehicle beside you or in your blind spot. Several external factors can reduce the performance of Lane Assist (see [Limitations and Inaccuracies on page 339](#)). It is the driver's responsibility to stay alert and pay attention to the driving lane and other road users. Failure to do so can result in serious injury or death.

Steering Interventions

Lane Assist provides steering interventions if Model S/Model X drifts into (or close to) an adjacent lane in which an object, such as a vehicle, is detected. In these situations, Model S/Model X automatically steers to a safer position in the driving lane. This steering is applied only when Model S/Model X is traveling between 30 and 85 mph (48 and 140 km/h) on major roads with clearly visible lane markings. When a steering intervention is applied, the instrument panel briefly displays a warning message.

Lane Departure Warning

Lane Departure Warning alerts you of undesired lane departures by slightly vibrating the steering wheel/steering yoke if a front wheel passes over a lane marking when the associated turn signal is off. To turn this warning on or off, touch **Controls > Autopilot > Lane Departure Warning**. Lane Departure Warning is active only when driving between approximately 40 and 90 mph (64 and 145 km/h).



Active Safety Features

Lane Departure Avoidance

Lane Departure Avoidance is designed to warn you if Model S/Model X is drifting out of, or nears the edge of, your driving lane.

Lane Departure Avoidance operates when driving between 40 and 90 mph (64 and 145 km/h) on roads with clearly visible lane markings. You can choose if and how you want Lane Departure Warning to operate by touching **Controls > Autopilot > Lane Departure Avoidance** and selecting between these options:

- **OFF:** You are not warned of lane departures or potential collisions with a vehicle in an adjacent lane.
- **WARNING:** If a front wheel passes over a lane marking, the steering wheel/steering yoke vibrates.
- **ASSIST:** Corrective steering is applied to keep Model S/Model X in a safe position if Model S/Model X drifts into an adjacent lane or near the edge of the road.

When Lane Departure Avoidance is enabled and Traffic-Aware Cruise Control is active, if Model S/Model X drifts out of the driving lane when the associated turn signal is off, Lane Assist also checks to see whether your hands are on the steering wheel/steering yoke. If hands are not detected, the instrument panel displays a series of alerts, similar to those that are used when driving with Autosteer. If hands are repeatedly not detected Model S/Model X gradually slows down to 15 mph (25 km/h) below the detected speed limit, or below the set cruising speed, and the hazard lights start flashing.

NOTE: Lane Departure Avoidance does not warn you of lane departures, or provide steering interventions, if the associated turn signal is on, which indicates an intentional lane change.

 **WARNING:** Lane Departure Avoidance is intended to help keep you safe, but it does not work in every situation and does not replace the need to remain attentive and in control.

 **WARNING:** Keep your hands on the steering wheel/steering yoke and drive attentively at all times.

 **WARNING:** Steering interventions are minimal and are not designed to move Model S/Model X out of its driving lane. Do not rely on steering interventions to avoid side collisions.

Emergency Lane Departure Avoidance

Emergency Lane Departure Avoidance automatically applies steering to avoid a potential collision in situations where:

- Model S/Model X is departing a lane and may collide with a vehicle traveling in the same direction in the adjacent lane (regardless of the status of the turn signal).
- Model S/Model X is departing a lane into an oncoming lane, the turn signal is off, and an oncoming vehicle is detected.
- Model S/Model X is departing the road and the turn signal is off (for example, very close to the edge of the road and a collision may occur).

To turn this feature on or off, touch **Controls > Autopilot > Emergency Lane Departure Avoidance**.

When Emergency Lane Departure Avoidance applies steering, a chime sounds and the instrument panel displays a warning and highlights the lane marking in red.

Emergency Lane Departure Avoidance operates when Model S/Model X is traveling between 40 and 90 mph (64 and 145 km/h) on a road with clearly visible lane markings, curbs, etc.

 **WARNING:** Emergency Lane Departure Avoidance is not a substitute for attentive driving and sound judgment. Keep your eyes on the road when driving and never depend on Emergency Lane Departure Avoidance to prevent a collision. Several factors can reduce or impair performance. Depending on Emergency Lane Departure Avoidance to prevent a potential collision can result in serious injury or death.

Blind Spot Camera and Collision Warning Chime

To display the image from the corresponding side repeater camera whenever you engage a turn signal to change lanes, touch **Controls > Autopilot > Blind Spot Camera**.

If you want a chime to sound when a vehicle is in your blind spot and a possible collision is detected, touch **Controls > Autopilot > Blind Spot Collision Warning Chime**.



 **WARNING:** Blind Spot Camera does not eliminate the need to drive attentively and manually perform shoulder checks when changing lanes.

 **WARNING:** Blind Spot Collision Warning Chime cannot detect every collision. It is the driver's responsibility to remain alert and perform the appropriate shoulder checks when changing lanes.

Limitations and Inaccuracies

Lane Assist features cannot always detect lane markings and you may experience unnecessary or invalid warnings in these situations:

- Visibility is poor and lane markings are not clearly visible (due to heavy rain, snow, fog, etc.). The exact detection zone of the ultrasonic sensors varies depending on environmental conditions.
- Bright light (such as from oncoming headlights or direct sunlight) is interfering with the view of the camera(s).
- A vehicle in front of Model S/Model X is blocking the view of the camera(s).
- The windshield is obstructing the view of the camera(s) (fogged over, dirty, covered by a sticker, etc.).
- Lane markings are excessively worn, have visible previous markings, have been adjusted due to road construction, or are changing quickly (for example, lanes branching off, crossing over, or merging).
- The road is narrow or winding.
- Objects or landscape features are casting strong shadows on lane markers.

Lane Assist may not provide warnings, or may apply inappropriate warnings, in these situations:

- One or more of the ultrasonic sensors is damaged, dirty, or obstructed (by mud, ice, or snow, or by a vehicle bra, excessive paint, or adhesive products such as wraps, stickers, rubber coatings, etc.).
- Weather conditions (heavy rain, snow, fog, or extremely hot or cold temperatures) are interfering with sensor operation.
- The sensors are affected by other electrical equipment or devices that generate ultrasonic waves.
- An object that is mounted to Model S/Model X is interfering with and/or obstructing a sensor (such as a bike rack or a bumper sticker).

In addition, Lane Assist may not steer Model S/Model X away from an adjacent vehicle, or may apply unnecessary or inappropriate steering, in these situations:

- You are driving Model S/Model X on sharp corners or on a curve at a relatively high speed.
- Bright light (such as from oncoming headlights or direct sunlight) is interfering with the view of the camera(s).
- You are drifting into another lane but an object (such as a vehicle) is not present.
- A vehicle in another lane cuts in front of you or drifts into your driving lane.
- Model S/Model X is not traveling within the speeds at which the Lane Assist feature is designed to operate.
- One or more of the ultrasonic sensors is damaged, dirty, or obstructed (such as by mud, ice, or snow, or by a vehicle bra, excessive paint, or adhesive products such as wraps, stickers, rubber coating, etc.).
- Weather conditions (heavy rain, snow, fog, or extremely hot or cold temperatures) are interfering with sensor operation.
- The sensors are affected by other electrical equipment or devices that generate ultrasonic waves.
- An object mounted to Model S/Model X (such as a bike rack or a bumper sticker) is interfering with or obstructing a sensor.
- Visibility is poor and lane markings are not clearly visible (due to heavy rain, snow, fog, etc.).
- Lane markings are excessively worn, have visible previous markings, have been adjusted due to road construction or are changing quickly (for example, lanes branching off, crossing over, or merging).

 **WARNING:** The lists above do not represent every possible situation that may interfere with Lane Assist features. There are many reasons why Lane Assist may not operate as intended. To avoid a collision, stay alert and always pay attention to the road so you can anticipate the need to take corrective action as early as possible.



Collision Avoidance Assist

If your Model S Model X is equipped with Autopilot components (see [About Autopilot on page 286](#)), the following collision avoidance features are designed to increase the safety of you and your passengers:

The following collision avoidance features are designed to increase the safety of you and your passengers:

- **Forward Collision Warning** - provides visual and audible warnings in situations when Model S Model X detects that there is a high risk of a frontal collision (see [Forward Collision Warning on page 340](#)).
- **Automatic Emergency Braking** - automatically applies braking to reduce the impact of a frontal collision (see [Automatic Emergency Braking on page 342](#)).
- **Obstacle-Aware Acceleration** - reduces acceleration if Model S Model X detects an object in its immediate driving path (see [Obstacle-Aware Acceleration on page 343](#)).

 **CAUTION:** Ensure all cameras and sensors are clean. Dirty cameras and sensors, as well as environmental conditions such as rain and faded lane markings, can affect performance.

 **WARNING:** Forward Collision Warning is for guidance purposes only and is not a substitute for attentive driving and sound judgment. Keep your eyes on the road when driving and never depend on Forward Collision Warning to warn you of a potential collision. Several factors can reduce or impair performance, causing either unnecessary, invalid, inaccurate, or missed warnings. Depending on Forward Collision Warning to warn you of a potential collision can result in serious injury or death.

 **WARNING:** Automatic Emergency Braking is not designed to prevent all collisions. In certain situations, it can minimize the impact of a frontal collision by attempting to reduce your driving speed. Depending on Automatic Emergency Braking to avoid a collision can result in serious injury or death.

 **WARNING:** Obstacle-Aware Acceleration is not designed to prevent a collision. In certain situations, it can minimize the impact of a collision. Depending on Obstacle-Aware Acceleration to avoid a collision can result in serious injury or death.

Forward Collision Warning

Model S Model X monitors the area in front of it for the presence of an object such as a vehicle, motorcycle, bicycle, or pedestrian. If a collision is considered likely unless you take immediate corrective action, Forward Collision Warning is designed to sound a chime and highlight the vehicle in front of you in red on the instrument panel. If this happens, **TAKE IMMEDIATE CORRECTIVE ACTION!**





Warnings cancel automatically when the risk of a collision has been reduced (for example, you have decelerated or stopped Model S Model X, or the object in front of your vehicle has moved out of your driving path).

If immediate action is not taken when Model S Model X issues a Forward Collision Warning, Automatic Emergency Braking (if enabled) may automatically apply the brakes if a collision is considered imminent (see [Automatic Emergency Braking on page 342](#)).

By default, Forward Collision Warning is turned on. To turn it off or adjust its sensitivity, touch **Controls > Autopilot > Forward Collision Warning**. Instead of the default warning level of **Medium**, you can turn the warning **Off**, or you can choose to be warned **Late** or **Early**.

NOTE: Your chosen setting for Forward Collision Warning is retained until you manually change it.



Active Safety Features

-  **WARNING:** The camera(s) and sensors associated with Forward Collision Warning are designed to monitor an approximate area of up to 525 feet (160 meters) in your driving path. The area being monitored by Forward Collision Warning can be adversely affected by road and weather conditions. Use appropriate caution when driving.
-  **WARNING:** Forward Collision Warning is designed only to provide visual and audible alerts. It does not attempt to apply the brakes or decelerate Model SModel X. When seeing and/or hearing a warning, it is the driver's responsibility to take immediate corrective action.
-  **WARNING:** Forward Collision Warning may provide a warning in situations where the likelihood of collision may not exist. Stay alert and always pay attention to the area in front of Model SModel X so you can anticipate whether any action is required.

Forward Collision Warning operates only when driving between approximately 7 mph (10 km/h) and 90 mph (150 km/h) 3 mph (5 km/h) and 90 mph (150 km/h).

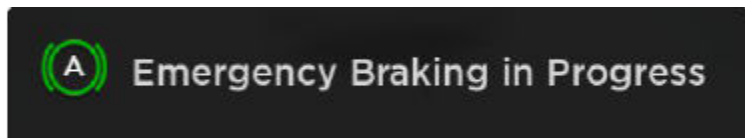
Forward Collision Warning operates only when driving between approximately 7 mph (10 km/h) and 90 mph (150 km/h).

-  **WARNING:** Forward Collision Warning does not provide a warning when the driver is already applying the brake.

Automatic Emergency Braking

Model SModel X is designed to determine the distance from a detected object traveling in front of it. When a frontal collision is considered unavoidable, Automatic Emergency Braking is designed to apply the brakes to reduce the vehicle's speed and therefore, the severity of the impact. The amount of speed that is reduced depends on many factors, including driving speed and environment.

When Automatic Emergency Braking applies the brakes, the instrument panel displays a visual warning and sounds a chime. You may also notice abrupt downward movement of the brake pedal. The brake lights turn on to alert other road users that you are slowing down.



Automatic Emergency Braking operates only when driving between approximately 5 mph (8 km/h) and 90 mph (150 km/h) 3 mph (5 km/h) and 90 mph (150 km/h).

In addition, your vehicle may apply the brakes, regardless of driving speed, to prevent or mitigate a subsequent impact after an initial collision.

Automatic Emergency Braking operates only when driving between approximately 6 mph (10 km/h) and 90 mph (150 km/h).

Automatic Emergency Braking does not apply the brakes, or stops applying the brakes, when:

- You turn the steering wheelsteering yoke sharply.
- You press and release the brake pedal while Automatic Emergency Braking is applying the brakes.
- You accelerate hard while Automatic Emergency Braking is applying the brakes.
- The vehicle, motorcycle, bicycle, or pedestrian is no longer detected ahead.

Automatic Emergency Braking is always enabled when you start Model SModel X. To disable it for your current drive, touch **Controls > Autopilot > Automatic Emergency Braking**. Even if you disable Automatic Emergency Braking, your vehicle may still apply the brakes after detecting an initial collision to reduce further impact.

-  **WARNING:** It is strongly recommended that you do not disable Automatic Emergency Braking. If you disable it, Model SModel X does not automatically apply the brakes in situations where a collision is considered likely.
-  **WARNING:** Automatic Emergency Braking is designed to reduce the severity of an impact. It is not designed to avoid a collision.



-  **WARNING:** Several factors can affect the performance of Automatic Emergency Braking, causing either no braking or inappropriate or untimely braking, such as when a vehicle is partially in the path of travel or there is road debris. It is the driver's responsibility to drive safely and remain in control of the vehicle at all times. Never depend on Automatic Emergency Braking to avoid or reduce the impact of a collision.
-  **WARNING:** Automatic Emergency Braking is designed to reduce the impact of frontal collisions only and does not function when Model SModel X is in Reverse.
-  **WARNING:** Automatic Emergency Braking is not a substitute for maintaining a safe traveling distance between you and the vehicle in front of you.
-  **WARNING:** The brake pedal moves downward abruptly during automatic braking events. Always ensure that the brake pedal can move freely. Do not place material under or on top of the driver's floor mat (including an additional mat) and always ensure that the driver's floor mat is properly secured. Failure to do so can impede the ability of the brake pedal to move freely.

Obstacle-Aware Acceleration

Obstacle-Aware Acceleration is designed to reduce the impact of a collision by reducing motor torque and in some cases applying the brakes, if Model SModel X detects an object in its driving path. The instrument panel displays a visual warning and sounds a chime when the brakes are automatically applied. For example, Model SModel X, while parked in front of a closed garage door with Drive engaged, detects that you have pressed hard on the accelerator pedal. Although Model SModel X still accelerates and hits the garage door, the reduced torque may result in less damage.

Obstacle-Aware Acceleration is designed to operate only when all of these conditions are simultaneously met:

- Drive or Reverse is engaged.
- Model SModel X is stopped or traveling less than 10 mph (16 km/h).
- Model SModel X detects an object in its immediate driving path.

To disable Obstacle-Aware Acceleration, touch **Controls > Autopilot > Obstacle-Aware Acceleration**.

-  **WARNING:** Obstacle-Aware Acceleration is designed to reduce the severity of an impact. It is not designed to avoid a collision.
-  **WARNING:** Obstacle-Aware Acceleration may not limit torque in all situations. Several factors, including environmental conditions, distance from an obstacle, and a driver's actions, can limit, delay, or inhibit Obstacle-Aware Acceleration.
-  **WARNING:** Obstacle-Aware Acceleration may not limit torque when performing a sharp turn, such as into a parking space.
-  **WARNING:** Do not rely on Obstacle-Aware Acceleration to control acceleration or to avoid, or limit, the severity of a collision, and do not attempt to test Obstacle-Aware Acceleration. Doing so can result in serious property damage, injury, or death.
-  **WARNING:** Several factors can affect the performance of Obstacle-Aware Acceleration, causing an inappropriate or untimely reduction in motor torque and/or undesired braking. It is the driver's responsibility to drive safely and remain in control of Model SModel X at all times.

Limitations and Inaccuracies

Collision Avoidance features cannot always detect all objects, vehicles, bikes, or pedestrians, and you may experience unnecessary, inaccurate, invalid, or missed warnings for many reasons, particularly if:

- The road has sharp curves.
- Visibility is poor (due to heavy rain, snow, fog, etc.).
- Bright light (such as from oncoming headlights or direct sunlight) is interfering with the view of the camera(s).
- A camera or sensor is obstructed (dirty, covered, fogged over, covered by a sticker, etc.).
- One or more of the ultrasonic sensors is damaged, dirty, or obstructed (such as by mud, ice, or snow, or by a vehicle bra, excessive paint, or adhesive products such as wraps, stickers, rubber coating, etc.).
- Weather conditions (heavy rain, snow, fog, or extremely hot or cold temperatures) are interfering with sensor operation.
- The sensors are affected by other electrical equipment or devices that generate ultrasonic waves.



Active Safety Features

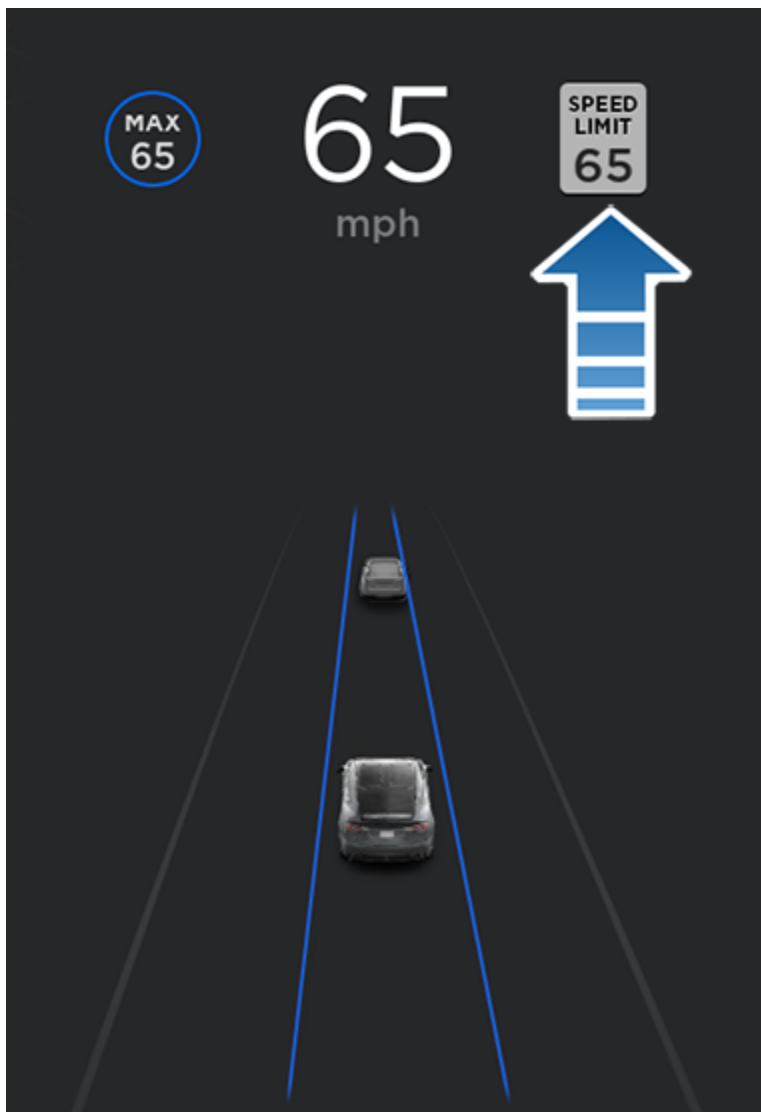
WARNING: The limitations previously described do not represent an exhaustive list of situations that may interfere with proper operation of Collision Avoidance Assist features. These features may fail to provide their intended function for many other reasons. It is the driver's responsibility to avoid collisions by staying alert, paying attention, and taking corrective action as early as possible.

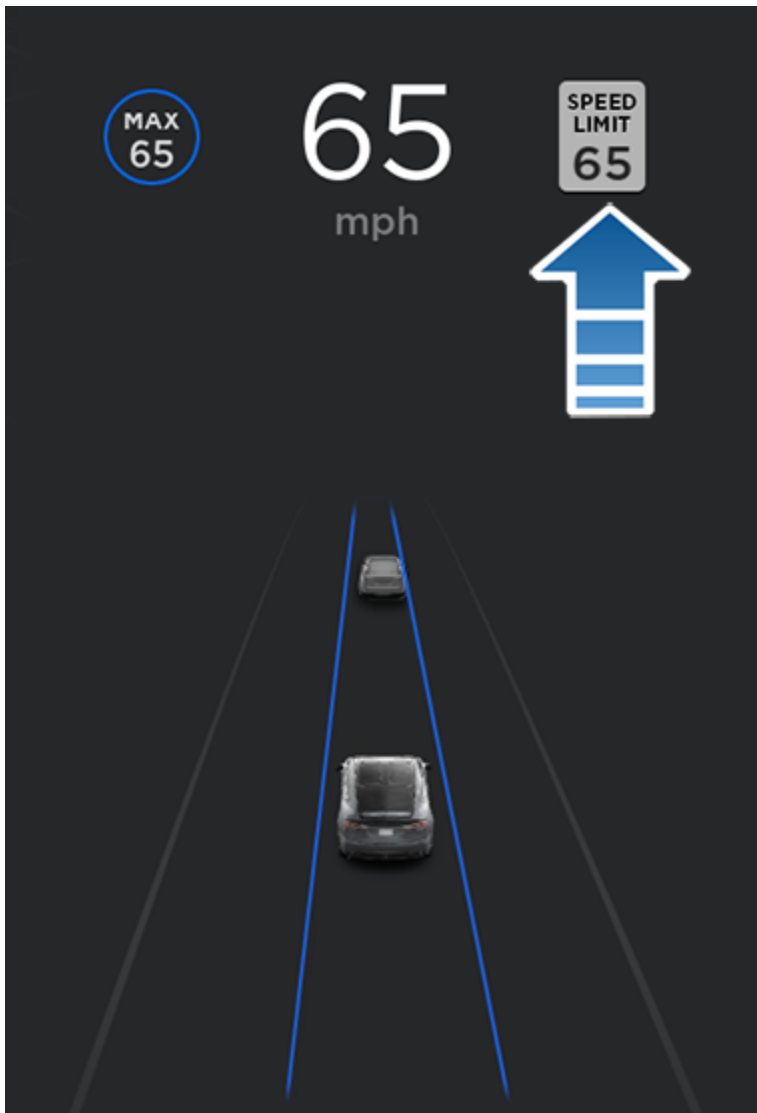
CAUTION: If a fault occurs with a Collision Avoidance Assist feature, Model S/Model X displays an alert. Contact Tesla Service.

Speed Assist

How Speed Assist Works

Model S/Model X displays a speed limit on the instrument panel and you can choose if and how you are warned when you exceed the speed limit. Also, instead of using the detected speed limit, you can base warnings on an arbitrary speed limit that you enter manually.





In situations where Model S/Model X is unable to determine a speed limit, or if Speed Assist is uncertain that an acquired speed limit is accurate, the instrument panel may not display a speed limit sign and warnings do not take effect.

NOTE: Speed limit warnings go away after ten seconds, or when Model S/Model X slows down below the specified limit.



WARNING: Do not rely on Speed Assist to determine the appropriate speed limit or driving speed. Always drive at a safe speed based on traffic and road conditions.

Controlling Speed Assist

To adjust the Speed Limit Warning setting, touch **Controls > Autopilot > Speed Limit Warning**, then choose one of these options:

- **Off** - Speed limit warnings do not display and chimes are not sounded.
- **Display** - Speed limit signs display on the instrument panel and the sign increases in size when you exceed the determined limit.
- **Chime** - In addition to the visual display, a chime is sounded when you exceed the determined speed limit.

You can also specify how the speed limit is determined:

- **Relative** - You can set a speed limit offset (+ or -) if you want to be alerted only when you exceed the offset speed limit by a specified amount. For example, you can increase the offset to +10 mph (10 km/h) if you only want to be warned when you exceed the speed limit by 10 mph (10 km/h).



Active Safety Features

NOTE: The offset from speed limit also affects the number shown in the gray speed icon on the instrument panel.

- **Absolute** - Manually specify any speed limit between 20 and 140 mph (30 and 240 km/h).

NOTE: Speed Assist is not always accurate. In some situations, the location of a road can be miscalculated and Speed Assist can display a speed for a directly adjacent road that may have a different speed limit. For example, Speed Assist can assume Model S/Model X is on a controlled-access highway when it is actually on a nearby surface street, and vice versa.

NOTE: Your chosen setting is retained until you manually change it.

Limitations and Inaccuracies

Speed Assist may not be fully functional or may provide inaccurate information in these situations:

- Visibility is poor and speed limit signs are not clearly visible (due to heavy rain, snow, fog, etc.).
- Bright light (such as from oncoming headlights or direct sunlight) is interfering with the view of the camera(s).
- Model S/Model X is being driven very close to a vehicle in front of it which is blocking the view of the camera(s).
- The windshield is obstructing the view of the camera(s) (fogged over, dirty, covered by a sticker, etc.).
- Speed limit signs are concealed by objects.
- The speed limits stored in the map database are incorrect or outdated.
- Model S/Model X is being driven in an area where GPS or map data is not available or where speed limit signs can not be detected.
- Traffic signs do not conform to standard recognizable formats.
- A road or a speed limit has recently changed.

 **WARNING:** The list above does not represent an exhaustive list of situations that may interfere with proper operation of Speed Assist. Speed Assist may fail to provide warnings for many other reasons.



Security Settings

About the Security System

If Model S/Model X does not detect a key nearby and a locked door or trunk is opened, an alarm sounds. The headlights and turn signals also flash. To deactivate the alarm, press any button on the key fob.

To manually enable or disable the alarm system, touch **Controls > Safety > Security Alarm**. When enabled, Model S/Model X activates its alarm one minute after you exit, the doors lock, and a recognized key is no longer detected.

A battery-backed siren (if equipped) sounds in situations where a locked door or trunk is opened and Model S/Model X does not detect a key nearby. If you also want this siren to sound in situations where the vehicle detects motion inside the cabin, enable **Tilt/Intrusion** (see [Tilt/Intrusion \(if equipped\) on page 394](#)).

NOTE: If Model S/Model X is in Sentry Mode (see [Using Sentry Mode on page 397](#)), you must disable Sentry Mode before you can disable the Security alarm or the Tilt/Intrusion alarm.

Tilt/Intrusion (if equipped)

The **Security Alarm** must be on to enable **Tilt/Intrusion**.

Tilt/Intrusion sounds the alarm in your vehicle if Model S/Model X detects motion inside the cabin, or is moved or tilted (for example, with a tow truck or jack). To enable, touch **Controls > Safety > Tilt/Intrusion**.

The intrusion sensor automatically disables in situations where the climate control system is operating when you leave your vehicle. To override, you can manually turn the Tilt/Intrusion Sensor on again after choosing Keep Climate On, Dog, or Camp Mode.

NOTE: If you plan to leave something that moves inside your locked vehicle, remember to turn off **Tilt/Intrusion**. If this setting is on, any motion detected inside Model S/Model X activates the intrusion alarm.

Enhanced Anti-Theft Upgrade (if equipped)

If your vehicle is equipped with the Enhanced Anti-Theft upgrade, the horn sounds in situations where a locked door or trunk is opened and Model S/Model X does not detect a key nearby. If **Tilt/Intrusion** is on, the horn also sounds if Model S/Model X detects motion inside the cabin or if the vehicle is moved or tilted (for example, with a tow truck or jack). To turn the Tilt/Intrusion detection system on or off, touch **Controls > Safety > Tilt/Intrusion**.

PIN to Drive

To increase security, you can prevent Model S/Model X from being driven until a 4-digit PIN (Personal Identification Number) is entered. To enable this setting, touch **Controls > Safety > PIN to Drive** and follow the on-screen prompts to create a driving PIN.

When enabled, in addition to entering the 4-digit driving PIN to drive, you must also use it to enter Valet mode for the first time and create the 4-digit valet PIN to enter and exit Valet mode. In Valet mode, Model S/Model X can be driven without the need for the valet to enter a driving PIN. The **PIN to Drive** setting is disabled whenever Valet mode is active.

If you forget your driving PIN, touch the link to enter your Tesla login credentials on the PIN to Drive popup, then follow the on-screen prompts.

NOTE: In the unlikely event that your touchscreen is unresponsive, you may be unable to enter the PIN. In this case, first try to restart the touchscreen (see [Restarting the Touchscreen on page 197](#)). If the touchscreen is still unresponsive, you can still bypass PIN to Drive by turning on Keyless Driving in the Tesla mobile app.

Glovebox PIN

For additional security, you can protect the contents in your glovebox with a 4-digit PIN. To enable this setting, touch **Controls > Safety > Glovebox PIN** and follow the on-screen prompts. When enabled, you are prompted to enter the PIN to open the glovebox. To disable this setting, select the toggle to disable and then enter the PIN.

If you forget your glovebox PIN, reset it by entering your Tesla login credentials, then follow the on-screen prompts.



Using the Touchscreen

NOTE: When you open the glovebox with **Glovebox PIN** while Valet mode is enabled, Valet mode disables after the glovebox opens.

Dashcam

NOTE: Depending on market region, vehicle configuration, options purchased, and software version, your vehicle may not be equipped with Dashcam or the features may not operate exactly as described. **It is your sole responsibility to consult and comply with all local regulations and property restrictions regarding the use of cameras.**

Dashcam records video footage of your vehicle's surroundings while driving. Use Dashcam to record driving incidents or other notable events, like you would for an external dashcam on other vehicles.

The Dashcam icon is located in the app launcher. You can add the Dashcam app to the bottom bar for easy access (see [Customizing My Apps on page 19](#)). When Model S/Model X is in Park, touching the Dashcam icon displays the Viewer (see [Viewing Video Recordings on page 842](#)).



To protect your privacy, video recordings are saved locally to a formatted USB flash drive's onboard memory. Recordings are not sent to Tesla. Model S/Model X does not record videos when Dashcam is **Off**.

How to Use Dashcam

1. Format a USB flash drive. Dashcam requires a properly formatted USB drive inserted in your vehicle's USB port to store and retrieve footage. Vehicles manufactured beginning approximately 2020 are equipped with a pre-formatted USB flash drive in the glove box. There are two ways to format the flash drive if needed:
 - Format the flash drive with Model S/Model X. Insert the flash drive into the USB port and navigate to **Controls > Safety > Format USB Drive**.
 - Format the flash drive on a computer. See [USB Drive Requirements for Recording Videos on page 842](#) for more information.
2. Insert the USB flash drive into your vehicle's USB port, preferably the one in the glovebox (if equipped).
3. Enable Dashcam by touching **Controls > Safety > Dashcam**. Dashcam allows you to choose how and when footage is saved. You can choose between:
 - **Auto:** Dashcam automatically saves a recording to the USB drive when Model S/Model X detects a safety-critical event, such as a collision or airbag deployment. When **Auto** is selected, detection can vary and is subject to your vehicle's power, sleep, and Autopilot state.

NOTE: Several factors determine whether Dashcam automatically saves a recording of a safety-critical event (for example, amount of force, whether or not airbags deploy, etc.). Do not rely on Dashcam to automatically record all safety-critical events.
 - **Manual:** You must manually touch the Dashcam icon to save a recording of the most recent ten minutes of footage.
 - **On Honk:** When you press the horn, Dashcam saves a recording of the most recent ten minutes of footage. You can enable this along with **Auto** or **Manual** simultaneously.
4. Once enabled, the Dashcam icon indicates when footage is saved. You can also view the status of the Dashcam icon in **Controls**:



The icon changes to show the status of Dashcam:



RECORDING: Dashcam is recording. To save video footage, touch the icon. To pause recording, press and hold the icon.



AVAILABLE: Dashcam is available but not actively recording. Touch the dashcam icon to start recording footage.



PAUSED: Dashcam is paused. To resume recording, touch the icon. To avoid losing video footage, pause Dashcam before removing the flash drive.



BUSY: Dashcam is in the process of loading, saving, or overwriting footage. While dashcam is busy, footage is not being captured and recorded.



SAVED: Footage is saved. You can also save Dashcam clips by touching the Dashcam icon in the app launcher while Driving.

5. When your desired footage is saved, view the clips on the touchscreen or a computer:
 - Touchscreen: Ensure Model S/Model X is in Park and touch the Dashcam icon in the app launcher. Videos are organized by timestamp. See [Viewing Video Recordings on page 842](#) for more information.
 - Computer: Insert the USB flash drive into a computer and navigate to the TeslaCam folder. Videos are organized by timestamp. See [Viewing Video Recordings on page 842](#) for more information.
6. To turn Dashcam off, navigate to **Controls > Safety > Dash cam > Off**. If set to **Auto**, **Manual**, or **On Honk**, Dashcam automatically enables (but may not be actively saving footage, depending on your preferences) every time you drive.



Sentry Mode

NOTE: Depending on market region, vehicle configuration, options purchased, and software version, your vehicle may not be equipped with Sentry Mode or the features may not operate exactly as described. **It is your sole responsibility to consult and comply with all local regulations and property restrictions regarding the use of cameras.**

When enabled, your vehicle's cameras and sensors (if equipped) remain powered on and ready to record suspicious activity around your vehicle when Model S/Model X is locked and in Park. Think of Sentry Mode as an intelligent vehicle security system that alerts you when it detects possible threats nearby.

If a threat is detected or the vehicle sensors determine there is a lot of jerky movement like when getting towed or shaken, Sentry Mode pulses the headlights, sounds the alarm, and displays a message on the touchscreen indicating that the cameras may be recording to inform individuals outside of the vehicle. The mobile app alerts you of the alarm and saves footage of the event to a USB drive (if installed).

Sentry Mode is disabled by default. You can use voice commands or the Tesla mobile app to easily enable or disable Sentry Mode. To enable Sentry Mode using voice commands, say "Keep Tesla safe," "Keep my car safe," "Sentry on," or "Enable Sentry" (see [Voice Commands on page 391](#)).

Sentry Mode requires your Battery to be at least 20% charged. If the Battery falls below 20%, Sentry Mode turns off and the mobile app sends you a notification. Power consumption may increase when Sentry Mode is active.

NOTE: When Sentry Mode is enabled, the Security Alarm settings (**Controls > Safety > Security Alarm**) are not available.



CAUTION: Do not rely on Sentry Mode to protect Model S/Model X from all possible security threats. Sentry Mode uses many factors to determine whether to activate the security alarm. All impacts may not be detected and the alarm may not activate in all situations. While it may help deter some threats, no security system can prevent all attacks.

NOTE: Sentry Mode only sends notifications to the mobile app when the alarm is triggered or sudden jerky motions are detected by the vehicle.

How to Use Sentry Mode (With a USB Flash Drive)

1. Sentry Mode requires a properly formatted USB drive inserted in your vehicle's USB port. Vehicles manufactured beginning approximately 2020 are equipped with a pre-formatted USB flash drive in the glove box. There are two ways to format the USB drive:
 - Insert the USB drive into the USB port and navigate to **Controls > Safety > Format USB Drive**. Your vehicle automatically formats the USB drive for you.
 - Format the USB drive on a computer. See [USB Drive Requirements for Recording Videos on page 842](#) for more information.
2. Insert the USB drive into the vehicle's USB port, preferably the one in the glove box (if equipped).
3. With your vehicle in Park, enable Dashcam by navigating to **Controls > Safety > Dashcam** (Dashcam must be enabled for Sentry Mode to work).
4. Touch **Controls > Safety > Sentry Mode > On**. Once enabled, the Sentry Mode icon in **Control**son the status bar turns red.



NOTE: Rear camera recordings are available only on vehicles manufactured after approximately February 2018.

When enabled, Sentry Mode is idle, ready to sound the alarm and save a recording of the security event if triggered. See [Viewing Video Recordings on page 842](#) for information on viewing footage.

5. To silence the security alarm and audio system when the alarm is triggered, navigate to **Controls > Safety > Disable Sentry Sounds**. When enabled, Sentry Mode still sends a notification through the mobile app and saves the last 10 minutes footage.
6. To manually enable/disable Sentry Mode until the next drive, touch the Sentry Mode icon. Sentry Mode is Off when the icon is no longer red.



Turn Sentry Mode **Off** in **Controls > Safety > Sentry Mode** to disable for more than one drive cycle.

How to Use Sentry Mode (Without a USB Flash Drive)

When Sentry mode is enabled and a security event is detected but without a USB drive plugged into a USB port, your vehicle alerts you through the mobile app, without any camera recordings.

Sentry Mode Settings

• Exclude specific locations

In **Controls > Safety > Sentry Mode**, you can determine if you want Sentry Mode to *not* enable in certain locations (see [Home, Work, and Favorite Destinations on page 371](#) for more information):

- **Exclude Home:** Sentry Mode does not automatically enable at the location set as Home in your Favorites list.
- **Exclude Work:** Sentry Mode does not automatically enable at the location set as Work in your Favorites list.
- **Exclude Favorites:** Sentry Mode does not automatically enable at any location in your Favorites list.

NOTE: To recognize a location listed as Home, Work, or a Favorite, Model SModel X must be parked within approximately 1,640 feet (500 meters) of the saved location.

To set up your Home or Work location, touch **Navigate > Set Home/Set Work**. To set up a **Favorite**, touch the star when viewing an address on the map. Manually turning Sentry Mode on or off using the touchscreen or the mobile app overrides your Home, Work, or Favorite exclusion preferences until your next drive.

• Set Camera-Based Detection

When **Camera-Based Detection** is enabled, Sentry Mode uses the vehicle's external cameras in addition to vehicle sensors to detect a security event while parked. If disabled, your vehicle only saves clips to the USB drive if a physical threat is detected. To adjust, touch **Controls > Safety > Sentry Mode > Camera-Based Detection**.

• View Live Camera

NOTE: View Live Camera requires premium connectivity and version 4.2.1 (or newer) of the Tesla mobile app installed on a phone that has been paired as a key to Model SModel X.

When Sentry Mode is enabled, use the mobile app to remotely view the area surrounding Model SModel X as seen through the exterior cameras. To enable, touch **Controls > Safety > Sentry Mode > View Live Camera via Mobile App** on the touchscreen to see what Sentry Mode records in real-time. Ensure there are no occupants in the vehicle and all doors are locked. Then, on the mobile app, navigate to **Safety > Sentry Mode > View Live Camera**.

When **View Live Camera** is actively in use, Model SModel X periodically flashes its exterior lights and displays a message on the touchscreen to notify others that the area surrounding the vehicle is being viewed through the cameras.

View Live Camera is limited to approximately one hour (or 15 minutes for some regions) of cumulative usage per day.

If Model SModel X is equipped with a pedestrian warning speaker (see [Pedestrian Warning System on page 267](#)), you can press and hold the microphone button on the mobile app to transmit your voice through this speaker.

You can also enable Dog Mode at the same time and switch the live camera view to see through the interior camera on the mobile app. See [Keep Climate On, Dog, and Camp on page 366](#) for more information. This feature is not supported in vehicles with Autopilot computer 2.0 or 2.5. Touch **Controls > Software > Autopilot computer** to find out which computer your vehicle has.

NOTE: If Dog and Sentry are enabled at the same time, Sentry defaults to **Disable Sentry Sounds** to protect your pet.

NOTE: Video quality can vary depending on network connectivity. No audio is captured.



Using the Touchscreen

NOTE: The live camera feed is fully encrypted and cannot be accessed by Tesla.

See [Viewing Video Recordings on page 842](#) for more information on viewing Sentry Mode footage.

NOTE: When the internal storage reaches full capacity, new recordings overwrite the older recordings.

USB Drive Requirements for Recording Videos

Some features require you to use a USB drive (for example, Dashcam, Sentry Mode and Track Mode, if equipped,) that meet these requirements:

- Minimum storage capacity of 64 GB. Use a USB drive with as much available storage as possible. Video footage can occupy a large amount of space.
- A sustained write speed of at least 4 MB/s. Note that sustained write speed differs from peak write speed.
- USB 2.0 compatible. If using a USB 3.0 drive, it must also support USB 2.0.
- Properly formatted (either automatically or [manually on page 842](#)).

NOTE: In some market regions you can purchase recommended USB drives on <http://www.tesla.com>.

Automatically Formatting a USB Drive

Insert the USB drive into a front USB port that supports the ability to format, save, and view video footage (see [Interior Storage and Electronics on page 79](#) [Interior Storage and Electronics on page 84](#)). and touch **Controls** > **Safety** > **Format USB Drive**. This automatically formats the USB drive as exFAT and creates folders for TeslaCam and TeslaTrackMode (if equipped). The USB drive is now ready to record and save video footage.

Format USB Drive is available only when a USB drive (with one or fewer partitions) is inserted into a front USB port. Choosing **Format USB Drive** erases any existing content on the USB drive. Before using this feature, move any content you want to keep to a different device.

Manually Formatting a USB Drive

If Model S/Model X is unable to format the USB drive, format it using a computer:

1. Format the USB drive as exFAT, MS-DOS FAT (for Mac), ext3, or ext4 (NTFS is currently not supported).
2. Create a base-level folder titled **TeslaCam**. For Track Mode (if equipped), create another base-level folder called **TeslaTrackMode**. You can use one USB drive for Dashcam, Sentry Mode, Track Mode (if equipped), and audio files, but you must create separate partitions or folders on the exFAT USB drive.
3. Once formatted, insert the USB drive into the glovebox USB port (if equipped), otherwise use a front USB port in the center console. Do not use a rear USB port because they can only charge devices. It may take a few seconds for Model S/Model X to recognize the USB drive.
4. Once recognized, ensure icons for Dashcam and Sentry Mode appear at the top of your touchscreen. Icons for Dashcam and Sentry Mode are available when you touch **Controls**. Model S/Model X is now ready to record videos.

NOTE: You may need to first enable Sentry Mode by touching **Controls** > **Sentry** > **Sentry Mode**.

Viewing Video Recordings

If footage is saved, you can view the clips on the touchscreen or a computer.

When the USB drive runs out of storage space, video footage can no longer be saved. To prevent the USB drive from getting full, regularly move saved videos to another device and delete them from the USB drive.

Viewing on the Touchscreen

You can view recorded footage on the touchscreen when Model S/Model X is in Park. Touch the Dashcam icon located in the app launcher. The tabs display a list of all video clips, organized by location and timestamp. Pause, rewind, fast forward, and delete clips as needed. Swipe to the right or press and hold to quickly delete certain clips.



Navigate to **Controls > Safety > Delete Dashcam Clips** to delete all Dashcam and Sentry Mode footage.

NOTE: Dashcam recording pauses when you launch the Viewer.

Viewing on a Computer

Insert the USB drive into a computer and navigate to the TeslaCam or TeslaTrackMode (if equipped) folder.

The TeslaCam folder contains these sub-folders:

- **RecentClips:** Contains the last 60 minutes of recorded content.
- **SavedClips:** Contains all recordings that are saved and renamed from the RecentClips folder.
- **SentryClips:** Contains recordings from all Sentry Mode security events. If storage space on the USB drive becomes limited, the oldest Sentry Clips are deleted to provide space for new ones. Once deleted, you cannot retrieve them.

Operating Climate Controls

Overview of Climate Controls

Climate controls are available at the bottom of the touchscreen. By default, climate control is set to **Auto**, which maintains optimum comfort in all but the most severe weather conditions. When you adjust the cabin temperature while in **Auto**, the system automatically adjusts the heating, air conditioning, air distribution, and fan speed to maintain the cabin at your selected temperature.

Touch the displayed temperature at the bottom of the touchscreen to access the main climate controls screen, where you can adjust your climate preferences. You can return to Auto at any time by touching **Auto**. Touch the power button on the main climate controls screen to toggle on or off. For quick access to common controls, touch the temperature at the bottom of the screen to display the climate popup.

The touchscreen may display **Warming Up** or **Cooling Down** while getting to your preferred temperature. You may hear the fan speed increase or decrease during this time.

NOTE: The climate control system is powered by the high voltage Battery. Therefore, prolonged use decreases driving range.

⚠ WARNING: To avoid burns resulting from prolonged use, individuals who have peripheral neuropathy, or whose capacity to feel pain is limited because of diabetes, age, neurological injury, or some other condition, should exercise caution when using the climate control system and seat heaters.

Adjusting Climate Control Settings

Easily adjust your climate preferences, such as turning on the seat heater or changing the cabin temperature, hands-free by using voice commands (see [Voice Commands on page 391](#)).

NOTE: For one-touch access to seat heaters and defrosters, you can add these controls to My Apps. See [Customizing My Apps on page 653](#).

The climate controls allow you to customize temperature, fan, and more, such as:

	Turn the climate control system on or off. Turning it off reduces cooling, but saves energy. When the climate control system is operating, the front passenger vent can be turned off independently of the driver's vent. For more information, see Adjusting the Front and Rear Vents on page 849. NOTE: Because Model SModel X runs much quieter than a gasoline-powered vehicle, you may notice the sound of the air conditioning compressor as it is operating. To minimize noise, reduce the fan speed.
	Control the flow of air inside the cabin. Air can be drawn into Model SModel X from outside or air can be recirculated inside the cabin.
	Adjust the fan speed using the slider. When in Auto, the fan speed levels change to Low/ Medium/ High. NOTE: Adjusting the fan speed may change the selected setting for how air is drawn into Model SModel X in order to increase or reduce air flow.
AUTO	Adjust climate settings for the front and rear cabin. If Auto is enabled and a passenger is detected, the set temperature is maintained for the rear cabin.
	Choose where air flows into the front cabin (windshield, face-level, or foot-level vents). You can choose one or more vents.



	Touch the driver's, or passenger's, side seat icon to adjust seat heaters for the driver. The seat operates at three levels from 3 (highest) to 1 (lowest). The seat icon displays twisting lines that turn red (heating) or blue (cooling) corresponding with the set level. Auto, which displays when the climate control system is set to Auto, warms or cools the front seats based on cabin temperature. For one-touch access to seat heaters, you can add them to the touchscreen's bottom bar (see Customizing My Apps on page 653).
	Adjust the heated steering wheelsteering yoke. The icon displays red twisting lines that correspond to the set level. If set to Auto, the steering wheel is heated as needed, based on cabin temperature, whenever the climate control system is set to Auto. For one-touch access, you can add this control to the touchscreen's bottom bar (see Customizing My Apps on page 653).
	Turn on the wiper defroster.
	When in Park, Keep Climate On, Dog, and Camp allow you to keep the climate control system operating, even when you leave Model SModel X (see Keep Climate On, Dog, and Camp on page 846).
FRONT REAR	Customize the front or rear climate settings
	When in Park, touch Schedule to set a recurring daily time when you want Model SModel X to be ready to drive by preconditioning the Battery and cabin climate and/or charging during off-peak hours (see #unique_1383 on page).
	The HEPA filter ensures the best quality air inside the cabin whenever the climate control system is on and outside air is entering the cabin (recirculate is off). The HEPA filter is extremely effective at removing particles, including pollution, allergens, bacteria, pollen, mold spores, and viruses. When you engage Bioweapon Defense Mode, the positive pressure inside the cabin minimizes the amount of outside air that can enter the vehicle. NOTE: Some gases, such as carbon monoxide, are not effectively removed by activated carbon.
	Warm up the side mirrors and the charge port.
	Defog or Defrost the windshield. Touch once to <i>defog</i> the windshield (the icon turns blue). Touch a second time to <i>defrost</i> the windshield. Touch a third time to turn off and restore the air distribution, heating, and fan to their previous settings. In low ambient temperatures, the exterior side mirrors are also heated whenever the windshield defroster is operating. See Cold Weather Best Practices on page 284 for more information on preparing for cold weather.

Climate Popup

Touch the temperature arrows on the bottom of the touchscreen to display a popup for easy access to some of the most common climate controls:

NOTE: For one-touch access to seat heaters and defrosters, you can add these controls to My Apps. See [Customizing My Apps on page 653](#).

- Touch to access the main climate controls screen.
- Enable or disable heated or cooled seats (if equipped).
- Enable or disable the front or rear windshield defrosters.
- Modify the cabin temperature by dragging the slider. You can also enable temperature splitting which allows the driver and front passenger to customize their own climate preferences. The front passenger can touch the temperature icon on the bottom of the touchscreen or the main climate controls screen to adjust. Touch **Split** again to disable climate splitting.

Keep Climate On, Dog, and Camp

These settings allow you to keep the climate control system running when in Park, whether you stay inside of, or leave, your vehicle. These settings are useful when it is important to maintain the cabin temperature in hot or cold weather conditions.

Keep Climate On: Maintains the climate control system on at a desire temperature. For example, when leaving groceries in Model S/Model X on hot days, you may want to use Keep Climate On to pre-condition the cabin to maintain a particular temperature.

Dog: Keeps the cabin at a comfortable temperature for your pet while you actively and frequently monitor this temperature using the mobile app (which requires both your phone and the vehicle to have cellular connectivity plenty of battery). When in Dog, the touchscreen displays the current cabin temperature to inform people passing by that your pet is safe. This setting is not intended for people, and should only be used for short periods of time while you stay in close proximity should you need to return to the vehicle in situations where the temperature can no longer be maintained.

NOTE: To avoid accidentally pressing the window switch (such as your dog stepping on it), the windows cannot be rolled down while Dog is enabled.

NOTE: If Dog and Sentry are enabled at the same time, Sentry defaults to **Disable Sentry Sounds** to protect your pet. The cabin camera shows the inside of the vehicle so you can check on your pet at any time. See [Sentry Mode on page 840](#) for more information.

Camp: Allows you to power electronics through the USB ports and low voltage outlets and maintain the cabin temperature. The touchscreen remains on so you can play music, browse the internet, play games, or watch shows in Tesla Theater. You can also control media and climate settings from a paired phone. Camp is ideal for remaining inside your vehicle, such as camping or staying with a child. While active, Sentry Mode and the vehicle alarm system are disabled. Walk-Away Door Lock is inactive.

To operate Keep Climate On, Dog, or Camp:

1. Make sure the Battery's charge level is at least 20%.
2. Engage Park. These settings are available only when Model S/Model X is in Park.
3. Adjust the climate settings.
4. On the climate controls screen, touch **Keep Climate On**, **Dog**, or **Camp**.

NOTE: You can also control **Dog** and **Camp** from the mobile app by swiping up from the gray bar on the Climate screen.

The climate control system attempts to maintain your climate settings until you shift out of Park or manually turn it off. Avoid using these features when the Battery's charge level is low. If the Battery's charge level drops below 20%, the Tesla mobile app attempts to repeatedly send notifications reminding you to check on anything that you have left in Model S/Model X.

NOTE: Software updates cannot be performed when Keep Climate On, Dog, or Camp is active.



WARNING: Never leave a child unattended in your vehicle.



WARNING: Check local laws for any restrictions on leaving pets unattended in your vehicle.

-  **WARNING:** You are responsible for the safety of your dog or pet. Never leave them in Model SModel X for long periods of time. Constantly monitor the vehicle temperature and their well-being. Make sure you have sufficient cellular coverage on your phone and time to return to the vehicle, if necessary.
-  **WARNING:** In the unlikely event that your climate control system needs service or is not working as expected, avoid using Keep Climate On, Dog, and Camp. Never rely on your vehicle to protect something irreplaceable.
-  **WARNING:** You can adjust and monitor the climate control system remotely using the mobile app. However, if you use the mobile app to turn off the climate control system, Keep Climate On, Dog, and Camp stop operating.

Cabin Overheat Protection

Cabin Overheat Protection prevents the cabin from getting too hot in scorching ambient conditions. While not necessary to activate whenever you leave Model SModel X, the climate control system can reduce and maintain the temperature of your vehicle's cabin. This can prevent the cabin from getting too hot after leaving it parked in the sun, making the vehicle more comfortable when you return. Cabin Overheat Protection may take up to 15 minutes to enable once you exit the vehicle. This feature is intended for passenger comfort and has no impact on the reliability of your vehicle's components.

To turn on, touch **Controls > Safety > Cabin Overheat Protection** and choose:

- **On:** The air conditioning operates when the cabin temperature exceeds 105° F (40° C), or the selected temperature on the touchscreen or mobile app. Customizing temperatures may require the most recent version of the mobile app.
- **Off:** Disables Cabin Overheat Protection.

You can also enable Cabin Overheat Protection remotely through the mobile app by touching **Climate**. Swipe up on the bottom menu and select a setting under **Cabin Overheat Protection** (see [Mobile App on page 406](#)).

Cabin Overheat Protection operates until 12 hours has elapsed once you exit Model SModel X, or until the Battery energy drops below 20%, whichever comes first. Using Cabin Overheat Protection requires energy from the Battery, which may decrease range.

-  **WARNING:** Due to automatic shut-off, extreme outside conditions, or other potential inability to maintain the selected temperature, the inside of the vehicle can become dangerously hot, even when Cabin Overheat Protection is enabled. If you experience temperatures exceeding the selected temperature repeatedly, contact Tesla service.
-  **WARNING:** Never leave children or pets in the vehicle unattended. Due to automatic shut-off or extreme outside conditions, the inside of the vehicle can become dangerously hot, even when Cabin Overheat Protection is enabled.

Climate Control Operating Tips

Normal behavior:

- When you use the mobile app to turn on the climate control system, it automatically turns off when the charge level drops to 20%, or if two hours has passed. To cool or heat the cabin for a longer period of time, charge the vehicle and re-enable your climate control preference through the mobile app.
- To reduce the temperature in the cabin in hot weather conditions, the fan may turn on to vent the cabin when the vehicle is parked. This occurs only if the Battery's charge level is above 20%.
- In addition to cooling the interior, the air conditioning compressor also cools the Battery. Therefore, in hot weather, the air conditioning compressor can turn on even if you turned it off. This is normal because the system's priority is to cool the Battery to ensure it stays within an optimum temperature range to support longevity and optimum performance.
- You may hear the sound of the climate system inside the cabin of Model SModel X when parked. It makes a low fan noise. The climate system attempts to dry itself out to minimize additional moisture or musty odors. This is a normal operation and not a cause for concern.
- Even when not in use, you may hear Model SModel X emit a whining noise or the sound of water circulating. These sounds are normal and occur when the internal cooling systems turn on to support various vehicle functions, such as maintaining the low voltage battery and balancing the temperature of the high voltage Battery.
- In very humid conditions, it is normal for the windshield to fog slightly when you first turn on the air conditioning.
- It is normal for a small pool of water to form under Model SModel X when parked. Extra water produced by the dehumidifying process is drained underneath.

Tips:



- If the climate control system is louder than you prefer, manually reduce the fan speed.
- Improve the efficiency of the cabin heating or cooling by reducing your rate of acceleration. This allows the heat pump system to take more heat from the Battery to efficiently heat the cabin, instead of maintaining the Battery's ability to provide peak acceleration performance. Note that when subsequently increasing the acceleration mode, the Battery requires time to warm up before the increased level of acceleration is available.
- To ensure the climate control system operates efficiently, close all windows and ensure that the exterior grille in front of the windshield is free of ice, snow, leaves, and other debris.
- Your charge port latch may freeze in extremely cold weather or icy conditions. In cases where you cannot remove or insert the charge cable, or your vehicle is not Supercharging due to the latch being frozen in place, enable **Defrost Truck** in the mobile app. This helps thaw ice on the charge port latch so the charge cable can be removed or inserted. See [Cold Weather Best Practices on page 284](#) for more information.



Adjusting the Front and Rear Vents

Model SModel X has a unique horizontal face-level vent that spans the width of the dashboard. It also has vents at the top and bottom of the rear console.

NOTE: Outside air is drawn into Model SModel X through the grill in front of the windshield. Keep the grill clear of obstructions, such as leaves and snow.

Using the front and rear touchscreens, you can pinpoint exactly where you want to direct the air flowing from this vent when heating or cooling the cabin. When the face-level vent is on you can adjust the direction of the air flow from each vent. To adjust the direction of the air flow, touch the radiating air waves from the corresponding vent on the touchscreen. The air flows in a single stream when centered or splits into mirrored air streams when air is directed outward or inward from the center of the vent.

NOTE: When you split a vent into two separate air flows, the air flow in each direction is not as strong as when all air is flowing in a single direction.

Front passengers can turn off the flow of air from the passenger vent. To turn off air flow, press and hold the front passenger air waves on the touchscreen. You can turn on the flow of air again by touching the front passenger vent.

Cabin Air Filter(s)

Model SModel X has a HEPA filter to prevent pollen, industrial fallout, road dust and other particles from entering through the vents.

NOTE: The HEPA filter requires periodic replacement. See [Service Intervals on page 429](#).

Cold Weather Best Practices

To ensure that Model S/Model X provides you with the best ownership experience possible in harsh cold weather conditions, follow these best practices.

Before Driving

When snow and ice accumulate on your vehicle, moving parts, such as the door handles, windows, mirrors, and wipers can freeze in place. To achieve maximum range and performance, it is helpful to warm the cabin and Battery before you leave. There are several ways to do so:

- Touch **Schedule**, available on both the charging and climate control screens, to set a time when you want your vehicle to be ready to drive (see [Scheduled Charging and Scheduled Departure on page 425](#)).
- On the mobile app, navigate to **Climate** to customize the temperature at which you want to heat the cabin. This also warms the high voltage Battery as needed.
- On the mobile app, navigate to **Climate > Defrost Car > Defrost** to melt snow, ice, and frost on the windshield, windows, and mirrors. This also warms the high voltage Battery as needed.

NOTE: Tesla recommends activating climate settings at least 30–45 minutes before departure (see [Climate Controls on page 360](#)). Preconditioning times depend on outside temperature and other factors. The Mobile App will notify you once your vehicle has reached the desired preconditioning temperature.

- In extremely cold weather or icy conditions, it is possible that your charge port latch may freeze in place. In cases where you cannot remove or insert the charge cable, or the vehicle is not Supercharging due to the latch being frozen in place, use your Tesla mobile app to precondition on **HI** for approximately 30–45 minutes (you must use your mobile app to precondition; setting your climate to **HI** using the touchscreen is not effective). This can help thaw ice on the charge port latch so the charge cable can be removed or inserted.
- In extremely cold weather or icy conditions, it is possible that your charge port latch may freeze in place. In cases where you cannot remove or insert the charge cable, or the vehicle is not Supercharging due to the latch being frozen in place, use the **Defrost Car** setting in the mobile app. This can help thaw ice on the charge port latch so the charge cable can be removed or inserted.
- Warming the Battery using Scheduled Departure or the mobile app before driving can also reduce charging time at a Supercharger or third party fast charger, especially if the Supercharger or third party fast charger is close enough that Trip Planner does not have sufficient time to precondition the Battery (see [Warming the Battery Before Supercharging on page 285](#)).

Windows

- On the mobile app, navigate to **Climate > Defrost** as mentioned previously.
- Use the mobile app to schedule a service appointment for Tesla to provide hydrophobic coating to your windows for a nominal fee.

Mirrors

If ice buildup is expected when parking, turn off **Auto-Fold Mirrors**. Touch **Controls > Vehicle > Auto-Fold**. Ice can prevent exterior side mirrors from folding or unfolding.

NOTE: Side mirrors automatically heat as needed during preconditioning, or when the rear defroster is turned on.

Wipers

If you expect snow or ice to build up when parked, touch **Controls > Service > Wiper Service Mode**. This raises wipers against the windshield so they can defrost when the windshield defrosts (see [Wipers and Washers on page 228](#)).

Tires and Tire Chains

- Use winter tires to increase traction in snowy or icy conditions. You can purchase winter tires on <http://www.tesla.com> (see [Seasonal Tire Types on page 438](#)).

- Tire chains provide additional traction when driving in snowy or icy conditions. Check local regulations to determine if tire chains are recommended or required during winter months. See [Using Tire Chains on page 439](#) for more information.

Your vehicle's tire pressures will drop in cold ambient temperatures. If the TPMS indicator light appears, inflate the tires before driving. The tires will lose one PSI for every 10° F (6° C) drop in outside temperature (see [Tire Care and Maintenance on page 431](#)). Proper tire pressures help protect tires from potholes and improve range when properly inflated.

While Driving

Cold weather can increase energy consumption because more power is required for driving, cabin and Battery heating. Follow these suggestions to reduce energy consumption:

- Use seat heaters to keep warm. Seat heaters use less energy than the cabin heater. Lowering the cabin temperature and using seat heaters reduces energy consumption (see [Climate Controls on page 360](#)).
- Slow down your driving and avoid frequent and rapid acceleration.
- Turn on Range Mode to automatically limit the power that the climate control system uses to maintain the temperature of the Battery and the cabin area. Range Mode also turns off signature lights (if equipped) and adjusts the front and rear motor torque split to maximize range (see [Getting Maximum Range on page 261](#)).

Regenerative Braking

Regenerative braking can be limited if the Battery is too cold. As you continue to drive, the Battery warms up and regenerative power increases (see [Regenerative Braking on page 233](#)).

NOTE: Limited regenerative braking can be avoided if you allow enough time to precondition your vehicle or if you use **Schedule** to precondition Model S/Model X before your departure time (see [Scheduled Charging and Scheduled Departure on page 425](#)).

Blue Snowflake Icon



A blue snowflake icon appears on your instrument panel when some of the stored energy in the Battery is unavailable because the Battery is cold. This portion of unavailable energy displays in blue on the Battery meter. Regenerative braking, acceleration, and charging rates may be limited. The snowflake icon no longer displays when the Battery is sufficiently warm.

Warming the Battery Before Supercharging

By using Trip Planner (see [Trip Planner on page 373](#)) to navigate to a Supercharger, Model S/Model X pre-heats the Battery to ensure when you arrive at the Supercharger, the Battery temperature is optimal and ready to charge. This reduces the amount of time it takes to charge.

NOTE: Tesla recommends using Trip Planner to navigate to a Supercharger for at least 30–45 minutes before arrival to ensure optimal Battery temperature and charging conditions. If the drive to the Supercharger is less than 30–45 minutes, consider preconditioning the Battery prior to driving (see [Before Driving on page 284](#)).

Autopilot

To ensure optimal Autopilot performance, keep the sensors and radar free of snow, ice, mud, and dirt (see [About Autopilot on page 286](#)).

After Driving

Leave Model S/Model X plugged in when not in use. This uses the charging system, rather than the Battery itself, to keep the Battery warm (see [High Voltage Battery Information on page 415](#)).

Scheduled Departure

When parked, plug in Model S/Model X and use the **Schedule** settings, available on both the charging and climate control screens, to set a time when you want to precondition Model S/Model X (see [Scheduled Charging and Scheduled Departure on page 425](#)). Your vehicle determines the appropriate time to begin charging so it is complete during off-peak hours and the cabin and Battery are warm by your set departure time. For more information, see [Scheduled Charging and Scheduled Departure on page 425](#).

Charge Port

- If your charge port latch freezes in place and a charging cable becomes stuck in the charge port, try manually releasing the charge cable. See [Manually Releasing Charge Cable on page 426](#)[Manually Releasing Charge Cable on page 427](#)[Manually Releasing Charge Cable on page 426](#).
- Use the mobile app to precondition your vehicle to help thaw ice on the charge port latch so that the charge cable can be removed or inserted (see [Mobile App on page 406](#)).

NOTE: You can also prevent the occurrence of a charge port latch freezing in place by using the **Schedule** settings (see [Scheduled Charging and Scheduled Departure on page 425](#)).

NOTE: If your charge port latch is frozen in place, it may not lock the charging cable in place when inserted, but it can still charge at a slow AC rate even if the latch is not engaged.

Storage

If you leave Model SModel X parked for an extended period of time, plug the vehicle into a charger to prevent normal range loss and to keep the Battery at an optimal temperature. Your vehicle is safe to stay plugged in for any length of time.

When not in use, Model SModel X enters a sleep mode to conserve energy. Reduce the number of times you check your vehicle's status on the mobile app, as this automatically wakes up your vehicle and starts normal energy consumption.

Hot Weather Best Practices

To ensure that Model SModel X provides you with the best ownership experience possible in hot ambient conditions, follow these best practices.

Before Driving

There are several ways to prepare your vehicle for a drive, without having to get into an already hot vehicle:

- Precondition the cabin by moving the direction of air flow from the vents, and turn the seat heaters on or off. In the mobile app, navigate to **Climate** to customize the temperature at which you want to cool the cabin.
- Touch **Schedule**, available on both the Charging and Climate Control screens, to set a time when you want your vehicle to be ready to drive (see [Scheduled Charging and Scheduled Departure on page 880](#)).
- Enable **Cabin Overheat Protection**, which prevents the cabin from getting too warm in hot ambient conditions.
- In the mobile app, navigate to **Controls** to vent the windows.

NOTE: Tesla recommends activating climate settings at least 30–45 minutes before departure (see [Climate Controls on page 360](#)). Preconditioning times depend on outside temperature and other factors. The mobile app will notify you once your vehicle has reached the desired preconditioning temperature.

After Driving

Leave Model SModel X plugged in when not in use, especially if using Preconditioning or Cabin Overheat Protection. This uses the charging system, rather than the battery itself, to maintain a comfortable temperature (see [High Voltage Battery Information on page 415](#)). In addition, there are several ways to minimize a hot cabin:

- Before leaving your vehicle (to run errands, for example), use Dog Mode to keep the cabin cool for pets or perishable goods. See [Keep Climate On, Dog, and Camp on page 366](#) for more information.
- Tesla recommends turning the air conditioning off approximately 30 seconds before pressing Park to reduce puddling below the vehicle.
- Park in the shade to help reduce power consumption and maintain cooler cabin temperatures.
- Use a sun shade (available on the Tesla Shop) if you have to park outside in the sun.
- When parked, plug in Model SModel X and **Schedule** your charging. Your vehicle determines the appropriate time to begin charging so it is complete during off-peak hours. The cabin and Battery are also prepared by your set departure time. For more information, see [Scheduled Charging and Scheduled Departure on page 880](#).

Charging

When using Trip Planner or navigating to a Supercharger station, your vehicle automatically prepares the Battery for most efficient charging. In extreme heat, you may not see the message that the vehicle is preconditioning the Battery while navigating to a Supercharger, but it is still preparing the Battery for charging.

NOTE: Tesla recommends using Trip Planner to navigate to a charging location for at least 30–45 minutes before arrival to ensure optimal Battery temperature and charging conditions. If the drive to the charging location is less than 30–45 minutes, consider preconditioning the Battery before driving (see [Before Driving on page 284](#)).

If possible, leave your vehicle plugged into a charger whenever not in use, even in warm weather, especially if using Preconditioning or Cabin Overheat Protection.

Storage

If you leave Model SModel X parked for an extended period of time, plug the vehicle into a charger to prevent normal range loss and to keep the Battery at an optimal temperature. Your vehicle is safe to stay plugged in for any length of time.

When not in use, Model SModel X enters a sleep mode to conserve energy. Reduce the number of times you check your vehicle's status on the mobile app, as this automatically wakes up your vehicle and starts normal energy consumption.



Maps and Navigation

Map Overview

The touchscreen displays a map at all times (except when Model S/Model X is shifted into Reverse).

Use your finger(s) to interact with the map:

- To move the map in any direction, hold and drag a finger.
- To rotate the map in any direction, hold and turn two fingers.
- To zoom the map in or out, expand or pinch two fingers, respectively.

NOTE: When you rotate or move the map, your current location is no longer tracked. The message "Tracking Disabled" displays briefly next to the map orientation icon and the icon turns gray. To re-enable tracking, touch the map's orientation icon and choose North Up or Heading Up.

NOTE: The map zooms in and out automatically when a navigation route is active.

To change the orientation of the map, toggle between these options:



North Up - North is always at the top of the screen.



Heading Up - The direction you are driving is always at the top of the screen. The map rotates as you change direction. This icon has an integrated compass that indicates the direction you are driving.

NOTE: Touching this icon while navigating to a destination displays the route overview.



The route overview is available when you are navigating to a destination. The route overview also displays when you expand the turn-by-turn direction list (by swiping it downward). When you collapse the turn-by-turn direction list by swiping it upward, the map reverts back to displaying your previously chosen orientation.

Your current location is shown on the map. When you rotate or move the map, your current location is no longer tracked. To re-enable tracking, touch the map's orientation icon to choose North Up or Heading Up. When you touch the map while a navigation route is active, the turn-by-turn direction list displays the next set of directions and the orientation icon disappears. Touch anywhere on the map to re-display it.

Map Display

Touch these icons to customize what the map displays:



Display/hide satellite imagery (if equipped with premium connectivity).



Display/hide traffic conditions (if equipped with premium connectivity). Green lines indicate no traffic; orange lines indicate light traffic; red lines indicate moderate traffic; and pink lines indicate heavy traffic. To ensure traffic is easy to identify along a navigation route, green traffic lines display under the blue route line, whereas orange, red, and pink traffic lines display on top of the blue route line.



Display/hide map details (such as points of interest).

Drop a pin anywhere on the map by pressing and holding your finger on a desired location. When you drop a pin, or touch an existing pin, the chosen location is centered on the map, and a popup screen provides information about the location. From this popup, you can navigate to the location, call the location (if a phone number is available) and add or remove the location from your list of favorite destinations (see [Home, Work, and Favorite Destinations on page 371](#)).



Display/hide all charging locations and a popup list that includes the city and proximity of the corresponding stations on the map. Charging locations include Tesla Superchargers, destination charging sites, third-party fast chargers, and public chargers that you have used previously. See [Charging Locations on page 372](#).

Touch the lightning bolt icons in the popup list to filter by the types of chargers based on max power.

NOTE: In some market regions, third-party fast chargers are also included on the map as dark gray pins when you display chargers.

Navigation Settings



The navigation settings icon displays when you touch ... once you start navigating to a destination.

NOTE: You can also access navigation settings by touching **Controls > Navigation**.

Touch the navigation settings icon to customize the navigation system to suit your preferences: (the available settings vary depending on your market region and vehicle configuration):

- Touch - or + to increase or decrease the volume of spoken navigation instructions. Decreasing all the way to the left, or touching the speaker icon, mutes the instructions. You can also mute/unmute navigation instructions by touching the speaker icon. This volume setting applies only to the navigation system's spoken instructions. Volume for Media Player and Phone is not changed.
- Enable **Automatic Navigation** if you want Model S/Model X to automatically initiate a navigation destination when you get in your vehicle. Destinations are predicted based on commonly driven routes, time of day, and calendar entries (see [Automatic Navigation on page 371](#)).
- Enable **Trip Planner** to add supercharger stops as needed. Supercharging stops are added to navigation routes with the goal of minimizing the amount of time you spend driving and charging (see [Trip Planner on page 373](#)).
- Enable **Online Routing** to be automatically rerouted to avoid heavy traffic (see [Online Routing on page 373](#)).
- Touch **Avoid Ferries** to be automatically routed to avoid ferries.
- Touch **Avoid Tolls** to be automatically routed to avoid tolls.
- Touch **Use HOV Lanes** to include High Occupancy Vehicle (HOV) lanes on navigation routes. This is particularly useful when using Navigate on Autopilot (see [Navigate on Autopilot on page 316](#)).

NOTE: The navigation settings available can vary depending on region and vehicle configuration.

Navigating to a Destination

To navigate to a location, touch the search bar in the corner of the map and enter a destination, send the destination from your phone, or speak a voice command (see [Voice Commands on page 391](#)). You can enter or speak an address, landmark, business, etc. When you touch the search bar, you can also choose from the following types of locations:

- A saved **Home** or **Work** location (see [Home, Work, and Favorite Destinations on page 371](#)).
- A **Charging** destination (see [Charging Locations on page 372](#)).



Navigation and Entertainment

- A **Recent** destination (the most recent destination is listed at the top).
- A destination you have marked as a **Favorite** (see [Home, Work, and Favorite Destinations on page 371](#)).
- A popular restaurant when you're feeling **Hungry** or a popular destination (such as museums and amusement parks) when you're feeling **Lucky** (see [I'm Feeling Lucky, Hungry on page 371](#)).

NOTE: If a data connection is not available, onboard maps allow you to navigate to any destination, but you must enter the exact and complete address.

NOTE: You can start navigation remotely from your iOS® or Android™ device using the "share" functionality on your device after allowing access to the Tesla mobile app.

When you specify a location, the touchscreen zooms out to provide an overview of the route you need to travel and displays a turn-by-turn direction list. Estimated arrival time, driving time, and mileage displays at the bottom of the direction list. Battery images at the bottom of the list provide a visual representation showing estimates of how much Battery energy will remain when you reach your destination, and how much will remain if you make a round trip back to your current location. Note the following about the turn-by-turn direction list:

- A battery image provides a visual representation of how much Battery energy will remain when you reach your destination. See [Predicting Energy Usage on page 373](#).
- If charging is needed to reach your destination and Trip Planner is enabled (and available in your market region), the navigation route automatically includes Supercharger stops (see [Trip Planner on page 373](#)).
- If you won't have enough energy to reach your destination and there is no Supercharger on the route, an alert tells you that charging is needed to reach your destination.
- Each turn is preceded by the distance to the maneuver.
- To see the bottom of the list, you may need to drag the list upward.
- Touch the top of the list to minimize it.

While navigating, the map tracks your location and displays the current leg of your trip. You can display the entire route at any time by swiping down to expand the turn-by-turn direction list or touching the route overview icon.

If Navigate on Autopilot is enabled, you can turn it on for the navigation route by touching **Navigate on Autopilot** in the turn-by-turn direction list. Navigate on Autopilot is a full self-driving (Beta) feature that automatically changes lanes and steers Model S/Model X along a navigation route, exiting controlled-access highways, etc. For details, see [Navigate on Autopilot on page 316](#).



The **Navigate on Autopilot** icon is blue when the feature is active.

To stop navigating, touch **END**, located in the bottom corner of the turn-by-turn direction list.

Adding Stops to a Route

After you have entered a destination, you can edit your route by adding, deleting or reordering stops. Touch the three dots at the bottom of the turn-by-turn direction list to view options to edit your route.



Add Stop allows you to add a stop by searching for a location or adding a Home, Recent or Favorite destination. You can also add a stop by touching any pin on the map and selecting **Add** from the popup.



Edit Stop allows you to set up a complex trip by adding or deleting stops on your route. Drag and drop stops by touching the equal sign to reorder your trip.



Automatic Navigation

NOTE: Automatic Navigation may not be available in all market regions and on all vehicle configurations.

Automatic Navigation can predict a destination when you get in your vehicle. When your phone's calendar is synced to Model S/Model X, and the calendar includes an event that takes place within two hours of when you get in your vehicle to drive, Automatic Navigation suggests the location of the event (assuming a valid address is associated with the event).

In addition, if you are Home and get in your vehicle on weekdays (Monday to Friday) from 5:00 AM to 11:00 AM, Automatic Navigation can automatically route you to your specified Work location (see [Home, Work, and Favorite Destinations on page 371](#)). Likewise, if you are at work on weekdays from 3:00 PM to 11:00 PM, Automatic Navigation can automatically route you to your specified Home location.

To enable Automatic Navigation, touch **Controls > Navigation > Automatic Navigation**. You must have your phone's calendar synced to Model S/Model X and the event must include a uniquely specified and valid address (see [Phone and Calendar on page 381](#)).

NOTE: Navigation instructions that you enter manually, or send to Model S/Model X, override routes suggested by Automatic Navigation.

I'm Feeling Lucky, Hungry

NOTE: "I'm Feeling Lucky" and "I'm Feeling Hungry" may not be available in all market regions and on all vehicle configurations.

In addition to navigating to a destination of your choice, Model S/Model X can also suggest nearby locations based on whether you are feeling **Hungry** or **Lucky**. In the navigation search bar, touch **Hungry** or **Lucky**. **Hungry** suggests popular restaurants, whereas **Lucky** suggests popular destinations (such as museums and amusement parks). For a new suggestion, go back and touch **Hungry** or **Lucky** again for different results. When you discover a destination that interests you, touch **Navigate** to proceed to the destination.

This feature requires the latest version of Navigation maps. To download, connect Model S/Model X to Wi-Fi and touch **Controls > Software** to check if an update is available (see [Map Updates on page 374](#)).

Home, Work, and Favorite Destinations

If you frequently drive to a destination, you may want to add it as a favorite to avoid having to enter the location's name or address each time. When you add a destination as a Favorite, you can easily navigate to it by touching the navigation search bar and then touching **Favorites** and choosing it from your list of favorite destinations.



To add a destination to your Favorites list touch its pin on the map, then touch the star icon on the popup screen that appears. Enter a name (or leave as-is to accept the default name), then touch **Add to Favorites**. The star becomes solid and the destination is included on your Favorites list.

To delete a Recent or Favorite destination, touch it on the destination list and hold it down briefly until the **X** appears. Then touch the **X** to delete it from the list.

Home and **Work** locations also display under the map's search bar. Touch to set an address to the corresponding location. After entering the address, touch **Save as Home** or **Save as Work**. Then simply touch these shortcuts whenever you want to navigate home or to work.

To change or delete the address associated with Home or Work, press and hold its icon and in the popup screen that displays, enter a new address and touch **Save as Home** or **Save as Work**, or touch **Clear Home** or **Clear Work**.

NOTE: Based on your usage patterns, Model S/Model X may prompt you to save a location as Home or Work.

NOTE: Once a Home or Work location is saved, Model S/Model X may prompt you to navigate to your Work location in the mornings and to your Home location in the evenings and provide an estimated driving time based on current traffic conditions. See [Automatic Navigation on page 371](#).

For security reasons, if you sell Model S/Model X, it is recommended that you delete your Home and Work locations. You can delete these individually or you can perform a factory reset to erase all personal data (touch **Controls > Service > Factory Reset**).



Charging Locations

To display charging locations on the map, touch the map's search bar, then touch **Charging**. Charging locations are shown in a list (with the closest charging location at the top of the list) and represented by corresponding pins on the map. Touch a pin to display more information, navigate to it, or mark it as a favorite.

Touch the lightning bolt icons to specify the types of charging locations you want the map to include (by default, the map displays only superchargers):



Touch to include destination chargers.



Touch to include standard superchargers.



Touch to include high-powered superchargers.

NOTE: In some market regions, third-party fast chargers are also included as dark gray pins when you choose to display all charging stations.

The appearance of a charging location's pin reveals status information about the location. Touch the pin to display details.



The Supercharger location is operational and the number displayed on the pin represents the number of available Supercharger stalls.

NOTE: A Supercharger located on your current navigation route is colored black (or white, if the touchscreen is in night mode).



The Supercharger location is experiencing a high volume of users and you may need to wait before charging.



The Supercharger location may be operating at a reduced capacity.



The Supercharger location may be closed.



The Supercharger location has no data available but should be operational.



The location is either a destination charging location, a third-party fast charger, or a public charging station that you have previously used. Touch to display more information such as usage restrictions and available charge current.

NOTE: When the map is zoomed out and more than one destination charging location is available in an area, the pin is round and displays the number of stations. Touch the pin to zoom in. Then you can touch an individual pin for details about a specific location.

Touch a charging location's pin to display a popup from which you can:

- Determine it's exact location and approximate distance from your current location.
- View amenities that are available at the charging location, including restrooms, restaurants, lodging, shopping, and Wi-Fi. On a supercharger popup, touch an amenity icon to search the surrounding area for the associated amenity.
- Touch the navigation icon to navigate to the charging location.

NOTE: When navigating to a Supercharger (or third-party fast charger in some regions), Model SModel X preconditions the Battery to prepare for charging. This ensures you arrive with an optimal Battery temperature, reducing the amount of time it takes to charge. In some circumstances (such as cold weather), it is normal for the motor(s) and components to make noise as it generates heat to warm the Battery (see [Warming the Battery Before Supercharging on page 285](#)).

Predicting Energy Usage

When navigating to a destination, Model SModel X helps you anticipate your charging needs by calculating the amount of energy that remains when you reach your destination. The calculation is an estimate based on driving style (predicted speed, etc.) and environmental factors (elevation changes, temperature, etc.). When navigating, the map displays this calculation at the bottom of the expanded turn-by-turn direction list (see [Navigating to a Destination on page 369](#)). When the turn-by-turn direction list is compressed, touch the top of the list to expand it.

Throughout your route, Model SModel X monitors energy usage and updates the calculation. A popup warning displays at the bottom of the turn-by-turn direction list in these situations:

- A yellow warning displays when you have very little energy remaining to reach your destination, requiring you to drive slowly to conserve energy. For tips on conserving energy, see [Getting Maximum Range on page 261](#).
- A red warning displays when you must charge to reach your destination.

To determine if you have enough energy for a round trip, touch the battery icon at the bottom of the turn-by-turn direction list to display an estimated calculation of your round trip energy usage.

Online Routing

Model SModel X detects real-time traffic conditions and automatically adjusts the estimated driving and arrival times. In situations where traffic conditions will delay your estimated time of arrival and an alternate route is available, the navigation system can reroute you to your destination. You can also specify the minimum number of minutes that must be saved before you are rerouted. To turn this feature on or off, touch the map's settings icon (see [Navigation Settings on page 369](#)), then touch **Online Routing**.

Trip Planner

Trip Planner (if equipped) helps you take longer road trips with confidence. If reaching your destination requires charging, Trip Planner routes you through the appropriate Supercharger locations. Trip Planner selects a route and provides charging times to minimize the amount of time you spend driving and charging. To enable Trip Planner, touch the map's settings icon (see [Navigation Settings on page 369](#)), then touch **Trip Planner**.

When Trip Planner is enabled and charging is required to reach your destination, the turn-by-turn direction list includes Supercharger stops, recommended charging times at each Supercharger, and an estimate of how much energy will be available when you arrive at the Supercharger location.

NOTE: When navigating to a Supercharger or, in some regions, a third-party fast charger using Trip Planner, Model SModel X may allocate some energy to pre-heat the Battery to arrive at the Supercharger or third-party fast charger with an optimal Battery temperature. This reduces charging time (see [Warming the Battery Before Supercharging on page 285](#)).



Navigation and Entertainment

To remove Supercharger stops and display directions only, touch **Remove all charging stops** at the bottom of the turn-by-turn direction list. If you remove charging stops, the turn-by-turn direction list may display an alert indicating that charging is needed to reach your destination. To add Supercharger stops back to the turn-by-turn direction list, touch **Add charging stops**.

While charging at a Supercharger, the charging screen displays the remaining charging time needed to drive to your next Supercharger stop, or destination (if no further charging is needed). If you charge for a shorter or longer length of time, charging time at subsequent Supercharger stops is adjusted accordingly.

NOTE: You can also use the mobile app to monitor remaining charging time needed.

NOTE: If a Supercharger on your navigation route experiences an outage, Trip Planner displays a notification and attempts to reroute you to a different Supercharger location.

If Trip Planner estimates that you won't have enough energy for your round trip, and there are no Superchargers available on your route, Trip Planner displays an alert at the top of the turn-by-turn direction list notifying you that charging is needed to reach your destination.

Map Updates

As updated maps become available, they are automatically sent to Model S/Model X over Wi-Fi. To ensure you receive them, periodically connect Model S/Model X to a Wi-Fi network (see [Connecting to Wi-Fi on page 403](#)). The touchscreen displays a message informing you when new maps are installed.



Media

Overview

The Media Player displays on the touchscreen and is used to play various types of media. You can drag Media Player upward to expand it (allowing you to browse), and downward to minimize it so that just the Miniplayer displays. The convenient Miniplayer, which occupies the least amount of space on the touchscreen, displays what's currently playing and provides only the basic functions associated with what's playing. You can also drag Media Player to display on the left or right side of the touchscreen.

Media Player displays content and options associated with the app (or source) you choose from the app launcher, or from the dropdown list that displays when you maximize Media Player:

NOTE: Media apps vary depending on market region. Some apps described may not be available in your market region, or may be replaced by different ones.



Radio: Choose from a list of available radio stations or touch the numeric keypad to directly tune the radio to a specific frequency. Touch the next or previous arrows to move from one frequency to the next (or previous).



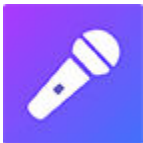
Bluetooth: Play audio from a bluetooth-connected phone or USB device (see [Playing Media from Devices on page 377](#)).



Streaming: Play the audio streaming service available in your market region (for example, Slacker Radio), if equipped.



Spotify: Play audio available on Spotify.



Karaoke: Sing along with various songs (see [Karaoke on page 376](#)).



TuneIn: Play audio available on TuneIn.



Tidal: Play audio available on Tidal.

NOTE: You can show or hide any media app/source. See [Media Settings on page 376](#).

When listening to internet radio or a music streaming service, the options available on the Media Player screen vary depending on what you are listening to. Touch the next (or previous) arrows to play the next (and in some cases previous) available station, episode, or track. You can also play next/previous using the left scroll button on the steering wheelsteering yoke.



Navigation and Entertainment

Streaming services are available only when a data connection is available (for example, Wi-Fi or Premium Connectivity). For some media services, you can use a default Tesla account. For others, you may need to enter account credentials the first time you use it.

NOTE: Instead of launching a different media app, you can change the source from within the Media Player screen by choosing a source from the dropdown list on the left side.

NOTE: You can use voice commands to adjust media settings and preferences, such as volume control, playing certain songs, or switching the media source (see [Voice Commands on page 391](#)).

Volume Controls

Roll the scroll button on the left side of the steering wheelsteering yoke up or down to increase or decrease volume respectively. The scroll button adjusts the volume for media, voice commands, and phone calls.

You can also adjust the volume by touching the arrows associated with the speaker icon on the bottom corner of the touchscreen.

To mute the volume, press the left scroll button. Press again to unmute.

NOTE: Pressing the left scroll button during a phone call mutes both the sound and your microphone.

NOTE: If you're playing media and you receive a phone call, or the navigation system is speaking directions, the volume of what you are listening to is temporarily muted.

Media Settings

NOTE: The settings available vary depending on market region. Also, a setting may not be applicable to all audio sources.



When displaying an audio source screen, press the settings icon located in the search bar to access audio settings.

You can adjust these settings:

- **Tone:** Drag the sliders to adjust the subwoofer and any of the five frequency bands (Bass, Bass/Mid, Mid, Mid/Treble, and Treble). If equipped with premium audio, you can adjust the level of sound immersion to make your music experience more engaging by dragging the immersive sound slider according to your preferences.
- **Balance:** Drag the center circle to the location in Model S/Model X where you want to focus the sound.
- **Options:** Set preferences for optional features. For example, you can turn **DJ Commentary**, **Explicit Content**, and **Allow Mobile Control** on or off.
- **Sources:** Displays all available media sources and allows you to choose whether you want to show or hide each source. You may want to hide media sources that you never use. Once hidden, the media source does not appear on the drop down list in Media Player, nor will it appear in the app tray when you touch the App Launcher. You can re-display a hidden media source at any time by returning to this settings screen.

Searching Audio Content



Touch Media Player's magnifying glass icon to search for a particular song, album, artist, podcast, or station. You can also use voice commands to search hands-free (see [Voice Commands on page 391](#)). If available, touch **HD®** to play high definition versions of the selected frequency.



Caraoke

In addition to various streaming services, your vehicle is equipped with Caraoke. To access Caraoke, navigate to Media Player and select the drop down menu to change the media source to Caraoke. Or add Caraoke as an app in the app launcher. You can browse through various songs and select the song you want to sing. Touch the microphone icon to enable or disable the song's main vocals. Disabling the microphone leaves only the song's instrumentals and background vocals. Touch the lyrics icon (located next to the microphone icon) to enable or disable the song's lyrics.

NOTE: Depending on vehicle configuration and market region, Caraoke may not be available on your vehicle.



WARNING: Never read Caraoke lyrics while driving. You must always pay attention to the road and traffic conditions. When driving, the Caraoke lyrics are intended only for use by a passenger.

Recents and Favorites

For most source content, recents and favorites display at the top for easy access.



To add a currently playing station, podcast, or audio file to your Favorites list, touch the **Favorites** icon on Media Player.



To remove an item as a favorite, touch the highlighted **Favorites** icon. You can also remove multiple favorites by expanding Media Player to show all favorites for the applicable type of source content. Then press and hold any favorite. An **X** appears on all favorites and you can then touch the **X** to remove them from your Favorites list.



Your recently played selections are updated continuously so you don't need to remove them.

NOTE: Selections you play on FM radio are not included in the Recents list.

Playing Media from Devices

You can play audio files from a Bluetooth-connected device (like a phone) or a USB-connected flash drive. When you connect a Bluetooth or USB device, Media Player includes the device as a media source.

USB Connected Flash Drives

Insert a flash drive into a front USB port (see [USB Ports on page 86](#)[USB Ports on page 79](#)). Touch **Media Player** > **USB**, and then touch the name of the folder that contains the song you want to play. After you display the contents of a folder on the USB connected flash drive, you can touch any song in the list to play it. Or use the previous and next arrows in Media Player to scroll through your songs. You can also scroll to next/previous songs using the left scroll button on the steering wheelsteering yoke.

NOTE: To play media from a USB connection, Model SModel X recognizes flash drives only. To play media from other types of devices (such as an iPod), you must connect the device using Bluetooth.

NOTE: Media Player supports USB flash drives with exFAT formatting (NTFS is not currently supported).

NOTE: Use a USB port located at the front of the center console. The USB connections at the rear of the console are for charging only.

Bluetooth Connected Devices

If you have a Bluetooth-capable device such as a phone that is paired and connected to Model SModel X (see [Pairing a Bluetooth Phone on page 381](#)), you can play audio files stored on it. Choose Media Player's **Phone** source, touch the name of your Bluetooth-connected device, then touch **CONNECT**.



Navigation and Entertainment

Your Bluetooth device begins playing the audio file that is currently active on your device. If no audio file is playing, use your device to choose the audio file you want to listen to. When the chosen file begins to play, you can then use Media Player's next and previous icons (or use the left scroll button on the steering wheelsteering yoke) to play other tracks.

NOTE: To play media from a Bluetooth-connected device, ensure that access to the device's media is turned on (see [Pairing a Bluetooth Phone on page 381](#)).



Entertainment

Overview

NOTE: Entertainment options vary by market region.

The touchscreen displays the Entertainment screen when you choose any of the following apps:



Theater: Play various video streaming services (such as Netflix, YouTube, Hulu, etc.) while parked.



Arcade: Want to game? Depending on the game, you may need to use the steering wheelsteering yoke buttons or a USB controller to play arcade games.



Toybox: Play in the Toybox while parked.



Browser: Access the web browser.



WARNING: Use entertainment features only when Model SModel X is parked. Always pay attention to road and traffic conditions when driving. Using these features while driving is illegal and very dangerous.

NOTE: Many entertainment features can be easily accessed hands-free using voice commands (see [Voice Commands on page 391](#)).

Toybox

Select This...	To Do This...
007 (air suspension vehicles only)	You are no longer a "Driver", you're a "Diver"! Touch Controls > Suspension to change your depth.
Boombox	Joy to the world! If Model SModel X is equipped with a Pedestrian Warning System, delight pedestrians with a variety of sounds from your vehicle's external speaker while in Park. See Boombox on page 379 for more details. NOTE: Check local laws before use in public spaces.
Emissions Testing Mode	Holiday fun can come in surprising ways. Select your preferred fart style and target seat. For those lucky vehicles equipped with a Pedestrian Warning System, you can choose to broadcast externally when in Park. Use your turn signal or press the left scroll wheel when you're ready to "release" your prank.
Light Show	Park outside, turn the volume up, roll down your windows, then enjoy the show.
Light Show	Park outside, turn the volume up, roll down your windows, then enjoy the show.



Navigation and Entertainment

Ludicrous Speed (P100D vehicles only)	Press and hold the Ludicrous setting (open the Controls drawer and touch Controls > Driving > Acceleration > Ludicrous) for approximately five seconds. Touch Yes, bring it on! if you want to go fast. To display power and acceleration readings on the instrument panel, press either scroll button briefly until the available options are displayed. Then, roll the scroll button to highlight Readout then press the scroll button again.
Mars	The map shows your Model SModel X as a rover on the Martian landscape, and the About Your Tesla box displays SpaceX's interplanetary spaceship.
Rainbow Charge Port	When Model SModel X is locked and charging, press the button on the mobile connector ten times in quick succession. Neat, huh?
Rainbow Road	Need more cowbell? Visit Rainbow Road by pulling the Autopilot stalk toward you four times in quick succession while Autosteer is enabled.
Romance Mode	You can't roast chestnuts by an open fire in your car, but you can still cozy up with your loved ones by this virtual fireplace. While in Park, access Romance Mode from your Toybox. Queue the music and get your romance on!
Sketchpad	Channel your inner Picasso. Show us what you got! Touch Publish to submit your artistic compositions to Tesla for critiquing.
TRAX	It's never too late to follow your dream of becoming a world-famous DJ. With TRAX, you can turn your vehicle into your own personal music studio. While in Park, choose from an array of instruments and unique sounds to create the next hit song. Access TRAX through your Toybox on the touchscreen and get jamming. Microphone and headset not included (depending on vehicle configuration and market region, this may not be available on your vehicle).
The Answer to the Ultimate Question of Life, The Universe, and Everything	Rename your car to 42 (touch Controls > Software and touch the vehicle's name). Notice the new name of your Model SModel X.

Boombox

Boombox, an app in Toybox, uses the Pedestrian Warning System (PWS) speaker to play media externally when Model SModel X is parked, when you press the horn, or when you use Summon to move Model SModel X. When Boombox is enabled, you can control external volume only when playing current media. You can customize sounds by plugging in a specifically-formatted USB drive.

NOTE: Check local laws before using Boombox in public places.

1. Play current media

- Available in Park only.
- Internal and external volume control.
- If Camp Mode is enabled in Climate Controls, you can exit the car and control the volume with the mobile app.

2. Megaphone When toggled on, you can project a modulated voice through the external speaker of Model SModel X.

- Available in Park only.
- External volume control.

3. Horn sound

- Available in Park only.
- Settings can be adjusted only when in Park.
- Selecting from a USB drive plays the first five seconds.

4. Summon sound

- Preview is only available in Park.
- Some sounds are only available if you are logged into a specific music streaming service and have internet connectivity.
- Plays when using [Summon on page 330](#) or [Smart Summon on page 333](#).



Formatting a USB drive for Boombox

You can add up to five custom Boombox sounds.

1. Using a computer, format a USB drive to exFAT, MS-DOS FAT (for Mac), ext3, or ext4 (NTFS is currently not supported) and upload audio files to a folder named **Boombox**.
 - Supported file types: .wav and .mp3.
 - You can add as many files as you want to the folder, but you can only select from the first five, as listed alphabetically.
 - File names, of any length, can only contain these characters: a-z, A-Z, 0-9, (. - _).
 - The drive should only contain one folder; it cannot be shared with Dashcam.
2. Plug the USB drive into a front USB port.
3. Choose sounds from your USB drive by selecting them in the **Boombox** dropdown menus.

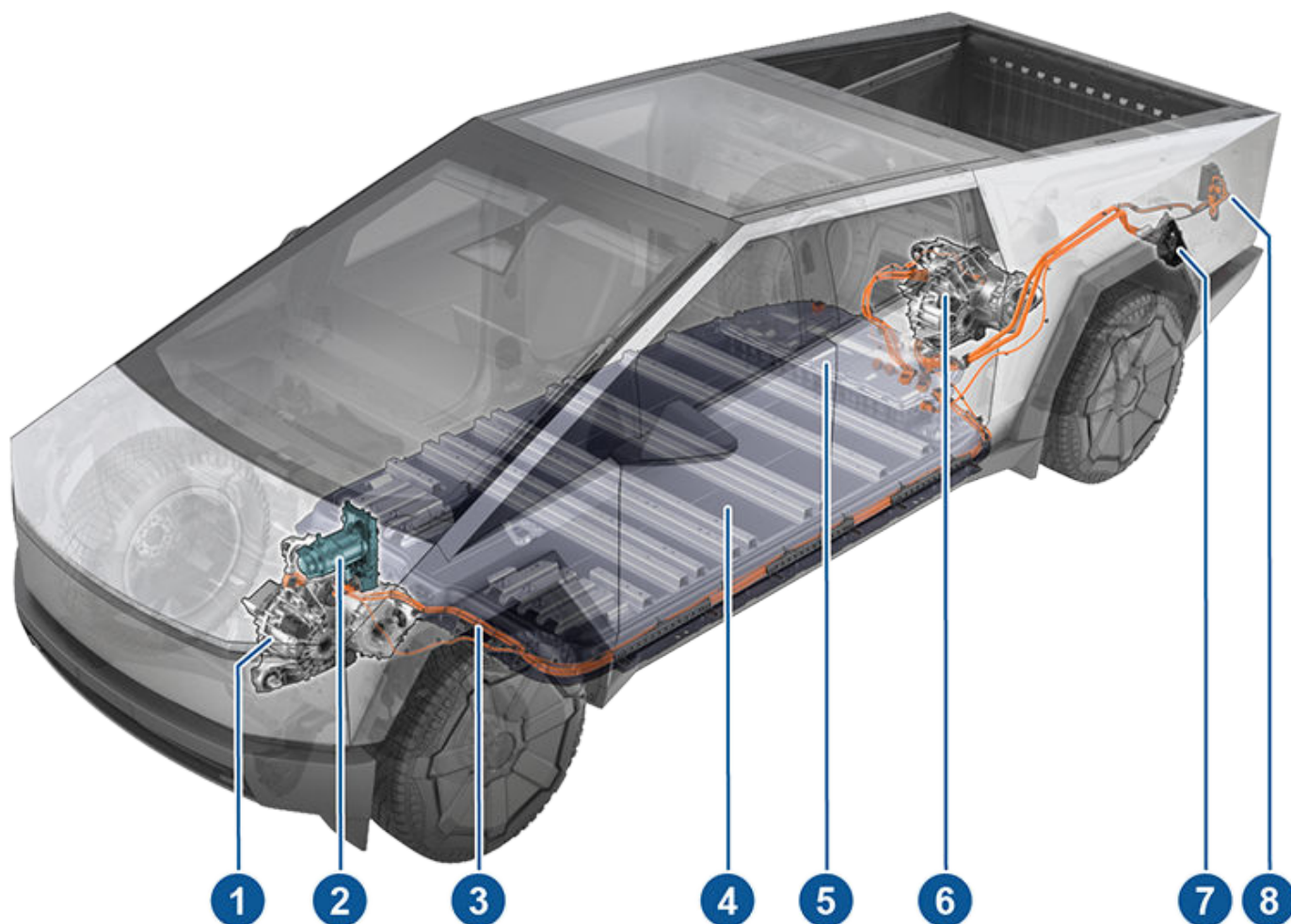
Car Colorizer

Change the color of your Model S Model X on the touchscreen by navigating to Toybox or **Controls > Software**. Touch the color swatch next to the vehicle name and customize the paint, tone, and more.



Electric Vehicle Components

High Voltage Components



1. Front drive unit
2. Heat pump assembly
3. High voltage cables
4. High voltage Battery
5. Service access panel for high voltage components (ancillary bay)
6. Rear drive unit(s)
7. Charge port
8. Cargo bed outlets

⚠ WARNING: The high voltage system must be serviced **only** by a trained technician. Do not disassemble, remove or replace high voltage components, cables or connectors. High voltage cables are typically colored orange for easy identification.

⚠ WARNING: Read and follow all instructions provided on the labels that are attached to Model SModel X. These labels are there for your safety.

⚠ WARNING: In the unlikely event that a fire occurs, exit the vehicle, move to an area at least 100 ft. (30 meters) away from Model SModel X, and immediately contact your local fire emergency responders.



Charging Equipment

Charging equipment designed specifically to charge your Model S/Model X is available from Tesla.

For information on the charging equipment **available for your region**, go to <http://shop.tesla.com>.

Tesla offers:

- **Wall Connector:** Installs in your parking space and is the fastest way to charge your vehicle for daily use.
- **Mobile Connector:** Allows you to plug into most commonly used power outlets. When using the Mobile Connector, attach the smart adapter (if required) to the Mobile Connector before plugging it in to the power outlet, and then plug in your vehicle.
- **Adapters:** Allows you to plug into the most commonly used public charging stations in your region. At a public charge station, first attach the adapter to the station's charging connector and then plug in your vehicle.

There is also a network of Superchargers, destination chargers, and other fast charging stations for when charging while traveling.

Low Voltage Battery



Model S/Model X uses a 48V lithium-ion low voltage battery. The 48V battery powers the windows, doors, touchscreen, and other low voltage vehicle systems when the high voltage Battery is unavailable. The 48V battery also provides a redundant source of power for critical systems (such as power steering).

NOTE: 48V low voltage connectors are colored blue for easy identification, and wires that operate at 48V are marked with blue tape.

By using a 48V low voltage battery instead of the 12V lead-acid battery found in many conventional vehicles, Model S/Model X is able to operate more efficiently.



WARNING: Assume that the low voltage components of Model S/Model X, including all cables and connectors, are always energized. Do not handle low voltage cables or connect/disconnect connectors when the low voltage system is powered. Because the 48V low voltage system operates at a higher voltage than a typical low voltage system, there is an increased risk of personal injury, arcing, or component damage if the low voltage components of Model S/Model X are handled improperly.



High Voltage Battery Information

About the High Voltage Battery

Model S/Model X has one of the most sophisticated battery systems in the world. The most important way to preserve the high voltage Battery is to **LEAVE YOUR VEHICLE PLUGGED IN** when you are not using it. This is particularly important if you are not planning to drive Model S/Model X for several weeks.

NOTE: When left idle and unplugged, your vehicle periodically uses energy from the Battery for system tests and recharging the low voltage battery when necessary.

There is no advantage to waiting until the Battery's level is low before charging. In fact, the Battery performs best when charged regularly.

NOTE: If you allow the Battery to discharge to 0%, other components may become damaged or require replacement (for example, the low voltage battery). In these cases, you are responsible for repair and/or transporting expenses. Discharge-related expenses are not covered by the warranty or under the Roadside Assistance policy.

The peak charging rate of the Battery may decrease slightly after a large number of DC Fast Charging sessions, such as those at Superchargers. To ensure maximum driving range and Battery safety, the Battery charge rate is decreased when the Battery is too cold, when the Battery's charge is nearly full, and when the Battery conditions change with usage and age. These changes in the condition of the Battery are driven by battery physics and may increase the total Supercharging duration by a few minutes over time. You can minimize the amount of charge time by using Trip Planner to warm the Battery while driving to a Supercharger. See [Trip Planner on page 373](#) for more information.

Battery Care

Never allow the Battery to fully discharge. Even when Model S/Model X is not being driven, its Battery discharges very slowly to power the onboard electronics. The Battery can discharge at a rate of approximately 1% per day, though the discharge rate may vary depending on environmental factors (such as cold weather), vehicle configuration, and your selected settings on the touchscreen. Situations can arise in which you must leave Model S/Model X unplugged for an extended period of time (for example, at an airport when traveling). In these situations, keep the 1% in mind to ensure that you leave the Battery with a sufficient charge level. For example, over a two week period (14 days), the Battery may discharge by approximately 14%.

Discharging the Battery to 0% may result in damage to vehicle components. To protect against a complete discharge, Model S/Model X enters a low-power consumption mode when the displayed charge level drops to approximately 0%. In this mode, the Battery stops supporting the onboard electronics and auxiliary low voltage battery. Once this low-power consumption mode is active, immediately plug in Model S/Model X to prevent a jump-start and low voltage battery replacement.

NOTE: If Model S/Model X is unresponsive and does not unlock, open, or charge, the low voltage battery may be discharged. In this situation, try jump starting the low voltage battery (see [Instructions for Transporters on page 510](#) [Instructions for Transporters on page 517](#) for instructions on how to jump start the battery). If the vehicle is still unresponsive, contact Tesla.

Temperature Limits

For better long-term performance, avoid exposing Model S/Model X to ambient temperatures above 140° F (60° C) or below -22° F (-30° C) for more than 24 hours at a time.

Energy Saving Feature

Model S/Model X has an energy-saving feature that reduces the amount of energy being consumed by the displays when Model S/Model X is not in use. On newer vehicles, this feature is automated to provide an optimal level of energy saving. However, on older vehicles, you can control the amount of energy being consumed by the displays by touching **Controls** > **Display** > **Energy Saving**. For more information on maximizing range and saving energy, see [Getting Maximum Range on page 261](#).

Battery Warnings and Cautions



WARNING: The Battery has no parts that an owner or a non-Tesla authorized service technician can service. Under no circumstances should you open or tamper with the Battery. Always contact Tesla to arrange for Battery servicing.



-  **CAUTION:** If the Battery's charge level falls to 0%, you must plug it in. If you leave it unplugged for an extended period, it may not be possible to charge or use Model S/Model X without jump starting or replacing the low voltage battery. Leaving Model S/Model X unplugged for an extended period can also result in permanent Battery damage. If you are unable to charge Model S/Model X after attempting to jump start the low voltage battery, contact Tesla immediately.
-  **CAUTION:** The Battery requires no owner maintenance. Do not remove the coolant filler cap and do not add fluid. If the instrument panel warns you that the fluid level is low, contact Tesla immediately.
-  **CAUTION:** Do not use the Battery as a stationary power source. Doing so voids the warranty.



Charging Instructions

Opening the Charge Port

The charge port is located above the driver's side rear wheel of Model S/Model X.

With Model S/Model X in Park and a valid key is detected, press and release the button on the Tesla charge cable to open the charge port door.



You can also open the charge port door using any of these methods:

- On the touchscreen, touch the charge port on the vehicle avatar and touch **Open**.
- On the touchscreen, touch **Controls** > **Charging** > **Open Charge Port**.
- Press the charge port door when Model S/Model X is unlocked and an authenticated phone is nearby.
- When the vehicle is locked with an authenticated key in range, you can also press the button on the charge cable to open the charge port door (see [Keys on page 674](#)).
- Use voice commands. You can also use voice commands to close the charge port door, and begin or stop charging (see [Voice Commands on page 391](#)).
- Use the mobile app.



The icon lights up white when you open the charge port door (see [Charge Port Light on page 875](#)). If you do not insert a charge cable into the charge port within a few minutes after opening the charge port door, the charge port door closes. If this happens, open the charge port door again.



NOTE: In extremely cold weather or icy conditions, it is possible that your charge port latch may freeze in place. If this happens, you can thaw ice on the charge port latch by turning on the rear defrost or by enabling preconditioning using the mobile app. To prevent this from occurring, use the **Schedule** settings, which are also available on both the charging and climate control screens, to schedule a **Precondition by** (see [Preconditioning on page 875](#)).



CAUTION: Do not try to force the charge port door open.

During Charging

Tesla strongly recommends leaving Model S/Model X plugged in when not in use. This maintains the Battery at the optimum level of charge.

During charging, the charge port light (the icon) pulses green, and the touchscreen displays real-time charging status. The frequency at which the green charge port light pulses slows down as the charge level approaches full. When charging is complete, the light stops pulsing and is solid green. If Model S/Model X is locked, the charge port light does not light up. For more information, see [Charge Port Light on page 875](#).

If the charge port light turns red while charging, there is an issue with charging. Check the touchscreen for an alert describing the issue. An issue can occur due to something as common as a power outage. If a power outage occurs, charging resumes automatically when power is restored.

NOTE: The thermal system may produce steam while Model S/Model X charges. For example, odorless steam can come from the front of your vehicle while charging at a Supercharger in cold temperatures. This is normal and not a cause for concern. Likewise, it is normal to hear sounds during charging. Particularly at high currents, the refrigerant compressor and fan operate as needed to keep the Battery cool.

NOTE: Air conditioning performance is generally not affected by charging. However, in some circumstances (for example, charging at high currents during a particularly warm day), the air coming from the vents may not be as cool as expected and a message displays on the touchscreen. This is normal and ensures that the Battery stays within an optimal temperature range while charging to support longevity and optimum performance.



WARNING: Never spray liquid at a high velocity (for example, a pressure washer) towards the charge port while charging. Doing so can result in serious injury or damage to the vehicle, charging equipment, or property.



WARNING: Do not use third-party charging adapters with Model S/Model X.



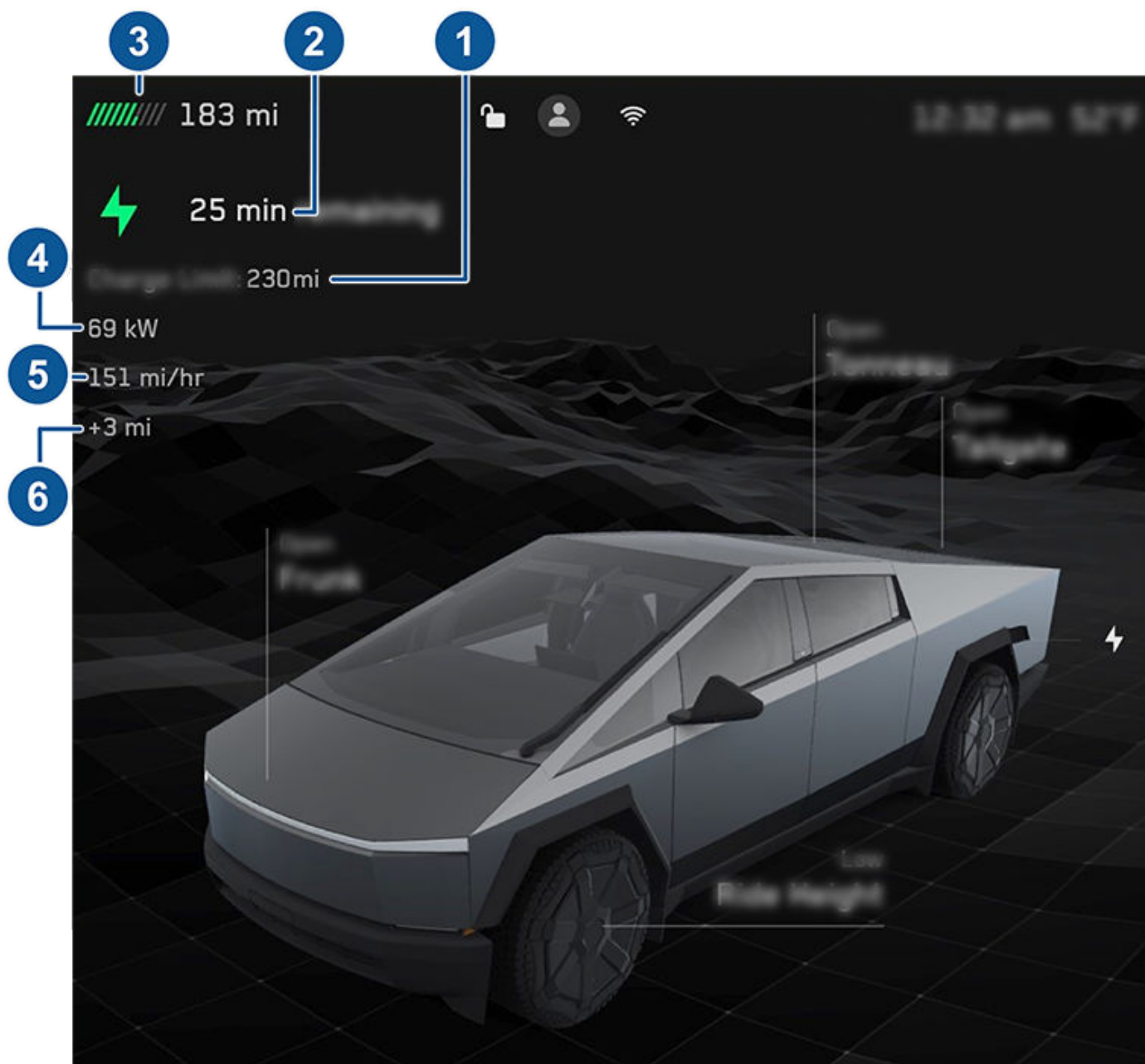
CAUTION: Keep the cargo bed outlet cover closed when Cybertruck is charging, especially in wet weather. Charging may be disabled if moisture enters one of the outlets.

Charging Status

On the touchscreen, the charging status displays at the top of the vehicle status area when the charge port door is open.



Charging



1. **Charge limit:** The set charge limit. The charge limit is the capacity at which Model S/Model X will stop charging. To change the charge limit, touch **Controls** > **Charging**.
2. **Time remaining:** The estimated time remaining to charge to your set limit. Or, if you are navigating to a destination, the estimated time remaining until you can continue your trip.
NOTE: When charging to 100%, the Model S/Model X may continue to charge with low power when charging is displayed as complete. This is expected. Because the added energy beyond this point is low, it is usually not beneficial to continue charging.
3. **Range:** The total estimated driving distance or energy percentage (depending on your display setting) available.
NOTE: To change how energy units are displayed, touch **Controls** > **Display** > **Energy Display**. You can also touch the driving distance or energy percentage on the touchscreen to switch between them.
4. **Charging:** The amount of power currently being provided by the charger.
5. **Charging rate:** The speed at which the vehicle is charging, shown in range gained per hour.
6. **Range gained:** The estimated increase in driving distance achieved in the charging session.



Charge Port Light

Above the charge port, the charge port light shows charging status. The charge port light turns off after a short period of time if the vehicle is locked (for example, if you walk up to the vehicle after it has been charging for a while).

After you insert a charge cable into Model S/Model X, wait a few seconds and confirm that the charge port light begins blinking green and that your vehicle is charging. If the light is amber or red, troubleshoot the issue before you leave to ensure a successful charging session.



WHITE: The charge port door is open. Model S/Model X is ready to charge and the connector is not inserted, or the charge port latch is unlocked and the connector is ready to be removed.



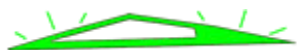
BLUE, BLINKING: Model S/Model X is communicating with the charger but has not started charging or providing power yet (such as when your vehicle is preparing to charge, or when your vehicle is preparing to provide power from the high voltage Battery).



BLUE: The charger is connected, but Model S/Model X is not charging (such as when scheduled charging is active).



PURPLE, BLINKING: Model S/Model X is providing power from the high voltage Battery. The frequency of blinking corresponds to the amount of power that Cybertruck is providing (more frequent blinks correspond to more power being provided). For more information, see [Powershare Home Backup on page 884](#).



GREEN, BLINKING: Charging is in progress. As Model S/Model X approaches a full charge, the frequency of the blinking slows.



GREEN, SOLID: Charging is complete.



AMBER, BLINKING: Model S/Model X is charging at a reduced current because the connector is not fully plugged in.



AMBER, SOLID: Model S/Model X is not charging because the connector is not fully plugged in. Realign the connector to the charge port and insert fully.



RED: A fault is detected and charging has stopped. Check the touchscreen for an alert. In some cases, an alert can be easily cleared by unplugging the charge cable, returning it to the charger, then trying again. In other cases (such as a tripped fuse or a faulty charger), you may need to check the power source. If the red light persists, try using a different charger.

Stopping Charging

Stop charging at any time by pressing the button on the charge cable to disconnect, or touch **Stop Charging** on the touchscreen or mobile app. To disconnect the charge cable:

1. Ensure your vehicle is unlocked. To prevent unauthorized unplugging of the charge cable, the charge cable latch remains locked and Model S/Model X must be unlocked before you can disconnect the charge cable.
2. Press and hold the button on the connector handle to release the latch.
3. Pull the connector from the charge port. The charge port door automatically closes.

To disconnect the charge cable when using an adapter at a public charge station:

1. Unlock Model S/Model X.
2. While holding the public charging handle in one hand and the adapter in the other hand, press and hold the button on the public charging handle and pull both outwards, removing the handle and adapter at the same time.

NOTE: If the charging station handle separates from the adapter, leaving the adapter in Model S/Model X, use the touchscreen to unlock the charge port.

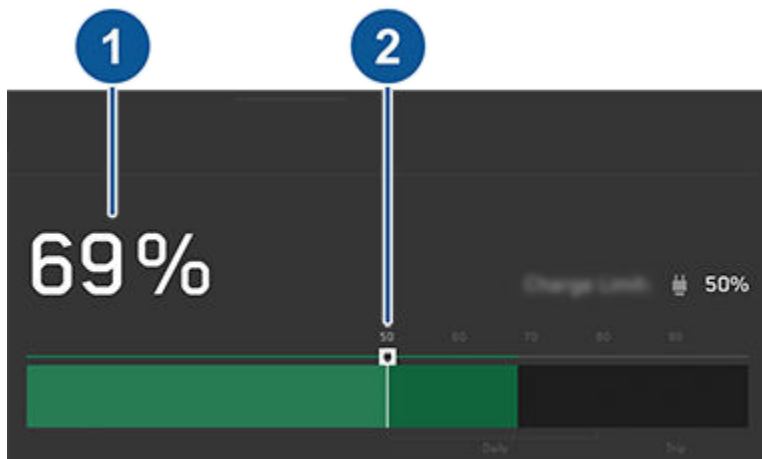
3. Press and hold the button on the charging handle again to release the adapter from the public charging handle.

The charge port door closes automatically shortly after you remove the charge cable.

You can also automatically stop charging from a specified time by creating a charge schedule. For more information, see [#unique_1401__unique_1401_Connect_42_GUID-B5CABEAD-127F-4716-B9C7-74D3BB91A8AB on page .](#)

Charge Settings

Access charge settings by touching **Controls** > **Charging** when Model S/Model X is in Park. You can also touch the Battery icon on the touchscreen to access charge settings.



1. **Energy available:** Displays the remaining energy available in the high voltage Battery. To show the remaining energy as estimated driving distance (miles or kilometers) rather than a percentage, touch **Controls** > **Display** > **Energy Display**.
2. **Set charge limit:** Adjust the charge slider to the level of charging you want. The setting you choose applies to immediate and scheduled charging sessions.

NOTE: Refer to the information on the touchscreen (navigate to **Controls** > **Charging**) or mobile app (touch the **Charging** icon) for recommended daily and trip charging limits.

NOTE: A portion of the Battery image may appear blue. This indicates that a small portion of the energy stored in the Battery is not available because the Battery is cold. This is normal and no reason for concern. When the Battery warms up, the blue portion no longer displays.

Open/Unlock Charge Port

When not charging, touch **Open Charge Port** or **Unlock Charge Port** to open the charge port door or to unlock the charge cable from the charge port.

Stop Charging

Use **Stop Charging** when you are finished charging.

Charge Current at this Location

The current automatically sets to the maximum current available from the attached charge cable, unless it was previously reduced to a lower level. If needed, touch **-** or **+** to change the current (for example, you may want to reduce the current if you are concerned about overloading a domestic wiring circuit shared by other equipment). It is not possible to set the charging current to a level that exceeds the maximum available from the attached charge cable. When you change the current, Model S/Model X remembers the location.

NOTE: When charging with the Mobile Connector, your vehicle may automatically select a default charge current. Override this default current to a higher setting by customizing **Charge Current at this location** or through the mobile app.

If Model S/Model X is charging and detects unexpected fluctuations in input power, the charging current is automatically reduced by 25%. For example, a 40 amp current is reduced to 30 amps. This automatic current reduction increases robustness and safety in situations when an external problem exists (for example, a home wiring system, receptacle, adapter or cord is unable to meet its rated current capacity). As a precaution, when Model S/Model X automatically reduces current, it saves the reduced current at the charging location. Although you can manually increase it, Tesla recommends charging at the lower current until the underlying problem is resolved and the charging location can provide consistent power.

Supercharging

Displays Supercharger usage fees, the location, the time that charging started, and a cost estimate for the session. To reduce congestion at high-usage Supercharger sites, you may be limited to a maximum charge of 80% when not using Trip Planner (if available in your market region). See [Supercharger Fees on page 877](#).

NOTE: Tesla does not recommend using low-power charging equipment (such as a 120V NEMA 5-15 outlet and the Universal Mobile Connector) to charge, especially in low ambient temperatures. Due to the size of the high voltage Battery, charging with equipment that produces less than 2 kW of power will charge very slowly. If you are charging with such a method, turn off climate to reduce idle power consumption while charging.

Supercharger Fees

When charging at a Tesla Supercharger, information about the charging session displays at the bottom of the charging screen. This includes the location, the time that charging started, and a cost estimate for the session. When you stop Supercharging, the estimated cost of the session displays until a new Supercharging session begins.

NOTE: Estimated cost may not reflect the final cost of the Supercharging session. Final pricing for Supercharging sessions can be found in your Tesla account.

You are subject to additional fees after charging is complete or, at a busy Supercharger location, after your vehicle has reached the congestion limit. Superchargers are designed for fast charging, and these fees encourage drivers to move their vehicles when charging is complete.

Idle fees apply when half or more of the Superchargers at a site are occupied, and begin accruing when the vehicle reaches its charge limit. The Tesla mobile app notifies you when charging is almost complete, and again when charging is complete. Additional notifications are sent if idle fees are incurred. Idle fees are waived if you move your vehicle within five minutes of when charging completed.

The rate structure for each site, including whether idle fees apply, can be found on the site's popup on the touchscreen (see [Charging Locations on page 372](#)) or in the Tesla mobile app.

Log into your Tesla account to view fees and details about Supercharger sessions, set up a payment method, and make payments. Once a payment method is saved, fees are automatically paid from your account.

Manually Releasing Charge Cable



CAUTION: Use the release cable **only** in situations where you can not release the charge cable using the usual methods. Frequent use can damage the release cable or charging equipment.



WARNING: Do not perform this procedure when your vehicle is charging, or if any orange high voltage connectors are exposed. Failure to follow these instructions can result in electric shock and serious injury or damage to the vehicle. If you are uncertain as to how to safely perform this procedure, use the mobile app to schedule a service appointment.

If the usual methods for releasing a charge cable from the charge port (using the charge handle release button, touchscreen, or mobile app) do not work, carefully follow these steps:

1. Ensure that Model S/Model X is not actively charging by navigating to **Controls > Charging** on the touchscreen, or use the mobile app. If necessary, touch **Stop Charging**.
2. Open the tailgate.
3. Pull firmly on the edges of the panel on the left side of the bed to release the panel's clips and expose the release cable. The panel does not fully come off, but can be pulled just far enough to reach the cable.



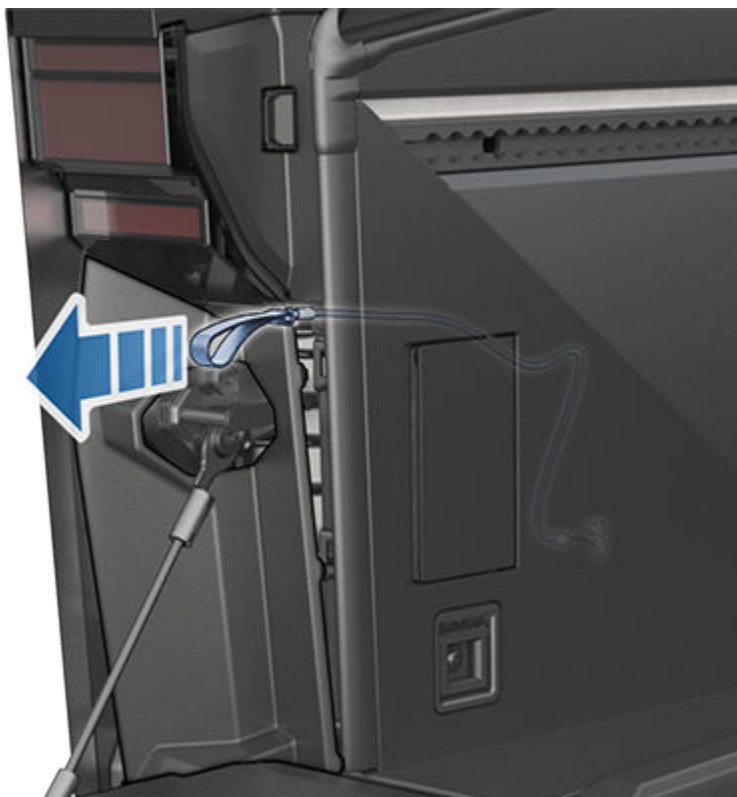
Charging



4. Pull the release cable to unlatch the charge cable.



WARNING: Do not pull the release cable while simultaneously attempting to remove the charge cable from the charge port. Always pull the release cable *before* attempting to remove the charge cable. Failure to follow these instructions can result in electric shock and serious injury.



NOTE: The release cable may be recessed within the opening of the trim.

5. Pull and release the charge cable from the charge port.



6. Reinstall the panel, ensuring that the clips are fully engaged.

Charging Best Practices

- Avoid allowing the Battery to get too low (the Battery icon turns yellow when the capacity remaining in the Battery drops to 20% or below).
- Refer to the information on the vehicle touchscreen (navigate to **Controls > Charging**) or the mobile app (touch the **Charging** icon) for recommended daily and trip charging limits.
- After you plug in your vehicle, confirm that the charge port light begins blinking green (indicating that Model S/Model X is charging) before you walk away. If Model S/Model X does not begin charging after a few seconds, the connector may not be fully inserted into the charge port, or there may be an issue preventing charging. Check the touchscreen for an alert with more information.

NOTE: If the charge port light begins blinking amber, Model S/Model X is charging at a reduced current. If the charge port light is solid blue, the charger is connected but the vehicle is not charging (such as when a charge is scheduled). For more information, see [Charge Port Light on page 875](#).

Fast charging tips:

- Find fast chargers by filtering for three lightning bolts in the navigation search bar.
- Navigate to fast chargers to allow for preconditioning of the high voltage Battery. An optimal Battery temperature can help speed up charging.
- Typically, a lower state of charge results in faster charging.

NOTE: It is your responsibility to monitor your vehicle's charge at all times. Do not wait until the vehicle is discharged to plug it in. Always ensure you have more than enough charge to safely get to a charger.

- At Superchargers, leave some space between other vehicles, as neighboring stalls may share power.

Scheduled Charging and Scheduled Departure

Toggle between Scheduled Departure and Scheduled Charging by touching **Controls > Charging > Switch to Scheduled Charging/Scheduled Departure** when Model S/Model X is in Park.

NOTE: Scheduled Charging/Scheduled Departure settings are also available on the Climate Controls screen and in the Tesla mobile app.

Think of **Scheduled Charging** as "When do I want charging to start?" and think of **Scheduled Departure Off-Peak Charging** which is "When do I want charging to be complete?"

Scheduled Charging can be used together with **Scheduled Departure Preconditioning** but not with **Scheduled Departure Off-Peak Charging**.

Scheduled Charging/Scheduled Departure settings are automatically saved for each location.

NOTE: If you plug in Model S/Model X with both **Off-Peak Charging** and **Scheduled Charging** deselected, your vehicle charges immediately.

Using Scheduled Charging

Use **Scheduled Charging** to specify a daily time in which you want Model S/Model X to **start** charging.

With **Scheduled Charging** selected, enable the feature then set a daily time to start charging.

NOTE: Scheduled Charging starts charging immediately if Model S/Model X is plugged in up to six hours after the scheduled start time. However, if Model S/Model X is plugged in after six hours of the scheduled charging time, charging may not start until the scheduled time on the next day.

Using Scheduled Departure

Use **Scheduled Departure** to set a daily time when you want Model S/Model X to be ready to drive. Model S/Model X automatically calculates when it needs to start preconditioning and/or charging. This ensures that charging is complete and/or the cabin climate and Battery are preconditioned by your departure time.

When **Scheduled Departure** is displayed, touch **Schedule** to set a daily time when you want Model S/Model X to be ready to drive. Specify a time, then touch **Settings** to enable one or both of the following departure features. When plugging in with **Off-Peak Charging** enabled, the vehicle briefly draws power (you may hear clicking) to calculate the necessary charging start time.

After you've specified your desired settings, touch **Set**. The touchscreen displays your scheduled departure time.

- **Preconditioning** warms the Battery for improved performance and ensures a comfortable cabin climate at your set departure time.

NOTE: When Model S/Model X is not plugged in, preconditioning operates but only when the Battery's charge level is above 20%.

- **Off-Peak Charging** delays charging and automatically starts charging in order to finish before your scheduled departure time while also ensuring to charge the Battery during off-peak hours to reduce energy costs. Touch **Change Off-Peak Hours** to customize the time when off-peak utility rates end.

NOTE: Choosing **Off-Peak Charging** can reduce energy costs even in market regions where off-peak utility rates are not applicable. For example, if charging starts as soon as you plug in, charging may complete much sooner. This causes the Battery to cool down to ambient temperatures and requires energy to warm it back up by your departure time. Therefore, even if off-peak utility rates are not applicable to you, it is recommended that you set Off-Peak Hours to the same time as your departure time in order to reduce energy consumption.

NOTE: If there is not enough time to reach the charge limit, charging starts immediately in order to charge as much as possible.

NOTE: Once charging has started and there is not enough time to complete charging during off-peak hours, charging continues until the charge limit is reached.

You can limit **Preconditioning** and **Off-Peak Charging** to weekdays only.

Getting Maximum Range

Factors Affecting Energy Consumption

While driving:

- Elevated driving speed.
- Environmental conditions such as cold or hot weather and wind.
- Using climate controls to heat or cool the cabin.
- Uphill travel: Driving uphill requires more energy and depletes range at a faster rate. However, driving downhill allows your vehicle to regain a portion of its expended energy through regenerative braking (see [Regenerative Braking on page 233](#)).
- Short trips or stop-and-go traffic: It takes energy to bring the cabin and Battery to a specified temperature when starting the vehicle. You may see a higher average consumption when the vehicle is used for very short trips or in heavy traffic.
- Heavy cargo load.
- Windows rolled down.
- Wheels and tires not maintained.
- Customized settings or third-party accessories (roof or trunk racks, third-party wheels).

While parked and not plugged in to a charger:

- Preconditioning the cabin or using climate controls.
- Summon.
- Vehicle infotainment and climate controls system.
- Sentry mode.
- Tesla or third-party mobile app requests.

Tips to Maximize Range

You can maximize your driving range using the same driving habits you use to conserve fuel in a gasoline-powered vehicle. To achieve maximum range:

- Slow down your driving and avoid frequent and rapid acceleration. Consider using Chill Mode (touch **Controls > Pedals & Steering > Acceleration**) and Speed Assist (see [Speed Assist on page 344](#)) to assist in controlling your acceleration and speed.
- If safe to do so, modulate the accelerator pedal instead of using the brake pedal when gradually slowing down. Whenever Model S/Model X is moving and you are not pressing the accelerator pedal, regenerative braking slows down the vehicle and feeds surplus energy back to the Battery (see [Regenerative Braking on page 233](#)).
- Limit the use of resources such as heating and air conditioning. Using seat and steering wheel/steering yoke heaters (if equipped) to keep warm is more efficient than heating the cabin using climate controls.
- With your vehicle plugged in, use the mobile app to precondition your vehicle to ensure the cabin is at a comfortable temperature and windows are defrosted (if needed) before your drive by touching **Climate > On** and customizing your preferences (see [Mobile App on page 406](#)).
- Touch **Schedule**, available on both the charging and climate control screens, to set a time when you want your vehicle to be ready to drive (see [Scheduled Charging and Scheduled Departure on page 425](#)).
- Set Stopping Mode to **Hold** to gain the benefit of regenerative braking at low driving speeds.
- Ensure the wheels are aligned to specification, the tires are kept at the recommended inflation pressures (see [Tire Care and Maintenance on page 431](#)), and are rotated when needed (see [Maintenance Schedule on page 429](#)).
- Lighten your load by removing any unnecessary cargo.
- Fully raise all windows.
- Turn on Range Mode (see [Range Mode on page 262](#)).



- Features such as Sentry Mode and Cabin Overheat Protection can impact range. Disable features when not needed.
- To prevent an excessive amount of energy consumption while the vehicle is idle, keep the vehicle plugged in when not in use.
- Minimize the use of DC chargers (such as Superchargers) for optimal Battery health.

It is normal for estimated range to decrease slightly over the first few months before leveling off. Over time, you may see a gradual, but natural, decrease in range at full charge – this depends on factors such as Supercharging regularly or the mileage and age of the Battery. Your Model S/Model X will inform you in the unlikely event a hardware issue is causing excessive Battery or range degradation.

The power meter on the instrument panel provides feedback on energy usage.

You can also display the Energy app to view real-time and projected energy usage (see [Energy App on page 262](#)). With this feedback, you can become familiar with how driving habits and environmental conditions impact how much energy Model S/Model X is using.

Range Assurance

The driving range displayed in Model S/Model X is based on estimated remaining battery energy and EPA-rated consumption. It does not account for your personal driving patterns or external conditions. The displayed range on the instrument panel may decrease faster than the actual distance driven. To view estimated range based on your recent energy consumption, open the Energy app to display the graph.

Model S/Model X helps protect you against running out of energy. Your vehicle continuously monitors its energy level and proximity to known charging locations.



Touch **Chargers** in the Navigation search bar to toggle between types of chargers, including Superchargers and destination charging sites.

When you are at risk of driving beyond the range of known charging locations, the touchscreen displays a message giving you the opportunity to display a list of charging locations that are within range. When you select a charging location from the list, Model S/Model X provides navigation instructions and the turn-by-turn direction list displays the predicted amount of energy that will remain when you arrive at the charging destination.

Trip Planner routes you through Supercharger locations to minimize the amount of time you spend charging and driving. To enable, touch **Controls > Navigation > Trip Planner** (see [Trip Planner on page 373](#)).

Energy App

The Energy app provides a visual representation of your vehicle's real-time and projected energy usage. To use the Energy app, navigate to **Application Launcher > Energy** on the touchscreen. Choose from two types of charts:

- **Consumption:** Display how much energy Model S/Model X has consumed over the past 5, 15 or 30 miles (10, 25 or 50 km).

Touch **Instant Range** or **Average Range** to adjust the projected range estimation. Instant Range uses only the latest few data points to estimate the projected range, whereas Average Range uses the past 5, 15 or 30 miles (10, 25 or 50 km) of energy consumption to provide a more accurate projected range.

- **Trip:** You can monitor the amount of energy being used while navigating to a destination. You can track actual usage against the initial prediction. The green line represents the actual usage whereas the gray line represents predicted usage. To change the zoom level, touch the zoom icon located in the top right corner of the chart.

NOTE: The Trip chart displays energy usage only if you are currently navigating to a destination.

Range Mode

Range Mode conserves energy by limiting the power of the climate control system and turns off the signature lights. Turn Range Mode on by touching **Controls > Driving > Range Mode**. When turned on in an All-Wheel Drive vehicle, Range Mode also optimizes torque distribution between the motors to maximize range.

Saving Energy

Model S Model X has an energy-saving feature that reduces the amount of energy being consumed when Model S Model X is not in use. On newer vehicles, this feature is automated to provide an optimal level of energy saving. However, on older vehicles, you can touch **Controls > Display > Energy Saving** and choose from the following options:

- **OFF** - Model S Model X automatically shifts to the energy-saving mode only at night (10 pm to 5 am). Idle energy consumption may increase.
- **ON** - Significantly less energy is consumed whenever Model S Model X is not in use. The start-up time of the instrument panel and Bluetooth could be slower.
- **Always Connected** - Preserves cellular connectivity when energy saving is active. This allows the mobile app to connect to Model S Model X quicker, and provides immediate internet access when entering the car. Slightly more energy is consumed.

Powershare Home Backup

Prerequisites

Before you can use Powershare Home Backup, make sure that the following requirements are met:

- Model S Model X is running vehicle firmware 2024.14 or later.
- You have the Tesla mobile app version 4.31 or later (see [Mobile App on page 406](#)).
- You have the Tesla Universal Wall Connector with Powershare Gateway installed in your home.

For more information about installation and to purchase a Tesla Universal Wall Connector, go to the Tesla shop: <https://shop.tesla.com/>.

To Use Powershare Home Backup

Before using Powershare Home Backup, enable it from your vehicle's instrument cluster by touching **Controls > Charging > Powershare Home Backup**.

Once Powershare Home Backup is enabled, your Model S Model X automatically begins to provide power to your house when:

- The electric grid stops providing power to your home (there is a power outage).



CAUTION: When the grid first stops providing power to your home, your home may lose power briefly as Model S Model X prepares to begin Powershare Home Backup.

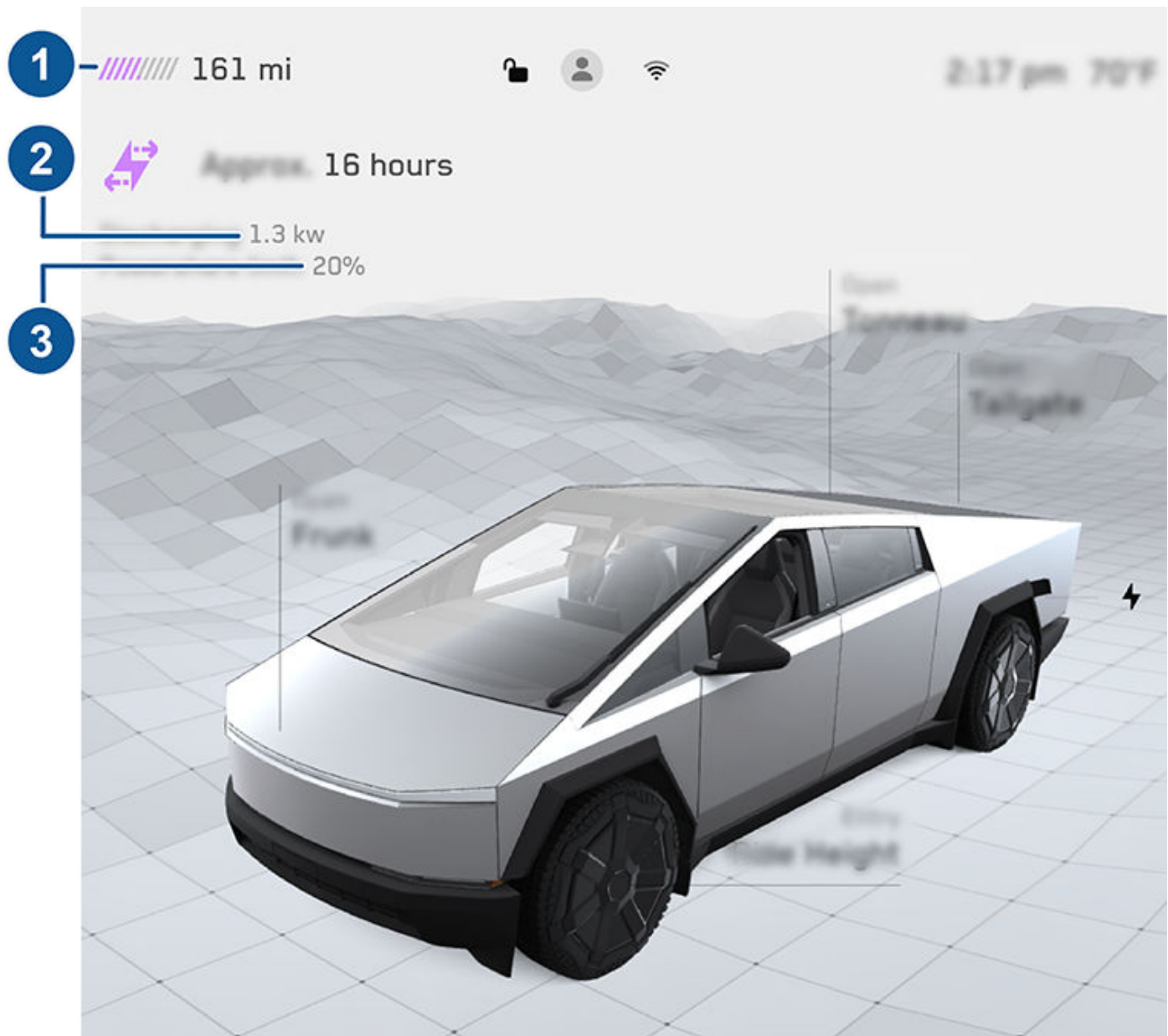
- The high voltage Battery has more energy remaining than the Powershare discharge limit (see [Setting the Discharge Limit on page 885](#)).
- Model S Model X is connected to the Universal Wall Connector.



When Powershare Home Backup is actively providing power to your home, the instrument cluster displays the Tesla Powershare icon.

The charge port status light is also purple to indicate that Model S Model X is providing power from the high voltage Battery (see [Charge Port Light on page 875](#)).

You can also see the status of the high voltage Battery on the instrument cluster, or in the mobile app.



1. **Energy remaining:** The total estimated driving distance or energy percentage (depending on your display setting) available. The amount of energy available to Powershare Home Backup (the amount remaining above the Powershare limit) is shown in purple.
2. **Powershare rate:** The amount of power currently being provided by the high voltage Battery.
3. **Powershare discharge limit:** The level of energy remaining at which at the high voltage Battery stops providing power.

Maximum Draw

Model S/Model X provides a maximum draw of 11.5 kW.

NOTE: The maximum draw may be limited by the charger installed in your home. Tesla strongly recommends that the charger (such as a Tesla Wall Connector) that you use for Powershare Home Backup is connected to a 240V circuit.

Setting the Discharge Limit

You can set the discharge limit from the Tesla mobile app by adjusting the slider.

When Powershare Home Backup is active, you can see how much energy is remaining in the high voltage Battery above the discharge limit in the vehicle status area of the touchscreen, or by touching **Controls > Charging**.



To Stop Powershare Home Backup

To stop Model SModel X from providing power to your home, touch **Controls** > **Charging** > **Stop Powershare**

To restart Powershare, touch **Controls** > **Charging** > **Start Powershare**.

Powershare Home Backup also stops providing power when:

- The high voltage Battery discharges past the Powershare discharge limit.
- The electric grid starts supplying power (the power outage ends).

When the grid is about to start providing power again, you receive a notification from the Tesla mobile app and on the vehicle touchscreen.

 **CAUTION:** When the grid begins providing power to your home again, your home may lose power for several seconds as Model SModel X stops providing power.

Limitations

Be aware of the following limitations when using Powershare Home Backup.

- While Model SModel X is actively providing power to your home, the AC outlets in the cabin and in the cargo bed are disabled (see [Interior Electronics on page 660](#) and [Cargo Bed Outlets on page 664](#)).

If Powershare Home Backup stops providing power, you receive a notification on the vehicle touchscreen and through the Tesla mobile app. This may happen for one of the following reasons.

- Your home is drawing more power than Powershare Home Backup can provide. In this case, reduce the load as much as possible (for example, by turning off large appliances).
- The high voltage Battery is cold. This is more likely in low ambient temperatures (for example, if Model SModel X is parked in a cold garage) or if Model SModel X has not been driven recently.
- There is an issue with the Universal Wall Connector, with your vehicle's charge port, or with your vehicle's high voltage Battery. Check the touchscreen for an alert with more information.

Backup Troubleshooting

- If a brownout or blackout is experienced during backup operation, reduce the loads and check that the load breakers have not opened.

NOTE: See tesla.com/support/energy/powerwall/own/best-practices-during-power-outages for best practices to extend the backup duration of your system during an outage.

- If it is necessary to restart the Powershare Gateway, Tesla support may direct you to press the Reset button on the device.



1. Powershare Gateway RESET button
2. Powershare Gateway circuit breaker (in most whole-home backup systems)

Technical Support

If you need further assistance, contact the Tesla Support team via the *Contact Us* page:

tesla.com/support/energy/more/additional-support/contact-us

Have the following information available when contacting Tesla:

- Owner name
- Best way for Tesla to contact you (name, phone number, email)
- Powershare Gateway serial number
- Brief description of the issue

Find the serial number on a sticker on the panel cover of Powershare Gateway.



Charging





Software Updates

Loading New Software

Tesla updates your vehicle's software wirelessly, constantly providing new features. Tesla recommends you install software updates as soon as they are available on your vehicle. To ensure the fastest and most reliable delivery of software updates, leave Wi-Fi turned on and connected whenever possible. In most cases, your vehicle must be connected to Wi-Fi to start an update (see [Connecting to Wi-Fi on page 403](#)).

Software updates are not performed when the following features are active:

- Smart Preconditioning,
- Keep Climate On, Dog Mode, or Camp Mode
- Sentry Mode

NOTE: On an as-needed basis, Tesla also sends software updates using a cellular connection.



WARNING: Do not attempt to use the vehicle while the software is being updated. Vehicle functions, including some safety systems, may be limited or disabled when a software update is in progress and you could damage the vehicle.

When a software update is available, a yellow clock icon appears at the top of the touchscreen **Controls** screen. There are three ways you can install software updates:

- Touch the yellow clock icon to display the scheduling screen, which prompts you to select a time to install the update (**Set For This Time**) or install it now (**Install Now**). Once scheduled, the yellow clock icon changes to a white clock icon until the update begins. At any time before the update begins, you can touch this clock icon to reschedule the update.
- Touch **Controls** > **Software** to determine if an update is available for your vehicle. If available, touch **Software Update Available** to navigate to the scheduling screen, as mentioned above.
- Start updates using the Tesla mobile app.

NOTE: Some software updates can take up to three hours to complete. Model S/Model X must be in Park while the software is being updated. To ensure the fastest and most reliable delivery of software updates, leave the Wi-Fi turned on and connected whenever possible (see [Connecting to Wi-Fi on page 403](#)).

The yellow clock icon becomes a green download icon when a software update is downloading. If a yellow download icon displays, a software update is available but your vehicle is not connected to Wi-Fi. Connect your vehicle to Wi-Fi to start the download.

Software Update Preferences

You can choose how quickly and often you receive software updates. To change your preference, touch **Controls** > **Software** > **Software Update Preferences** and choose either of these options:

- **Standard:** Receive software updates using the normal rollout timeframe for your region and vehicle configuration. When a software release is made available it has generally been running on other customer vehicles for a period of time.
- **Advanced:** Receive the latest software updates for your region and vehicle configuration as soon as they are available. Tesla determines how, when, and where to send updates to vehicles based on various factors unique to each release. Keep in mind that although you receive updates as soon as they are available for your specific vehicle, you may not be in the first Tesla group of Tesla owners to receive the update. Choosing Advanced does not enroll your vehicle in Tesla's early access program.

NOTE: Tesla does not update software upon request for those wanting to receive the latest features and improvements. Selecting **Advanced** and consistently connecting to Wi-Fi (see [Connecting to Wi-Fi on page 403](#)) is the best way to receive the latest software updates.

NOTE: The software update screen persists until you install the update. You must install a software update as soon it becomes available. Any harm resulting from failure to install a software update is not covered by the vehicle's warranty. Failure or refusal to install updates can cause some vehicle features to become inaccessible, digital media devices to become incompatible, and can limit Tesla's ability to diagnose and service your vehicle.



NOTE: Reverting to a previous software version is not possible.

If the touchscreen displays a message indicating that a software update was not successfully completed, contact Tesla.

Charging

If Model S/Model X is charging when the software update begins, charging stops. Charging resumes automatically when the software update is complete. If you are driving Model S/Model X at the scheduled update time, the update is canceled and must be rescheduled.

Viewing Release Notes

When a software update is complete, read the release notes displayed on the touchscreen to learn about changes or new features. To display release notes about the current version of your vehicle's software at any time, touch **Controls > Software > Release Notes**.

Tesla strongly recommends reading all release notes. They may contain important safety information or operating instructions for your Model S/Model X.

Maintenance Schedule

Service Intervals

Your vehicle should generally be serviced on an as-needed basis. However, Tesla recommends the following maintenance items and intervals, as applicable to your vehicle, to ensure continued reliability and efficiency of your Model S/Model X.

- Brake fluid health check every 2 years (replace if necessary) or, if the vehicle is used for towing, replace the brake fluid every 2 years.
- A/C desiccant bag replacement every 243 years.
- Cabin air filter replacement every 3 years.
- Cabin air filter replacement every 2 years.
- HEPA filter replacement every 3 years.
- HEPA filter replacement every 3 years.
- Clean and lubricate brake calipers every year or 12,500 miles (20,000 km) if in an area where roads are salted during winter
- Rotate tires every 6,250 miles (10,000 km) or if tread depth difference is 2/32 in (1.5 mm) or greater, whichever comes first

NOTE: The above intervals are based on normal driving behaviors and scenarios. Additionally, the above list should not be considered comprehensive and does not include consumable parts such as windshield wipers, brake pads, etc.

NOTE: Damages or failures caused by maintenance or repairs performed by non-Tesla certified technicians are not covered by the warranty.

Schedule Service

Scheduling a service visit through the mobile app is easy. After touching **Schedule Service**, select the type of service needed and follow the directions in the mobile app. Provide as much detail as possible, such as:

- Photos, sound recordings, or videos.
- Date(s), time(s), and time zone when the issue occurred.
- Country of use and location.
- Approximate speed the vehicle was traveling (if applicable).
- Environmental conditions (rain, snow, cold, etc.).
- Road name and type of road (if applicable).
- Quality of lane markings (if applicable).
- Applicable vehicle settings.



- Identifiable symptoms.

Visit <https://www.tesla.com/support/service-visits> for more information on scheduling service.

Daily Checks

- Check the Battery's charge level, displayed on the instrument panel or mobile app.
- Check the condition and pressure of each tire (see [Tire Care and Maintenance on page 431](#)).
- Check that all exterior lights, horn, turn signals, and wipers and washers are working.
- Check for any unexpected indicator lights or vehicle alerts on the touchscreen or instrument panel.
- Check the operation of the brakes, including the parking brake.
- Check the operation of the seat belts (see [Seat Belts on page 117](#)).
- Look for abnormal fluid deposits underneath Model SModel X that might indicate a leak. It is normal for a small pool of water to form (caused by the air conditioning system's dehumidifying process).
- Look around the exterior of Model SModel X and immediately remove any corrosive substances (such as bird droppings, tree resin, tar spots, dead insects, industrial fallout, etc.) to prevent damage to the paint (see [Cleaning on page 446](#)).

Monthly Checks

- Check windshield washer fluid level and top up if necessary (see [Topping Up Windshield Washer Fluid on page 458](#)).
- Check that the air conditioning system is operating correctly (see [Climate Controls on page 360](#)).

NOTE: In addition to cooling the interior, the air conditioning compressor also cools the Battery. Therefore, in hot weather, the air conditioning compressor can turn on even if you turned it off. This is normal because the system's priority is to cool the Battery to ensure it stays within an optimum temperature range to support longevity and optimum performance. Also, even when not in use, you may hear Model SModel X emit a whining noise or the sound of water circulating. These sounds are normal and occur when the internal cooling systems turn on to support various vehicle functions, such as maintaining the low voltage battery and balancing the temperature of the high voltage Battery.



WARNING: Contact Tesla immediately if you notice any significant or sudden drop in fluid levels or uneven tire wear.

Fluid Replacement Intervals

Your Battery coolant does not need to be replaced for the life of your vehicle under most circumstances. Brake fluid should be checked every 2 years, replacing if necessary**.

*If the vehicle is used for towing, the brake fluid should be replaced every 2 years regardless of the health check.

*If the vehicle is used for towing, the brake fluid should be replaced every 2 years regardless of the health check.

NOTE: Any damage caused by opening the Battery coolant reservoir is excluded from the warranty.

High Voltage Safety

Your Model SModel X has been designed and built with safety as a priority. However, be aware of these precautions to protect yourself from the risk of injury inherent in all high-voltage systems:

- Read and follow all instructions provided on the labels that are attached to Model SModel X. These labels are there for your safety.
- The high voltage system has no user-serviceable parts. Do not disassemble, remove or replace high voltage components, cables or connectors. High voltage cables are colored orange for easy identification.
- If a collision occurs, do not touch any high voltage wiring, connectors, or components connected to the wiring.
- In the unlikely event that a fire occurs, immediately contact your local fire emergency responders.



WARNING: Always disconnect the charge cable before working underneath Model SModel X, even if charging is not in progress.



Maintenance

-  **WARNING:** Keep your hands and clothing away from cooling fans. Some fans operate even when Model S/Model X is powered off.
-  **WARNING:** Some fluids (battery acid, Battery coolant, brake fluid, windshield washer additives, etc.) used in vehicles are poisonous and should not be inhaled, swallowed, or brought into contact with open wounds. For your safety, always read and follow instructions printed on fluid containers.



Cleaning

Cleaning the Exterior

To prevent damage to the paint, immediately remove corrosive substances (bird droppings, tree resin, dead insects, tar spots, road salt, industrial fallout, etc.). Do not wait until Model SModel X is due for a complete wash. If necessary, use denatured alcohol to remove tar spots and stubborn grease stains, then immediately wash the area with water and a mild, non-detergent soap to remove the alcohol.

Keep the exterior cameras free of dirt, condensation, or obstructions. These substances can cause unclear pictures or Autopilot and safety features to stop working (see [Cleaning a Camera on page 446](#)).

Follow these steps when washing the exterior of Model SModel X:

1. Rinse Thoroughly

Before washing, flush grime and grit from the vehicle using a hose. Flush away accumulations of mud in areas where debris easily collects (such as wheel wells and panel seams). If salt has been used on the highways (such as during winter months), thoroughly rinse all traces of road salt from the underside of the vehicle, wheel wells, and brakes.

2. Hand Wash

Hand wash Model SModel X using a clean soft cloth and cold or lukewarm water containing a mild, high-quality car shampoo.



CAUTION: Some cleaners and car shampoos contain chemicals that can cause damage or discoloration, especially to plastic trim pieces, lamps, or camera lenses. For example, some car cleaning formulas contain hydroxide or other highly alkaline or caustic ingredients that can damage exterior components. Damage or discoloration resulting from cleaning products is not covered by the warranty.

3. Rinse with Clean Water

After washing, rinse with clean water to prevent soap from drying on the surfaces.

4. Dry Thoroughly and Clean Exterior Glass

After washing and rinsing, dry thoroughly with a chamois. If necessary, dry the brakes by going on a short drive and applying the brakes multiple times.

Clean windows and mirrors using an automotive glass cleaner. Do not scrape, or use any abrasive cleaning fluid on glass or mirrored surfaces.

Car Wash Mode

When taking Model SModel X to a car wash, Car Wash Mode closes all windows, locks all doors, and disables windshield wipers, Sentry Mode, walk-away door locking, and parking sensor chimes. To enable, touch **Controls** > **Service** > **Car Wash Mode**. Your vehicle must be stationary and not actively charging.

If using an automatic car wash, **Enable Free Roll** keeps your vehicle in Neutral and activates free roll for the duration of the wash, while preventing Model SModel X from applying the Parking brake if you leave the driver's seat. To enable, press on the brake pedal and touch **Enable Free Roll**; or shift into Neutral.

Car Wash Mode disables if the vehicle's speed exceeds 10 mph (16 km/h) or by touching **Exit** on the touchscreen.



CAUTION: Failure to put Model SModel X in Car Wash Mode may result in damage (for example, to the charge port or windshield wipers). Damage caused by car washes is not covered by the warranty.

Cleaning a Camera

To ensure a clear picture, the camera lens must be clean and free of obstructions. Remove any build-up of dirt or debris by spraying water onto the camera lens with a spray bottle or pressure washer.



Maintenance

CAUTION: Do not attempt to remove dirt or debris by wiping an exposed lens with your hands or a cloth. This debris can damage the surface of the lens when rubbed against it during wiping.

CAUTION: Do not use chemical-based or abrasive cleaners. Doing so can damage the surface of the lens.

Cautions for Exterior Cleaning

CAUTION: Do not wash in direct sunlight.

CAUTION: Do not use windshield treatment fluids. Doing so can interfere with wiper friction and cause a chattering sound.

CAUTION: Do not use hot water, detergents, or highly alkaline or caustic cleaning products, especially those containing hydroxide.

CAUTION: If using a pressure washer, maintain a distance of at least 12" (30 cm) between the nozzle and the surface of Model SModel X. Avoid aiming the water jet directly at parking sensors. Keep the nozzle moving and do not concentrate the water jet on any one area.

CAUTION: Do not aim water hoses directly at windows, door, or hood seals or at electronic modules or exposed cabling.

CAUTION: To avoid corrosive damage that may not be covered by the warranty, rinse away any road salt from the underside of the vehicle, wheel wells, and brakes. After cleaning the vehicle, dry the brakes by going on a short drive and applying the brakes multiple times.

CAUTION: Avoid using tight-napped or rough cloths, such as washing mitts. A high-quality microfiber cleaning cloth is recommended.

CAUTION: If washing in an automatic car wash, use touchless car washes only. These car washes have no parts (brushes, etc.) that touch the surfaces of Model SModel X. Some touchless car washes use caustic solutions that, over time, can cause discoloration of decorative exterior trim. Avoid exposure to soaps and chemicals above pH 13. If unsure, check the product label or ask the staff at the car wash. Damage caused by improper washing is not covered by the warranty.

CAUTION: If washing in an automatic car wash, make sure the vehicle is locked. In addition, avoid using controls on the touchscreen that can result in accidentally opening doors or trunks while the vehicle is being washed. Any damage caused is not covered by the warranty.

CAUTION: Ensure the wipers are off before washing Model SModel X to avoid the risk of damaging the wipers.

CAUTION: Do not use chemical based wheel cleaners or pre-wash products. These can damage the finish on the wheels.

WARNING: Never spray liquid at a high velocity (for example, if using a pressure washer) towards the charge port while Model SModel X is charging. Failure to follow these instructions can result in serious injury or damage to the vehicle, charging equipment, or property.

Cleaning the Interior

Frequently inspect and clean the interior to maintain its appearance and to prevent premature wear. If possible, immediately wipe up spills and remove marks. For general cleaning, wipe interior surfaces using a soft cloth (such as microfiber) dampened with a mixture of warm water and mild non-detergent cleaner (test all cleaners on a concealed area before use). To avoid streaks, dry immediately with a soft lint-free cloth.

Interior Glass

Do not scrape, or use any abrasive cleaning fluid on glass or mirrored surfaces. This can damage the reflective surface of the mirror and the heating elements in the rear window.

Airbags

Do not allow any substance to enter an airbag cover. This could affect correct operation.

Dashboard and Plastic Surfaces

Do not polish the upper surfaces of the dashboard. Polished surfaces are reflective and could interfere with your driving view.



Seats

Wipe spills and chemical residues from interior surfaces as soon as possible using a soft cloth moistened with warm water and non-detergent soap. Wipe gently in a circular motion. Then wipe dry using a soft, lint-free cloth.

Although seating surfaces are designed to repel stains, Tesla recommends regular cleaning to maintain performance and an as-new appearance. Promptly treat dye transfer from clothing, such as indigo-dyed denim. Avoid contact with harsh chemicals, including certain cosmetics. Never use cleaners containing alcohol or bleach. Spot-test cleaners on an inconspicuous area before applying to visible surfaces.

If equipped with leather seats, note that leather is prone to dye-transfer which can cause discoloration, particularly on light colored leather. White and tan leather is coated with an anti-soiling treatment. Using detergents or commercially available leather cleaners and conditioners is not recommended because they can discolor or dry out the leather.

Vacuum cloth seats as needed to remove any loose dirt.



CAUTION: Aftermarket, non-Tesla seat covers may inhibit the sensitivity of a seat's occupancy sensors and may cause staining or damage.



CAUTION: The front seats are equipped with microphones (see [Active Road Noise Reduction on page 91](#)) that must not be exposed to liquids. To prevent damage to these microphones when cleaning, do not over-saturate the area of the seats where these microphones are located.

Carpets

Avoid over-wetting carpets. For heavily soiled areas, use a diluted upholstery cleaner.

Seat Belts

Extend the belts to wipe. Do not use any type of detergent or chemical cleaning agent. Allow the belts to dry naturally while extended, preferably away from direct sunlight.

Door Seals

Wipe door seals with a damp cloth to remove any debris. Excessive debris on the door seals can cause paint damage when contacting surrounding surfaces. Avoid using alcohol wipes or any chemical products that can potentially deteriorate the coating on the door seals.

Tesla Built-In Rear Facing Child Seats

Vacuum the seats to remove any loose dirt. Wipe the seats with a soft cloth dampened with warm water. You can also use an upholstery cleaner designed for automotive use. Extend the belts to wipe. Allow the belts to dry naturally, preferably away from direct sunlight.

Touchscreen, Rear Touchscreen, and Instrument Panel

Clean the touchscreen and instrument panel using a soft lint-free cloth specifically designed to clean monitors and displays. Do not use cleaners (such as a glass cleaner) or alcohol-based gel products (such as hand sanitizer) and do not use a wet wipe or a dry statically-charged cloth (such as a recently washed microfiber). To wipe the touchscreen without activating buttons and changing settings, you can enable Screen Clean Mode. Touch **Controls > Display > Screen Clean Mode**. The display darkens to make it easy to see dust and smudges. To exit Screen Clean Mode, press and hold **HOLD TO EXIT**.

Chrome and Metal Surfaces

Polish, abrasive cleaners, alcohol-based gel products (such as hand sanitizer), and hard cloths can damage the finish on chrome and metal surfaces.

Cautions for Interior Cleaning



CAUTION: Using solvents (including alcohol), alcohol-based gel products (such as hand sanitizer), bleach, citrus, naphtha, or silicone-based products or additives on interior components can cause damage.



CAUTION: Statically-charged materials can cause damage to the touchscreen or instrument panel.



WARNING: If you notice any damage on an airbag or seat belt, contact Tesla immediately.



Maintenance

- WARNING:** Do not allow any water, cleaners, or fabric to enter a seat belt mechanism.
- WARNING:** Exposure to chemical cleaners can be hazardous and can irritate eyes and skin. Read and observe the instructions provided by the manufacturer of the chemical cleaner.

Polishing, Touch Up, and Body Repair

To preserve the cosmetic appearance of the body, you can occasionally treat the paint surfaces with an approved polish containing:

- Very mild abrasive to remove surface contamination without removing or damaging the paint.
- Filling compounds that fill scratches and reduce their visibility.
- Wax to provide a protective coating between the paint and environmental elements.

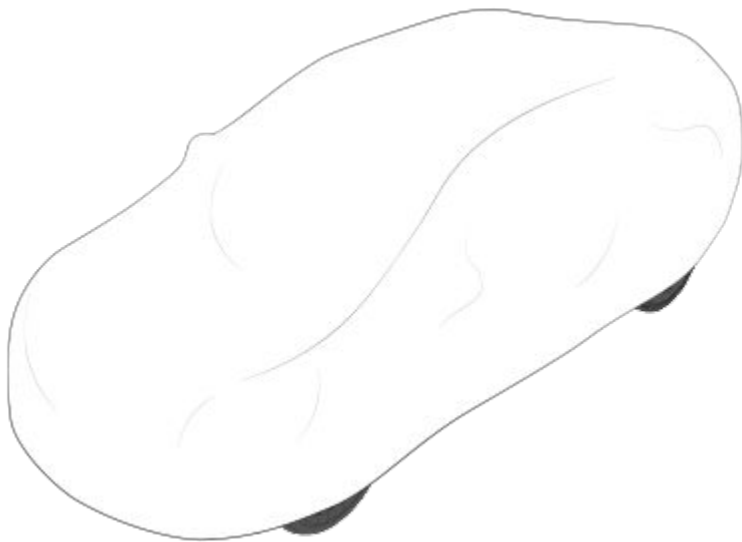
Regularly inspect the exterior paint for damage. Treat minor chips and scratches using a paint touch-up pen (available for purchase from Tesla). Use the touch-up pen after washing but before polishing or waxing.

Repair rock chips, fractures or scratches. Refer to <https://www.tesla.com/support/body-shop-support> for more information on repair locations and available services.

- CAUTION:** Do not use cutting pastes, color restoration compounds, or polishes containing harsh abrasives. These can scour the surface and permanently damage the paint.
- CAUTION:** Do not use chrome polish or other abrasive cleaners.

Using a Car Cover

To preserve the cosmetic appearance of the body when Model S/Model X is not being used, use a genuine Tesla car cover. Car covers can be purchased from Tesla. See [Parts and Accessories on page 465](#).



- CAUTION:** Use only a Tesla-approved car cover when Model S/Model X is plugged in. Using a non-Tesla car cover can prevent the Battery from being adequately cooled during charging.

Floor Mats

To extend the life of your carpet and make them easier to clean, use genuine Tesla floor mats (see [Parts and Accessories on page 465](#)). Maintain floor mats by regularly cleaning them and checking that they are properly attached. Replace floor mats if they become excessively worn.

- WARNING:** To avoid potential interference with a foot pedal, ensure that the driver's floor mat is securely fastened, and never place an additional floor mat on top of it. Floor mats should always rest on top of the vehicle carpeting surface and not on another floor mat or other covering.

Tire Pressures

Displaying Tire Pressures

Tire pressures display on the touchscreen by touching **Controls > Service**, or use the mobile app. The pressure of each tire displays in the visualization of Model SModel X, in addition to the time the tire pressures were last read by the system.

The touchscreen also displays your vehicle's recommended cold tire pressures so you can easily determine how much to inflate your tires.

To choose whether to display tire pressures using Bar or PSI, touch **Controls > Display > Tire Pressure**.

NOTE: You may need to drive briefly before the visualization displays the tire pressure values.

Maintaining Tire Pressures



Keep tires inflated to the recommended pressures, even if it differs from the pressure printed on the tire itself. The Tire and Loading Information label on the center door pillar is visible when the driver door is open and represents a nominal driving scenario in which the vehicle is carrying cargo in the front trunk and up to five passengers. When carrying heavy loads, up to the vehicle's GVWR, in a Cybertruck equipped with All Terrain tires, the tire pressures should be increased.

Tires (Front and Rear)	Normal Load*	GVWR**
20" All Season	50 psi	50 psi
20" All Terrain	50 psi	65 psi

*Normal Load assumes a fully loaded front trunk and up to five occupants (see [Calculating Load Limits on page 930](#)).

**GVWR load capacity not exceeding the vehicle's Gross Vehicle Weight Rating (see [Weights - Vehicle on page 934](#)).



CAUTION: If you are towing a trailer, do not use the tire pressures printed on the Tire and Loading Information Label. Instead, refer to the tire pressures published (see [Tire Pressures when Towing on page 785](#)).



The Low Tire Pressure indicator light on the touchscreen alerts you if a tire is under-inflated. This light does not immediately turn off when you adjust tire pressure. After inflating the tire to the recommended pressure, you must drive over 15 mph (25 km/h) for a short amount of time to activate the Tire Pressure Monitoring System (TPMS), which turns off the Low Tire Pressure indicator light.

If the indicator light flashes for one minute whenever you power on Model S/Model X, a fault with the TPMS is detected.

Your vehicle's tire pressures will drop in cold ambient temperatures. If the TPMS indicator light appears, inflate the tires before driving. The tires will lose approximately one PSI for every 10° F (6° C) drop in outside temperature. Proper tire pressures help protect tires from potholes and improve range and tire longevity when properly inflated.



WARNING: The Low Tire Pressure indicator light alerts you only in situations when a tire is below the recommended threshold (as indicated on the Tire and Loading Information label) under normal driving conditions. It does not alert you when a tire is under-inflated based on the load you are carrying.



WARNING: Under-inflation is the most common cause of tire failures and can cause a tire to overheat, resulting in severe tire cracking, tread separation, or blowout. This may lead to unexpected loss of vehicle control and increased risk of injury. Under-inflation also reduces the vehicle's range and tire tread life.

Checking and Adjusting Tire Pressures



WARNING: Check tire pressures using an accurate pressure gauge when tires are cold. It takes only about one mile (1.6 km) of driving to warm up the tires sufficiently to affect tire pressures. Parking the vehicle in direct sunlight or in hot weather can also affect tire pressures. If you must check warm tires, expect increased pressures. Do not let air out of warm tires in an attempt to match recommended cold tire pressures. A hot tire at or below the recommended cold tire inflation pressure is dangerously under-inflated.

Follow these steps when tires are cold and Model S/Model X has been stationary for over three hours:

1. Refer to the Tire and Loading Information label located on the driver's center door pillar for the target tire pressure.
2. Remove the wheel cover (see [Removing and Installing Wheel Covers on page 904](#)).
3. Remove the valve cap.
4. Firmly press an accurate tire pressure gauge onto the valve to measure pressure.

NOTE: You can also view tire pressures on the touchscreen.



5. If required, add or remove air to reach the recommended pressure.

NOTE: You can release air by pressing the metal stem in the center of the valve.

6. Re-check pressure using the accurate tire gauge.
7. Repeat steps 5 and 6 as necessary until the tire pressure is correct.
8. Reinstall the valve cap to prevent dirt from entering. Periodically check the valve for damage and leaks.
9. Reinstall the wheel cover.

Tire Pressure Monitoring



The Model S Model X is equipped with a tire pressure monitoring system that warns the driver of significant under-inflation or over-inflation of the tires by displaying the Tire Pressure Indicator Light. Check the Tire Information label located on the driver's door pillar for more details, or see [Maintaining Tire Pressures on page 897](#).

Each tire, including the spare (if provided), should be checked monthly when cold and inflated to the inflation pressure recommended by the vehicle manufacturer on the vehicle placard or tire inflation pressure label. (If your vehicle has tires of a different size than the size indicated on the vehicle placard or tire inflation pressure label, you should determine the proper tire inflation pressure for those tires.)

As an added safety feature, your vehicle has been equipped with a tire pressure monitoring system (TPMS) that illuminates a low tire pressure telltale when one or more of your tires is significantly under-inflated. Accordingly, when the low tire pressure telltale illuminates, you should stop and check your tires as soon as possible, and inflate them to the proper pressure. Driving on a significantly under-inflated tire causes the tire to overheat and can lead to tire failure. Under-inflation also reduces fuel efficiency and tire tread life, and may affect the vehicle's handling and stopping ability.

Please note that the TPMS is not a substitute for proper tire maintenance, and it is the driver's responsibility to maintain correct tire pressure, even if under-inflation has not reached the level to trigger illumination of the TPMS low tire pressure telltale.



TPMS Malfunction

Your vehicle has also been equipped with a TPMS malfunction indicator to indicate when the system is not operating properly. The TPMS malfunction indicator is combined with the low tire pressure telltale. When the system detects a malfunction, the telltale will flash for approximately one minute and then remain continuously illuminated. This sequence will continue upon subsequent vehicle start-ups as long as the malfunction exists.

When the malfunction indicator is illuminated, the system may not be able to detect or signal low tire pressure as intended. TPMS malfunctions may occur for a variety of reasons, including the installation of replacement or alternate tires or wheels on the vehicle that prevent the TPMS from functioning properly. Always check the TPMS malfunction telltale after replacing one or more tires or wheels on your vehicle to ensure that the replacement or alternate tires and wheels allow the TPMS to continue to function properly.



The TPMS malfunction indicator is combined with the tire pressure indicator light. If Model S or Model X detects a fault with the TPMS, this indicator flashes for one minute whenever you power on Model S or Model X.

NOTE: Installing accessories that are not approved by Tesla can interfere with the TPMS.

NOTE: If a tire has been replaced or repaired using a different tire sealant than the one available from Tesla, and a low tire pressure is detected, it is possible that the tire sensor has been damaged.



Inspecting and Maintaining Tires

Regularly inspect the tread and side walls for any sign of distortion (bulges), foreign objects, cuts or wear.



WARNING: Do not drive Model SModel X if a tire is damaged, excessively worn, or inflated to an incorrect pressure. Check tires regularly for wear, and ensure there are no cuts, bulges or exposure of the ply/cord structure.

To improve the mileage you get from your tires, maintain tires at the recommended tire pressures, observe speed limits and advisory speeds, and avoid:

- Pulling away quickly, or hard acceleration.
- Fast turns and heavy braking.
- Potholes and objects in the road.
- Hitting curbs when parking.
- Contaminating tires with fluids that can cause damage.

Tire Wear

Adequate tread depth is important for proper tire performance.

Model SModel X is originally fitted with tires that have wear indicators molded into the tread pattern. When the tread has been worn down to 2/32" (1.6 mm), the indicators start to appear at the surface of the tread pattern, producing the effect of a continuous band of rubber across the width of the tire. For optimal performance and safety, Tesla recommends replacing tires before the wear indicators are visible.

Tires with a tread depth less than 4/32" (3 mm) are more likely to hydroplane and should not be used when driving in wet conditions. Tires with a tread depth less than 5/32" (4 mm) do not perform well in snow and slush and should not be used when driving in winter conditions.

To improve vehicle handling characteristics and minimize hydroplaning in wet conditions, put tires with the most tread on the rear of the car.

Tire Rotation, Balance, and Wheel Alignment

Tesla recommends rotating the tires every 6,250 miles (10,000 km) or if tread depth difference is 2/32 in (1.6 mm) or greater, whichever comes first.

Tire rotation is an essential part of tire maintenance. It helps maintain an even tread wear pattern which enhances the tire's overall wear quality, decreases road noise and maximizes tire life.

Unbalanced wheels (sometimes noticeable as vibration through the steering wheel) affect vehicle handling and tire life. Even with regular use, wheels can get out of balance. Therefore, they should be balanced as required.

If tire wear is uneven (on one side of the tire only) or becomes abnormally excessive, check the wheel alignment.

Punctured Tires

A puncture eventually causes the tire to lose pressure, which is why it is important to check tire pressures frequently. Permanently repair (if safe to do so) or replace punctured or damaged tires as soon as possible.

Your tubeless tires may not leak when penetrated, provided the object remains in the tire. If, however, you feel a sudden vibration or ride disturbance while driving, or you suspect a tire is damaged, immediately reduce your speed. Drive slowly, while avoiding heavy braking or sharp steering and, when safe to do so, stop the vehicle and contact Roadside Assistance.

NOTE: In some cases, you can temporarily repair small tire punctures (under 1/4" (6 mm)) using an optional tire repair kit available from Tesla. This allows you to slowly drive Model SModel X to a nearby tire repair facility.



WARNING: Do not drive with a punctured tire that has not been repaired, even if the puncture has not caused the tire to deflate. A punctured tire can deflate suddenly at any time.



Flat Spots

If Model S/Model X is stationary for a long period, tires can form flat spots. When Model S/Model X is driven, these flat spots cause a vibration which gradually disappears as the tires warm up and regain their original shape.

To minimize flat spots during storage, inflate tires to the maximum pressure indicated on the tire's sidewall. Then, before driving, release air to adjust tire pressure to the recommended levels.

Tire Pressure Monitoring System (TPMS)

After replacing one or more wheels (but not after just replacing a tire or rotating wheels), the TPMS sensors are reset to ensure tire pressure warnings are accurate. TPMS sensors reset automatically after driving over 15 mph (25 km/h) for longer than 10 minutes.

NOTE: After replacing a wheel, false tire pressure warnings may display before you've driven 15 mph (25 km/h) for longer than 10 minutes.

 **WARNING:** If your Model S/Model X is equipped with aftermarket tires that differ in size from those printed on the Tire and Loading Information Label (see [Vehicle Loading on page 928](#)), it is the driver's responsibility to determine the correct tire pressure. Do not drive on public roads when tires are not inflated to the correct pressure.

 **WARNING:** Do not depend on TPMS sensors to accurately determine pressures and trigger alerts. It is the driver's responsibility to maintain correct tire pressures (see [Maintaining Tire Pressures on page 897](#)). Over or under-inflated tires can result in loss of control or tire damage, which can lead to serious injury.

TPMS Malfunction

Model S/Model X has also been equipped with a TPMS malfunction indicator to indicate when the system is not operating properly.



The TPMS malfunction indicator is combined with the tire pressure indicator light. When the system detects a malfunction, the indicator flashes for approximately one minute, then remains continuously lit. This sequence continues upon subsequent vehicle start-ups as long as the malfunction exists. When the TPMS malfunction indicator is on, the system might not be able to detect or signal under-inflated tires as intended.

TPMS malfunctions can occur for a variety of reasons, including installing replacement or alternate tires or wheels that prevent the TPMS from functioning properly. Always check the TPMS malfunction indicator light after replacing one or more tires or wheels on your vehicle to ensure that the replacement tires or wheels allow the TPMS to continue to function properly.

NOTE: If a tire has been replaced or repaired using a different tire sealant than the one available from Tesla, and a low tire pressure is detected, it is possible that the tire sensor has been damaged. Use the mobile app to schedule a service appointment to have the fault repaired as soon as possible.

Replacing a Tire Sensor

If the Tire Pressure warning indicator displays frequently, schedule a service appointment to determine if a tire sensor needs to be replaced. Non-Tesla Service Center must replace using a Tesla OEM sensor.

Seasonal Tire Types

Understand Your Tire Type

The type of tires that your vehicle is originally equipped with depends on vehicle model and market region. It is important to understand the capabilities of your vehicle's tires and whether they are suited for summer, all-season, or winter driving. Check the information on the sidewall of a tire for information about a tire's performance characteristics (see [Tire Pressures on page 897](#)).

Summer and All-Season Tires

Summer tires and all season tires are designed for maximum dry and wet road performance but are not designed to perform well in winter conditions. All-season tires are designed to provide adequate traction in most conditions year-round, but may not provide the same level of traction as winter tires in snowy or icy conditions. All-season tires can be identified by "ALL SEASON" and/or "M+S" (mud and snow) on the tire sidewall.



If driving in cold temperatures or on roads where snow or ice may be present, Tesla recommends using winter tires.



WARNING: In cold temperatures or on snow or ice, summer and all-season tires do not provide adequate traction. Selecting and installing the appropriate tires for winter conditions is important to ensure the safety and optimum performance of your Model S/Model X.

All-Terrain Tires

Use all-terrain tires if you regularly drive on gravel and dirt roads. All-terrain tires are suitable for driving on both paved roads (city streets, highways, etc.) as well as off-road (sand, dirt, mud, etc.). All-terrain tires must be the same diameter, brand, construction and tread pattern on all four wheels.

When driving with all-terrain tires, you may experience more road noise, shorter tread life, and less traction on dry roads.

Winter Tires

Use winter tires to increase traction in snowy or icy conditions. When installing winter tires, always install a complete set of four tires at the same time. Winter tires must be the same diameter, brand, construction and tread pattern on all four wheels.



Winter tires can be identified by a mountain/snowflake symbol on the tire's sidewall.

When driving with winter tires, you may experience more road noise and shorter tread life.

Driving in Low Temperatures

Tire performance is reduced in low ambient temperatures, resulting in reduced grip and an increased susceptibility to damage from impacts. Performance tires (summer applications) have reduced traction in ambient temperatures below 5° C/40° F (5° C), and are not recommended in snow/ice conditions. Performance tires can temporarily harden when cold, causing you to hear rotational noise for the first few miles (kilometers) until the tires warm up.

Tire Chains

Only use tire chains on the REAR tires.

Tesla has tested and approved the following tire chains to increase traction in snowy conditions. Install tire chains on rear tires only. The approved tire chains can be purchased from Tesla.



CAUTION: You must remove wheel covers before installing tire chains. Failure to do so can cause damage not covered by the warranty.

Tire Size	Recommended Chain
20"	Konig XD-16 Pro Size 285

When installing tire chains, follow the instructions and warnings provided by the tire chain manufacturer. Mount them evenly and as tight as possible.

When using tire chains:

- Inspect the tire chains for loose fittings and damaged links before each use.
- Set air suspension to **Medium** and turn off the **Preferred Ride Height to Low** setting (see [Suspension on page 767](#)).
- Avoid heavily loading Model S/Model X (heavy loads can reduce the clearance between the tires and the body).
- Do not drive the vehicle without the chains properly installed.
- Drive slowly. Do not exceed 30 mph (48 km/h).
- Remove the tire chains as soon as conditions allow.

NOTE: Tire chains are prohibited in some jurisdictions. Check local laws before installing tire chains.



Maintenance

- CAUTION:** Using non-recommended tire chains, or using tire chains on other sized tires can damage the suspension, body, wheels, and/or brake lines. Damage caused by using non-recommended tire chains, or incorrectly installing tire chains, is not covered by the warranty.
- CAUTION:** Never deflate your tires to put on tire chains. When re-inflated, the chains might fit too tightly and cause tire damage.
- CAUTION:** Install tire chains on rear tires only. Installing chains on front tires can cause damage.
- CAUTION:** Ensure that the tire chains cannot touch suspension components or brake lines. If you hear the chains making unusual noises that would indicate contact with Model SModel X, stop and investigate immediately.

Removing and Installing Wheel Covers

If your Model SModel X is equipped with wheel covers, you must remove them to access the valve stem and the lug nuts.

To remove a wheel cover:

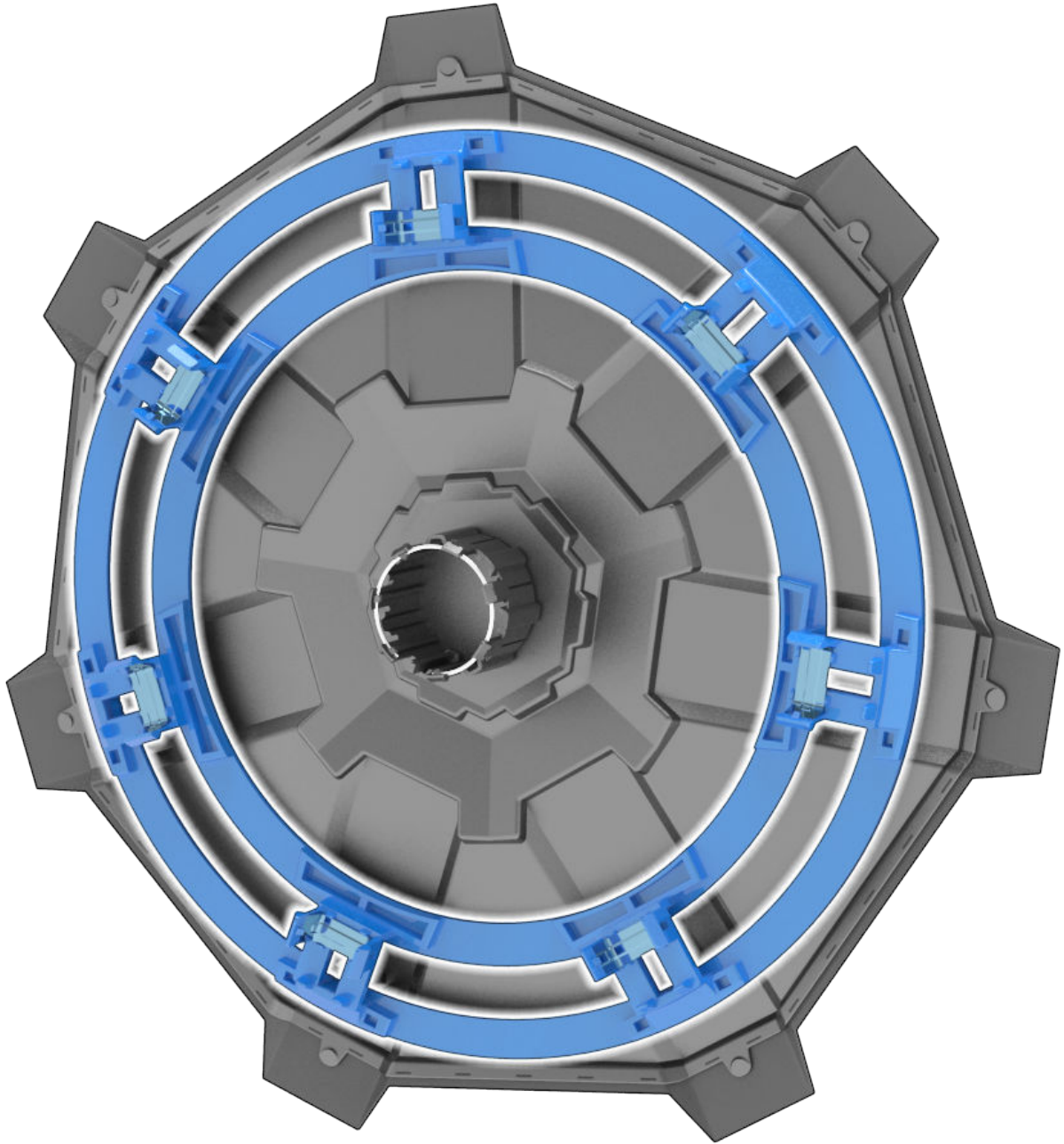
1. Grasp the cover firmly with both hands.
2. Pull the cover toward you to release the retaining clips.



NOTE: Make sure the mounting ring is removed with the wheel cover.

To install a wheel cover:

1. Separate the mounting ring from the wheel cover by pulling the plastic ring from the inside of the wheel cover.



2. Align the mounting ring with the spokes of the wheel. Firmly press the mounting ring into the wheel to secure it.



3. Align the wheel cover with the design of the tire.
4. Firmly press the center of the cover to secure it in place, then work your way out to firmly pressing the outer perimeter of each spoke. You may need to hold the opposite side of the cover until all spokes are secured.
5. Firmly press the center of the cap with your hands (do not hit the cover with your hands) to ensure it is secured.
6. As a final check, quickly pull each spoke to confirm it is secured in place.



CAUTION: To prevent the wheel cover from falling off, ensure that it is fully secured before driving.



Wheel and Tire Specifications

Wheel Specifications (Factory)

Configuration - Location	Size (in)	Offset (mm)
Dual Motor - Front and Rear	20 x 9.0J	ET58.5
Tri Motor - Front and Rear	20 x 9.0J	ET58.5
Lug Nut Torque	151 lb. ft (205 Nm)	
Lug Nut Socket Size	21 mm	

NOTE: For instructions on how to jack/lift Model S/Model X, see [Jacking and Lifting on page 462](#).

Tire Specifications (Factory)

Location	Type/Purpose	Name	Design	Size
Front and Rear	20" All Season	Pirelli Scorpion ATR	Hard Metric	285/65R20
Front and Rear	20" All Terrain	Goodyear Wrangler Territory RT	Light Truck	LT285/65R20

Refer to the tire pressures printed on the Tire and Loading Information label. This label is located on the center door pillar and is visible when the driver's door is open (also see [Checking and Adjusting Tire Pressures on page 898](#)).

Winter tires can be purchased from a Tesla service center or may be available for purchase on the Tesla web site.



WARNING: Do not use tires with a load carrying capacity that is lower than the original tires. Doing so can reduce the maximum GVWR (Gross Vehicle Weight Rating) and GAWR (Gross Axle Weight Rating) as printed on the door pillar ([Weights - Vehicle on page 934](#)). Conversely, replacement tires with a higher load capacity do not increase the GVWR and GAWR.



Understanding Tire Markings

Laws require tire manufacturers to place standardized information on the sidewall of all tires. This information identifies and describes the fundamental characteristics of the tire. It also provides the tire identification number (TIN) for certification of safety standards, and in case of a recall.



NOTE: You can identify a Tesla-approved tire by the "T-mark" specification on the tire's sidewall (for example, T0, T1, T2). Tesla-approved tires are designed to work with your vehicle and optimize performance, safety, reliability, and durability. For more information about Tesla-approved replacement tires, refer to the [Service Manual](#).

1. **Tire category:** P (passenger), LT (light truck), or None (hard metric) indicates the tire classification and corresponding load classification.
2. **Tire width:** This 3-digit number is the width (in millimeters) of the tire from sidewall edge to sidewall edge.
3. **Aspect ratio:** This 2-digit number is the sidewall height as a percentage of the tread width. So, if the tread width is 205 mm, and the aspect ratio is 50, the sidewall height is 102 mm.
4. **Tire construction:** R indicates that the tire is of Radial ply construction.
5. **Wheel diameter:** This 2-digit number is the diameter of the wheel rim in inches.
6. **Load index:** This 2 or 3-digit number is the weight each tire can support. This number is not always shown.



7. **Speed rating:** When stated, indicates the maximum speed (in mph) at which the tire can be used for extended periods. Q=99 mph (160 km/h), R=106 mph (170 km/h), S=112 mph (180 km/h), T=118 mph (190 km/h), U=124 mph (200 km/h), H=130 mph (210 km/h), V=149 mph (240 km/h), W=168 mph (270 km/h), Y=186 mph (300 km/h), (Y)=vehicle's top speed (exceeds the "Y" rating).
8. **Load range:** Shown as Standard Load (SL) or Extra Load (XL), the load range determines how much weight your tires can support at a specified tire pressure. When replacing tires, only use tires of the same load range. If towing with snow tires, ensure they are the same load range of the tires your vehicle came equipped with.
9. **Tire composition and materials:** The number of plies in both the tread area and the sidewall area indicates how many layers of rubber coated material make up the structure of the tire. Information is also provided on the type of materials used.
10. **Maximum tire load:** The maximum load which can be carried by the tire.
11. **Maximum permissible inflation pressure:** This pressure should not be used for normal driving.
12. **U.S. DOT Tire Identification Number (TIN):** Begins with the letters DOT and indicates that the tire meets all federal standards. The next 2 digits/letters represent the plant code where it was manufactured, and the last 4 digits represent the week and year of manufacture. For example, the number 1712 is used to represent the 17th week of 2012. The other numbers are marketing codes used at the manufacturer's discretion. This information can be used to contact consumers if a tire defect requires a recall.
13. **Treadwear grade:** This number indicates the tire's wear rate. The higher the treadwear number is, the longer it should take for the tread to wear down. A tire rated at 400, for example, lasts twice as long as a tire rated at 200.
14. **Traction grade:** Indicates a tire's ability to stop on wet roads. A higher graded tire should allow you to stop your vehicle in a shorter distance than a tire with a lower grade. Traction is graded from highest to lowest as AA, A, B, and C.
15. **Temperature grade:** The tire's resistance to heat is grade A, B, or C, with A indicating the greatest resistance. This grading is provided for a correctly inflated tire, which is being used within its speed and loading limits.



Uniform Tire Quality Grading

The following information relates to the tire grading system developed by the National Highway Traffic Safety Administration (NHTSA), which grades tires by tread wear, traction and temperature performance. Tires that have deep tread, and winter tires, are exempt from these marking requirements.

Where applicable, quality grades are found on the tire's sidewall between the tread shoulder and maximum section width. For example:

- TREADWEAR 180
- TRACTION AA
- TEMPERATURE A

The quality grades are described next.

NOTE: In addition to the marking requirements, passenger car tires must conform to Federal Safety Requirements.

Treadwear

The treadwear grade is a comparative rating based on the wear rate of the tire when tested under controlled conditions on a specified government test course.

For example, a tire graded 150 wears one and a half times better on a government test course than a tire graded 100. The relative performance of tires depends on the actual conditions of their use, however, and can depart significantly from the norm due to variations in driving habits, service practices, road characteristics, and climate.

Traction

The traction grades, from highest to lowest, are: AA, A, B, and C. These grades represent a tire's ability to stop on wet pavement as measured under controlled conditions on test surfaces of asphalt and concrete. A tire marked C might have poor traction performance.

 **WARNING:** Defective tires are dangerous. Do not drive if a tire is damaged, excessively worn, or is inflated to an incorrect pressure. The safety of the vehicle and occupants can be adversely affected. Check tires regularly for wear and to ensure there are no cuts, bulges or exposure of the ply/cord structure.

 **WARNING:** The traction grade assigned to the tire is based on straight-ahead braking tests, and does not include: acceleration, cornering, hydroplaning or peak traction characteristics.

Temperature

The temperature grades are A (the highest), B, and C, representing the tire's resistance to the generation of heat and its ability to dissipate heat when tested under controlled conditions on a specified indoor laboratory test wheel. Sustained high temperature can cause the tire to degenerate and reduce tire life, and excessive temperature can lead to sudden tire failure.

The grade C corresponds to the minimum level of performance that all passenger car tires must meet under the Federal Motor Safety Standard No. 109. Grades B and A represent levels of performance on the laboratory test wheel that exceed the minimum requirements.

 **WARNING:** A tire's temperature grade is established for a tire that is properly inflated and not overloaded. Excessive speed, under-inflation, or excessive loading, either separately or in combination, can cause heat buildup and possible tire failure.

Tire and Loading Glossaries

General Wheel and Tire Terms

Accessory Weight	The combined weight (in excess of those items replaced) of items available as factory installed equipment.
Bead	The inner edge of a tire that is shaped to fit to the rim and form an air tight seal. The bead is constructed of steel wires which are wrapped, or reinforced, by the ply cords.



Cold Tire Pressure	The air pressure in a tire that has been standing in excess of three hours, or driven for less than one mile.
Curb Weight	The weight of a standard vehicle, including any optional equipment fitted, and with the correct fluid levels.
Gross Vehicle Weight	The maximum permissible weight of a vehicle with driver, passengers, load, luggage, and equipment.
kPa (kilo pascal)	A metric unit used to measure pressure. One kilo pascal equals approximately 0.145 psi.
Maximum Inflation Pressure	The maximum pressure to which the tire should be inflated. This pressure is given on the tire side wall in psi (lbf/in²).  CAUTION: This pressure marked on the tire is the maximum allowed by the tire manufacturer. It is not the pressure Tesla recommends using for Model S/Model X.
Maximum Loaded Vehicle Weight	The sum of curb weight, accessory weight, vehicle capacity weight, and production options weight.
Production Options Weight	The combined weight of options installed which weigh in excess of 3 lb (1.4 kg) more than the standard items that they replaced, and are not already considered in curb or accessory weights.
PSI (lbf/in ²)	Pounds per square inch (the unit used to measure tire pressure).
Recommended Tire Inflation Pressure	Tire inflation pressure, established by Tesla, which is based on the type of tires that are mounted on the vehicle at the factory. This information can be found on the Tire and Loading Information label located on the door pillar.
Rim	The metal support for a tire, or tire and tube, upon which the tire beads are seated.
Vehicle Capacity Weight	The number of seats multiplied by 150 lbs (68 kg) plus the rated amount of load/luggage.

Load Carrying Definitions

Normal occupant weight	68 kilograms (150 lbs) times the number of occupants specified in the second column of the tables for calculating load limits (see Vehicle Loading on page 471).
Occupant distribution	Distribution of occupants in a vehicle.
Passenger car tire	A tire intended for use on passenger cars, multipurpose passenger vehicles, and trucks, that have a gross vehicle weight rating (GVWR) of 10,000 lbs (4536 kg) or less.
Rim diameter	Nominal diameter of the bead seat.
Rim size designation	Rim diameter and width.
Rim type designation	The manufacturing industry's designation for a rim by style or code.
Rim width	Nominal distance between the rim's flanges.
Vehicle maximum load on the tire	Load on an individual tire that is determined by distributing to each axle its share of the maximum loaded vehicle weight and dividing by two.
Vehicle normal load on the tire	Load on an individual tire that is determined by distributing to each axle its share of the curb weight, accessory weight, and normal occupant weight and dividing by two.

Pneumatic Radial Tire Definitions

Bead separation	A breakdown of the bond between components in the bead.
Bias ply tire	A pneumatic tire in which the ply cords that extend to the beads are laid at alternate angles substantially less than 90 degrees to the center line of the tread.
Carcass	The tire structure, except tread and sidewall rubber which, that when inflated, bears the load.
Chunking	The breaking away of pieces of the tread or sidewall.



Maintenance

Cord	The strands forming the plies in the tire.
Cord separation	The parting of cords from adjacent rubber compounds.
Cracking	Any parting within the tread, sidewall, or inner liner of the tire extending to cord material.
Extra load tire	A tire designed to operate at higher loads and higher inflation pressure than the corresponding standard tire.
Groove	The space between two adjacent tread ribs.
Inner liner	The layer(s) forming the inside surface of a tubeless tire that contains the inflating medium within the tire.
Inner liner separation	The parting of the inner liner from cord material in the carcass.
Load rating	The maximum load that a tire is rated to carry for a given inflation pressure.
Maximum load rating	The load rating for a tire at the maximum permissible inflation pressure for that tire.
Measuring rim	The rim on which a tire is fitted for physical dimension requirements.
Open splice	Any parting at any junction of tread, sidewall, or inner liner that extends to the cord material.
Outer diameter	The overall diameter of an inflated new tire.
Overall width	The linear distance between the exteriors of the sidewalls of an inflated tire, including elevations due to labeling, decorations, or protective bands or ribs.
Ply	A layer of rubber-coated parallel cords.
Ply separation	A parting of rubber compound between adjacent plies.
Pneumatic tire	A mechanical device made of rubber, chemicals, fabric and steel or other materials, that, when mounted on an automotive wheel, provides the traction and contains the gas or fluid that sustains the load.
Radial ply tire	A pneumatic tire in which the ply cords that extend to the beads are laid at substantially 90 degrees to the center line of the tread.
Reinforced tire	A tire designed to operate at higher loads and at higher inflation pressures than the corresponding standard tire.
Section width	The linear distance between the exteriors of the sidewalls of an inflated tire, excluding elevations due to labeling, decoration, or protective bands.
Sidewall	The portion of a tire between the tread and bead.
Sidewall separation	The parting of the rubber compound from the cord material in the sidewall.
Snow tire	A tire that attains a traction index equal to or greater than 110, compared to the ASTM E1136-93 (re-approved 2003, incorporated by reference, see §571.5) Standard Reference Test Tire when using the snow traction test as described in ASTM F1805-00 (incorporated by reference, see §571.5), and that is marked with an Alpine Symbol specified in S5.5(i) on at least one sidewall.
Test rim	The rim on which a tire is fitted for testing, and may be any rim listed as appropriate for use with that tire.
Tread	The portion of a tire that comes into contact with the road.
Tread rib	A tread section running around the circumference of a tire.
Tread separation	The pulling away of the tread from the tire carcass.
Tread wear indicators (TWI)	The projections within the principal grooves designed to give a visual indication of the degrees of wear of the tread.
Wheel-holding fixture	The fixture used to hold the wheel and tire assembly securely during testing.



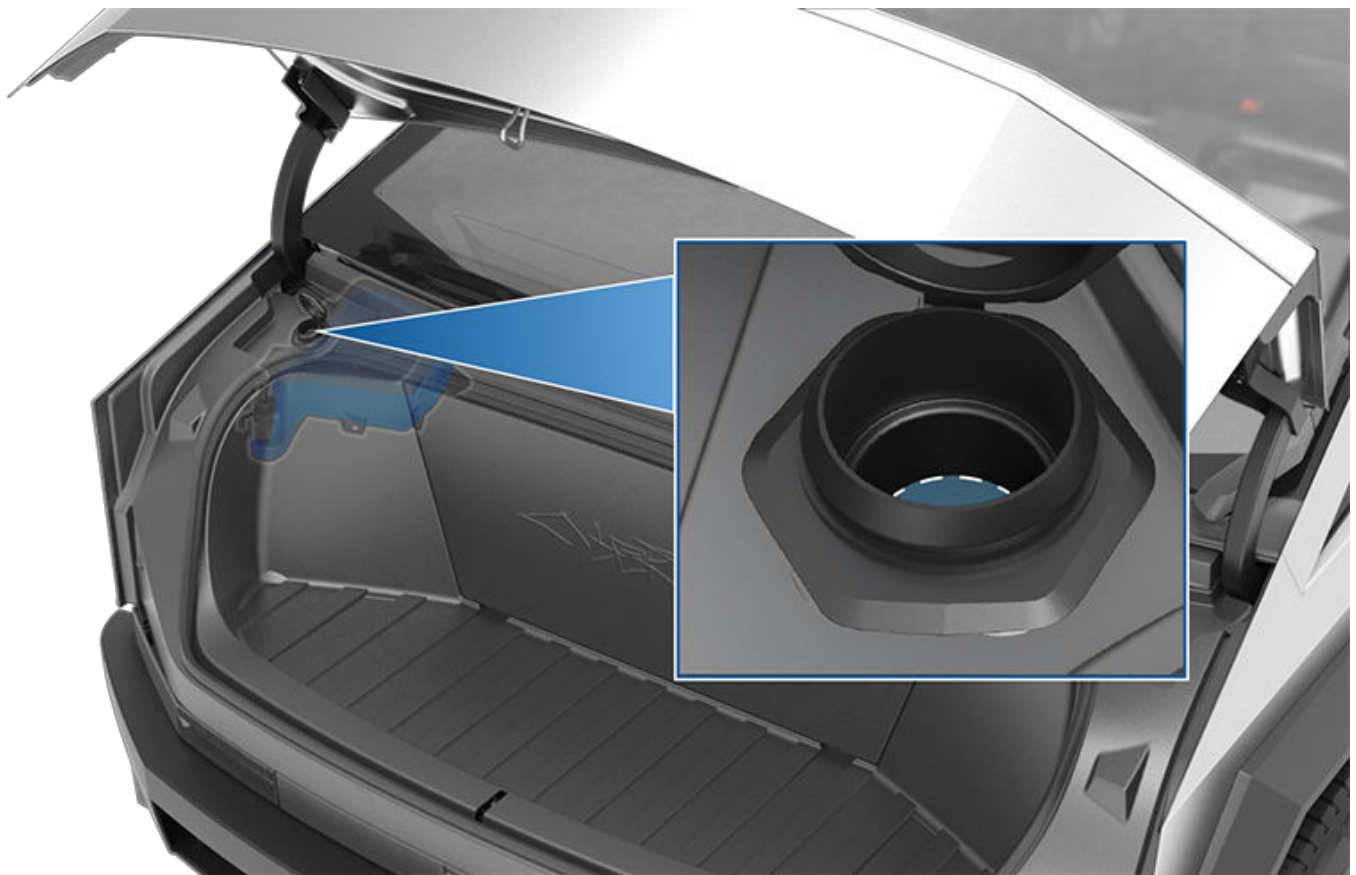
Windshield Wiper Blade, Jets and Fluid

Topping Up Windshield Washer Fluid

The only reservoir into which you can add fluid is the windshield washer fluid reservoir, which is located behind the powered frunk liner. When the level is low, a message displays on the touchscreen.

To top up the washer fluid:

1. Open the powered frunk.
2. Use a microfiber cloth to clean around the filler cap before opening it to prevent dirt from entering the reservoir.
3. Open the filler cap.
4. While avoiding spillage, fill the reservoir until the fluid level is visible just below the filler neck. The reservoir has a total capacity of 4.2 liters.



5. Wipe up any spills immediately and wash the affected area with water.
6. Close the filler cap.



CAUTION: Some national or local regulations restrict the use of Volatile Organic Compounds (VOCs). VOCs are commonly used as freeze protection in washer fluid. Use a washer fluid with limited VOC content only if it provides adequate freeze resistance for all climates in which you drive Model S Model X.



CAUTION: Use only ethanol-based windshield washer fluid meant for automotive vehicles. Using other substances, such as untreated water, can result in bacterial growth within the climate control system resulting in odor or potential damage that is not covered by warranty. Untreated pure water expands to ice when freezing, which may result in damage.



CAUTION: Do not add formulated washer fluids that contain water repellent or bug wash. These fluids can cause streaking, smearing, and squeaking or other noises.



WARNING: In temperatures below -32°F (0°C), use a washer fluid with antifreeze. In cold weather, using a washer fluid without antifreeze can impair visibility through the windshield.



 **WARNING:** Windshield washer fluid can irritate eyes and skin. Read and observe the instructions provided by the washer fluid manufacturer.

Cleaning the Wiper Blade

Periodically clean the edge of the wiper blade and check the rubber for cracks, splits, and roughness. If damaged, replace the blade immediately to prevent damage to the glass and improve visibility.

Contaminants on the windshield or wiper blade can reduce the effectiveness of the wiper. Contaminants include ice, wax spray from car washes, washer fluid with bug and/or water repellent, bird droppings, tree sap, and other organic substances.

Follow these guidelines for cleaning:

1. Lift the wiper arm a short distance away from the windshield, just far enough to access the wiper blade. Do not lift the wiper arm beyond its intended position.
2. Place a towel between the wiper arm and windshield to avoid scratching or cracking the windshield.
3. Clean the windshield and wiper blade using washer fluid or non-abrasive glass cleaner approved for use on automotive glass and rubber.

 **CAUTION:** Inappropriate products can cause damage or smears and create glare on the windshield.

4. Gently place the wiper blade back onto the windshield.
5. Test the wiper blade again. If the wiper remains ineffective after cleaning, replace the wiper blade.

Replacing the Wiper Blade

For optimum performance, replace the wiper blade at least once a year. You can purchase a replacement wiper blade on the Tesla Shop.

 **CAUTION:** Only install a replacement blade that is identical to the original blade. Using an inappropriate blade can damage the wiper system and windshield.

To replace the wiper blade:

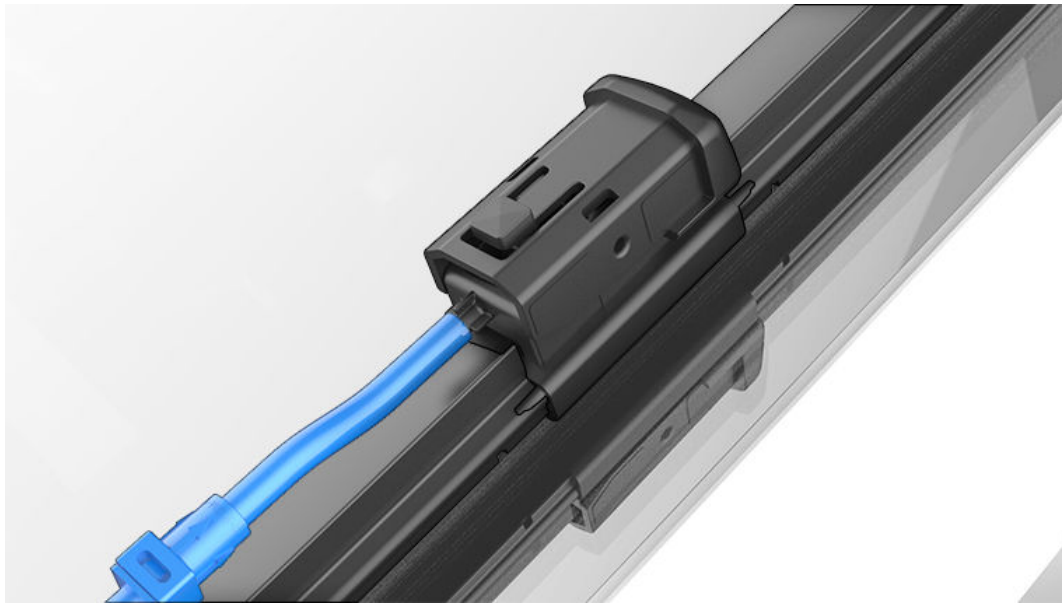
1. Shift into Park and turn off the wiper. Ensure the wiper setting is **Off** and not in **Auto**, because the wiper blade may still sweep if there is any liquid detected on the windshield.
2. Place a towel between the wiper arm and windshield to avoid scratching or cracking the windshield.
3. Lift the wiper arm a short distance away from the windshield, just far enough to access the wiper blade.

 **CAUTION:** Wiper blade does not lock into a lifted position. Do not lift the wiper arm beyond its intended position or drop it onto the windshield.

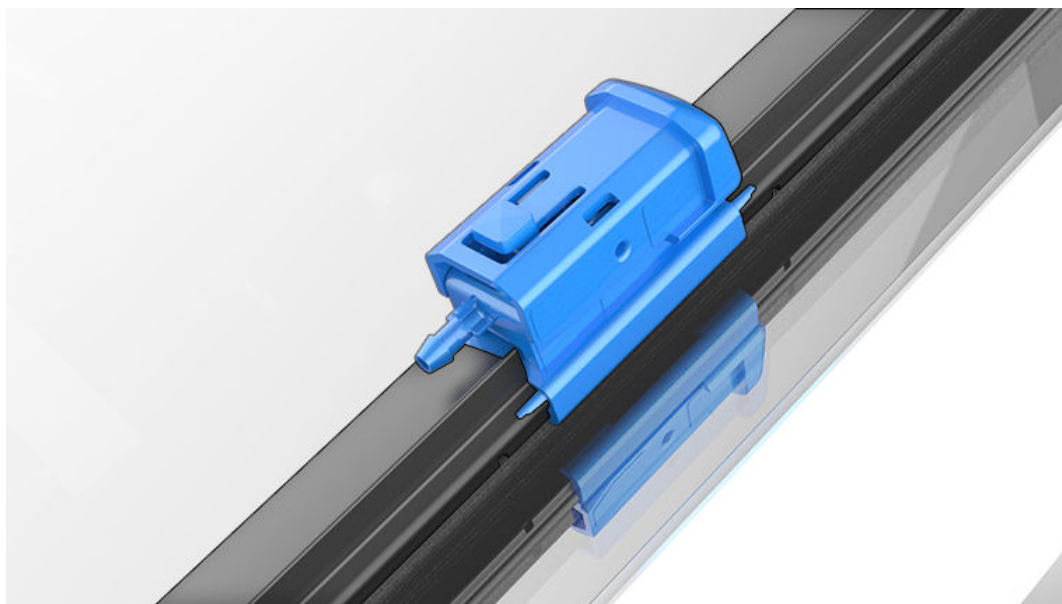
4. While holding the wiper arm, press the locking tab, then slide the blade away from the arm. Set the wiper blade next to the wiper arm.



5. Disconnect the washer hose from the wiper blade by pulling the hose from the barb fitting.



6. Connect the new washer hose to the barb fitting on the new wiper blade.



7. Align the new wiper blade on the wiper arm and slide it toward the base of the wiper arm until it locks into place.
8. Ensure the wiper blade is fully secured by lightly pushing and pulling on the blade. The blade should not jostle or move around.
9. Remove the towel and gently place the wiper blade against the windshield.

Washer Jets

The windshield washer fluid sprays from nozzles along the length of the wiper blade. You cannot adjust them. If a windshield washer nozzle becomes blocked, use a thin strand of wire to clear any blockages.

If the blade is not dispensing washer fluid, make sure there is enough wiper fluid in the reservoir and refill if needed. If this issue still persists, check the hose connection between the arm and blade for any leaks, kinks, or disconnections.

 **WARNING:** Do not operate the washers while cleaning Model SModel X. Windshield washer fluid can irritate eyes and skin. Read and observe the washer fluid manufacturer's instructions for safe handling.



Jacking and Lifting

Jacking Procedure

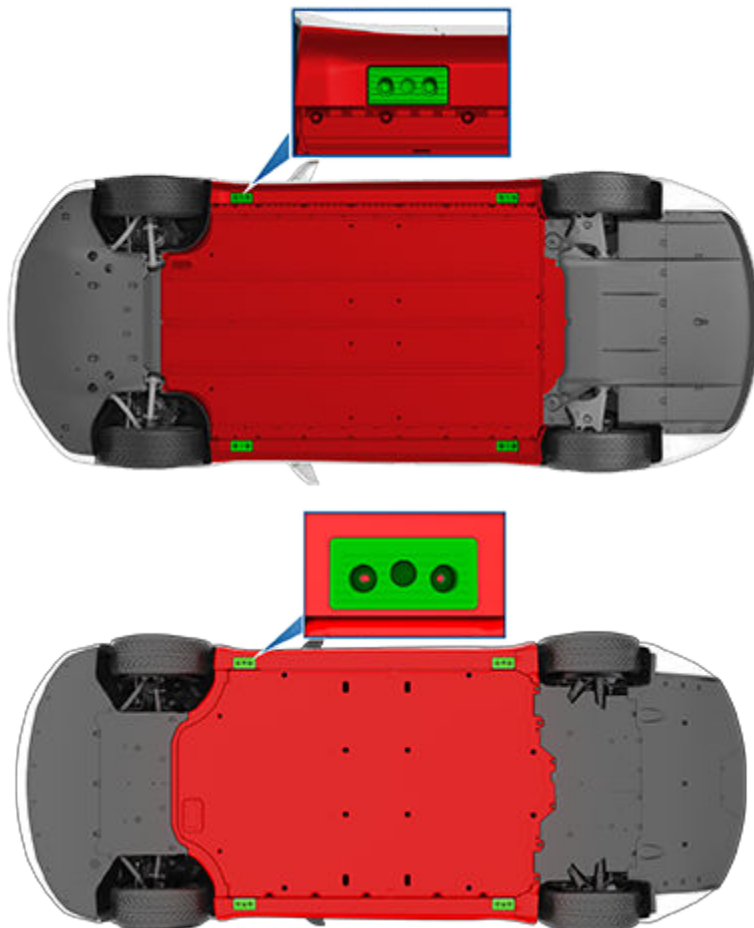
Follow the steps below to lift Model S/Model X. Ensure that any non-Tesla repair facility is aware of these lifting points.

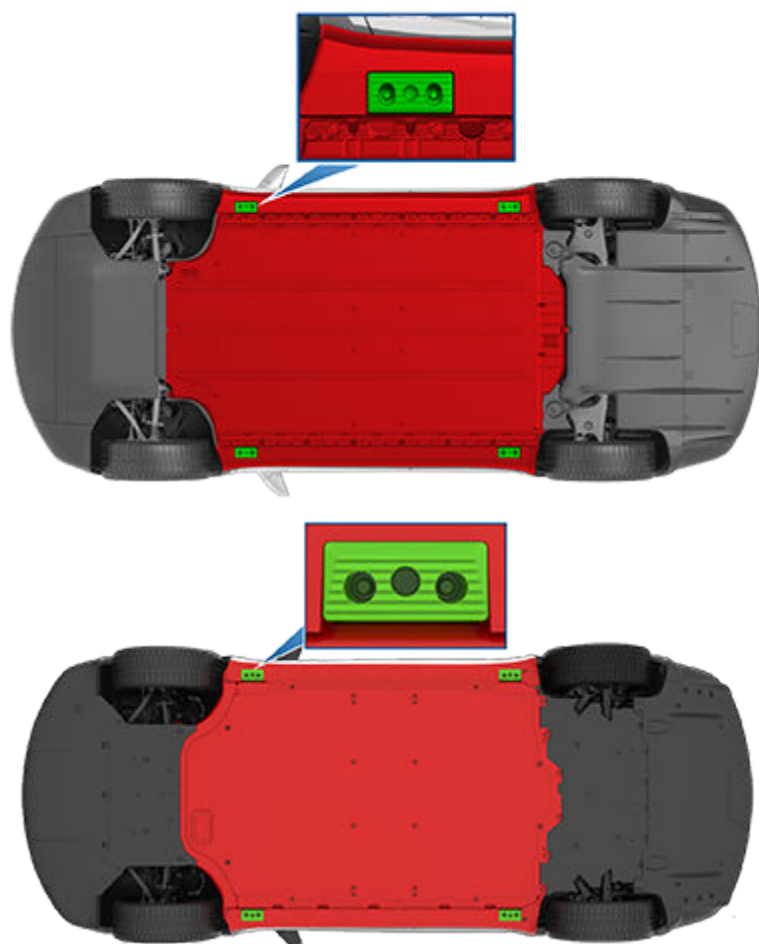
1. Position Model S/Model X centrally between the lift posts.
2. If your Model S/Model X is equipped with air suspension, it automatically self-levels, even when power is off (see [Jack Mode on page 463](#)). Use the touchscreen to set the suspension as follows:
 - Touch **Controls** > **Suspension**.
 - Press the brake pedal, then touch **Very High** to maximize the height of the suspension.
 - Touch **Controls** > **Service** > **Jack Mode** to disable self-leveling.



When Jack mode is active, Model S/Model X displays this indicator light on the instrument panel, along with a message telling you that active suspension is disabled.

3. Close the falcon wing doors.
 4. Position the lift arm pads under the designated body lift points at the locations shown.
-  **WARNING: DO NOT** position the lift arm pads under the Battery or side rails, as shown in red.





5. Adjust the height and position of the lift arm pads to ensure that they are correctly located.
6. With assistance, raise the lift to the desired height, ensuring the lift arm pads remain in their correct positions.
7. Engage any lift safety locks. Follow the lift manufacturer's instructions.

NOTE: Jack mode cancels when Model S Model X is driven over 4 mph (7 km/h).

NOTE: Jack mode may be unexpectedly enabled in situations where an object is supporting the vehicle's weight (for example the bumper of the vehicle is resting on a curb).

⚠ WARNING: The air suspension system automatically self-levels, even when power is off. You **MUST** disable this system by engaging Jack mode before lifting or jacking. If you do not disable the air suspension, Model S Model X can attempt to self-level, causing serious damage, bodily injury, or death.

⚠ WARNING: Never raise Model S Model X when the charge cable is connected, even if charging is not in progress.

⚠ WARNING: Do not work on an incorrectly supported vehicle. Doing so can cause serious damage, bodily injury, or death.

⚠ CAUTION: DO NOT lift from under the Battery or side rails. Place the lift arm pads under the designated body lift points only. The locations shown are the only approved lifting points for Model S Model X. Lifting at any other points can cause damage. Damage caused by incorrectly lifting Model S Model X is not covered by the warranty.

Jack Mode

If Model S Model X is equipped with air suspension, it automatically self-levels, even when power is off. To prevent damage when jacking or lifting the vehicle, you must activate Jack mode to disable self-leveling. Jack mode prevents the self-leveling that occurs even when Model S Model X is powered off.

Press the brake pedal, then touch **Controls > Service > Jack Mode**.



When Model SModel X is in **Jack Mode**, a red air suspension indicator lights up on the instrument panel.



To deactivate, touch **Jack Mode** again.

NOTE: **Jack Mode** automatically cancels when you drive over 4 mph (7 km/h).

NOTE: Model SModel X also sets Jack mode automatically if it detects that the vehicle cannot lower to its target height, or if it detects that an object is supporting the vehicle's weight (for example the bumper of the vehicle is resting on a curb).

Parts and Accessories

Parts, Accessories, and Modifications

Use only genuine Tesla parts and accessories. Tesla performs rigorous testing on parts to ensure their suitability, safety, and reliability. Purchase these parts from Tesla, where they can be professionally installed and you can receive expert advice about modifications to Model SModel X. Accessories are available for purchase online at the Tesla Shop. Some accessories may not be available in your market region or compatible with your exact vehicle.

NOTE: Adding accessories to your vehicle may impact expected range, vehicle dimensions, etc.

Tesla is unable to assess parts manufactured by other distributors and therefore accepts no responsibility if you use non-Tesla parts on Model SModel X.



WARNING: Installing non-approved parts and accessories, or performing non-approved modifications, can affect the performance of Model SModel X and the safety of its occupants. Any damage caused by using or installing non-approved parts, or by performing non-approved modifications, is not covered by the warranty.



WARNING: Tesla does not accept liability for death, personal injury or damage that occurs if you use or install non-approved accessories or make non-approved modifications.

Body Repairs

If your Model SModel X is in a collision, contact Tesla or a Tesla-approved Body Shop to ensure that it is repaired with genuine Tesla parts. Tesla has selected and approved body shops that meet strict requirements for training, equipment, quality, and customer satisfaction.

Some repair shops and insurance companies might suggest using non-original equipment or salvaged parts to save money. However, these parts may not meet Tesla's high standards for quality, fit, and corrosion resistance. In addition, non-original equipment and salvaged parts (and any damage or failures they might cause) are not covered by the warranty.

Connecting Accessories to the 48V Power Feeds

Model SModel X is equipped with two power feeds. The power feeds provide access to the 48V low voltage system, which can be used to power accessories.



CAUTION: Do not connect a power source (such as a solar panel or external battery) to a power feed. Doing so may damage Model SModel X.



WARNING: The two power feeds are the only points at which you can connect accessories directly to the low voltage system. Do not use any other low voltage wiring in Model SModel X to power accessories. Doing so can lead to unpredictable or unexpected results (such as a total loss of power steering) and can affect the performance of Model SModel X and the safety of its occupants. Any damage caused by using or installing non-approved parts, or by performing non-approved modifications, is not covered by the warranty. Tapping into the power feeds should only be done by knowledgeable and experienced individuals. Tesla does not accept liability for death, personal injury or damage that occurs if you install accessories using non-approved methods or circuits.

48V Power Feed Specifications

There are two power feeds:



Maintenance

- One power feed is located on the roof (400W maximum draw).
- One power feed is located in the powered frunk (400W maximum draw).

Each power feed operates in the following range:

- Minimum: 28V
- Nominal: 44–50V
- Maximum: 58V

Each power feed contains three wires:

Wire Color	Function
Red with a blue stripe	Positive (+) terminal: Provides 48V power
Green	Provides access to the Local Interconnect Network (LIN)
Roof power feed: Black with a blue stripe	Negative (-) terminal: Provides a grounding point
Powered frunk power feed: Brown with a blue stripe	

NOTE: The power feeds are designed to stop providing power when current that exceeds the listed specifications is detected. If a power feed unexpectedly stops providing power, reset them by touching **Controls > Outlets & Mods > Reset**.

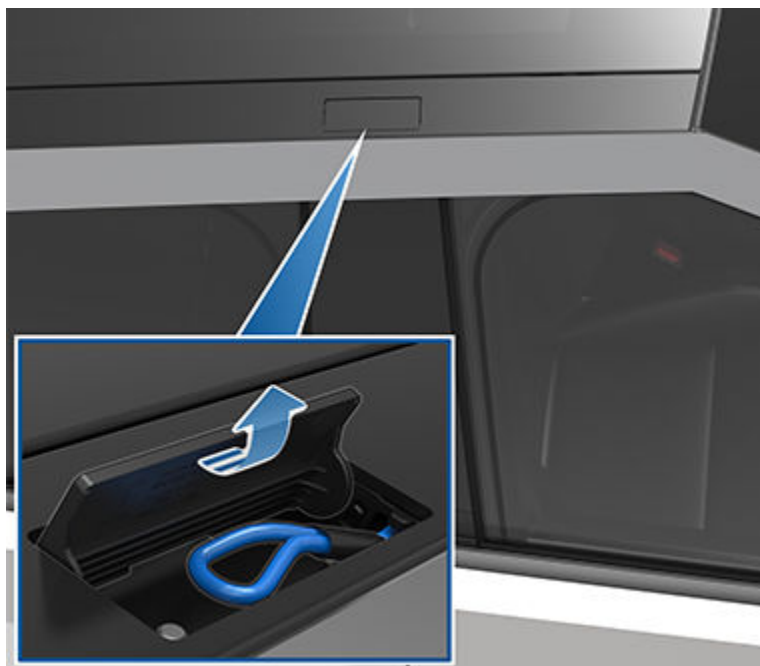
CAUTION: If the wires in the vehicle do not match this information, use the mobile app to schedule a service appointment.

Accessing the Power Feed on the Roof

1. Ensure that Model S/Model X is powered off (see [Powering Off](#) on page 742).

WARNING: Failure to ensure the vehicle is powered off can result in serious injury. Tesla recommends wearing appropriate personal protective equipment to mitigate any potential for injury.

2. Locate the strip of applique on the right side of the roof and use a flat, non-marring tool to gently lift under the edge and release the five clips that hold it in place. Lift upwards to remove the applique.



3. Locate the shrink-wrapped loop of wires. This is the power feed.



4. Remove the shrink wrap from the power feed, then splice or solder the accessory's wire harness to it.



WARNING: Use extreme care when accessing the power feed. Assume that the low voltage components of Model S/Model X, including all wires and connectors, are always energized. Because the 48V low voltage system operates at a higher voltage than a typical low voltage system, there is an increased risk of personal injury, arcing, or component damage if the low voltage components of Model S/Model X are handled improperly.



CAUTION: Carefully check the wiring of the accessory and ensure that you are connecting the positive (+) wire of the accessory to the positive wire (red with a blue stripe) of the power feed, and the negative (-) wire of the accessory to ground (black with a blue stripe). See [48V Power Feed Specifications on page 919](#). Accessories without proper power and grounding may not function as expected, and may be damaged as a result.



CAUTION: Ensure that the wires are properly insulated (taped or heatshrunk) after splicing or soldering an accessory's wiring to the power feed.

5. Ensure your accessory or attachment is properly secured to the vehicle.
6. Replace the roof applique by pressing it into place to ensure that the trim clips are secured.
7. Power on the vehicle (see [Starting and Powering Off on page 741](#)) and enable power to the power feed, if desired (see [Enabling Power to the Power Feeds on page 924](#)).

Accessing the Power Feed in the Powered Frunk

To access the power feed in the powered frunk, you must first remove the frunk lining.

1. Open the powered frunk (see [Powered Frunk on page 717](#)).
2. Ensure that Model S/Model X is powered off (see [Powering Off on page 742](#)).



WARNING: Failure to ensure the vehicle is powered off can result in serious injury. Tesla recommends wearing appropriate personal protective equipment to mitigate any potential for injury.

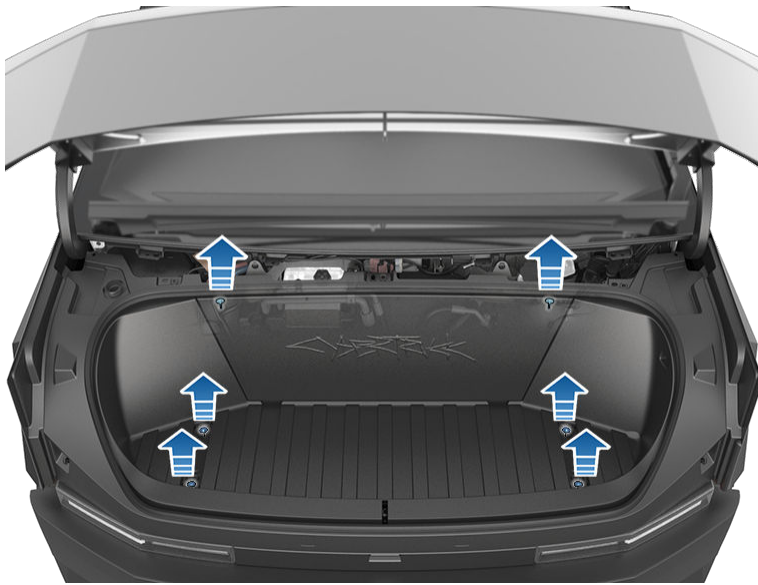
3. Remove the frunk maintenance panel by pulling it upwards to release the trim clips that hold it in place.



4. Remove the two bump stops (one on each side above the headlights) by turning them counterclockwise.
5. Remove the windshield washer fluid cap.
6. Using a trim tool or flat, plastic tool, remove the two pieces of trim on the bottom of the frunk lining to expose the four bolts that hold the lining in place.



7. Using a 10 mm socket, remove the four bolts on the bottom of the frunk and the two bolts beneath the maintenance panel.

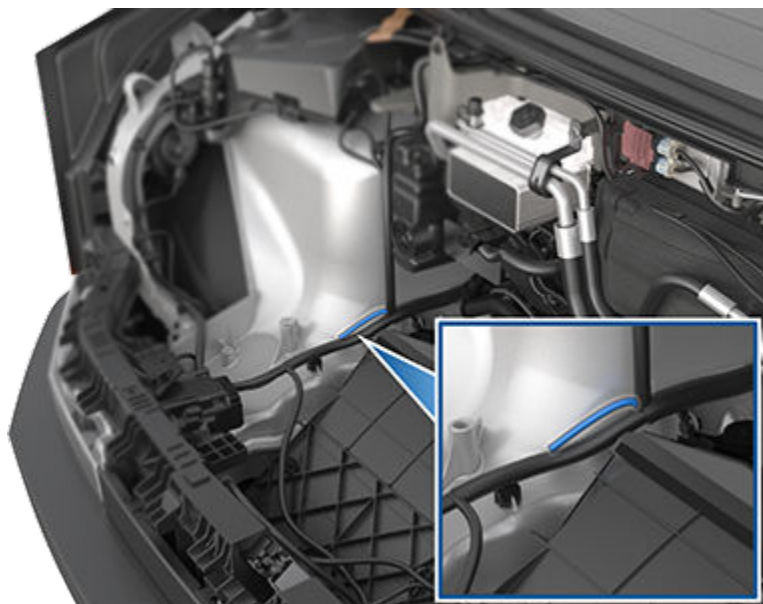


8. Carefully lift the frunk lining partially upward and unplug the emergency interior release connector. Once the connector is unplugged, the frunk lining can be removed.



CAUTION: As you remove the frunk lining, be careful not to damage or jostle the connector for the powered frunk emergency interior release.

9. Locate the shrink-wrapped wires. This is the power feed.



10. Remove the shrink wrap from the power feed, then splice or solder the accessory's wire harness to it.



WARNING: Use extreme care when accessing the power feed. Assume that the low voltage components of Model S/Model X, including all wires and connectors, are always energized. Because the 48V low voltage system operates at a higher voltage than a typical low voltage system, there is an increased risk of personal injury, arcing, or component damage if the low voltage components of Model S/Model X are handled improperly.



CAUTION: Carefully check the wiring of the accessory and ensure that you are connecting the positive (+) wire of the accessory to the positive wire (red with a blue stripe) of the power feed, and the negative (-) wire of the accessory to ground (brown with a blue stripe). See [48V Power Feed Specifications on page 919](#). Accessories without proper power and grounding may not function as expected, and may be damaged as a result.



CAUTION: Ensure that the wires are properly insulated (taped or heatshrunk) after splicing or soldering an accessory's wiring to the power feed.

11. Ensure your accessory or attachment is secured to the vehicle.
12. Replace the powered frunk lining, connect the emergency interior release connector, and replace all fasteners and trim. Torque the bolts to 12 Nm (8.87 ft-lb).
13. Power on the vehicle (see [Starting and Powering Off on page 741](#)) and enable power to the power feed, if desired (see [Enabling Power to the Power Feeds on page 924](#)).

Enabling Power to the Power Feeds

Once you have connected an accessory to a power feed, enable power from the touchscreen. Touch **Controls > Outlets & Mods** and then touch a power feed on the touchscreen to enable it.

 **CAUTION:** Leaving an accessory powered depletes the High Voltage Battery. Power to the power feed shuts off when the capacity of the High Voltage Battery is very low.

By default, the power feeds stop providing power when you exit Model S/Model X and close the doors. To instead keep the power feeds on when you leave the vehicle, touch **Keep On Cabin and Bed Outlets** (see [Keep On Cabin and Bed Outlets on page 665](#)).

Using RFID Transponders

When attaching an RFID transponder (used by many automated toll systems) inside Model S/Model X, place the transponder next to the rear view mirror. This ensures best results and minimizes any obstruction to your driving view. Refer to the RFID manufacturer's instructions for specific placement.

NOTE: You can also attach a weather-proof transponder to the front license plate.



Do It Yourself Maintenance

Learn how to perform simple Do It Yourself procedures, such as replacing wiper blades and cabin filters, or installing the paint protection film kit. Go to <https://www.tesla.com/support/do-it-yourself-guides> for instructions, animations, and videos of these procedures.

NOTE: Due to market region or vehicle configuration specifics, some parts and procedures may not be available for your vehicle. When navigating to <https://www.tesla.com/support/do-it-yourself-guides>, select your vehicle, region, and/or language to see an updated list of parts and accessories available for your region.



CAUTION: Perform each procedure in a dry and well-lit area. For your safety, only perform a procedure if you feel comfortable doing so, and always follow provided instructions.



Identification Labels

Vehicle Identification Number

You can find the VIN at the following locations:

- The Tesla mobile app.
- Touch **Controls** > **Software**.
- Stamped onto the driver's side A-pillar. Can be seen by looking through the windshield on the driver's side of the vehicle.



- Printed on the Vehicle Certification label, located on the door pillar. Can be seen when the driver's door is open.





Emission Control Label

The emission control label is located on the opening face of the powered frunk.

VEHICLE EMISSION CONTROL INFORMATION

THIS VEHICLE CONFORMS TO U.S. EPA REGULATIONS APPLICABLE TO 2024 MODEL YEAR NEW TIER 3 BIN 0 HEAVY-DUTY VEHICLES AND TO CALIFORNIA REGULATIONS APPLICABLE TO ZEV MEDIUM-DUTY VEHICLES AND IS CERTIFIED FOR SALE IN CALIFORNIA.

MODEL:

MOTOR:

TEST GROUP:

EVAPORATIVE FAMILY:



Vehicle Loading

It is important to understand your vehicle's original tire sizes and pressures, and the GVWR (Gross Vehicle Weight Rating) and GAWR (Gross Axle Weight Rating). This information can be found on two labels attached to the front door pillar on the driver's side of the vehicle.



1. Tire and Loading Information Label
2. Vehicle Certification Label

WARNING: Overloading Model S Model X has an adverse effect on braking and handling, which can compromise your safety or cause damage.

CAUTION: Never store large amounts of liquid in Model S Model X. A significant spill can cause electrical components to malfunction.

Tire and Loading Information Label

The Tire and Loading Information label provides:

- The maximum number of occupant seating positions.
- The maximum vehicle capacity weight.
- The size of the original tires.
- The cold inflation pressures for the original front and rear tires. These pressures are recommended to optimize ride and handling characteristics.





Never change this label, even if you use different tires in the future.

NOTE: If Model SModel X is loaded to its full capacity, double check all tires to ensure they are inflated to their recommended pressure levels (see [Maintaining Tire Pressures on page 897](#)).

WARNING: Tire pressures printed on the Tire and Loading Information label DO NOT APPLY to towing. When towing, tire pressures must be increased. For information about the tire pressures required when towing, refer to see [Towing a Trailer on page 784](#).

Vehicle Certification Label

WARNING: The Vehicle Certification label specifies the weight ratings for Model SModel X based on the tires that were installed at time of manufacture and the tire pressures indicated on the Tire and Loading Information label. However, the weight ratings will change if you change the factory-installed tires or inflate tires to a pressure that differs from those shown on the Tire and Loading Information label.

The Vehicle Certification label provides:

- GVWR - Gross Vehicle Weight Rating. The maximum allowable total mass of Model SModel X. This is calculated as the weight of Model SModel X equipped with the heaviest factory selectable options, all passengers, fluids, and cargo.
- GAWR FRT and GAWR RR - Gross Axle Weight Rating for the front and rear axles. The GAWR is the maximum distributed weight that each axle can support.

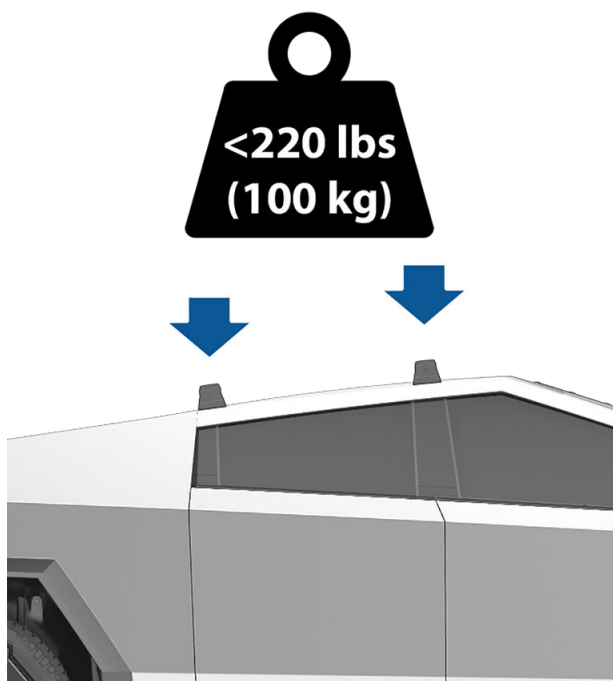
MFD BY TESLA, INC.			
GVWR	WITH TIRES		
GAWR FRT	WITH TIRES	RIM	COLD TIRE PRESSURE
GAWR RR	WITH TIRES	RIM	COLD TIRE PRESSURE
THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.			

CAUTION: To prevent damage, never load Model SModel X so that it is heavier than GVWR or exceeds the individual GAWR weights.

Roof Racks

Model SModel X supports the use of Tesla-approved roof racks. Roof racks can be installed over the roof, over the bed, or both. To install roof racks, you must use only roof rack systems that have been approved by Tesla. You can find the roof rack instructions in the box or on the Tesla Shop.

Maximum Load on Roof Racks: 220 lb (100 kg) per 2-crossbar set. For example, a 2-crossbar set placed on the roof has a maximum load of 220 lb. An additional 2-crossbar set placed over the cargo bed also has a maximum load of 220 lb (100 kg).



See [Carrying Accessories and Crossbars on page 792](#) for more information.

CAUTION: Failure to use the correct roof racks and follow the instructions can cause significant damage.

WARNING: When loading the roof racks, distribute the load evenly and maintain a low center of gravity. Loaded vehicles, with higher centers of gravity, may handle differently than unloaded vehicles. Take extra precautions, such as slower speeds and increased stopping distance, when driving heavily loaded roof racks.

Calculating Load Limits

1. Locate the statement "The combined weight of occupants and cargo should never exceed XXX lbs or XXX kg" on the "Tire and Loading Information" label.
2. Determine the combined weight of all occupants that will ride in the vehicle.
3. Subtract the combined weight of the occupants from XXX lbs or XXX kg (see Step 1).
4. The resulting figure equals the available cargo load capacity. For example, if the "XXX" amount equals 1400 lbs (635 kg) and there will be five 150 lb (68 kg) passengers in the vehicle, the amount of available cargo capacity is 650 lbs ($1400 - 750$) (5×150) = 650 lbs) or 295 kg ($635 - 340$) (5×68) = 295 kg).
5. Determine the combined cargo weight being loaded on the vehicle. That weight must not exceed the available cargo load capacity calculated in Step 4.

WARNING: The powered frunk and the cargo bed are the preferred places to carry objects. In a collision, or during hard braking and sharp turns, loose items in the cabin could injure occupants.

Example Load Limit Calculations

How much cargo Model S Model X can carry depends on the number and weight of passengers. The following calculated load limit examples assume passengers weigh 150 lbs (68 kg). If passengers weigh more or less, available cargo weight decreases or increases respectively.

Driver and one passenger

Description	Total
Vehicle capacity weight	954 lbs (433 kg)
Subtract occupant weight (2 x 150 lbs/68 kg)	300 lbs (136 kg)



Description	Total
Available cargo weight	654 lbs (297 kg)

Driver and four passengers

Description	Total
Vehicle capacity weight	954 lbs (433 kg)
Subtract occupant weight (5 x 150 lbs/68 kg)	750 lbs (340 kg)
Available cargo weight	204 lbs (93 kg)

Cautions and Warnings

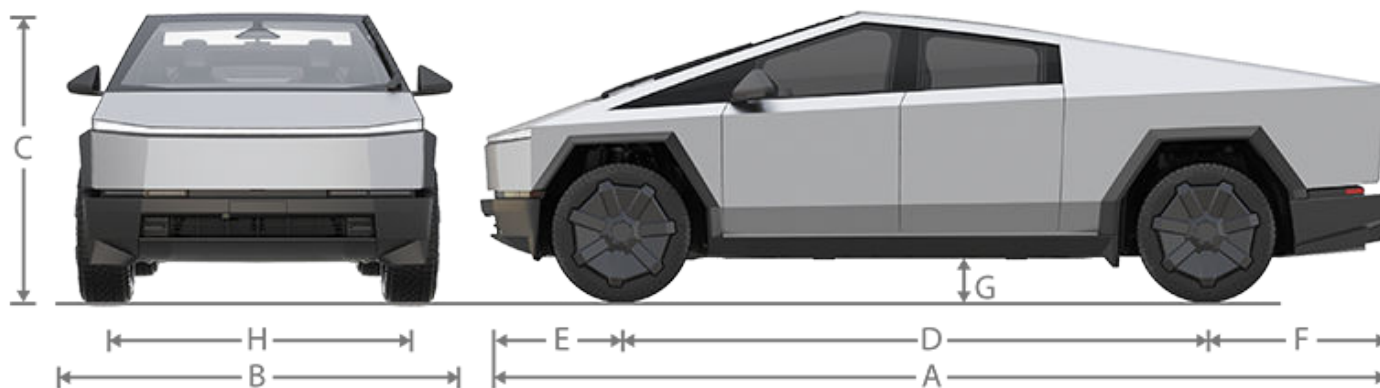
-  **WARNING:** Drive cautiously when Cybertruck is carrying a large load. Increase braking distance, reduce speed when making sharp turns, and avoid abrupt steering. Failure to drive cautiously increases the risk of losing control which can result in property damage, personal injury, and death.
-  **WARNING:** The loading capacity of your vehicle is limited either by how much space is available (volume capacity) or by how much weight the vehicle can carry (payload capacity). When you have loaded Cybertruck to its maximum weight capacity, do not add more cargo, even if there is space available. Overloading, or improper loading, can contribute to property damage, personal injury, or death.



Specifications

Dimensions, Weights, and Cargo Capacity

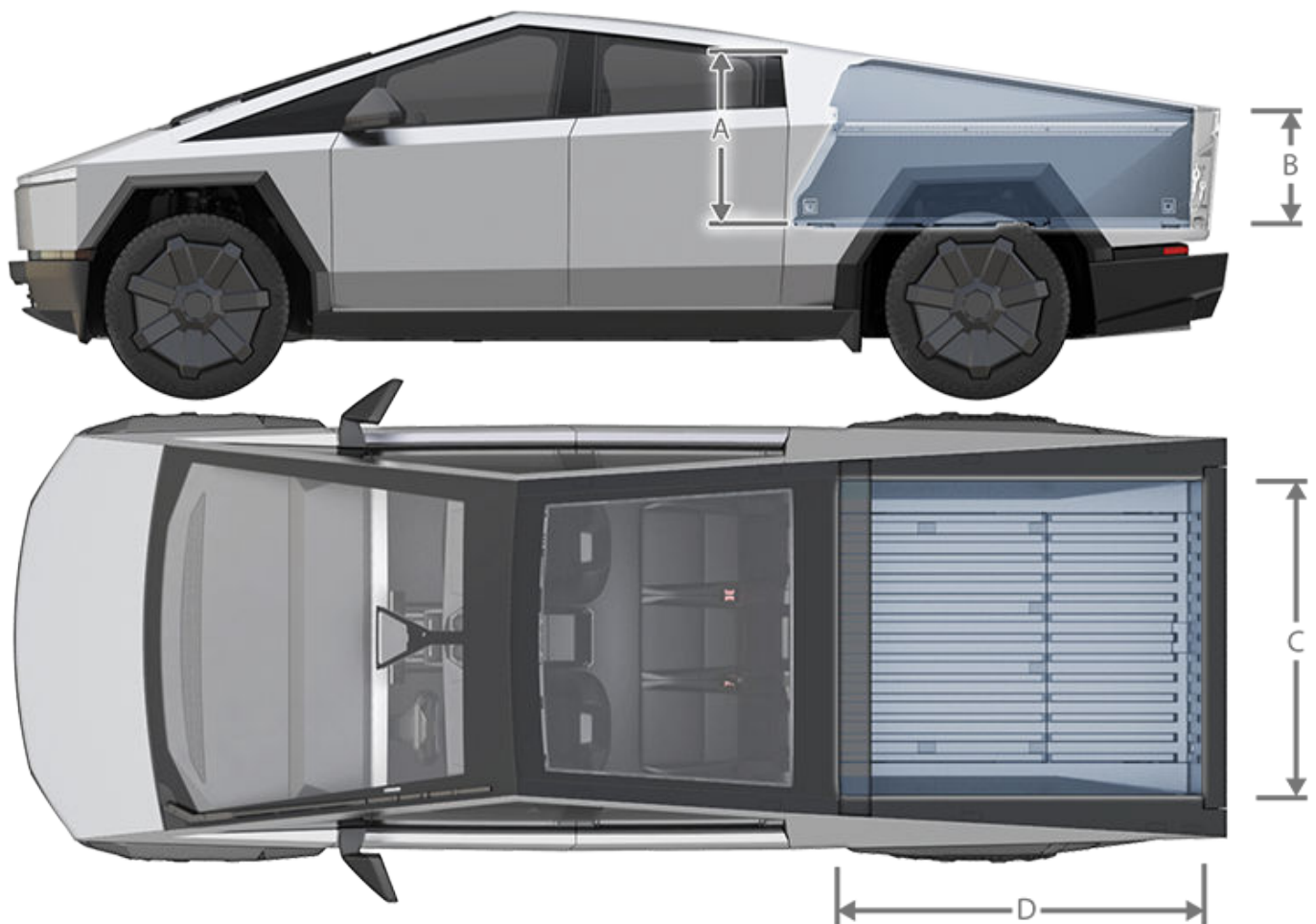
Dimensions - Exterior



NOTE: Adding accessories can affect the dimensions listed.

Callout	Description	Measurement (in)	Measurement (mm)
A	Overall Length	223.74	5,682.9
B - Overall Width	Including mirrors	95.01	2,413.3
	Folded mirrors	86.64	2,200.7
	Excluding mirrors	79.99	2,031.8
C - Overall Height	Entry/Exit air setting	68.54	1740.8
	Low air setting	69.13	1755.8
	Medium air setting	70.70	1795.8
	High air setting	73.06	1855.8
	Very High air setting	74.64	1895.8
	Extract (highest) air setting	76.61	1945.8
D	Wheelbase	143.11	3,635.0
E - Overhang	Front	34.58	878.3
F - Overhang	Rear	46.05	1,169.6
G - Ground Clearance	Entry/Exit air setting	7.93	201.3
	Low air setting	8.52	216.3
	Medium air setting	10.09	256.3
	High air setting	12.45	316.3
	Very High air setting	14.03	356.3
	Extract (highest) air setting	16.00	406.3
H - Track	Front and Rear	69.76	1,772.0

Dimensions - Cargo Bed



Callout	Description	Measurement (in)	Measurement (mm)
A	Maximum Height - Front	28.66	727.9
B	Maximum Height - Rear	19.89	505.2
C	Width at Floor	51.00	1,295.4
D	Length at Floor	72.92	1,852.2

Dimensions - Interior Cabin

Location	Measurement (in)	Measurement (mm)
Head Room - Front	41.69	1,058.8
Head Room - Rear	39.05	991.9
Leg Room - Front	41.09	1,043.6
Leg Room - Rear	40.90	1,038.8
Shoulder Room - Front	63.31	1,608.0
Shoulder Room - Rear	62.06	1,576.4



Specifications

Location	Measurement (in)	Measurement (mm)
Hip Room - Front	57.22	1,453.3
Hip Room - Rear	57.22	1,453.5

Weights - Vehicle

NOTE: Weight values are approximate and can vary slightly depending on a vehicle's options.

	Dual Motor All Season	Dual Motor All Terrain	Tri Motor All Season	Tri Motor All Terrain
Curb Mass Total*	6,634 lb (3,009 kg)	6,669 lb (3,025 kg)	6,863 lb (3,113 kg)	6,898 lb (3,129 kg)
Curb Mass - Front Axle	3,287 lb (1,491 kg)	3,305 lb (1,499 kg)	3,336 lb (1,513 kg)	3,353 lb (1,521 kg)
Curb Mass - Rear Axle	3,347 lb (1,518 kg)	3,364 lb (1,526 kg)	3,527 lb (1,600 kg)	3,545 lb (1,608 kg)
Payload	2,200 lb (998 kg)	2,500 lb (1,134 kg)	2,000 lb (907 kg)	2,270 lb (1,030 kg)
GVWR Total**	8,834 lb (4,007 kg)	9,169 lb (4,159 kg)	8,863 lb (4,020 kg)	9,169 lb (4,159 kg)
GVWR - Front Axle	4,096 lb (1,858 kg)	4,107 lb (1,863 kg)	4,019 lb (1,823 kg)	4,160 lb (1,887 kg)
GVWR - Rear Axle	4,738 lb (2,149 kg)	5,062 lb (2,296 kg)	4,844 lb (2,197 kg)	5,009 lb (2,272 kg)
GAWR - Front Axle***	4,255 lb (1,930 kg)	4,255 lb (1,930 kg)	4,255 lb (1,930 kg)	4,255 lb (1,930 kg)
GAWR - Rear Axle	5,009 lb (2,272 kg)	5,247 lb (2,380 kg)	5,009 lb (2,272 kg)	5,247 lb (2,380 kg)
Maximum Towing Capacity	11,000 lb (4,990 kg)	11,000 lb (4,990 kg)	11,000 lb (4,990 kg)	11,000 lb (4,990 kg)

For more details on towing, see [Towing a Trailer on page 784](#).



	Dual Motor All Season	Dual Motor All Terrain	Tri Motor All Season	Tri Motor All Terrain
*Curb Mass = Weight of the vehicle with correct fluid levels, no occupants and no cargo. **GVWR = Gross Vehicle Weight Rating ***GAWR = Gross Axle Weight Rating				

WARNING: When loading cargo, always consider the vehicle's Gross Vehicle Weight Rating (GVWR). The GVWR is the maximum allowable total mass of the vehicle including all passengers, fluids, and cargo. In addition, never exceed the GAWR (Gross Axle Weight Rating) on a single axle. GVWR and GAWR are printed on the [Vehicle Certification Label on page 929](#), located on the door pillar and are also detailed in [Weights - Vehicle on page 934](#).

CAUTION: Follow all local regulations when driving with loaded cargo on public roads.

Weights - Nominal GVWR Reference

The following loading scenario assumes that cargo is uniformly distributed in their respective areas (cargo bed and front trunk), and the cabin is fully occupied by five people weighing 150 lb (68 kg) each. In this scenario, loads heavier than the combined weights as specified for passengers or cargo would exceed the vehicle's GVWR.

Location	Dual Motor All Season	Dual Motor All Terrain	Tri Motor All Season	Tri Motor All Terrain
Cargo Bed	1,010 lb (458 kg)	1,310 lb (594 kg)	919 lb (417 kg)	1080 lb (490 kg)
Front Trunk	441 lb (200 kg)	441 lb (200 kg)	331 lb (150 kg)	441 lb (200 kg)

Cargo - Weight Limits

CAUTION: Exceeding the weights specified can cause damage not covered by the warranty.

The front trunk and under bed compartments are designed to hold the following weights:

Front Trunk	Maximum 441 lb (200 kg)
Under Bed Compartment	Maximum 220 lb (100 kg)

Cargo - Volumes

WARNING: The loading capacity of your vehicle is limited either by how much space is available (volume capacity) or by how much weight the vehicle can carry (payload capacity). When you have loaded Cybertruck to its maximum weight capacity, do not add more cargo, even if there is space available. Overloading, or improper loading, can contribute to property damage, personal injury, or death.

Location	Cubic Feet	Liters
Front trunk	7.1	200
Cargo Bed (enclosed) - Above load floor	56.2	1,591
Cargo Bed - Lower storage compartment	3.4	97
Cabin - Behind front seats with rear seat cushions folded up	54.2	1,533



Specifications

Location	Cubic Feet	Liters
Total volume with five passengers	66.7	1,888
Total volume with two passengers	120.9	3,421

Subsystems

Motor Type

Motor Type	Dual Motor	Tri-Motor
Front	One AC induction motor, liquid-cooled, with variable frequency drive.	One AC permanent magnet synchronous motor, liquid-cooled, with variable frequency drive.
Rear	One AC permanent magnet synchronous motor, liquid-cooled, with variable frequency drive.	Two AC induction motors, liquid-cooled, with variable frequency drive.

Transmission

Type	Dual Motor	Tri-Motor
Type	Single speed fixed gear	Single speed fixed gear
Overall Final Drive Ratio	Front and Rear unit motors: 15.02:1	Front unit motor: 15.02:1 Rear unit motor: 2 Independent Gearsets: 15.02:1
Reverse Gear	Reverse direction of motor, limited to 15 mph (24 km/h).	Reverse direction of motor, limited to 15 mph (24 km/h).

Steering

Steering	Specifications
Type	4-wheel directional steer-by-wire
Number of turns lock to lock	0.94 (340 degrees)
Turning Circle (curb to curb)	Approximately 43.5 ft (13.25 meters)

Brakes

Brakes	Specifications
Type	4-wheel anti-lock braking system (ABS) with Electronic Brake Force Distribution, Integrated Advanced Stability Control and Electronic Accelerator pedal actuated regenerative braking system.
Calipers	Front: Four piston, fixed
	Rear: Single piston, floating
Rotor Diameters (ventilated)	Front: 13.8 in (351 mm)
	Rear: 14 in (356 mm)
Front Rotor thickness	New: 1.26 in (32 mm)



Brakes	Specifications
	Service limit: 1.18 in (30 mm)
Rear Rotor thickness	New: 0.91 in (23 mm) Service limit: 0.83 in (21 mm)
Front Brake Pad Thickness (excluding back plate)	New: 0.39 in (10 mm) Service limit: 0.12 in (3 mm)
Rear Brake Pad Thickness (excluding back plate)	New: 0.43 in (11 mm) Service limit: 0.08 in (2 mm)
Parking brake	Electrically actuated parking brake calipers

Suspension

Suspension	Specifications
Front	Independent, double wishbone, air spring with adaptive damper, stabilizer bar.
Rear	Independent, double wishbone, air spring with adaptive damper, stabilizer bar.

Battery - Low Voltage

Battery - Low Voltage	Specifications
Rating	4 amp hour
Voltage	48V

Battery - High Voltage

Battery - High Voltage	Specifications
Type	Liquid-cooled lithium ion (Li-ion)
Nominal Voltage	700V DC
Temperature Range	Do not expose Model S Model X to ambient temperatures above 149° F (65° C) or below -22° F (-30° C) for more than 24 hours at a time.

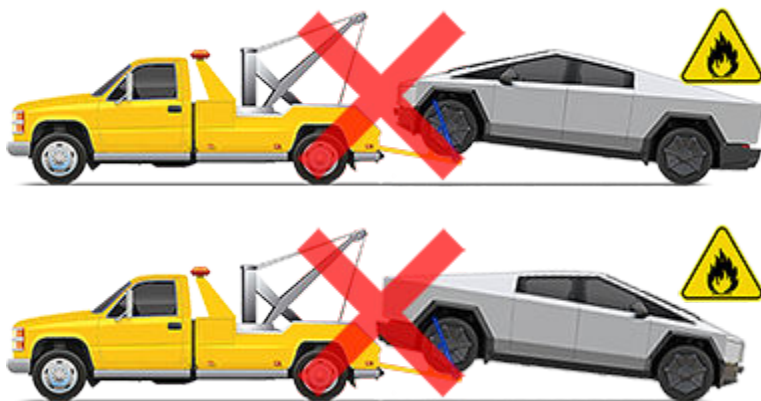


Instructions for Transporters

DO NOT TRANSPORT WITH WHEELS ON THE GROUND

The front motor and rear motor(s) in Model S/Model X may generate power when the wheels spin. Always transport Model S/Model X with all four tires off the ground. Ensure that the tires are unable to spin at any time during transport.

⚠ WARNING: NEVER TRANSPORT YOUR VEHICLE WITH THE TIRES IN A POSITION WHERE THEY CAN SPIN. DOING SO CAN LEAD TO SIGNIFICANT DAMAGE AND OVERHEATING. IN RARE CASES EXTREME OVERHEATING MAY CAUSE THE SURROUNDING COMPONENTS TO IGNITE.



Do not transport Model S/Model X using any method that is not specified by Tesla. Adhere to the instructions provided here and observe all warnings and cautions. Damage caused by improper transporting of your vehicle is not covered by the warranty.

NOTE: Tesla is not liable or responsible for reimbursing services not dispatched through Tesla Roadside Assistance.

Approved Methods for Transporting

A flatbed truck or comparable transport vehicle is the recommended method of transporting Model S/Model X. Model S/Model X can face either direction on the truck bed.



⚠ CAUTION: Use a flatbed truck with a bed that is at least 21 ft (6.5 meters) long (A). Before attempting to tow Model S/Model X, always check the tow truck's recommended loading capacity against the gross vehicle weight rating (GVWR) of Model S/Model X (see [Dimensions, Weights, and Cargo Capacity on page 932](#)) to ensure that the flatbed truck is capable.

Activate Transport Mode before repositioning Model S/Model X (if necessary) and winching it onto a flatbed tow truck. For more information, see [Activate Transport Mode on page 940](#).

If Model S/Model X has no low voltage power, attempt to jump start the low voltage system first so that you can then activate Transport Mode. For more information about jump starting, see [If Vehicle Has No Power on page 939](#).



 **CAUTION:** Model S Model X uses steer-by-wire technology. As a result, you will be unable to use the steering wheel to turn the wheels if Model S Model X has no power.

NOTE: Do not transport Model S Model X with the front or rear wheels on dollies unless absolutely necessary for a short distance. If you are transporting Model S Model X on dollies, ensure that a steering wheelsteering yoke lock is applied and care is taken to prevent the front wheels from spinning.

 **CAUTION:** Before using dollies, check the manufacturer's specifications and recommended loading capacity against the vehicle weight rating and axle weight rating of Model S Model X, as specified by the vehicle certification label (see [Vehicle Loading on page 928](#)).

 **CAUTION:** DO NOT TRANSPORT YOUR VEHICLE IF THERE IS ANY CHANCE OF ANY OF THE WHEELS SPINNING.

 **CAUTION:** Tesla is not responsible for any damage caused by or during the transport of Model S Model X, including personal property damage or damage caused by using self-loading dollies or tire skates.

 **WARNING:** Model S Model X is equipped with high voltage and low voltage components that may be compromised as a result of a collision (see [Electric Vehicle Components on page 868](#)). Before transporting Model S Model X, it is important to assume these components are energized. Always follow high voltage safety precautions (wearing personal protection equipment, etc.) until emergency response professionals have evaluated the vehicle and can accurately confirm that all high voltage systems are no longer energized. Failure to do so may result in serious injury.

If Vehicle Has No Power

If Model S Model X has no low voltage power:

1. Open the powered frunk. See [Opening the Powered Frunk with No Power on page 944](#).
2. Jump start the low voltage battery. See [Jump Starting on page 948](#).

Model S Model X must have low voltage power to open the doors from the outside or use the instrument cluster.

 **WARNING:** It may be more difficult to steer Model S Model X when the vehicle is being supported by an external low voltage power supply. The wheels may not be as responsive to the steering wheel as expected, and extreme caution should be taken when repositioning Model S Model X.

 **CAUTION:** Model S Model X uses a 48V low voltage architecture. As a result, some functions may be unavailable or degraded if you are supporting Model S Model X with less than 30V (for example, another vehicle or a 12V portable jump starter).

 **CAUTION:** Avoid using low voltage components of Model S Model X (such as the climate control system, cabin USB-C ports, lights, etc.) when the vehicle is being supported by an external low voltage power supply. Doing so may disable low voltage systems and make it necessary to jump start Model S Model X again.

NOTE: Tow providers: If the vehicle ran out of range, see [Running Out of Range on page 944](#) for more information on transporting the vehicle to a charging station and preparing the vehicle to charge.

If you are unable to jump start Model S Model X and the touchscreen is not accessible, use tire skates to re-position the rear tires, keeping front tires on the ground. When using tire skates, be sure to use skates of sufficient size to avoid contact between the tire and the bed/pavement. Before using tire skates, always check the manufacturer's specifications and recommended loading capacity.

Disable the Self-Leveling Air Suspension System

NOTE: If Model S Model X has no low voltage power (or is being supported by an external low voltage power supply) you will not be able to enter Jack Mode.

Your Model S Model X is equipped with an air suspension system that automatically self-levels, even when the vehicle is "asleep" and the touchscreen is powered off. To prevent damage, you must activate Jack Mode to disable self-leveling:

1. Touch **Controls** > **Ride and Handling** on the touchscreen.
2. Press the brake pedal, and then touch **Medium** to maximize ride height.
3. Touch **Controls** > **Service** > **Jack Mode**.

NOTE: Jack Mode cancels if you touch the button again or when driving speed exceeds 4 mph (7 km/h).



Activate Transport Mode

Transport Mode keeps the parking brake disengaged while winching Model S/Model X onto a flatbed truck. When active, Transport Mode displays a message indicating that the vehicle will remain free-rolling. The following are required to enable Transport Mode:

- Low voltage power. If Model S/Model X has no low voltage power, attempt to jump start the low voltage system so that you can use the touchscreen to activate Transport Mode (see [If Vehicle Has No Power on page 939](#)).
- Model S/Model X must detect a key. Transport Mode is available only when a key is detected.
- Ensure the vehicle is not connected to a charger. Transport Mode is not available if Model S/Model X is still plugged in.

To activate Transport Mode:

1. Ensure the vehicle is in Park and that it is not connected to a charge cable.
2. Chock the tires and make sure Model S/Model X is secure.



WARNING: Ensure that the wheels are secure and that Model S/Model X has continuous low voltage support while it is in Transport Mode. If there is a loss of low voltage power (for example, if the low voltage battery does not self-recover before activating Transport Mode or if the external power supply becomes disconnected) there is a risk of rollaway.

3. Press and hold the brake pedal, and then on the touchscreen, touch **Controls > Service > Towing**. The touchscreen displays a message reminding you how to properly transport Model S/Model X.
4. Touch **Transport Mode**. The **Transport Mode** button turns blue, and Model S/Model X is now free-rolling and can slowly be rolled (no faster than walking speed) for short distances or winched.



WARNING: Power steering may be disabled when Model S/Model X is in Transport Mode. The steering system may be less responsive and the steering wheel may be more difficult to turn. Use extreme caution when repositioning the wheels of Model S/Model X while in Transport Mode.

To cancel Transport Mode, touch **Transport Mode** again or shift Model S/Model X into Park. If your phone key is not detected, canceling **Transport Mode** powers off Model S/Model X. You may need your key card to restart the vehicle.

NOTE: Transport Mode is only intended to allow for winching Model S/Model X onto a flatbed truck or repositioning the vehicle out of a parking space. While in Transport Mode, the tires are allowed to rotate slowly (under 3 mph or 5 km/h) and for a very short distance (less than 30 feet or 10 meters). Exceeding these boundaries can lead to significant damage and overheating that is not covered by the warranty.

NOTE: If you are unable to activate Transport Mode (because, for example, the electrical system is not working and you are unable to jump start the low voltage system), use tire skates to reposition Model S/Model X. Before doing so, always check the manufacturer's specifications and recommended loading capacity.

Pull onto the Flatbed Truck From the Rear

To pull Model S/Model X from the rear, use the tow hitch:

1. Chock the tires.
2. Remove the rear tow hitch cover. See [Accessing the Trailer Hitch Assembly on page 789](#).
3. Attach the winch cable to the cutouts on either side of the tow hitch.



4. Activate Transport Mode. See [Activate Transport Mode on page 940](#).

NOTE: If Model S Model X has no low voltage power, you will need to jump start it before activating Transport Mode. See [If Vehicle Has No Power on page 939](#).

5. Remove the tire chocks.
6. Pull Model S Model X slowly onto the flatbed truck.
7. If Model S Model X is in Transport Mode, deactivate it by touching **Transport Mode** again.

Pull onto the Flatbed Truck From the Front

To pull Model S Model X onto a flatbed truck from the front, use one or both of the square tow hooks beneath the front fascia:

1. Chock the tires.
2. Attach the winch cable to the tow hook(s). Either one or both tow hooks can be used.



3. Activate Transport Mode. See [Activate Transport Mode on page 940](#).

NOTE: If Model S Model X has no low voltage power, you will need to jump start it before activating Transport Mode. See [If Vehicle Has No Power on page 939](#).

4. Remove the tire chocks.
5. Pull Model S Model X slowly onto the flatbed truck.
6. If Model S Model X is in Transport Mode, deactivate it by touching **Transport Mode** again.



Secure the Tires

The vehicle's tires must be secured onto the flatbed using the eight-point tie-down method.

- Remove any wheel covers before securing the tires.

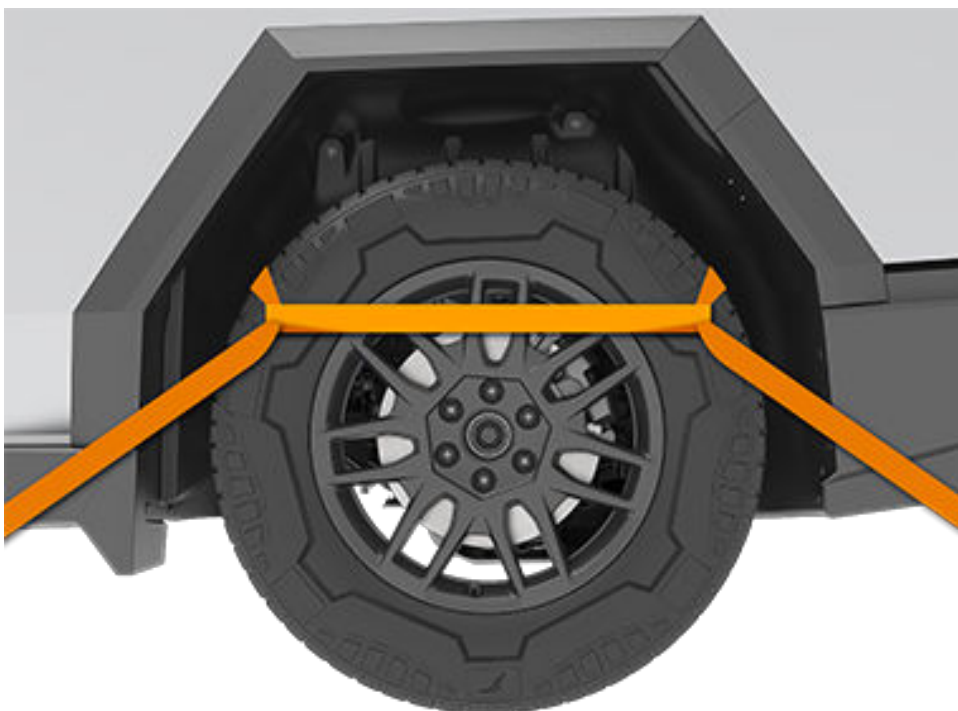


CAUTION: Failure to remove wheel covers before attaching tie-down straps may result in damage to the wheel covers.

- Ensure any metal parts on the tie-down straps do not touch the face of the wheels.
- Do not place tie-down straps over body panels or through the wheels.



CAUTION: Attaching the tie-down straps to the chassis, suspension or other parts of the vehicle's body may cause damage.





Contacting Tesla Roadside Assistance

Tesla Roadside Assistance is available to you 24 hours a day, 365 days a year, for the duration of your warranty period. Tesla Roadside Assistance is also available to speak with roadside service professionals to answer any questions and explain the proper procedure for transporting your vehicle.

When contacting Tesla Roadside Assistance, please provide:

- The Vehicle Identification Number (VIN). The VIN is displayed when you touch **Controls** > **Software**. The VIN can also be seen on the upper dashboard by looking through the driver's side of the windshield.
- Your exact location.
- The nature of the problem.

If available in your region, you can also expedite your request, by choosing the Roadside Assistance option in the Tesla mobile app.

NOTE: For a detailed description of Tesla's Roadside Assistance policy, go to the support page on the Tesla web site for your region.

Regional Phone Number(s)

Mexico: [1-800-228-8145](tel:1-800-228-8145)

United States and Canada: [1-877-79TESLA](tel:1-877-79TESLA) ([1-877-798-3752](tel:1-877-798-3752))

NOTE: The phone number is also available by touching **Controls** > **Service**.



Running Out of Range

CAUTION: It is your responsibility to monitor the state of the high voltage Battery and the remaining range of your vehicle. Do not assume that there is any range available when the range displayed on the instrument cluster is at 0 miles (0 km) (or 0%). Damage to the low voltage battery due to running out of range is not covered by the warranty.

NOTE: In the unlikely event your vehicle runs out of range while driving, pull over when safe to do so and contact [Tesla Roadside Assistance on page 502](#) or your preferred tow provider.

If Model SModel X runs out of range, the low voltage battery is no longer supported – and when low voltage is not supported, the vehicle cannot charge. Therefore, the low voltage battery must be supported by an external power supply to allow you to charge the High Voltage (HV) Battery. Once the vehicle begins charging, the external power supply is no longer required.

In the case of running out of range away from a charger, the tow provider should transport Model SModel X to the nearest charging station and unload the vehicle within the charging cable's reach. Once the vehicle is positioned next to a charger, follow these instructions:

NOTE: If the vehicle is being transported to a charger, make sure the tow provider does not leave until confirming that the vehicle's high voltage Battery is successfully charging.

1. Jump start the low voltage system (see [#unique_354 on page](#)). The low voltage battery must be jump started to support the high voltage Battery.
2. Wait a few minutes. Once the touchscreen powers on, plug the charge cable into Model SModel X to begin charging the high voltage Battery.
3. When Model SModel X begins to charge, disconnect the external power supply from the low voltage battery.

Before transporting to a non-Tesla charger, ensure your vehicle is equipped with an adapter that accommodates the specific type of charging station you will be using. Even at a non-Tesla charger, you will need to jump start the low voltage system before you can begin charging.

CAUTION: Always ensure Model SModel X has enough range for your drive, or for being stored for an extended period. Do not rely on the range estimates displayed on the touchscreen or mobile app as range can decrease faster than projected due to ambient temperature, driving habits, wind, vehicle settings (such as Sentry Mode), etc.

NOTE: Towing your vehicle as a result of running out of range is not covered by the warranty.

Opening the Powered Frunk with No Power

In the unlikely event that Model SModel X has no low voltage power, you will be unable to open the powered frunk using the touchscreen, mobile app, or powered frunk button.

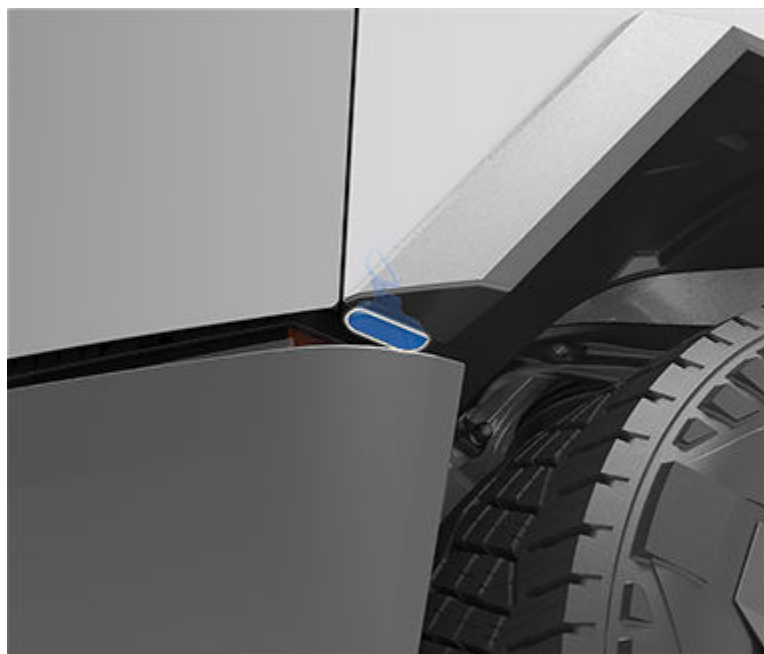
It is necessary to open the powered frunk before attempting to jump start Model SModel X. For more information, see [Jump Starting on page 948](#).

To open the powered frunk when Model SModel X has no power, you need a power source that provides between 9V and 16.5V (such as a 12V portable jump starter or another vehicle), or a power source that provides between 30V and 50V. A standard 9V battery may not have enough power to open the powered frunk if Model SModel X has no power. Instead, use a portable jump starter or another vehicle.

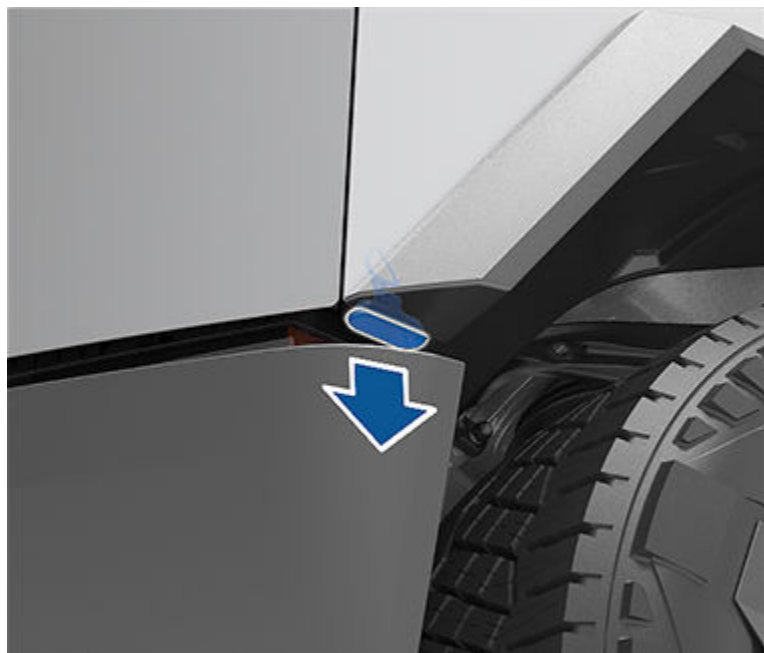
The steps below assume you are using an external low voltage power supply (such as a portable jump starter).

NOTE: The following steps do not open the powered frunk if Model SModel X is locked and has low voltage power.

1. Locate the front trunk access terminal beneath the front-left wheel well, behind the headlights.



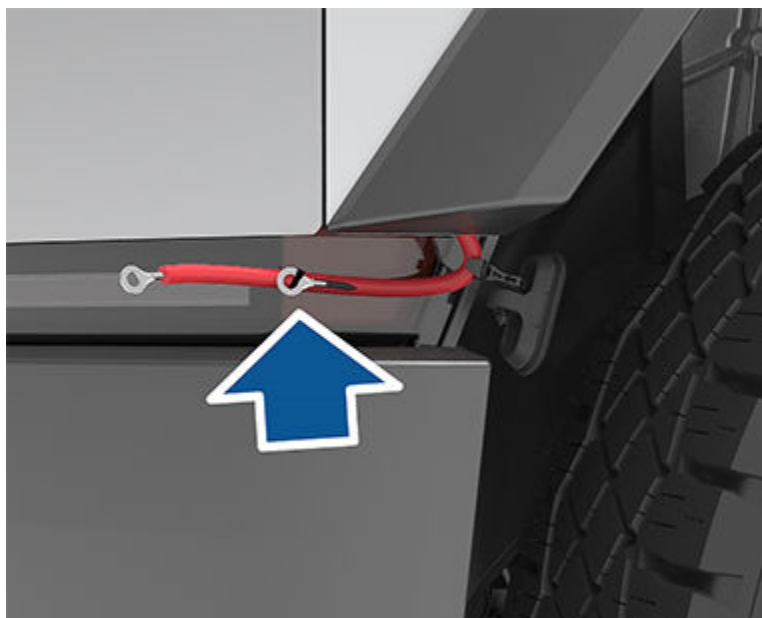
2. Use your finger to loosen the cover, then pull it down and toward you to remove it and expose the terminals. The cover is attached to a loop of cable containing both the red positive (+) and the black negative (-) terminals.



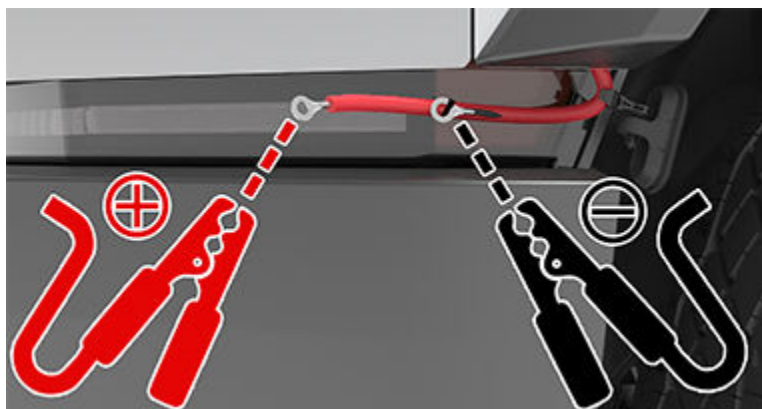
3. Carefully pull the terminals out from the cavity.



In Case of Emergency



4. Connect the low voltage power supply's red positive (+) cable to the red positive (+) terminal.
5. Connect the low voltage power supply's black negative (-) cable to the black negative (-) terminal.



NOTE: Applying external low voltage power to these terminals only releases the hood latches. You cannot charge the low voltage battery using these terminals. Do not leave the low voltage power cables connected to the terminals for more than 30 seconds – remove from the vehicle's terminals as soon as the hood latches.

6. If you are using a variable power supply, set the supplied voltage to a value between 9V and 16.5V or between 30V and 50V.
7. Turn on the external power supply (refer to the manufacturer's instructions). The latches are immediately released and you can now open the powered frunk to access the front trunk area.



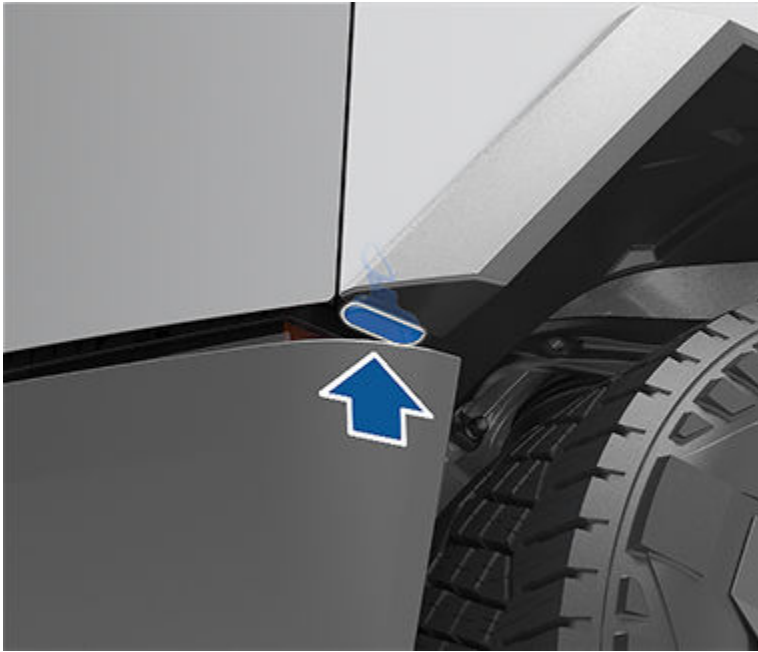
CAUTION: If you are using a variable power supply, do not change the supplied voltage while the cables are connected.

8. Shut off the external power supply.



WARNING: Shut off the external power supply before removing either cable. Removing the cables while the external power source is active may cause arcing.

9. Disconnect both cables, beginning with the black negative (-) cable.
10. Feed the terminals back into the cavity and then press the cover gently but firmly back into place to ensure that it is secured.





In Case of Emergency

Jump Starting

To jump start Model SModel X, use an external power source that is capable of supplying at least 12V, such as a portable jump starter or another vehicle.

CAUTION: When jump starting Model SModel X, use jump cables that are 30 ft. (9 meters) or less in length. Using cables that are longer than 30 ft. (9 meters) may result in damage to Model SModel X or to the external power source.

The steps below assume you are using an external low voltage power supply (such as a portable jump starter). If you are using another vehicle to jump start Model SModel X, follow the manufacturer's instructions.

WARNING: It may be more difficult to steer Model SModel X when the vehicle is being supported by an external low voltage power supply. The wheels may not be as responsive to the steering wheel as expected, and extreme caution should be taken when repositioning Model SModel X.

CAUTION: Model SModel X uses a 48V low voltage architecture. As a result, some functions may be unavailable or degraded if you are supporting Model SModel X with less than 30V (for example, another vehicle or a 12V portable jump starter).

CAUTION: Avoid using low voltage components of Model SModel X (such as the climate control system, cabin USB-C ports, lights, etc.) when the vehicle is being supported by an external low voltage power supply. Doing so may disable low voltage systems and make it necessary to jump start Model SModel X again.

CAUTION: Model SModel X cannot be used to jump start another vehicle. Doing so can result in damage.

CAUTION: Avoid short circuits when jump starting Model SModel X. Connecting cables to the wrong jump post, touching leads together, etc., can damage Model SModel X.

1. Open the powered frunk (see [Opening the Powered Frunk with No Power on page 944](#)).
2. Remove the maintenance panel by pulling it upwards to release the trim clips that hold it in place.



3. Connect the external low voltage power supply's red positive (+) cable to the horizontal jump post mounted next to the brake fluid reservoir. The positive jump post is marked with a + sign.



CAUTION: To avoid damaging Model S Model X, do not allow the positive cable to contact other metal components.

4. Connect the external low voltage power supply's black negative (-) cable to the vertical jump post. The negative jump post is marked with a - sign. This jump post is used as a grounding location for the external support.



5. If you are using a variable power supply, set the supplied voltage to a value between 12V and 16.5V or between 30V and 50V.
6. Turn on the external power supply.



CAUTION: If you are using a variable power supply, do not change the supplied voltage while the cables are connected. Doing so may cause damage to the vehicle.

7. Open the driver door and ensure that the touchscreen is on and the low voltage system is responsive. This may take up to two minutes.
8. Ensure the touchscreen is on and that the low voltage system is responsive.

NOTE: If attempting to activate Transport Mode (to winch the vehicle onto a flatbed truck), leave the power supply connected continuously until the vehicle has been secured. For more information, see [Activate Transport Mode on page 940](#).

9. Once external power is no longer required, shut off the external power supply.



In Case of Emergency



WARNING: Shut off the external power supply before removing either cable. Removing the cables while the external power source is active may cause arcing.

10. Disconnect both cables, beginning with the black negative (-) cable.

NOTE: Model S Model X may not be able to shift into Drive until after the high voltage Battery has been charged and the low voltage system is able to recover fully. See [Running Out of Range on page 944](#).

11. Replace the maintenance panel by placing it back in its original location and pressing down until it is secure.

12. Close the powered frunk (see [Closing on page 718](#)).

Opening Doors with No Power

In the unlikely event that Model S Model X has no low voltage power, you will not be able to open the doors from the interior by pressing the interior door open buttons. Instead, use the manual door releases.



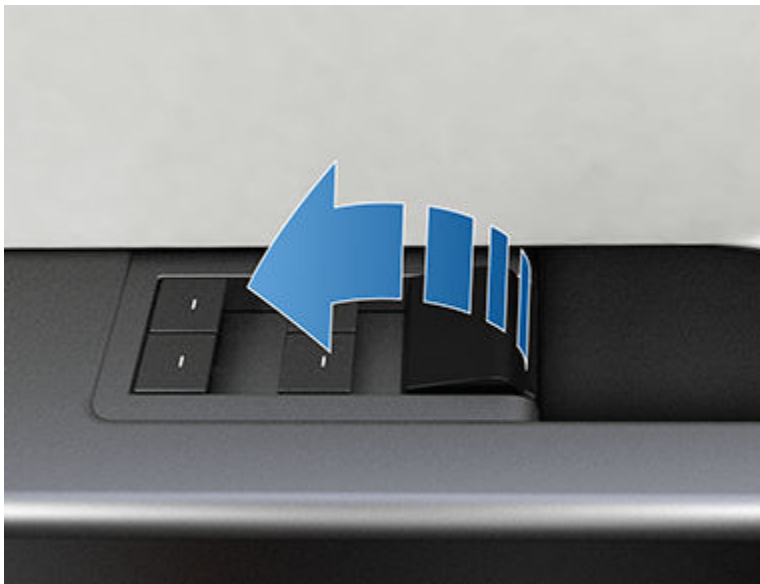
CAUTION: Manual door releases are designed to be used only in situations when Model S Model X has no power. When Model S Model X has power, use the interior door open buttons.



WARNING: Do not use the manual door release while the vehicle is moving.

Opening a Front Door with No Power

To open a front door manually, pull up the manual door release located in front of the window switches and push the door open.



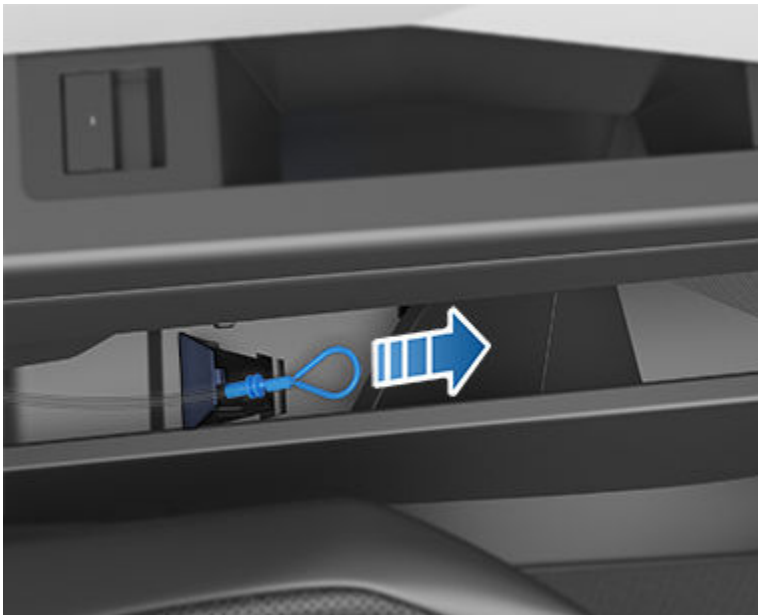
Opening a Rear Door with No Power

To open a rear door manually, perform the following steps:

1. Remove the rubber mat on the bottom of the rear door's map pocket.



2. Pull back the flap of plastic trim (if equipped), then pull the mechanical release cable forward and push the rear door open.

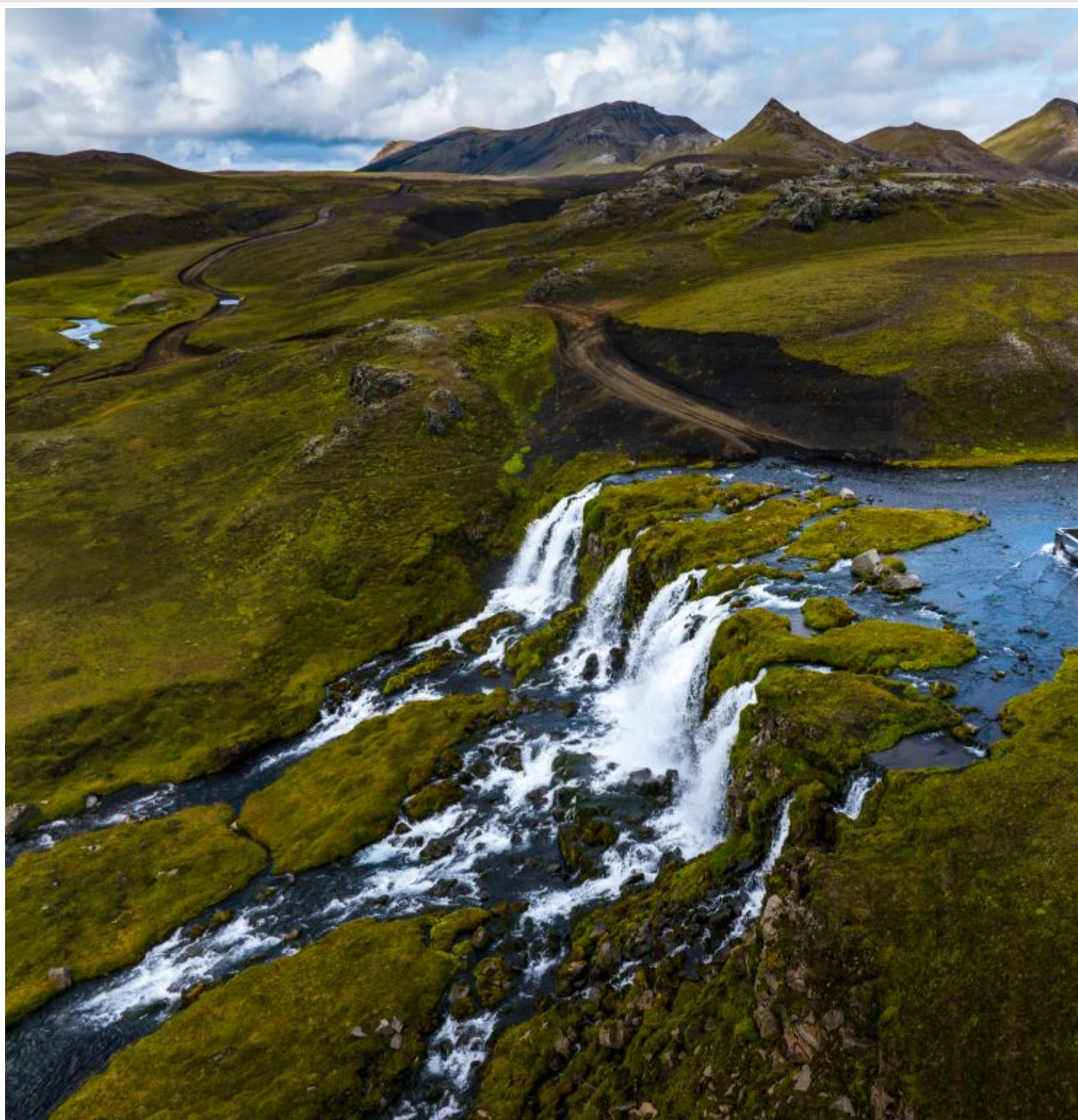




Cybertruck Off-Road Guide



Cybertruck Off-Road Guide



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1 - Sand. Dirt. Mud. Rocks. Snow.

Cybertruck is tough enough to go anywhere. Off-road mode is an advanced user setting which puts the driver in ultimate control by disabling certain control, hardware protections and collision avoidance safety features. What makes Cybertruck so capable off road:

- **Four-Wheel Steering**- Cybertruck has four-wheel steering. When the driver turns the steering wheel, all four wheels respond. This gives the driver more control and stability.
- **Steer-by-Wire**- Cybertruck uses steer-by-wire technology, meaning there is no physical connection between the steering wheel and the front wheels. As a result, steering feels more responsive and adaptive based on the terrain and driving speed.
- **Instant, Linear, and Predictable Torque**- Torque availability at zero speed is a unique difference from combustion engines and makes Cybertruck feel like a rocket. Stalling the motors for an extended time may cause them to overheat.
- **Adaptive Damping**- The compression and rebound of the dampers are adjusted based on your driving mode to maximize traction and control.
- **Adjustable Air Springs**- Enable adjustable ride height. **High** represents the ideal setting for compression and rebound balance. Increased clearance but comes with a trade-off, reducing your available compression and will make the ride harsher. In several ride heights there is a risk of damage. **Very High** (25mph) and **Extract** (10 mph).
- **Differential Lockers**- Cybertruck is equipped with locking differentials for increased performance and stability during low-traction environments (e.g. sand, ice, or snowy roads).

Locking differentials lock both wheels of an axle together, which forces the wheels to rotate at the same speed. This distributes the torque to the wheel with the most traction in each wheel. When one of the locked wheels has significantly reduced traction (on sand, ice, etc.), more torque is applied to the wheel with traction. In some cases, such as when one wheel is in the air, all available torque is sent to the wheel on the ground with traction. This distribution of torque is not ideal in all traction environments.



WARNING: Do not use locking differentials while driving on high-traction surfaces, such as asphalt.



WARNING: Driving with locked differentials may reduce vehicle response to steering and cause unpredictable vehicle dynamics.



PRND 65 %

13.0

MPH · OFF-ROAD

13.0

MPH

50 psi

Battery Temp

50 psi



50 psi

Front Motor

Rear Motor

50 psi



2 - Off-Roading Vitals

Monitor the health of Cybertruck on the left side of the touchscreen.

Common Vitals:

- **Tire Pressure**- Current read out of tire pressure from each wheel.
- **Motor Temp, and Battery Temp**- Current temperatures of the air suspension compressor, front and rear motor(s) and high voltage battery.
 - When operating within ideal temperature range, no color is displayed.
 - If performance is reduced due to temperature, value is shown in **yellow**.
 - If performance becomes critically limited, temperature is shown in **red**.
- **Locker State**- Drive unit differential locker status.

Overland Vitals:

- **Roll/Pitch/Bearing**- Degree of vehicle Roll, Pitch, and the bearing of travel.
- **Ground Clearance**- Current vehicle ground clearance up to the battery.



Off-Road Mode

Overland

Baja

Surface

All-Purpose

Rock

Gravel/
Deep Snow

Sand

Stopping Mode

Hold

Roll

Locking Differentials

Off

Rear On

All On



Rear Steer

Off

 Wad

Ride Height

High

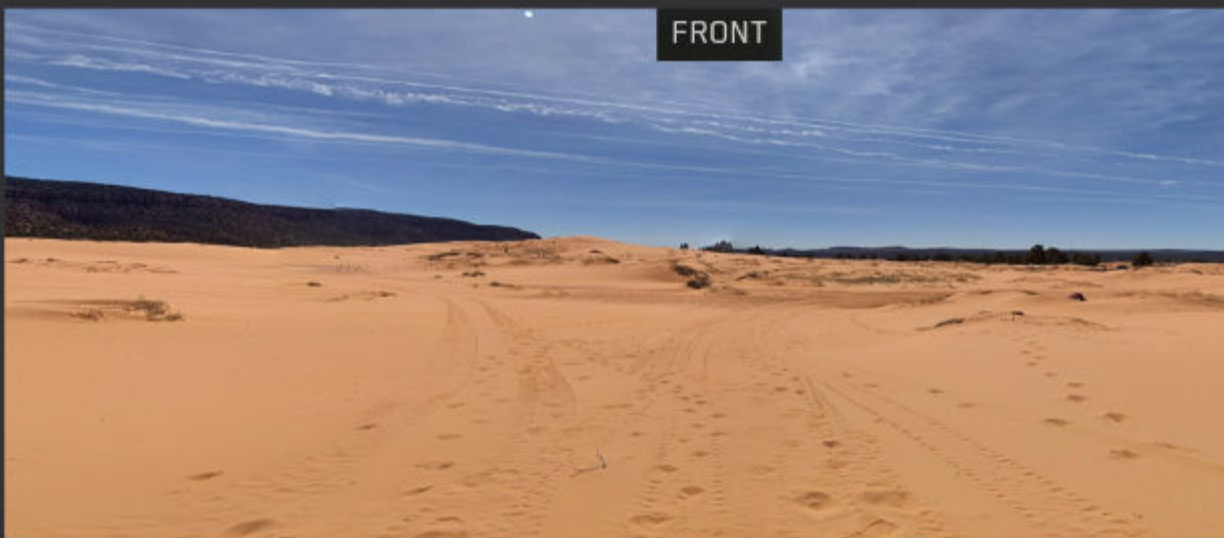
Very



3 - Off-Roading Controls: Overland

Quickly access off-road settings on the right side of the touchscreen:

- **Camera Views:** Backup camera and side repeaters are displayed. Swipe left or right to see other views.
- **Off-Road Mode:** Choose between **Overland** and **Baja** and customize your preferences.
- **Surface:** Manually adjust the surface on which you are driving.
- **Stopping Mode:** Choose if you want to roll freely or automatically hold the brake when you come to a stop.
- **Locking Differentials:** Engage or disengage locking differential(s).
- **Pitch / Roll / Heading:** These angles determine how capable the vehicle is of climbing over an obstacle or up an incline.
- **Rear Steer:** You can set **Rear Steer** to **Off** or **Auto**. **Auto** allows for a tighter turn radius while driving. This is useful for off-camber driving.
- **Wade Mode:** Use when navigating through shallow bodies of water.
- **Ride Height:** Customize your vehicle's ride height based on terrain and other drive settings.



Off-Road Mode

Overland

Baja

Handling Balance

Front: 50 • Rear: 50

Stability Assist

Standard

Reduced

Min

Locking Differentials

Off

Rear On

All On



Rear Steer

Off

Wade

Terrain

Smooth

Rugged



4 - Off-Roading Controls: Baja

Quickly access off-road settings on the right side of the touchscreen.

- **Handling Balance:** Adjust left for more stable front-wheel drive behavior, or right for more agile rear-wheel-drive behavior.
- **Stability Assist:** Select the desired amount of stability control intervention.
- **Locking Differential:** Engage or disengage rear locking differential(s)—applicable to Dual Motor only.
- **Terrain:** **Smooth** sets ride height to **Medium**. **Rugged** sets ride height to **High**. **Clearance** sets ride height to **Very High**.



5 - Best Practices

Always be aware of your surroundings. Drive slowly and carefully, staying within existing tracks. Do not harm nature and give way to wildlife.

Always keep both hands on the steering wheel. Avoid aggressive steering maneuvers and brake gradually to maximize traction.

Assess any potential off-roading risks or obstacles ahead. Where necessary, get out of Cybertruck and check the terrain. Use the touchscreen to adjust settings.

Upon returning to normal roads, remove any debris that may be a hazard to other road users and check steering and suspension components, wheel covers and wheel fairings.



6 - Before You Go Off-Road Checklist

1. **Plan your route.** Consult maps and weather reports. Familiarize yourself with the different types of terrain you may encounter. Research how weather and environmental conditions can change quickly and unexpectedly. Let someone know where you're going. Download maps with offline when you do not.
2. **Be prepared.** Equip your Cybertruck with supplies in case of emergency, such as a spare tire, a jack, an air compressor, which are available in the frunk, a charged phone, and a flashlight. Consider bringing recovery gear such as a kinetic rope, soft shackles, traction boards, and a shovel.
3. **Evenly distribute vehicle load.** Cybertruck performs best when the weight of passengers and cargo is distributed evenly across the front and back. You should understand the tongue weight contribution to your vehicle payload and consider leaving the trailer parked while you enjoy the trail.
4. **Secure passengers and cargo.** Confirm all passengers are wearing seat belts properly. Stow or secure loose items. The tonneau is not watertight. The powered frunk and gear locker are dry zones unless submerged.



5. **Charge up.** Ensure your vehicle has ample energy for your planned route. Charge beforehand and locate the nearest Supercharger to your destination. Supercharger locations will be higher off road and may vary with terrain.
6. **Lower tire pressure if needed** at the destination to increase traction on surfaces such as sand or on rocks. Reducing tire pressure allows for increasing grip and decreasing the risk of punctures. However, this does increase the risk of breaking the seal on the tire sidewall (do not reduce tire pressure on stock wheels and tires is 36 psi).
7. **Remove wheel aero covers and front fascia wheel fairings** to prevent damage. Rear wheel rocker fairings can also be removed if doing so. See the [Service Manual](#) for removal and replacement instructions.



7 - Spotting Ground Rules

A spotter is the second set of eyes to help a driver navigate difficult obstacles. Spotters are usually in front of the vehicle, using hand signals to steer the vehicle and other directions. Having a spotter makes a huge difference in off-roading.

Ground Rules:

- One spotter at a time should guide the driver. An exception to this is when a second spotter is located behind the vehicle for second set of eyes.
- The spotter should always remain in clear sight of the driver.
- While spotting, do not stand too close to the line of travel or directly downhill of a vehicle, as not only a safety precaution, but to be able to see the vehicle and any potential obstacles.
- Non-verbal communication, especially previously agreed-upon hand signals, work best to prevent directions from being drowned out by engine noise or other distractions.



Troubleshooting

- Signals need to be large, clear gestures that are not misunderstood for other commands.
- The driver should do no more and no less than directed by the spotter, until the spotter provides additional instruction.
- While inside the vehicle, spotters should continue to assist the driver by keeping an eye out for hazards on the sides of the vehicle, like r



8 - Off-Road Modes



Off-Road Modes give Cybertruck owners access to settings and preferences that allow customization to different environments. Customization includes cross-linking, traction, stability, pedal sensitivity, and vehicle stopping behaviors.

Off-Road Controls that are available in all modes:

- **Vehicle Hold or Roll** – Choose if you prefer the vehicle to roll freely, or automatically hold the brake when you come to a stop.
- **Rear Steering On/Off** – Disables the rear steering actuator at low speeds. Useful for off-camber driving, or drifting on very loose surfaces.
- **Double Pedal** – (Brake and accelerator) is allowed in off-road modes. This enables tight drive control when on a steep incline/decline.

If you cannot adjust your ride height:

- First, check that **Jack Mode** is not enabled (it can automatically enable when wheels leave the ground). If it is enabled accidentally, you must disable **Jack Mode**.
- Second, check that the compressor is not overheated. A notification appears on the touchscreen if overheated. Wait for it to cool down before attempting to adjust ride height again.

To maximize your efficiency:

- Use **Baja** and move torque to bias to the Permanent Magnet motor (for Dual Motor All-Wheel Drive this is the rear, for Tri-Motor Cybertruck this is the front).
- Reduce use of the accelerator pedal and switch to **Roll**.

Donuts:

- We know you want to do them. Best results achieved on a loose surface, in **Baja** with handling set to full oversteer and stability set to off.
- Ensure you have sufficient clear space and be aware stability controls are disabled. Donuts may cause property damage, so do not do them in public areas.





9 - Overland

Handle all surfaces including sand, gravel, and rocks with maximized traction at low speeds.

Recommended ride height is **High** for all-purpose, gravel, and sand modes. **Rock** will default to **Very High**. You can manually adjust the 25mph in **Very High**, and 10mph in **Extract**. Torque is also limited in **Extract**.

See [appendix on page 981](#) for ground clearance and approach/break-over/departure angles in each mode.

- **All-Purpose** - Automatically adjusts tire slip based on the amount of available traction. All-purpose is best suited for mixed terrain driving.
- **Gravel / Deep Snow**- Allows for medium amounts of tire slip to provide optimal traction on gravel and deep snow.
- **Rock** - Tightly manages tire slip to maximize grip in rock crawl conditions. Also enables air suspension cross-linking, where the suspension connects the front and rear axles, balancing vertical force under large suspension articulation for maximum traction.



Troubleshooting

- **Sand** – Allows for high amounts of tire slip to provide optimal traction on soft, deformable surfaces like sand.









10 - How to Drive on Certain Surfaces

- **Rock** - slow and measured. Aim to overcome obstacles with precision and with only as much power as needed. Hitting immovable objects is a good recipe to break something.
- **Water** - slow and measured. Viscosity of water is about 55x that of air, so driving fast through water puts a lot of stress on all the parts. In deep water, check the depth and bottom condition before going in blindly as it can be difficult to get unstuck when tires are sucked down.
- **Sand/Snow** - maintain momentum (don't stop in deep sand/snow, and if you do, start slowly) and avoid high side slip. It's easy for a vehicle to slide while sliding sideways and puts the vehicle at rollover risk.





11 - Wade Mode

Enter and drive through shallow bodies of water, such as defined crossing points of rivers or creeks using **Wade Mode**.

Check the water depth and current speed before entering. Cross through water slowly-- driving quickly through water can impart imm

Refer to the [Owner's Manual](#) for more information on **Wade Mode**.

Wade Mode defaults ride height to **Very High**, switches HVAC to recirculate, and pressurizes the battery pack to protect from water and

Intended for water up to 32 inches (815 mm) deep, measuring from the bottom of the tires in **Very High** ride height. It is not required for

Wade Mode duration is limited to 30 minutes and may take up to 10 minutes to completely fill the air system and pressurize the battery



12 - Baja

Drive high-speed on dirt roads or in the desert with optimized suspension and traction control.

Ride height is set to **High** to optimize suspension travel. Rebound and compression damping are adjusted to provide more stability as well as the electronic stability control system allows more tire slip for dynamic driving on low-traction surfaces.

You can adjust the handling balance from understeer, to neutral, to oversteer with the slider.

Additionally you can adjust the level of stability control:

- **Standard** – Allows much more vehicle yaw and wheel slip than on-road and Overland modes. However, stability control still augments your steering.
- **Reduced** – Further increases vehicle yaw allowance, stability control is greatly reduced.
- **Min** – Minimizes stability control.

If Cybertruck detects it is airborne, the dampers will adjust to attempt to protect the vehicle while landing.



13 - Climbing Over or Up

If approaching a large obstacle or change in incline, set the ride height to **Very High** to increase approach, breakover, and departure angles. Determine how capable Cybertruck is climbing over an obstacle or up an incline. **Extract** can be used for extreme cases but will be a very slow process. Switching into **Extract** multiple times can cause the air compressor to overheat. You can monitor this on the vitals screen and allow it to cool down before using it again.

Locking Differentials: If one wheel becomes airborne while climbing up or over an obstacle, the locking differentials will apply torque to the wheel that is still moving.

Dual Motor Variants are equipped with mechanical front and rear locking differentials.

Tri-Motor (Cyberbeast) Variants are equipped with a mechanical front locking differential and a virtual rear locking differential to provide the same level of traction. The locking differential automatically engages in certain drive modes and speeds, and cannot be manually engaged or disengaged.



WARNING: Large steering angle or high acceleration with lockers engaged will cause the vehicle to jerk and may damage your drivetrain on surfaces like asphalt.

Tips:

While engaging (icon blinking), you can move slowly forward or reverse while turning the steering slightly, or while stationary turn full lock to move the two shafts to allow the locker to engage.



Troubleshooting

While disengaging (icon blinking), driving slowly in a straight line will typically be all that is needed. If not, consider the direction you are turning. Driving in the opposite direction to relieve the torsional stress. When you can turn without the wheels scrubbing, the locker has disengaged.



14 - Trail Assist

Think of this as a low-speed cruise control.

This can be very helpful when navigating difficult terrain where your focus is best spent on steering. You can set trail assist from 1.0mph up to 20.0mph.

To use this feature, click the right scroll wheel on the steering wheel to enable, then scroll up or down to adjust set speed.

You can drive collaboratively with trail assist by using the brake or accelerator pedal.

To turn off **Trail Assist** either click the scroll wheel a second time or hold the brake, bringing the vehicle to a stop and then press firmly into the accelerator pedal.



15 - If You Get Stuck

Increase traction in Off-Road Mode:

1. Put Cybertruck into **Overland Mode**.
2. **Adjust Suspension height.** Raise until the vehicle isn't obstructed by obstacles. Avoid lowering to prevent underbody damage.
3. **Adjust Terrain Mode.** Based on surface conditions, determine the balance required between traction and momentum. For high traction, use **Mud**. For maximum momentum, use **Sand**.
4. **Engage front and/or rear locking differentials.**
5. For soft surfaces or steep inclines, engage **Trail Assist** for a steady progression through complex surfaces.

Additional counter-measures:

1. **Decrease tire pressures.** Decreasing tire pressures to 36psi will increase tire contact with the surface and can aid in traction to help get out.
2. **Use traction aids.** Traction boards can improve the traction of individual wheels to increase chances of recovery.
3. **Stack rocks.**
4. **Get assistance from another vehicle using recovery equipment.**

Tips:



Troubleshooting

- Being smooth and avoiding wheel spin in general is the best way to keep traction in technical driving situations—**Trail Assist** is helpful with obstacles should be a last resort as it commonly results in vehicle damage.
- In sand and snow, however, momentum is key to avoid sinking and being stuck, so avoid stopping in deep sand and snow if possible. If you do get stuck, use **Trail Assist** and set to a very low speed to crawl out.



16 - Auxiliary Power

Cybertruck is equipped with two 48V auxiliary power feeds. These feeds can be independently enabled on the touchscreen and can provide power to various accessories depending on the LV state of charge. Power feeds are located on the roof and in the powered frunk, and each provide up to 400W of power.

Power consumption may increase while using the vehicle to power other electronics and objects.

Refer to the [Owner's Manual](#) for more information on accessing the Cybertruck Power Feeds.

Off-Road Light Bar

You can purchase an Off-Road Light Bar from the Tesla Shop. This light bar is designed to work with existing high beams and communicate with the vehicle to control forward-facing or ditch lighting on separately as well as controlling the overall brightness of the light bar.

The off-road Light Bar is only intended for off-road use and should never be used on public roads. Always be aware of oncoming vehicles, and use caution as a driver.



17 - Vehicle Modifications

- **Tires:** Adding larger tires can compromise turning radius, as well as increasing chassis loads and potentially rubbing on the body. 18" tires add more cushion, provided the overall tire dimensions are equal or less than the OEM tire.
- **Aftermarket Tires:** Tires not designed for electric vehicles typically have lower efficiency and higher road noise.
 - **All-Terrain** is the least aggressive off-road tire, good for all-purpose driving, and will impact road noise and efficiency the least.
 - **3 Peak Mud and Snow Rated All Terrain** is a good option for cold weather driving where you expect to encounter snow and ice.
 - **Mud Terrain** is the most aggressive tire, useful for driving in dirt and mud but will come with the largest trade-off in range and road noise.



WHEELS AND TIRES



CYBERTRUCK SPARE TIRE + TOOL KIT
\$1,250



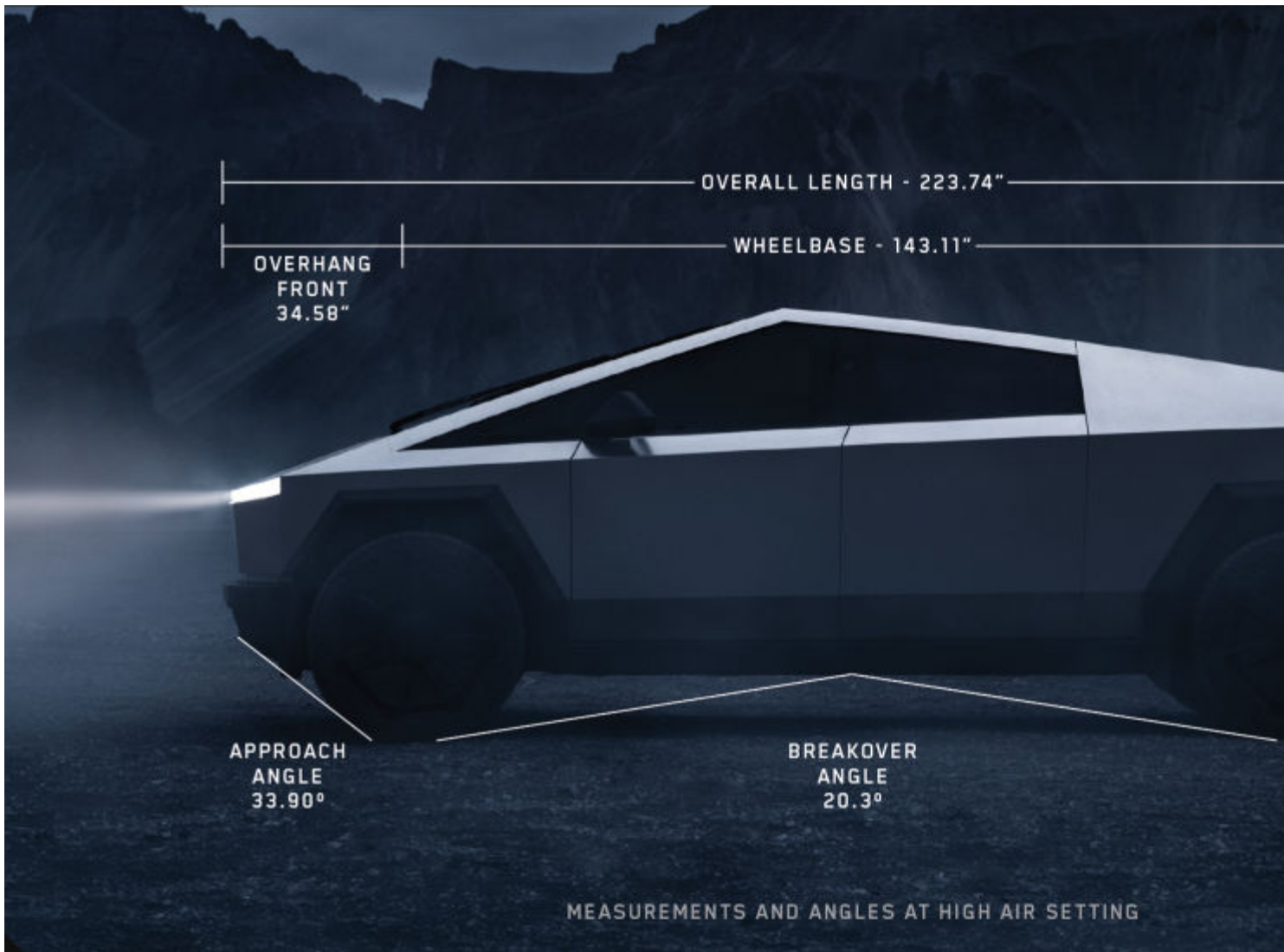
CYBERTRUCK 20" SNOW CHAINS
\$345

AVAILABLE

CYBERTRUCK
\$550

18 - Cybertruck Accessories

Visit shop.tesla.com for Cybertruck accessories like the air compressor, snow chains, and spare tire.



19 – Cybertruck Dimensions

Overall Length: 223.74"

Overall Height: 73.06"

Overhang Front: 34.58"

Overhang Rear: 46.05"

Wheelbase: 143.11"

Approach Angle: 33.90°

Breakover Angle: 20.3°

Departure Angle: 22.30°

Ground Clearance: 12.45"

20 - APPENDIX

GROUND CLEARANCE AND APPROACH/BREAK-OVER/DEPARTURE ANGLES



Troubleshooting

	Approach / Breakover / Departure	Angle
Approach Angles	Approach Angle - Entry/Exit Air Setting	25.0°
	Approach Angle - Low Air Setting	26.3°
	Approach Angle - Medium Air Setting	29.5°
	Approach Angle - High Air Setting	33.9°
	Approach Angle - Very High Air Setting	36.6°
	Approach Angle - Extract (Highest) Air Setting	39.9°
Breakover Angles	Breakover Angle - Entry/Exit Air Setting	13.0°
	Breakover Angle - Low Air Setting	13.9°
	Breakover Angle - Medium Air Setting	16.5°
	Breakover Angle - High Air Setting	20.3°
	Breakover Angle - Very High Air Setting	22.9°
	Breakover Angle - Extract Air Setting	26.0°
Departure Angles	Departure Angle - Entry/Exit Air Setting	14.4°
	Departure Angle - Low Air Setting	16.3°
	Departure Angle - Medium Air Setting	18.8°
	Departure Angle - High Air Setting	22.3°
	Departure Angle - Very High Air Setting	24.7°
	Departure Angle - Extract Air Setting	27.6°

Troubleshooting Alerts

(APP_w207)

Autosteer temporarily unavailable

Autosteer is currently unavailable. This could be a temporary condition due to external conditions that include:

- Missing or faded lane markers
- Narrow or winding roads
- Poor visibility due to rain, snow, fog, or other weather conditions
- Extremely hot or cold temperatures
- Bright light due to other vehicle headlights, direct sunlight, or other light sources

If the alert is caused by a temporary factor like these, no action or service is typically needed. Continue to your destination. The alert will clear and Autosteer will be available once the condition is no longer present.

Please note that the minimum speed to initiate Autosteer when there is no vehicle detected ahead of you and while driving on a road with visible lane markings is 18 mph (30 km/h), unless certain vehicle and environmental conditions are met. If a vehicle is detected ahead of you:

- You can initiate Autosteer at any speed under 90 mph (150 km/h).
- You can even initiate Autosteer when stationary, provided the other vehicle is at least 5 feet (150 cm) in front of you.

This alert will be present if you have temporarily exceeded 90 mph (150 km/h) with Autosteer active, and Autosteer will not be available for the rest of your current drive.



NOTE: If this alert becomes active while you are driving in Germany, Autosteer should again be available once your vehicle is traveling below 90 mph (150 km/h).

If Autosteer is not available by the time you reach your destination, and remains unavailable during your next planned drive, the problem might be one of these issues:

- Damage or obstruction caused by mud, ice, snow, or other environmental factors
- Obstruction caused by an object mounted on the vehicle, like a bike rack
- Obstructions caused by adding paint or adhesive products like wraps, stickers, or rubber coatings to your vehicle
- A damaged or misaligned bumper

The solution might be as simple as washing your vehicle. If you do not find any obvious obstructions or you find damage to the vehicle, schedule service at your convenience. Your vehicle is OK to drive in the meantime.

For more information, see [Autosteer on page 310](#).

(APP_w218) Autosteer speed limit exceeded Take control of steering wheelsteering yoke

Autosteer is unavailable because your vehicle has exceeded the maximum speed limit for this driver assistance feature. Autosteer is only available at speeds up to 90 mph (150 km/h).

Take immediate control of the steering wheelsteering yoke and maintain control until you reach your destination. Your vehicle is OK to drive.

In most cases, Autosteer will not be available for the rest of your current drive. To reset it, you will need to bring the vehicle to a complete stop and shift into Park. When you shift into Drive to travel to your next destination, Autosteer should again be available.

Please note that the minimum speed to initiate Autosteer when there is no vehicle detected ahead of you and while driving on a road with visible lane markings is 18 mph (30 km/h), unless certain vehicle and environmental conditions are met.

If a vehicle is detected ahead of you:

- You can initiate Autosteer at any speed under 90 mph (150 km/h).
- You can even initiate Autosteer when stationary, provided the other vehicle is at least 5 feet (150 cm) in front of you.

NOTE: If this alert becomes active while you are driving in Germany, Autosteer should again be available once your vehicle is traveling below 90 mph (150 km/h).

If Autosteer is not available during your next drive, and remains unavailable throughout subsequent drives, schedule service at your convenience. Your vehicle is OK to drive in the meantime.

For more information, see [Autosteer on page 310](#).

(APP_w221) Cruise control unavailable Reduced front radar visibility

Traffic-Aware Cruise Control and Autosteer are unavailable because the radar located in the front bumper area of your vehicle has no or low visibility. Continue to your destination. Your vehicle is OK to drive.

Traffic-Aware Cruise Control and Autosteer will remain unavailable as long as the radar lacks adequate visibility. This could be a temporary obstruction caused by factors like snow, ice, dirt, or mud. If the alert is caused by a temporary factor like these, no action might be needed: the condition might clear during your drive.

If the alert persists throughout your drive, examine the front bumper before your next planned drive and attempt to clear any obstruction.



- See the [About Autopilot on page 286](#) sections "How It Works" and "Cleaning Cameras and Sensors" for more on the radar location and care needed if clearing dirt / debris from that area of the vehicle.
- See [Cleaning on page 446](#) for general cleaning tips and cautions.

Once the radar regains adequate visibility, the alert will clear and both Traffic-Aware Cruise Control and Autosteer should again be available.

If this alert persists throughout subsequent drives but no obstruction is visible on the front bumper where the radar is located, schedule service at your earliest convenience. Your vehicle is OK to drive in the meantime.

(APP_w222)

Cruise control unavailable

Reduced front camera visibility

Traffic-Aware Cruise Control and Autosteer are unavailable because one or more of the front cameras in your vehicle is blocked or blinded by external conditions. Continue to your destination. Your vehicle is OK to drive.

Traffic-Aware Cruise Control and Autosteer will remain unavailable while a front camera lacks adequate visibility. Cameras can be blocked or blinded due to many factors that include:

- Dirt or debris on the camera surface
- Environmental conditions like rain, fog, snow, or dew
- Bright sunlight or glare from another light source
- Condensation (water droplets or mist) on the camera surface

This is often a temporary issue that will clear up when condensation evaporates or a particular environmental condition is no longer present.

If the alert does not clear by the end of your drive, inspect and clean the front camera area at the top center of the windshield before your next planned drive. Check the camera surface for condensation, dirt, or other debris and attempt to clear any obstruction. See the [About Autopilot on page 286](#) sections "How It Works" and "Cleaning Cameras and Sensors" for more on front camera location and tips for careful cleaning.

Although condensation on the inside of the front camera enclosure cannot be wiped clean, you can usually clear it quicker by following these steps:

1. Pre-condition the cabin with the temperature set to High and A/C turned ON.
2. Turn on the front windshield defroster.

Once all front cameras regain adequate visibility, the alert will clear and both Traffic-Aware Cruise Control and Autosteer should again be available.

If this alert persists throughout subsequent drives but no front camera obstruction is visible, schedule service at your earliest convenience. Your vehicle is OK to drive in the meantime.

(APP_w224)

Cruise control unavailable

Continue driving to allow cameras to calibrate

Traffic-Aware Cruise Control and Autosteer are unavailable because the cameras on your vehicle are not fully calibrated. Continue to your destination. Your vehicle is OK to drive.

Traffic-Aware Cruise Control and Autosteer will remain unavailable until camera calibration is complete.

Your vehicle must maneuver with great precision when features like Traffic-Aware Cruise Control and Autosteer are active. Before these features can be used for the first time, the cameras must complete an initial self-calibration. Occasionally, one or more cameras can become uncalibrated.



For your convenience, a calibration progress indicator is displayed on the touchscreen. Calibration typically completes after your vehicle has driven 20–25 miles (32–40 km), but the distance varies depending on road and environmental conditions. For example, driving on a straight road with highly visible lane markings helps the cameras calibrate quicker.

See [Drive to Calibrate Cameras on page 291](#) for more information.

When calibration is complete, Traffic-Aware Cruise Control and Autosteer should be available.

If the alert persists and camera calibration has not completed after your vehicle has driven 100 miles (160 km) or more, or Traffic-Aware Cruise Control and Autosteer remain unavailable despite successful camera calibration, schedule service at your earliest convenience. Your vehicle is OK to drive in the meantime.

(APP_w304)

Camera blocked or blinded

Clean camera or wait for it to regain visibility

One or more of the vehicle cameras is blocked or blinded due to external conditions. When the cameras cannot provide accurate visual information, some or all Autopilot features may be temporarily unavailable.

Cameras can be blocked or blinded due to many factors, including:

- Dirt or debris on the camera surface
- Environmental conditions like rain, fog, snow, or dew
- Bright sunlight or glare from another light source
- Condensation (water droplets or mist) on the camera surface

Continue to your destination. Your vehicle is OK to drive.

This is often a temporary issue that will be resolved when condensation evaporates or a particular environmental condition is no longer present.

If the alert does not clear by the time you reach your destination, check camera surfaces for condensation, dirt, or other debris.

For camera locations, see [About Autopilot on page 286](#).

Clean the cameras as necessary before your next planned drive. For recommended cleaning procedures, see [Cleaning Cameras and Sensors on page 292](#).

If you continue to see this alert after cleaning the cameras, check the inside surfaces of the door pillar camera enclosures for condensation.

Although condensation inside the camera enclosures cannot be wiped clean, you can usually clear it faster by following these steps:

1. Pre-condition the cabin with the temperature set to High and A/C turned ON.
2. Turn on the front windshield defroster.
3. Direct the air vents toward the door pillar cameras.

For more information on clearing condensation from camera enclosures, see [Cleaning Cameras and Sensors on page 292](#).

If the alert does not clear by the end of your next planned drive, despite cleaning the indicated camera(s) and following recommended steps to clear condensation, schedule service at your next convenient opportunity. Your vehicle is OK to drive in the meantime.

(CC_a001)

Unable to charge - Insufficient grounding

Proper wiring or outlet grounding must be verified

What this alert means:



No ground connection detected in the Wall Connector.

What to do:

Have the Wall Connector inspected by an electrician to make sure it is properly grounded. Your electrician should ensure there is proper grounding at your circuit breaker or power distribution box and also ensure that appropriate connections are made to the Wall Connector.

(CC_a002)

**Unable to charge - Insufficient grounding
Disconnect and retry or use different equipment**

What this alert means:

Ground fault. Current is leaking through an unsafe path. Possible Line to ground or Neutral to ground fault.

What to do:

Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting. If the issue persists, turn OFF the circuit breaker servicing the Wall Connector, wait 10 seconds, turn the circuit breaker ON again, then try reconnecting the Wall Connector to the vehicle. If the issue persists, consult your electrician or contact Tesla.

(CC_a003)

**Unable to charge - Wall Connector GFCI tripped
Disconnect and retry or use different equipment**

What this alert means:

Ground fault. Current is leaking through an unsafe path. Possible Line to ground or Neutral to ground fault.

What to do:

Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting. If the issue persists, turn OFF the circuit breaker servicing the Wall Connector, wait 10 seconds, turn the circuit breaker ON again, then try reconnecting the Wall Connector to the vehicle. If the issue persists, consult your electrician or contact Tesla.

(CC_a004)

**Unable to charge - Wall Connector issue
Wall Connector needs service**

What this alert means:

Wall Connector hardware issue. Possible issues include:

1. Contactor not working
2. Self-test of internal ground fault monitoring circuit failed
3. Thermal sensor disconnected
4. Other hardware component issues

What to do:

An internal issue was detected by the Wall Connector.

1. Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.
2. If the issue persists, turn OFF the circuit breaker for the Wall Connector, wait 10 seconds, and turn the circuit breaker ON again. Then try reconnecting the Wall Connector to the vehicle.
3. If the issue persists, have an electrician make sure all wires are properly connected and torqued according to the instructions in the Wall Connector Installation Manual.



4. Once your electrician has completed all work and restored power to the Wall Connector, try charging again by reconnecting the Wall Connector to the vehicle.
5. If the issue persists, the Wall Connector requires service.

(CC_a005)

Unable to charge - Wall Connector GFCI tripped Disconnect and retry or use different equipment

What this alert means:

Ground fault. Current is leaking through an unsafe path. Possible Line to ground or Neutral to ground fault.

What to do:

Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting. If the issue persists, turn OFF the circuit breaker servicing the Wall Connector, wait 10 seconds, turn the circuit breaker ON again, then try reconnecting the Wall Connector to the vehicle. If the issue persists, consult your electrician or contact Tesla.

(CC_a006)

Unable to charge - Wall Connector overcurrent Disconnect and retry or use different equipment

What this alert means:

Over current protection.

What to do:

Reduce the vehicle's charge current setting. If the issue persists, service is required.

(CC_a007)

Unable to charge - Input voltage too high Voltage must be within Wall Connector rating

What this alert means:

Over or under voltage protection.

What to do:

Consult your electrician to ensure appropriate voltage on the circuit breaker that services the Wall Connector.

(CC_a008)

Unable to charge - Input voltage too low Voltage must be within Wall Connector rating

What this alert means:

Over or under voltage protection.

What to do:

Consult your electrician to ensure appropriate voltage on the circuit breaker that services the Wall Connector.

(CC_a009)

Unable to charge - Input wired incorrectly Input wiring to Wall Connector must be corrected

What this alert means:



Input miswired: possibly Line and Neutral are swapped.

What to do:

The wiring between the wall power and the Wall Connector has been incorrectly installed. Consult your electrician.

(CC_a010)

Unable to charge - Wall Connector issue

Wall Connector needs service

What this alert means:

Wall Connector hardware issue. Possible issues include:

1. Contactor not working
2. Self-test of internal ground fault monitoring circuit failed
3. Thermal sensor disconnected
4. Other hardware component issues

What to do:

An internal issue was detected by the Wall Connector.

1. Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.
2. If the issue persists, turn OFF the circuit breaker for the Wall Connector, wait 10 seconds, and turn the circuit breaker ON again. Then try reconnecting the Wall Connector to the vehicle.
3. If the issue persists, have an electrician make sure all wires are properly connected and torqued according to the instructions in the Wall Connector Installation Manual.
4. Once your electrician has completed all work and restored power to the Wall Connector, try charging again by reconnecting the Wall Connector to the vehicle.
5. If the issue persists, the Wall Connector requires service.

(CC_a011)

Unable to charge - Wall Connector too hot

Let Wall Connector cool and try again

What this alert means:

Over temperature protection (latchoff).

What to do:

Make sure the Wall Connector is not covered by anything and that there is no heat source nearby. If the problem persists in normal ambient temperatures (under 100°F or 38°C) , service is required.

(CC_a012)

Unable to charge - Wall connection too hot

Outlet or Wall Connector wiring must be checked

High temperature detected by Wall Connector alerts indicate the building connection to the Wall Connector is getting too warm, so charging has stopped to protect the wiring and Wall Connector.

This is not typically an issue with your vehicle or your Wall Connector, but rather an issue with the building wiring. This may be caused by a loose building wiring connection to the Wall Connector and can be fixed quickly by an electrician.

To regain normal charge operation, try the following steps.

If the Wall Connector is plugged into a wall outlet, make sure:



- The plug is fully inserted into the receptacle / outlet
- The plug / outlet area is not blocked or covered by anything
- There is no heat source nearby

If the issue persists or the Wall Connector is hard-wired, contact an electrician to inspect the building wiring connection to the Wall Connector. They should make sure that all wires are properly connected and torqued according to the installation guide for the Wall Connector.

(CC_a013)

Unable to charge - Charge handle too hot

Check charge handle or charge port for debris

What this alert means:

Over temperature protection (latchoff).

What to do:

Make sure the connector is fully inserted into the charge inlet in the vehicle's charging port, is not covered by anything, and there is no heat source nearby. If the issue persists in normal ambient temperatures (under 100°F or 38°C) , service is required.

(CC_a014)

Unable to charge - Wall Connector issue

Wall Connector needs service

What this alert means:

Wall Connector hardware issue. Possible issues include:

1. Contactor not working
2. Self-test of internal ground fault monitoring circuit failed
3. Thermal sensor disconnected
4. Other hardware component issues

What to do:

An internal issue was detected by the Wall Connector.

1. Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.
2. If the issue persists, turn OFF the circuit breaker for the Wall Connector, wait 10 seconds, and turn the circuit breaker ON again. Then try reconnecting the Wall Connector to the vehicle.
3. If the issue persists, have an electrician make sure all wires are properly connected and torqued according to the instructions in the Wall Connector Installation Manual.
4. Once your electrician has completed all work and restored power to the Wall Connector, try charging again by reconnecting the Wall Connector to the vehicle.
5. If the issue persists, the Wall Connector requires service.

(CC_a015)

Unable to charge - Vehicle connection issue

Insert charge handle fully into charge port

What this alert means:

A communication error occurred between the Wall Connector and the vehicle.

**What to do:**

Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.

1. If the issue persists, turn OFF the circuit breaker servicing the Wall Connector, wait 10 seconds, turn the circuit breaker ON again, then try reconnecting the Wall Connector to the vehicle.
2. If the issue persists and other charging equipment is available, plug the vehicle into another Wall Connector or a Mobile Connector to determine if the vehicle is able to communicate with other charging equipment.
3. If the issue persists, service is required.

(CC_a016)**Unable to charge - Vehicle connection issue****Insert charge handle fully into charge port****What this alert means:**

A communication error occurred between the Wall Connector and the vehicle.

What to do:

Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.

1. If the issue persists, turn OFF the circuit breaker servicing the Wall Connector, wait 10 seconds, turn the circuit breaker ON again, then try reconnecting the Wall Connector to the vehicle.
2. If the issue persists and other charging equipment is available, plug the vehicle into another Wall Connector or a Mobile Connector to determine if the vehicle is able to communicate with other charging equipment.
3. If the issue persists, service is required.

(CC_a017)**Unable to charge - Vehicle connection issue****Insert charge handle fully into charge port****What this alert means:**

A communication error occurred between the Wall Connector and the vehicle.

What to do:

Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.

1. If the issue persists, turn OFF the circuit breaker servicing the Wall Connector, wait 10 seconds, turn the circuit breaker ON again, then try reconnecting the Wall Connector to the vehicle.
2. If the issue persists and other charging equipment is available, plug the vehicle into another Wall Connector or a Mobile Connector to determine if the vehicle is able to communicate with other charging equipment.
3. If the issue persists, service is required.

(CC_a018)**Unable to charge - Vehicle connection issue****Insert charge handle fully into charge port****What this alert means:**

A communication error occurred between the Wall Connector and the vehicle.

What to do:

Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.



1. If the issue persists, turn OFF the circuit breaker servicing the Wall Connector, wait 10 seconds, turn the circuit breaker ON again, then try reconnecting the Wall Connector to the vehicle.
2. If the issue persists and other charging equipment is available, plug the vehicle into another Wall Connector or a Mobile Connector to determine if the vehicle is able to communicate with other charging equipment.
3. If the issue persists, service is required.

(CC_a019)

Unable to charge - Vehicle connection issue

Insert charge handle fully into charge port

What this alert means:

A communication error occurred between the Wall Connector and the vehicle.

What to do:

Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.

1. If the issue persists, turn OFF the circuit breaker servicing the Wall Connector, wait 10 seconds, turn the circuit breaker ON again, then try reconnecting the Wall Connector to the vehicle.
2. If the issue persists and other charging equipment is available, plug the vehicle into another Wall Connector or a Mobile Connector to determine if the vehicle is able to communicate with other charging equipment.
3. If the issue persists, service is required.

(CC_a020)

Unable to charge - Wall Connector issue

Wall Connector needs service

What this alert means:

Wall Connector hardware issue. Possible issues include:

1. Contactor not working
2. Self-test of internal ground fault monitoring circuit failed
3. Thermal sensor disconnected
4. Other hardware component issues

What to do:

An internal issue was detected by the Wall Connector.

1. Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.
2. If the issue persists, turn OFF the circuit breaker for the Wall Connector, wait 10 seconds, and turn the circuit breaker ON again. Then try reconnecting the Wall Connector to the vehicle.
3. If the issue persists, have an electrician make sure all wires are properly connected and torqued according to the instructions in the Wall Connector Installation Manual.
4. Once your electrician has completed all work and restored power to the Wall Connector, try charging again by reconnecting the Wall Connector to the vehicle.
5. If the issue persists, the Wall Connector requires service.

(CC_a021)

Unable to charge - No primary Wall Connector

Check that primary unit is powered and available

What this alert means:



Load sharing (circuit breaker sharing) network: Need one (and only one) Wall Connector set as primary.

What to do:

Only one Wall Connector can be set to a primary configuration. Have your electrician confirm:

1. Only one of the Wall Connectors is set as primary.
2. All other Wall Connectors linked to the primary unit are set to paired position (position F).

(CC_a022)

Unable to charge - More than 1 primary unit

Ensure only 1 Wall Connector is set as primary

What this alert means:

Load sharing (circuit breaker sharing) network: Need one (and only one) Wall Connector set as primary.

What to do:

Only one Wall Connector can be set to a primary configuration. Have your electrician confirm:

1. Only one of the Wall Connectors is set as primary.
2. All other Wall Connectors linked to the primary unit are set to paired position (position F).

(CC_a023)

Unable to charge - Too many Wall Connectors

Ensure no more than 3 units paired with primary

What this alert means:

Load sharing (circuit breaker sharing) network: More than three Wall Connectors are paired with the same primary unit.

What to do:

Consult your electrician to have one or more paired Wall Connectors moved to a different circuit and disconnected (unpaired) from this load sharing (circuit breaker sharing) network.

(CC_a024)

Unable to charge - Low Wall Connector current

Primary unit current setting must be increased

What this alert means:

Incorrect rotary switch setting.

What to do:

Have your electrician adjust the Wall Connector's internal rotary switch to a valid operating current setting. They should first make sure there is no power to the Wall Connector. The correlation between switch setting and current should be printed on the inside of the Wall Connector. Your electrician should also refer to the Set the Operating Current section in the Wall Connector Installation Manual.

If the Wall Connector is set up for load sharing (circuit breaker sharing) and paired with other Wall Connectors, the rotary switch of the primary unit must be set to an operating current setting that allows each paired Wall Connector to receive at least 6A of charge current.

Example: Three Wall Connectors are paired for load sharing. The primary unit needs to be set to a current of at least $3 * 6A = 18A$ or greater.



(CC_a025)

Unable to charge - Wall Connector issue Wall Connector needs service

What this alert means:

Wall Connector hardware issue. Possible issues include:

1. Contactor not working
2. Self-test of internal ground fault monitoring circuit failed
3. Thermal sensor disconnected
4. Other hardware component issues

What to do:

An internal issue was detected by the Wall Connector.

1. Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.
2. If the issue persists, turn OFF the circuit breaker for the Wall Connector, wait 10 seconds, and turn the circuit breaker ON again. Then try reconnecting the Wall Connector to the vehicle.
3. If the issue persists, have an electrician make sure all wires are properly connected and torqued according to the instructions in the Wall Connector Installation Manual.
4. Once your electrician has completed all work and restored power to the Wall Connector, try charging again by reconnecting the Wall Connector to the vehicle.
5. If the issue persists, the Wall Connector requires service.

(CC_a026)

Unable to charge - Wall Connector issue Wall Connector needs service

What this alert means:

Wall Connector hardware issue. Possible issues include:

1. Contactor not working
2. Self-test of internal ground fault monitoring circuit failed
3. Thermal sensor disconnected
4. Other hardware component issues

What to do:

An internal issue was detected by the Wall Connector.

1. Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.
2. If the issue persists, turn OFF the circuit breaker for the Wall Connector, wait 10 seconds, and turn the circuit breaker ON again. Then try reconnecting the Wall Connector to the vehicle.
3. If the issue persists, have an electrician make sure all wires are properly connected and torqued according to the instructions in the Wall Connector Installation Manual.
4. Once your electrician has completed all work and restored power to the Wall Connector, try charging again by reconnecting the Wall Connector to the vehicle.
5. If the issue persists, the Wall Connector requires service.



(CC_a027)

Unable to charge - Wall Connector issue

Wall Connector needs service

What this alert means:

Wall Connector hardware issue. Possible issues include:

1. Contactor not working
2. Self-test of internal ground fault monitoring circuit failed
3. Thermal sensor disconnected
4. Other hardware component issues

What to do:

An internal issue was detected by the Wall Connector.

1. Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.
2. If the issue persists, turn OFF the circuit breaker for the Wall Connector, wait 10 seconds, and turn the circuit breaker ON again. Then try reconnecting the Wall Connector to the vehicle.
3. If the issue persists, have an electrician make sure all wires are properly connected and torqued according to the instructions in the Wall Connector Installation Manual.
4. Once your electrician has completed all work and restored power to the Wall Connector, try charging again by reconnecting the Wall Connector to the vehicle.
5. If the issue persists, the Wall Connector requires service.

(CC_a028)

Unable to charge - Incorrect switch setting

Wall Connector rotary switch must be adjusted

What this alert means:

Incorrect rotary switch setting.

What to do:

Have your electrician adjust the Wall Connector's internal rotary switch to a valid operating current setting. They should first make sure there is no power to the Wall Connector. The correlation between switch setting and current should be printed on the inside of the Wall Connector. Your electrician should also refer to the Set the Operating Current section in the Wall Connector Installation Manual.

If the Wall Connector is set up for load sharing (circuit breaker sharing) and paired with other Wall Connectors, the rotary switch of the primary unit must be set to an operating current setting that allows each paired Wall Connector to receive at least 6A of charge current.

Example: Three Wall Connectors are paired for load sharing. The primary unit needs to be set to a current of at least $3 * 6A = 18A$ or greater.

(CC_a029)

Unable to charge - Vehicle connection issue

Insert charge handle fully into charge port

What this alert means:

A communication error occurred between the Wall Connector and the vehicle.

What to do:



Try charging again by disconnecting the Wall Connector from the vehicle and reconnecting.

1. If the issue persists, turn OFF the circuit breaker servicing the Wall Connector, wait 10 seconds, turn the circuit breaker ON again, then try reconnecting the Wall Connector to the vehicle.
2. If the issue persists and other charging equipment is available, plug the vehicle into another Wall Connector or a Mobile Connector to determine if the vehicle is able to communicate with other charging equipment.
3. If the issue persists, service is required.

(CC_a030)

Unable to charge - Primary / paired unit mismatch Wall Connector current ratings must match

What this alert means:

Load sharing (circuit breaker sharing) network: The paired Wall Connectors have different maximum current capabilities.

What to do:

Only Wall Connectors with the same maximum current capabilities can be paired in a load sharing (circuit breaker sharing) network. Have your electrician inspect the type labels on the Wall Connectors and make sure the current capabilities match. It is further recommended that your electrician only pair Wall Connectors with the same part number, as an easy way to make sure paired units are compatible.

(CC_a041)

Charge rate reduced - Wall connection hot Outlet or Wall Connector wiring must be checked

High temperature detected by Wall Connector alerts indicate the building connection to the Wall Connector is getting too warm, so charging has been slowed to protect the wiring and Wall Connector.

This is not typically an issue with your vehicle or your Wall Connector, but rather an issue with the building wiring. This may be caused by a loose building wiring connection to the Wall Connector and can be fixed quickly by an electrician.

To regain normal charge speed, contact an electrician to inspect the building wiring connection to the Wall Connector. They should make sure that all wires are properly connected and torqued according to the installation guide for the Wall Connector.

(CC_a043)

Wall Connector configuration must be completed Refer to Installation Guide to enable charging

What this alert means:

Wall Connector configuration is incomplete.

What to do:

The Wall Connector needs to be commissioned to appropriately configure the circuit breaker size and protective earth connection type.

For more information, refer to Commissioning Procedure in the Wall Connector Installation Manual. If the issue persists, contact an electrician to inspect the building wiring connection to the Wall Connector. They should make sure the power output and grounding connections are properly configured according to the installation guide for the Wall Connector.

(CP_a004)

Charging equipment not recognized Try again or try different equipment

The charge port is unable to detect whether a charge cable is inserted or the type of charge cable connected.



Troubleshooting

If this alert appears while a charge cable **is** connected, it should be determined whether the issue is caused by the charging equipment or the vehicle. Try charging the vehicle using different external charging equipment (charge cable, charging station, charging stall, etc.).

- If the vehicle begins charging, the issue was likely with the equipment.
- If the vehicle still does not charge, the issue may be with the vehicle.

If this alert appears while a charge cable is **not** connected or if the issue is suspected to be with the vehicle, inspect the charge port inlet and the charge cable connector for any obstructions (use a flashlight as necessary). Debris, moisture, and/or foreign objects present in the charge port inlet or the charge cable connector can prevent the charge port from properly detecting charge cables.

It is recommended that any debris / foreign objects be removed and any moisture be allowed to dry. Afterward, try re-inserting the cable into the charge port. Charging should now be possible.

- Try charging with multiple, different types of charging equipment.
- Make sure any charge port inlet obstruction has been removed.

(CP_a010)

Charging equipment communication error

Try again or try different equipment

Your vehicle is unable to charge because it cannot communicate effectively with the external charging equipment. It cannot sense a valid control pilot signal coming from the charging equipment.

First, confirm the lack of effective communication is caused by the external charging equipment rather than an issue with your vehicle. This is usually the case.

Try charging the vehicle using different external charging equipment (including charge cable, charging station, or charging stall).

- If the vehicle begins charging, the issue was likely with the equipment.
- If the vehicle still does not charge, the issue may be with the vehicle.

If the issue is suspected to be with the vehicle, inspect the charge port inlet and the charge cable connector for any obstructions (use a flashlight as necessary). Debris, moisture, and/or foreign objects present in the charge port inlet or the charge cable connector can prevent the charge port from properly communicating with the charging equipment.

It is recommended that any debris / foreign objects be removed and any moisture be allowed to dry. Afterward, try re-inserting the cable into the charge port. Charging should now be possible.

As this alert is usually specific to external charging equipment and power sources, and it does not typically indicate an issue with your vehicle that can be resolved by scheduling service, it is recommended that you:

- Try charging with multiple, different types of charging equipment.
- Make sure any charge port inlet obstruction has been removed.

(CP_a043)

Charge port door sensor fault

Charge port may not operate as expected

One of the charge port door sensors is not functioning normally. When this occurs, the charge port may be unable to accurately sense the charge port door position and the charge port may not operate as expected.

- The charge port latch may intermittently remain engaged when the charge port door is opened.
- The charge port light may illuminate only intermittently when the charge port door is opened.



If you encounter these or similar behaviors while the alert is present, try closing the charge port door and then opening it again to restore normal function.

For more information, see [Opening the Charge Port on page 417](#).

(CP_a046)

Charging equipment communication lost

Check power source and charging equipment

Charging stopped because communication between the vehicle and the external charging equipment was interrupted.

Confirm whether the external charging equipment is powered by looking for any status lights, displays, or other indicators on the equipment.

If the equipment is **not** powered, try to restore the external charging equipment's power source.

- If attempting to charge at a public station and power is unable to be restored, contact the station operator.
- If attempting to charge at a private station (for example: charging at home) and power is unable to be restored, contact an electrician.

If the equipment is powered, try charging the vehicle using different external charging equipment.

- If the vehicle begins charging, the issue was likely with the equipment.
- If the vehicle still does not charge, the issue may be with the vehicle.
- Make sure the external charging equipment is powered.
- Try charging with multiple, different types of charging equipment.

(CP_a051)

Charge port may not open when pressed

Use another method to open the charge port

One of the charge port door sensors is not communicating properly. This may cause the charge port to not recognize the request to open when the charge port door is pressed.

You can still use all other usual methods to open the charge port door:

- Request that the charge port door open using your vehicle touchscreen.
- Request that the charge port door open using your Tesla Mobile App.
- With your vehicle unlocked, press the charge handle button on any Tesla charge cable, including a Wall Connector, Mobile Connector, or Supercharger.
- Hold and press the trunk button on your key fob.

For more information, see [Opening the Charge Port on page 417](#).

(CP_a053)

Unable to charge - Charge station not powered

Check power source or try a different station

Charging cannot begin because the charging equipment is not ready. A charge handle is detected, but the charging station is not communicating with the vehicle. This issue could occur because:

- The charging station is not powered.
- The control pilot signal between the charging station and the vehicle is interrupted.

Try charging the vehicle with different charging equipment or at a different charging station.



If the vehicle starts to charge, the issue was likely with the equipment.

If using a Mobile Connector or Wall Connector, first check the status lights on the front. If no status lights are visible, check the power source and contact an electrician to inspect the building wiring connection to the wall outlet or the Wall Connector to confirm that all wires are properly connected and torqued.

If using other external charging equipment, consult the product's owner's manual to learn how to confirm that the station is powered. Contact an electrician to inspect the building wiring and charging equipment as necessary.

If the vehicle still does not charge, the issue may be with the vehicle.

- Try charging with different charge equipment / at different stations.

(CP_a054)

Charge port latch not engaged

Fully insert charge cable or check for obstruction

The charge port latch is unable to latch the charge cable in the charge port inlet. If the latch is not engaged, AC charging (for example, charging with a Mobile Connector or Wall Connector) will be limited to 16A and DC Fast Charging / Supercharging will be unavailable.

The charge port light will pulse amber if this alert appears during AC charging and will be solid amber if this alert appears when attempting to DC Fast Charge / Supercharge.

Try re-inserting the charge cable fully into the charge port inlet.

If your vehicle begins charging and the charge port light pulses green, the charge cable may not have been fully inserted before. The latch may not have engaged during previous attempts because the cable was not fully inserted. AC charging should no longer be limited, and DC Fast Charging / Supercharging should be available.

If charging is still limited or the vehicle will not charge at all, inspect the charge port inlet and the charge cable connector for any obstructions (use a flashlight as needed). Debris and/or foreign objects in the charge port inlet or the charge cable connector can prevent you from fully inserting the charge cable. If the cable is not fully inserted, the charge port latch will not engage.

It is recommended that any debris / foreign objects be removed. Afterward, try re-inserting the cable into the charge port inlet. AC charging should no longer be limited, and DC Fast Charging / Supercharging should be available.

- Make sure the charge cable is fully inserted during charging.
- Make sure any charge port inlet obstruction has been removed.

(CP_a055)

Charging equipment communication lost

Check power source and charging equipment

Charging stopped because communication between the vehicle and the external charging equipment was interrupted.

Confirm whether the external charging equipment is powered by looking for any status lights, displays, or other indicators on the equipment.

If the equipment is **not** powered, try to restore the external charging equipment's power source.

- If attempting to charge at a public station and power is unable to be restored, contact the station operator.
- If attempting to charge at a private station (for example: charging at home) and power is unable to be restored, contact an electrician.

If the equipment is powered, try charging the vehicle using different external charging equipment.

- If the vehicle begins charging, the issue was likely with the equipment.
- If the vehicle still does not charge, the issue may be with the vehicle.



- Make sure the external charging equipment is powered.
- Try charging with multiple, different types of charging equipment.

(CP_a056)

Charging stopped - Charge cable disconnected

Close charge port - Press brake pedal and retry

Charging has stopped because your vehicle has detected that the connection between the charge port and charge cable has been unexpectedly interrupted.

Before disconnecting a charge cable, make sure you first stop charging.

With some external charging equipment, charging may be stopped by pressing the button on the charge handle.

You can also stop charging from your vehicle touchscreen, your Tesla Mobile App, or the charging station.

For more information, see [Stopping Charging on page 423](#).

(CP_a057)

Charging equipment reports error

Check equipment for error code or message

Charging was interrupted because the external charging equipment has reported a fault that prevents the vehicle from charging.

Inspect the external charging equipment and look for status lights, displays, or other status indicators on the equipment. Consult the equipment owner's manual for further troubleshooting instructions.

Try charging the vehicle with different charging equipment or at a different charging station.

- If the vehicle starts to charge, the issue was likely with the equipment.
- If the vehicle still does not charge, the issue may be with the vehicle.
- Try charging with different charge equipment / at different stations.

(CP_a058)

Unable to AC charge - Unplug and retry

Or try DC Fast Charging / Supercharging

Your vehicle is unable to AC charge because it has detected one of the following conditions and has tried to charge too many times without success:

- The charge port is unable to detect whether a charge cable is inserted or detect the type of charge cable connected.
- Your vehicle is unable to sense a valid pilot control signal coming from the charging station, so it cannot communicate effectively with the external charging equipment.
- Communication between your vehicle and the external charging equipment has been interrupted.
- The external charging equipment has reported an error that prevents your vehicle from charging.

When this alert is present, there will always be at least one other alert present that identifies a more specific condition.

For more information and troubleshooting suggestions, it is recommended that you check in your vehicle touchscreen for other recent alerts that involve charging.



(CP_a066)

Charging equipment not ready

See equipment instructions to start charging

Charging cannot begin because the charging station is communicating to your vehicle that either the external charging equipment is not ready or charging is not authorized. The control pilot signal that communicates between the charging station and your vehicle indicates that your vehicle is not allowed to start charging. This could occur because:

- The charging station is actively delaying charging. For example, this can happen because the station has a scheduled charging feature activated.
- The charging station requires further activation before the charge session can begin. Some additional authentication may be needed before the station will start charging your vehicle.
 - For example: a charging card, a mobile app, or a credit card may be required.

Check the charging station for any instructions that explain the steps necessary to enable charging. For example, look for a touchscreen terminal, LED status indicators, printed instructions, or a payment interface that might provide guidance. If you cannot enable charging on the current charging station, try charging the vehicle with different charging equipment or at a different charging station.

- If the vehicle starts to charge, the issue was likely with the equipment.
- If the vehicle still does not charge, the issue may be with the vehicle.

As this alert is usually specific to external charging equipment and power sources, and it does not typically indicate an issue with your vehicle that can be resolved by scheduling service, it is recommended that you:

- Try charging with different charge equipment / at different stations.

(CP_a078)

Cable blocked - Charge port latch may be frozen

Try using Defrost Car button in Mobile App

The charge port latch cannot unlatch the charge cable, and cold ambient temperature is detected.

To remove any strain on the cable, re-insert the charge cable fully into the charge port inlet. Try again to unlatch the charge cable.

If the charge cable still cannot be removed, the charge port latch may be frozen.

Press the Defrost Car button in your Tesla Mobile App to defrost your vehicle for approximately 30 - 45 minutes. This should help thaw any ice on the charge port latch so the charge cable can be removed.

NOTE: Be sure to use Defrost Car in your Mobile App to defrost your vehicle. Adjusting the climate control settings in your vehicle's touchscreen will not be as effective.

If the charge cable still cannot be removed, try the manual release cable in your vehicle's trunk.

1. Make sure your vehicle is not actively charging.
 - In your vehicle touchscreen, access the charging screen.
 - If necessary, press Stop Charging.
2. Open the rear trunk.
3. Pull the charge port release cable downwards to unlatch the charge cable.
 - Note: The release cable is located on the left hand side of the rear trunk. It may be recessed within a small opening of the trunk interior trim.
4. Pull the charge cable from the charge port.

For more information on using the manual release cable, see [Manually Releasing Charge Cable on page 426](#).



(CP_a079)

Charge rate reduced - Charge port may be frozen

Try using Defrost Car button in Mobile App

The charge port latch is unable to secure the charge cable in the charge port inlet, and cold ambient temperature is detected. If the latch is not engaged, AC charging (for example, charging with a Mobile Connector or Wall Connector) will be limited to 16A and DC Fast Charging / Supercharging will be unavailable.

The charge port light will pulse amber if this alert appears during AC charging, and it will be solid amber if this alert appears when attempting to DC Fast Charge / Supercharge.

Try re-inserting the charge cable fully into the charge port inlet.

If your vehicle begins charging and the charge port light pulses green, the charge cable may not have been fully inserted before. The latch may not have engaged during previous attempts because the cable was not fully inserted. AC charging should no longer be limited, and DC Fast Charging / Supercharging should be available.

If charging is still limited or the vehicle will not charge at all, inspect the charge port inlet and the charge cable connector for any obstructions (use a flashlight as needed). Debris and/or foreign objects in the charge port inlet or the charge cable connector can prevent you from fully inserting the charge cable. If the cable is not fully inserted, the charge port latch will not engage.

It is recommended that any debris / foreign objects be removed. Afterward, try re-inserting the cable into the charge port inlet. AC charging should no longer be limited, and DC Fast Charging / Supercharging should be available.

If you have checked for and cleared any debris or foreign objects, but charging is still limited or your vehicle will not charge at all, the charge port latch may be frozen. Press the Defrost Car button in your Tesla Mobile App to defrost your vehicle for approximately 30 - 45 minutes. This should help thaw any ice on the charge port latch so the charge cable can be properly inserted.

NOTE: Be sure to use Defrost Car in your Mobile App to defrost your vehicle. Adjusting the climate control settings in your vehicle's touchscreen will not be as effective.

As this alert usually indicates a temporary condition due to cold ambient temperature or a charge port inlet obstruction, and it does not typically indicate an issue with your vehicle that can be resolved by scheduling service, it is recommended that you:

- Make sure the charge cable is fully inserted during charging.
- Make sure any charge port inlet obstruction has been removed.
- Press the Defrost Car button in your Tesla Mobile App to defrost your vehicle for approximately 30 - 45 minutes before trying to charge again.

If the alert remains present, limited AC charging should still be available.

(CP_a101)

Charge rate reduced - Wall connection hot

Outlet or Wall Connector wiring must be checked

High temperature detected by Wall Connector alerts indicate the building connection to the Wall Connector is getting too warm, so charging has been slowed to protect the wiring and Wall Connector.

This is not typically an issue with your vehicle or your Wall Connector, but rather an issue with the building wiring. This may be caused by a loose building wiring connection to the Wall Connector and can be fixed quickly by an electrician.

To regain normal charge speed, contact an electrician to inspect the building wiring connection to the Wall Connector. They should make sure that all wires are properly connected and torqued according to the installation guide for the Wall Connector.



(CP_a102)

Unable to charge - Wall connection too hot

Outlet or Wall Connector wiring must be checked

High temperature detected by Wall Connector alerts indicate the building connection to the Wall Connector is getting too warm, so charging has stopped to protect the wiring and Wall Connector.

This is not typically an issue with your vehicle or your Wall Connector, but rather an issue with the building wiring. This may be caused by a loose building wiring connection to the Wall Connector and can be fixed quickly by an electrician.

To regain normal charge operation, contact an electrician to inspect the building wiring connection to the Wall Connector. They should make sure that all wires are properly connected and torqued according to the installation guide for the Wall Connector.

(CP_a143)

Charging adapter has electric arc flash hazard

Use different charging equipment

Charging is unavailable because your vehicle has detected an electric arc flash hazard in the third-party charging adapter used to connect a Combined Charging System (CCS) charge handle to your vehicle's charge port.

An electric arc flash can occur if you attempt to unplug **while actively charging with the third-party charging adapter**, and an electric arc flash can cause serious bodily injury and/or property damage.

Follow the steps below to mitigate this risk:

1. Make sure charging is completely stopped.
 - a. Use your vehicle touchscreen to confirm charging has stopped, or to stop charging if necessary.
 - b. Use the charging station display and controls to confirm charging has stopped, or to end any active charging session.
2. Make sure no flashing green or blue light (LED) is visible on your vehicle's charge port.
3. Unplug the charging adapter from your vehicle's charge port.
4. Confirm again that the charging station indicates no active charging session.
5. Unplug the charging adapter from the charge handle.

Use different charging equipment to charge your vehicle.

(DI_a175)

Cruise control unavailable

Cruise Control, including Traffic-Aware Cruise Control, is currently unavailable. Take control and drive your vehicle manually.

Continue to your destination. Your vehicle is OK to drive.

Cruise Control might become unavailable due to many factors, including:

- Driver input or behavior:
 - Unbuckling the driver's seat belt
 - Not closing the doors, front trunk, or trunk
 - Canceling a Cruise Control request
 - Trying to activate Cruise Control below minimum speed of 18mph (30 km/h)
- Environmental / external conditions
- Vehicle System Restraints:
 - May include camera or radar lack of visibility
- Valet Mode is active:



- For more information, see [Valet Mode on page 183](#).

When any condition preventing Cruise Control activation is no longer present, Cruise Control should be available.

If this alert persists throughout subsequent drives, schedule service at your convenience. Your vehicle is OK to drive in the meantime.

For more information, see [Traffic-Aware Cruise Control on page 299](#).

(DI_a184)

Autopark canceled

Take control

Autopark has been canceled. You need to park or finish parking your vehicle manually.

Once the parking maneuver is complete, apply the brakes and shift into Park. Your vehicle will otherwise remain free-rolling.

Autopark can be canceled due to many factors, including the following:

- Driver input or behavior
 - Moving the steering wheelsteering yoke
 - Pressing the accelerator pedal
 - Pressing the brake pedal
 - Opening a door and/or exiting the vehicle
 - Pressing the Cancel button on the touchscreen
- Environmental / external conditions
 - Steep slope / grade
 - Weather conditions affecting visibility / sensor function
 - Curb cannot be detected
- A trailer is attached to the vehicle
- Vehicle system constraints

Autopark should be available again during your next drive.

If this alert persists throughout subsequent drives, schedule service at your earliest convenience. Your vehicle is OK to drive in the meantime.

For more information, see [To Cancel Parking on page 329](#) and [Limitations on page 329](#).

(DI_a185)

Autopark aborted

Autopark has aborted and the Electronic Parking Brake has been applied. You need to park or finish parking your vehicle manually.

Once the parking maneuver is complete, apply the brakes and shift into Park. Your vehicle will otherwise remain free-rolling.

Autopark can abort due to many factors, including the following:

- Driver input or behavior
 - Using the gear stalk
 - Moving the steering wheelsteering yoke
 - Pressing the accelerator pedal
 - Pressing the brake pedal



- Opening a door and/or exiting the vehicle
- Pressing the Cancel button on the touchscreen
- Environmental / external conditions
 - Steep slope / grade
 - Weather conditions affecting visibility / sensor function
 - Curb cannot be detected
- A trailer is attached to the vehicle
- Vehicle system constraints

Autopark should be available again during your next drive.

If this alert persists throughout subsequent drives, contact Tesla Service at your earliest convenience. Your vehicle is OK to drive in the meantime.

For more information, see [To Cancel Parking on page 329](#) and [Limitations on page 329](#).

(DI_a201)

Regenerative braking temporarily reduced Regen will increase as vehicle is driven

Regenerative braking performance has been temporarily reduced to below 65% of its full capacity. The exact reduction is indicated by the dashed lines on the power meter.

While this alert is present, the deceleration rate of the vehicle due to regenerative braking will be reduced and more brake pedal application will be required to slow the vehicle (similar to what is needed in a gas-powered, non-electric, vehicle).

This alert is expected under the following conditions:

- Battery is near full charge:
 - Regenerative braking is reduced when the battery is at 95% charge or higher.
- Battery is cold:
 - The battery may not be warm enough for full regenerative braking performance (possibly at the beginning of a drive).
 - In extremely cold climates, this alert may remain present indefinitely and regenerative braking may remain reduced, as driving the vehicle may not warm the battery enough to fully restore performance.

Typically, driving will clear this alert because it will reduce the battery charge level below 95% and sufficiently warm the battery.

This is a completely normal part of vehicle operation and should not cause alarm. The notice on the screen is for your information only.

For more information on regenerative braking, see the Regenerative Braking section in the Owner's Manual. [Regenerative Braking on page 233](#).

(DI_a245)

Vehicle Hold feature unavailable Keep brake pedal pressed while stopped

Vehicle Hold is currently unavailable due to system constraints. When stopping, use the brake pedal to bring your vehicle to a complete stop and keep your vehicle stationary.

Continue to your destination. Your vehicle is OK to drive.

If Vehicle Hold is not available during your next drive, contact Tesla Service. Your vehicle is OK to drive in the meantime.

For more information, see [Vehicle Hold on page 252](#).



(ESP_a118)

Assist for low brake performance activated

To stop, keep brake pedal firmly pressed

Hydraulic Fade Compensation is active. This brake assist function activates temporarily to make sure you have full braking capability in conditions where reduced braking performance is detected by your vehicle.

Continue to press the brake pedal as you normally would, and do not "pump" (repeatedly press and release) the pedal as this will interrupt the function.

This alert will clear when your vehicle comes to a stop or you are no longer pressing the brake pedal. It may still be displayed for up to 5 seconds afterward.

When this assist function activates, you may feel the brake pedal pull away from your foot and notice a strong increase in brake pressure. You may also hear a pumping sound coming from the brake hydraulic unit at the front of the vehicle. This will usually last for a few seconds, depending on road surface and vehicle speed. This is completely normal and does not indicate any issue with your vehicle.

Reduced braking performance is usually temporary, and can occur for a number of reasons including high brake temperatures after heavy brake use, or driving in extremely cold or wet conditions. It can also indicate that your brake pads or rotors have worn to the point that normal replacement is needed.

If you continue to experience reduced braking performance which does not improve over time, please contact Tesla service at your convenience for a brake inspection.

For more information, see [Hydraulic Fade Compensation on page 232](#).

(PCS_a016)

Cannot charge – Poor grid power quality possible

Retry / Try other charge location or Supercharging

Charging has stopped due to a condition that prevents your vehicle from charging with AC power. DC fast charging / Supercharging should still function as expected.

This condition could occur due to power supply disturbances caused by the external charging equipment or by the electrical power grid. In some cases, this condition can even result from turning on nearby electric devices that draw a lot of power.

If these possible causes can be ruled out, then a condition with your vehicle itself may also be affecting AC charging.

This alert is often accompanied by other alerts that can help you identify and troubleshoot the condition. Start by investigating any other displayed alerts that relate to charging.

Further troubleshooting tips based on equipment type:

- If using a Mobile Connector, try charging your vehicle with a different wall outlet.
 - If your vehicle starts to charge and continues to charge as expected, the issue was likely with the original wall outlet. It is recommended that you contact an electrician to inspect the building wiring connection to that outlet.
 - If your vehicle still does not start to charge, or does not continue to charge as expected, the issue may be with the Mobile Connector or the electrical grid.
- If using a Wall Connector, try charging your vehicle with different charging equipment like a Mobile Connector powered by a separate wall outlet.
 - If your vehicle starts to charge and continues to charge as expected, the issue was likely with the Wall Connector. Contact an electrician to inspect the building wiring connection to the Wall Connector. They should make sure that all wires are properly connected and torqued according to the installation guide for the Wall Connector.

As this alert is usually specific to external charging equipment and power sources, and it does not typically indicate an issue with your vehicle that can be resolved by scheduling service, it is recommended that you:

- Try charging with different wall outlets.
- Try charging with multiple, different types of charging equipment at different locations.



(PCS_a017)

Charging stopped - Power lost while charging

Check power source and charging equipment

Power has been lost during charging. This could result from the charging equipment losing power from the source (for example, a wall outlet) or from an issue with the charging equipment.

This alert is often accompanied by other alerts that can help you identify and troubleshoot the issue. Start by investigating any other displayed alerts that relate to charging issues.

Alternatively, you can check Mobile Connector or Wall Connector status lights to confirm power to the device, and also refer to the product owner's manual for troubleshooting information based on blink codes. If using other (non-Tesla) external charging equipment, check for a display or other user interface that provides troubleshooting help.

If there is clearly no power to the charging equipment, check the circuit breaker for the wall outlet / Wall Connector to make sure it has not tripped.

Further troubleshooting tips based on equipment type:

- If using a Mobile Connector, try charging the vehicle with a different wall outlet.
 - If the vehicle starts to charge, the issue was likely with the original wall outlet. It is recommended that you contact an electrician to inspect the building wiring connection to that outlet.
 - If the vehicle still does not charge, the issue may be with the Mobile Connector.
- If using a Wall Connector, try charging the vehicle with different charging equipment like a Mobile Connector powered by a separate wall outlet.
 - If the vehicle starts to charge, the issue was likely with the Wall Connector. Contact an electrician to inspect the building wiring connection to the Wall Connector. They should make sure that all wires are properly connected and torqued according to the installation guide for the Wall Connector.
- Try charging with different wall outlets.
- Try charging with different charging equipment.

(PCS_a019)

Charging slowed - Poor grid power quality possible

Unplug and retry / Try different charging location

Charging speed has been reduced due to a condition that affects your vehicle's ability to charge with AC power. DC fast charging / Supercharging should still function as expected.

This condition could occur due to power supply disturbances caused by the external charging equipment or by the electrical power grid. In some cases, this condition can even result from turning on nearby electric devices that draw a lot of power.

If these possible causes can be ruled out, then a condition with your vehicle itself may also be affecting AC charging.

This alert is often accompanied by other alerts that can help you identify and troubleshoot the condition. Start by investigating any other displayed alerts that relate to charging.

Further troubleshooting tips based on equipment type:

- If using a Mobile Connector, try charging your vehicle with a different wall outlet.
 - If charging speed is no longer reduced, the issue was likely with the original wall outlet. It is recommended that you contact an electrician to inspect the building wiring connection to that outlet.
 - If charging speed is still reduced, the issue may be with the Mobile Connector or the electrical grid.
- If using a Wall Connector, try charging your vehicle with different charging equipment like a Mobile Connector powered by a separate wall outlet.



- If charging speed is no longer reduced, the issue was likely with the Wall Connector. Contact an electrician to inspect the building wiring connection to the Wall Connector. They should make sure that all wires are properly connected and torqued according to the installation guide for the Wall Connector.

As this alert is usually specific to external charging equipment and power sources, and it does not typically indicate an issue with your vehicle that can be resolved by scheduling service, it is recommended that you:

- Try charging with different wall outlets.
- Try charging with multiple, different types of charging equipment at different locations.

(PCS_a032)

Poor electric grid power quality detected

Try different charging station or location

Charging speed has been reduced or charging has been interrupted due to a condition that affects your vehicle's ability to charge with AC power. DC fast charging / Supercharging should still function as expected.

The onboard charger in your vehicle has detected power supply disturbances in the electrical power grid. These disturbances interfere with your vehicle's charging process.

Typical causes of these power supply disturbances include:

- Issues with the building wiring and/or the wall outlet.
- Issues with the external charging equipment.
- Other large electric devices, such as washing machines or air conditioning units, that temporarily draw a lot of power or otherwise disturb the electrical power grid.
- External conditions affecting the electrical power grid.

As this alert is usually specific to external charging equipment and power sources, and it does not typically indicate an issue with your vehicle that can be resolved by scheduling service, it is recommended that you:

- Try charging with different wall outlets.
- Try charging again (disconnect and reconnect to retry) when other large electric devices are not drawing power.
- Try charging with multiple, different types of charging equipment at different locations.

(PCS_a052)

External charging equipment not providing power

Check power source or try different equipment

Charging cannot begin due to a condition that prevents your vehicle from charging with AC power. DC fast charging / Supercharging should still function as expected.

Your vehicle has requested AC power from the external charging equipment, but the onboard charger does not detect any supply voltage coming from the equipment.

This can sometimes be caused by a hardware issue specific to the external charging equipment, which prevents the charging equipment from switching power to the vehicle on or off when requested. It could also occur due to another condition affecting the external charging equipment, the power source it is connected to, or your vehicle itself.

As this alert is usually specific to external charging equipment and power sources, and it does not typically indicate an issue with your vehicle that can be resolved by scheduling service, it is recommended that you try charging with multiple, different types of charging equipment.

For more information on troubleshooting Mobile Connector or Wall Connector status lights, refer to the product's Owner's Manual at [Charging & Adapter Product Guides](#). If using other external charging equipment, refer to the manufacturer's provided documentation for troubleshooting tips.



(PCS_a053)

Charge rate reduced - Unexpected voltage drop

Remove extension cords / Have wiring inspected

Charging speed has been reduced because the onboard charger in your vehicle has detected a large voltage drop during charging.

Likely causes of this issue include:

- Problems with the building wiring and/or the wall outlet.
- An extension cord or other wiring that cannot support the requested charge current.

This issue can also result from turning on electric devices that draw a lot of power from the same branch circuit while the vehicle is charging.

If this issue has occurred multiple times at your normal charging location, contact an electrician to inspect the electrical installation. They should check the following:

- Any installed charging equipment and its connection to the building wiring.
- The building wiring, including any wall outlet used with a Mobile Connector.
- The electrical connection to the power utility line where it enters the building.

Discuss with the electrician whether the charge current on the vehicle should be lowered, or if the installation should be upgraded to support a higher charge current.

- Try charging with multiple, different types of charging equipment at different locations.
- Contact an electrician to inspect the wiring and equipment at your normal charging location.

(PCS_a054)

Charging stopped due to large voltage drop

Remove extension cords / Have wiring inspected

Charging has been interrupted because the onboard charger in your vehicle has detected an unusually large voltage drop.

Likely causes of this issue include:

- Problems with the building wiring and/or the wall outlet.
- An extension cord or other wiring that cannot support the requested charge current.

This issue can also result from turning on electric devices that draw a lot of power from the same branch circuit while the vehicle is charging.

If this issue has occurred multiple times at your normal charging location, contact an electrician to inspect the electrical installation. They should check the following:

- Any installed charging equipment and its connection to the building wiring.
- The building wiring, including any wall outlet used with a Mobile Connector.
- The electrical connection to the power utility line where it enters the building.

Discuss with the electrician whether the charge current on the vehicle should be lowered, or if the installation should be upgraded to support a higher charge current.

- Try charging with multiple, different types of charging equipment at different locations.
- Contact an electrician to inspect the wiring and equipment at your normal charging location.



(PCS_a073)

External charging equipment error detected

Try different charging equipment

AC charging cannot begin due to a condition that prevents your vehicle from charging with AC power. DC fast charging / Supercharging should still function as expected.

Your vehicle's onboard charger is detecting input voltage at the charge port when no power has been requested from the external charging equipment, which indicates the external charging equipment is not functioning as expected.

This can sometimes be caused by a hardware issue specific to the external charging equipment, which prevents the charging equipment from switching power to the vehicle on or off when requested. It could also occur due to another condition affecting the external charging equipment, or a condition affecting your vehicle itself.

As this alert is usually specific to external charging equipment, and it does not typically indicate an issue with your vehicle that can be resolved by scheduling service, it is recommended that you try charging with multiple, different types of charging equipment.

(PCS_a090)

Charging slowed - Some AC phases not powered

Check power source and charging equipment

Charging speed has been reduced due to a condition that affects your vehicle's ability to charge with AC power. DC fast charging / Supercharging should still function as expected.

Your vehicle's onboard charger has detected that one or more power converters is not receiving the necessary AC input voltage. For example: during three-phase charging, one phase might be missing from the AC input power provided by the external source. This could occur due to a condition affecting the external charging equipment, the power source it is connected to, or your vehicle itself.

As this alert is usually specific to external charging equipment and power sources, and it does not typically indicate an issue with your vehicle that can be resolved by scheduling service, it is recommended that you try charging with multiple, different types of charging equipment.

(UI_a006)

Service is required

Schedule service now

This alert is set remotely by Tesla when a condition requiring service is detected on your vehicle.

This alert can be set due to various conditions. When you schedule service, more information should be available.

This alert can only be cleared by a service technician after your vehicle has been serviced.

As this alert can be present due to various conditions, it is recommended that you schedule service at your earliest convenience.

(UI_a137)

Active service connection to vehicle

Service performing remote diagnostics

A service technician is remotely logged into your vehicle for diagnosis or repair. You may notice some loss of Infotainment functionality while the connection persists, but this alert does not indicate an issue with your vehicle.

Your vehicle is OK to drive.

This alert should clear automatically after the technician completes vehicle diagnosis or repair. You may find it necessary to restart your touchscreen to restore full Infotainment functionality after the alert has cleared. For more information, see [Restarting the Touchscreen](#) in your vehicle's [Do It Yourself Guide](#).



Troubleshooting

If this alert does not clear after 24 hours, it is recommended that you schedule service via your Tesla Mobile App or with an independent service provider. Please note that independent service provider options may vary, based on your vehicle configuration and your location.

(UMC_a002)

Unable to charge - Mobile Connector GFCI tripped **Unplug charge handle from charge port and retry**

The vehicle cannot charge because the ground-fault circuit interrupter (GFCI) in the Mobile Connector has tripped.

Like the GFCI in a wall outlet, this feature is designed to stop the flow of electricity when there is a problem. It has interrupted charging to protect your vehicle and the charging equipment.

This could happen for many reasons. The problem could be in the charge cable, the charge handle, the charge port, or even an onboard vehicle component.

Inspect the charge port as well as the charge handle for pooled water or unusual levels of moisture.

- If you find excessive moisture, wait and let both the inside area of the charge port and the exposed portion of the charge handle dry sufficiently before trying again.

Inspect the charge equipment for damage.

- If the cable is in any way damaged or deteriorated, **do not use it**. Try different charging equipment instead.
- If the cable is in good condition, try charging again with the same Mobile Connector.

If the issue persists and prevents charging, try charging with different charging equipment.

- Try charging with multiple, different types of charging equipment.

(UMC_a004)

Unable to charge with Mobile Connector **Voltage too high / Try a different wall outlet**

The vehicle cannot charge, or charging is interrupted, because **either** the Mobile Connector:

- Detects the wall outlet voltage is too high.

OR

- Detects an unexpected increase in supply voltage from the wall outlet.

Try charging the vehicle with a different wall outlet.

If the vehicle starts to charge, the issue was likely with the original wall outlet. It is recommended that you contact an electrician to inspect the building wiring connection to that outlet.

If the vehicle still does not charge when you try a different wall outlet, try charging at a different location.

- Try charging with different wall outlets.
- Try charging with different charging equipment.

(UMC_a005)

Unable to charge with Mobile Connector **Voltage too low / Try a different wall outlet**

The vehicle cannot charge, or charging is interrupted, because **either** the Mobile Connector:



- Does not detect enough supply voltage from the wall outlet.

OR

- Detects an unexpected drop in supply voltage from the wall outlet.

Try charging the vehicle with a different wall outlet.

If the vehicle starts to charge, the issue was likely with the original wall outlet. It is recommended that you contact an electrician to inspect the building wiring connection to that outlet.

If the vehicle still does not charge when you try a different wall outlet, try charging at a different location.

- Try charging with different wall outlets.
- Try charging with different charging equipment.

(UMC_a008)

Unable to charge - Wall plug temperature high Wall outlet and wiring inspection recommended

High temperature detected by Mobile Connector alerts indicate the outlet used to charge is becoming too warm, so charging has stopped to protect the outlet.

This is not typically an issue with your vehicle or your Mobile Connector, but rather an issue with the outlet. A warm outlet may be caused by a plug that is not fully inserted, a loose building wiring connection to the outlet, or an outlet that is beginning to wear out.

To regain normal charge operation, make sure your adapter is fully plugged into the outlet. If charging speed does not return to normal, contact an electrician to inspect the outlet and building wiring connections to the outlet and complete any repairs needed.

If the outlet is worn, it should be replaced with a high-quality outlet. Consider upgrading to a Tesla Wall Connector for greater convenience and highest charging speed.

(UMC_a013)

Wall plug adapter error - Charge rate reduced Plug adapter fully into Mobile Connector and retry

Your Mobile Connector is unable to communicate with the wall plug adapter. Because your Mobile Connector cannot monitor the wall plug adapter temperature, charge current is automatically reduced to 8A.

It is recommended that you try the following troubleshooting steps:

1. Unplug your Mobile Connector, including the wall plug adapter, completely from the wall outlet.
2. Make sure the connection between the wall plug adapter and the main body of your Mobile Connector is secure.
 - a. Disconnect the wall plug adapter completely from the main body of your Mobile Connector.
 - b. Fully reinsert the wall plug adapter into the main body of your Mobile Connector by pushing it into the socket until it snaps into place.
3. Try charging again by plugging the Mobile Connector, including wall plug adapter, fully into the wall outlet.
4. If the alert persists, try using a different wall plug adapter (see steps above to make sure the adapter is fully connected to your Mobile Connector).
 - a. If the alert is no longer present, the issue is likely with the wall plug adapter you were using previously.
 - b. If the alert persists, the issue is likely with your Mobile Connector.

It is recommended that you obtain another wall plug adapter or Mobile Connector as needed, based on the troubleshooting steps above.



In the meantime, you can continue to charge with the same equipment. The charge rate will be reduced, as charge current will be limited to 8A while this condition persists.

(UMC_a014)

Wall plug adapter error - Charge rate reduced

Plug adapter fully into Mobile Connector and retry

Your Mobile Connector is unable to communicate with the wall plug adapter. Because your Mobile Connector cannot identify the type of wall outlet the wall plug adapter is connected to, charge current is automatically reduced to 8A.

It is recommended that you try the following troubleshooting steps:

1. Unplug your Mobile Connector, including the wall plug adapter, completely from the wall outlet.
2. Make sure the connection between the wall plug adapter and the main body of your Mobile Connector is secure.
 - a. Disconnect the wall plug adapter completely from the main body of your Mobile Connector.
 - b. Fully reinsert the wall plug adapter into the main body of your Mobile Connector by pushing it into the socket until it snaps into place.
3. Try charging again by plugging the Mobile Connector, including wall plug adapter, fully into the wall outlet.
4. If the alert persists, try using a different wall plug adapter (see steps above to make sure the adapter is fully connected to your Mobile Connector).
 - a. If the alert is no longer present, the issue is likely with the wall plug adapter you were using previously.
 - b. If the alert persists, the issue is likely with your Mobile Connector.

It is recommended that you obtain another wall plug adapter or Mobile Connector as needed, based on the troubleshooting steps above.

In the meantime, you can continue to charge with the same equipment. The charge rate will be reduced, as charge current will be limited to 8A while this condition persists.

(UMC_a015)

Wall plug adapter error - Charge rate reduced

Plug adapter fully into Mobile Connector and retry

Your Mobile Connector is unable to communicate with the wall plug adapter. Because your Mobile Connector cannot identify the type of wall outlet the wall plug adapter is connected to, charge current is automatically reduced to 8A.

It is recommended that you try the following troubleshooting steps:

1. Unplug your Mobile Connector, including the wall plug adapter, completely from the wall outlet.
2. Make sure the connection between the wall plug adapter and the main body of your Mobile Connector is secure.
 - a. Disconnect the wall plug adapter completely from the main body of your Mobile Connector.
 - b. Fully reinsert the wall plug adapter into the main body of your Mobile Connector by pushing it into the socket until it snaps into place.
3. Try charging again by plugging the Mobile Connector, including wall plug adapter, fully into the wall outlet.
4. If the alert persists, try using a different wall plug adapter (see steps above to make sure the adapter is fully connected to your Mobile Connector).
 - a. If the alert is no longer present, the issue is likely with the wall plug adapter you were using previously.
 - b. If the alert persists, the issue is likely with your Mobile Connector.

It is recommended that you obtain another wall plug adapter or Mobile Connector as needed, based on the troubleshooting steps above.

In the meantime, you can continue to charge with the same equipment. The charge rate will be reduced, as charge current will be limited to 8A while this condition persists.



(UMC_a017)

Charge rate reduced - Wall plug temperature high Wall outlet and wiring inspection recommended

High temperature detected by Mobile Connector alerts indicate the outlet used to charge is becoming too warm, so charging has been slowed to protect the outlet.

This is not typically an issue with your vehicle or your Mobile Connector, but rather an issue with the outlet. A warm outlet may be caused by a plug that is not fully inserted, a loose building wiring connection to the outlet, or an outlet that is beginning to wear out.

To regain normal charge speed, make sure your adapter is fully plugged into the outlet. If charging speed does not return to normal, contact an electrician to inspect the outlet and building wiring connections to the outlet and complete any repairs needed.

If the outlet is worn, it should be replaced with a high-quality outlet. Consider upgrading to a Tesla Wall Connector for greater convenience and highest charging speed.

(VCBATT_a180)

Electrical system power reduced Vehicle may shut down unexpectedly

The electrical system cannot maintain the voltage required to support all vehicle features.

If this alert is present while you are driving, it is possible your vehicle will shut down unexpectedly. It is also possible that your vehicle will not restart after the current drive.

If this alert is present when your vehicle is in Park or when it first wakes, it is possible your vehicle may not have adequate electrical power to start driving. A separate vehicle alert may be present to indicate that condition.

It is recommended that you eliminate or reduce your use of any nonessential features. This can help your vehicle maintain adequate electrical power for essential functions.

If this alert remains active, it is recommended that you schedule service immediately. Without service, your vehicle may not drive, may shut down unexpectedly, or may not restart.

(VCBATT_a182)

Schedule service to replace low voltage battery Software will not update until battery is replaced

The low voltage battery is showing degraded performance and needs to be replaced. Until the low voltage battery is replaced, vehicle software updates will not complete.

It is recommended that you have the low voltage battery replaced at your earliest convenient opportunity.

You can schedule service via your Tesla Mobile App, or with an independent service provider that offers low voltage battery replacement for your vehicle. Please note that independent service provider options may vary, based on your vehicle configuration and your location.

Your vehicle is OK to drive with this alert present. However, if you delay the low voltage battery replacement, your vehicle may eventually not have enough electrical power to start or to restart after a recent drive.

If the low voltage battery does not have enough electrical power to turn on your vehicle or open the doors, follow the instructions in [Jump Starting the Low Voltage Battery on page 526](#).

For more information on the battery system, see [High Voltage Battery Information on page 415](#).



(VCBATT_a191)

Electrical system power reduced

Vehicle shutting down

The low voltage battery cannot provide the electrical support necessary to drive or continue driving. Your vehicle is shutting down to preserve energy for essential functions other than driving.

Your vehicle cannot be driven or continue driving while this condition continues.

If this alert is present while you are driving, your vehicle needs to come to a stop immediately. It is recommended that you:

- Pull over safely immediately
- Use your Mobile App to contact Tesla Roadside Assistance immediately, or seek other roadside assistance if preferred

If you do not pull over safely within a short time, your vehicle may shut down unexpectedly. It is also possible that your vehicle will not restart once parked.

When this alert is present, the electrical system cannot maintain the voltage required to support all vehicle features. Many vehicle functions may no longer work.

It is possible your vehicle may lose all electrical power. If this occurs, you can still use the manual door releases to exit the vehicle if necessary. For more information, see [Opening Doors from the Interior on page 32](#).

This alert may be present due to various vehicle conditions. For more information and further recommended actions, check for other active vehicle alerts.

If this alert remains present, it is recommended that you schedule service immediately. Without service, your vehicle may not drive, may shut down unexpectedly, or may not restart.

(VCFRONT_a192)

Electrical system is unable to support all features

Shutting down features to conserve energy

The electrical system cannot support all vehicle features. Your vehicle is shutting down nonessential features to preserve energy for essential functions.

If you are driving when this alert is present, it is possible your vehicle may shut down unexpectedly. It is also possible that your vehicle will not restart once parked.

Nonessential features may be unavailable, including seat heaters, cabin climate control, and in-vehicle entertainment. This is expected behavior intended to help your vehicle maintain adequate electrical power for essential functions, including the ability to operate headlights, windows and doors, hazard lights, and the front trunk (frunk).

It is possible your vehicle may lose all electrical power. If this occurs, you can still use the manual door releases to exit the vehicle if necessary. For more information, see [Opening Doors from the Interior on page 32](#).

This alert may be present due to various vehicle conditions. For more information and further recommended actions, check for other active vehicle alerts.

(VCBATT_a220)

Electrical system is unable to support all features

Schedule service

The low voltage battery cannot provide the electrical support necessary to drive or continue driving.

If this alert is present while you are driving, your vehicle needs to come to a stop as soon as possible. Pull over safely at your earliest opportunity.

It is possible your vehicle will shut down unexpectedly. It is also possible that your vehicle will not restart after the current drive.



You may notice that some nonessential features are not available. This is expected behavior due to your vehicle preserving energy for essential functions.

It is recommended that you eliminate or reduce your use of any nonessential features. This can help your vehicle maintain adequate electrical power for essential functions other than driving, until it can be serviced.

If this alert remains present, it is recommended that you schedule service immediately. Without service, your vehicle may not drive, may shut down unexpectedly, or may not restart.

(VCBATT_a402)

Electrical system backup power is unavailable Vehicle will consume more energy while idle

The backup power source for the electrical system, the low voltage battery, is not available or cannot provide the voltage required to support all vehicle features.

The primary source of electrical power, the high voltage battery system, will continue to support vehicle functions, even when your vehicle is idle. For more information on the high voltage battery, see [About the High Voltage Battery on page 415](#).

You may notice that your vehicle consumes more energy than usual when you are not driving it, or that your vehicle displays a lower projected range than you would normally expect after charging. This is normal vehicle behavior when this alert is present, and it will continue until the backup power source is restored.

You may also notice that some nonessential features are not available. This is expected behavior due to your vehicle preserving energy for essential functions.

It is recommended that you limit or avoid the use of any nonessential features. This can help your vehicle maintain adequate electrical power for essential functions.

There is a chance that an issue affecting the primary power source could cause your vehicle to shut down unexpectedly.

It is recommended that you schedule service at your earliest opportunity, so the backup power source for the electrical system can be restored.

(VCBATT_a478)

Low voltage battery service is required Schedule service - Vehicle may not restart

The low voltage battery cannot provide the electrical support necessary to drive or continue driving.

If this alert is present while you are driving, your vehicle needs to come to a stop as soon as possible. Pull over safely at your earliest opportunity.

It is possible your vehicle will shut down unexpectedly. It is also possible that your vehicle will not restart after the current drive.

You may notice that some nonessential features are not available. This is expected behavior due to your vehicle preserving energy for essential functions.

It is recommended that you eliminate or reduce your use of any nonessential features. This can help your vehicle maintain adequate electrical power for essential functions other than driving, until it can be serviced.

If this alert remains present, it is recommended that you schedule service immediately. Without service, your vehicle may not drive, may shut down unexpectedly, or may not restart.

(VCBATT_a496)

Vehicle is preparing to shut down PULL OVER SAFELY

The electrical system cannot provide adequate support to drive or continue driving. Your vehicle is preparing to shut down to preserve energy for essential functions other than driving.



Your vehicle cannot be driven or continue driving while this condition continues.

If this alert is present while you are driving, your vehicle needs to come to a stop as soon as possible. It is recommended that you:

- Pull over safely at your earliest opportunity
- Use your Mobile App to contact Tesla Roadside Assistance immediately, or seek other roadside assistance if preferred

If you do not pull over safely within a short time, your vehicle may shut down unexpectedly. It is also possible that your vehicle will not restart once parked.

It is possible your vehicle may lose all electrical power. If this occurs, you can still use the manual door releases to exit the vehicle if necessary. For more information, see [Opening Doors from the Interior on page 32](#).

This alert may be present due to various vehicle conditions. For more information and further recommended actions, check for other active vehicle alerts.

(VCSEC_a221)

Air pressure below recommendation for tires

Check pressure and refill air as needed

This alert does NOT indicate that there is a flat tire.

The tire pressure monitoring system (TPMS) has detected that the air pressure in one or more of your tires is at least 20% lower than the recommended cold tire pressure. This recommended pressure should be displayed on the Tire and Loading information label.

See [Maintaining Tire Pressures on page 431](#) for detailed information on how to keep the tires properly inflated.

This alert may appear in cold weather because the air in your tires naturally contracts when it becomes cold, decreasing tire pressures.

- Although drops in tire pressure are expected in colder weather, air should still be added to maintain the recommended cold tire pressure.
- The alert may clear as the vehicle is driven. This is because the tires will warm up and the tire pressure will increase.
 - Even if the alert clears, the tires should still be refilled with air once they have cooled. For the best experience with your vehicle, the recommended cold tire pressure should be maintained at all times.

The alert should clear once the Tire Pressure Monitoring System detects that each of your tires is inflated to the recommended cold pressure.

- The alert and Tire Pressure indicator light may still be present immediately after you have filled your tires to the recommended cold pressure, but both should clear once you have driven a short distance.
- You may need to drive over 15 mph (25 km/h) for at least 10 minutes for the Tire Pressure Monitoring System to measure and report your updated tire pressures.

If you repeatedly see this alert for the same tire, have the tire inspected for a slow leak. You can visit a local tire shop or schedule service using your Tesla Mobile App.

For more information on tire pressure and inflation, see [Tire Care and Maintenance on page 431](#).

(VCSEC_a228)

Air pressure in tires very low

PULL OVER SAFELY - Check for flat tire

This alert indicates that one or more of the tires on your vehicle is extremely low or flat.

The tire pressure monitoring system (TPMS) has detected that the air pressure in one or more of your tires is significantly lower than the recommended cold pressure (RCP). This recommended pressure is displayed on the Tire and Loading information label.



You should pull over carefully as soon as possible. In a safe location, check for a flat tire.

You can request Tesla roadside assistance options (mobile tire, loaner wheel, tow) if required. See [Contacting Tesla Roadside Assistance on page 502](#) for more information.

In a non-emergency situation, it is recommended that you visit your local Service Center for assistance.

See [Maintaining Tire Pressures on page 431](#) for detailed information on how to keep the tires properly inflated.

The alert should clear once the Tire Pressure Monitoring System has a consistent tire pressure measurement for each of your tires of at least 30 psi.

- The alert and Tire Pressure indicator light may still be present immediately after you have filled your tires to the recommended cold pressure, but both should clear once you have driven a short distance.
- You may need to drive over 15 mph (25 km/h) for at least 10 minutes for the Tire Pressure Monitoring System to measure and report your updated tire pressures.

For more information on tire pressure, inflation, and maintenance, see [Tire Care and Maintenance on page 431](#).



About this Owner Information

Document Applicability

For the latest and greatest information that is customized to your vehicle, view the Owner's Manual on your vehicle's touchscreen by touching **Controls** > **Service** > **Owner's Manual**. The information is specific to your vehicle depending on the features you purchased, vehicle configuration, market region and software version. In contrast, owner information that is provided by Tesla elsewhere is updated as necessary and may not contain information unique to your vehicle.

Information about new features is displayed on the touchscreen after a software update, and can be viewed at any time by touching **Controls** > **Software** > **Release Notes**. If the content in the Owner's Manual on how to use your vehicle conflicts with information in the Release Notes, the Release Notes take precedence.

Illustrations

The illustrations provided in this document are for demonstration purposes only. Depending on vehicle options, software version and market region, the information displayed on the touchscreen in your vehicle may appear slightly different.

Feature Availability

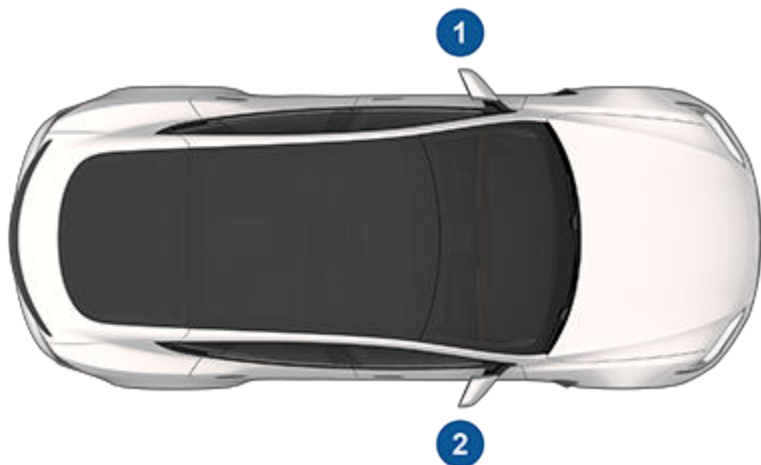
Some features are available only on some vehicle configurations and/or only in specific market regions. Options or features mentioned in the Owner's Manual does not guarantee they are available on your specific vehicle.

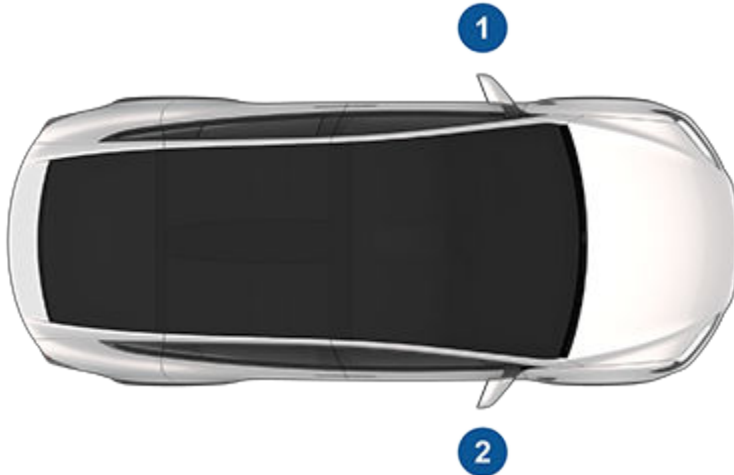
Errors or Inaccuracies

All specifications and descriptions are known to be accurate at time of publishing. However, because continuous improvement is a goal at Tesla, we reserve the right to make product modifications at any time. To communicate any inaccuracies or omissions, or to provide general feedback or suggestions regarding the quality of the Owner's Manual, send an email to ownersmanualfeedback@tesla.com.

Location of Components

Owner information may specify the location of a component as being on the left or right side of the vehicle. As shown, left (1) and right (2) represent the side of the vehicle when sitting inside.





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MODEL Y

T E S L A



All other trademarks contained in this document are the property of their respective owners and their use herein does not imply sponsorship or endorsement of their products or services. The unauthorized use of any trademark displayed in this document or on the vehicle is strictly prohibited.



Feature Availability Statement

Your Tesla is constantly changing, with new features being added and improved upon with every software update. However, depending on the firmware release operating on your vehicle, your vehicle may not be equipped with all features or may not operate exactly as described in this Owner's Manual. The features on your vehicle vary depending on market region, vehicle configuration, options purchased, software updates, and more.

Referencing options or features mentioned in this Owner's Manual does not guarantee they are available on your specific vehicle. The best way to ensure you are getting the latest and greatest features is update your vehicle's software as soon as you receive the notification to do so. You can also set your preferences to **Controls > Software > Software Preferences > Advanced**. See [Software Updates on page 404](#) for more information. For the features available on your vehicle, always comply with local laws and limits to ensure the safety of you, your passengers, and those around you.



Disclaimers

Event Data Recorder (EDR)

Model SModel X is equipped with an event data recorder (EDR). The main purpose of an EDR is to record, in certain crash or near crash-like situations, such as an air bag deployment or hitting a road obstacle, data to better understand how the vehicle's systems performed. The EDR is designed to record data related to vehicle dynamics and safety systems for a short period of time, typically 30 seconds or less. The EDR in Model SModel X is designed to record data such as:

- How various systems in your vehicle were operating;
- Whether or not the driver and passenger safety belts were buckled/fastened;
- How far (if at all) the driver was depressing the accelerator and/or brake pedal; and,
- How fast the vehicle was traveling.

The data can help provide a better understanding of the circumstances in which crashes and injuries occur.

NOTE: EDR data is recorded by your vehicle only if a non-trivial crash situation occurs; no data is recorded by the EDR under normal driving conditions and no personal data (for example, name, gender, age, and crash location) is recorded. However, other parties, such as law enforcement, could combine the EDR data with the type of personally identifying data routinely acquired during a crash investigation.

To read data recorded by an EDR, special equipment is required, and access to the vehicle or the EDR is needed. In addition to the vehicle manufacturer, other parties, such as law enforcement, that have the special equipment, can read the information if they have access to the vehicle or the EDR. Tesla may also access the EDR remotely in some crash circumstances.

Vehicle Telematics

Model SModel X is equipped with electronic modules that monitor and record data from various vehicle systems, including the motor, Autopilot components, Battery, braking and electrical systems. The electronic modules record information about various driving and vehicle conditions, including braking, acceleration, trip and other related information regarding your vehicle. These modules also record information about the vehicle's features such as charging events and status, the enabling/disabling of various systems, diagnostic trouble codes, VIN, speed, direction and location.

The data is stored by the vehicle and may be accessed, used and stored by Tesla service technicians during vehicle servicing or periodically transmitted to Tesla wirelessly through the vehicle's telematics system. This data may be used by Tesla for various purposes, including, but not limited to: providing you with Tesla telematics services; troubleshooting; evaluation of your vehicle's quality, functionality and performance; analysis and research by Tesla and its partners for the improvement and design of our vehicles and systems; to defend Tesla; and as otherwise may be required by law. In servicing your vehicle, Tesla can potentially resolve issues remotely simply by reviewing your vehicle's data log.

Tesla's telematics system wirelessly transmits vehicle information to Tesla on a periodic basis. The data is used as previously described and helps ensure the proper maintenance of your vehicle. Additional Model SModel X features may use your vehicle's telematics system and the information provided, including features such as charging reminders, software updates, and remote access to, and control of, various systems of your vehicle.

Tesla does not disclose the data recorded in your vehicle to any third party except when:

- An agreement or consent from the vehicle's owner (or the leasing company for a leased vehicle) is obtained.
- Officially requested by the police or other authorities.
- Used as a defense for Tesla.
- Ordered by a court of law.
- Used for research purposes without disclosing details of the vehicle owner or identification information.
- Disclosed to a Tesla affiliated company, including their successors or assigns, or our information systems and data management providers.

For additional information regarding how Tesla processes data collected from your vehicle, please review Tesla's Privacy Notice at <http://www.tesla.com/about/legal>.



Data Sharing

For quality assurance and to support the continuous improvement of advanced features such as Autopilot, your Model S/Model X may collect analytics, road segment, diagnostic, and vehicle usage data and send to Tesla for analysis. This analysis helps Tesla improve products and services by learning from the experience of billions of miles that Tesla vehicles have driven. Although Tesla shares this data with partners that contribute similar data, the collected information does not identify you personally and can be sent to Tesla only with your explicit consent. In order to protect your privacy, personal information is either not logged at all, is subject to privacy preserving techniques, or is removed from any reports before being sent to Tesla. You have control over what data you share by touching **Controls > Software > Data Sharing**.

For additional information regarding how Tesla processes data collected from your vehicle, please review Tesla's Privacy Notice at <http://www.tesla.com/about/legal>.

NOTE: Although Model S/Model X uses GPS in connection with driving and operation, as discussed in this owner's manual, Tesla does not record or store vehicle-specific GPS information, except the location where a crash occurred. Consequently, Tesla is unable to provide historical information about a vehicle's location (for example, Tesla is unable to tell you where Model S/Model X was parked/traveling at a particular date/time).

Quality Control

You might notice a few miles/km on the odometer when you take delivery of your Model S/Model X. This is a result of a comprehensive testing process that ensures the quality of your Model S/Model X.

The testing process includes extensive inspections during and after production. The final inspection takes place at Tesla and includes a road test conducted by a technician.

California Proposition 65

 **WARNING:** Operating, servicing and maintaining a passenger vehicle or off-highway motor vehicle can expose you to chemicals including phthalates and lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. To minimize exposure, wear gloves or wash your hands frequently when servicing your vehicle. For more information go to: www.P65Warnings.ca.gov/passenger-vehicle.

 **WARNING:** Certain components of this vehicle such as airbag modules and seat belt pre-tensioners may contain Perchlorate Material. Special handling may be required for service or vehicle end of life disposal. See www.dtsc.ca.gov/hazardouswaste/perchlorate.

 **WARNING:** Battery posts, terminals, and related accessories contain lead and lead compounds. Wash hands after handling.



Reporting Safety Defects

Contacting Tesla

For detailed information about your Model S/Model X, go to <http://www.tesla.com> and log on to your Tesla account or sign up to get an account.

If you have any questions or concerns about your Model S/Model X, in the United States, Canada or Puerto Rico, call 1-877-79TESLA (1-877-798-3752) and in Mexico, call 1-800-228-8145.

NOTE: You can also use voice commands to provide feedback to Tesla. Say "'Fold/unfold the mirrors'.", "'Open/close charge port'.", "'Start/stop charging'.", or "'Show me the tire pressures'." (in the English language) followed by brief comments in your language of choice. Model S/Model X takes a snapshot of its systems, including your current location, vehicle diagnostic data, and screen captures of the touchscreen and instrument panel. Tesla periodically reviews these notes and uses them to continue improving Model S/Model X.

Reporting Safety Defects - US

If you believe that Model S/Model X has a defect which could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying Tesla.

If NHTSA receives similar complaints, it may open an investigation. If it finds that a safety defect exists in a group of vehicles, it may order a recall and remedy campaign. However, NHTSA cannot become involved in individual problems between you, your dealer, or Tesla.

To contact NHTSA, you may call the Vehicle Safety Hotline toll-free at 1-888-327-4236 (TTY: 1-800-424-9153); go to www.safercar.gov; or write to: Administrator, National Highway Traffic Safety, 1200 New Jersey Avenue SE., Washington, DC 20590. You can also obtain other information about motor vehicle safety from www.safercar.gov.

Reporting Safety Defects - Canada

If you believe that your Model S/Model X has a defect which could cause a crash or could cause injury or death, you should immediately inform Transport Canada, in addition to notifying Tesla. To contact Transport Canada, call their toll-free number: 1-800-333-0510.

Certifications of Conformity

FCC and ISED Certification

Component	Manufacturer	Model	Operating Frequency (MHz)	FCC ID	IC
B Pillar Endpoint	Tesla	1948204	13.56 2400-2483.5 6000-8500	2AEIM-1948204	20098-1948204
Interior Endpoint	Tesla	1815669	2400-2483.5 6000-8500	2AEIM-1815669	20098-1815669
Fascia Endpoint	Tesla	1613851	2400-2483.5 6000-8500	2AEIM-1613851	20098-1613851
Vivaldi Endpoint	Tesla	1752108	2400-2483.5 6000-8500	2AEIM-1752108	20098-1752108
Fascia Endpoint	Tesla	1733130	2400-2483.5 6000-8500 315 or 433.9	2AEIM-1733130	20098-1733130
TPMS	Tesla	1472547G	2400-2483.5	2AEIM-1472547G	20098-1472547G



Consumer Information

Component	Manufacturer	Model	Operating Frequency (MHz)	FCC ID	IC
TPMS	Tesla	1849171	2400-2483.5	2AEIM-1849171	20098-1849171
Tire, Pirelli Scorpion ATR	Pirelli	1250241-00-A	2400- 2483.5	2ANX7CPSN1	24121-CPSN1
Tire, Goodyear Wrangler Territory	Goodyear	1250242-00-A	2402-2483.5	YMY-030218	1M02FXD
TCU	Tesla	1727111	--	XMR2020AG525RGL XMR202303AF51Y	10224A-2020AG525R 10224A-202201AF51Y
Wireless Phone Charger	Tesla	WC6	127.72 KHz 13.56 MHz	2AEIM-WC6	20098-WC6
Glovebox BT USB Module	Tesla	1776863	2400-2483.5	2AEIM-1776863	20098-1776863
In-cabin radar*	Tesla	1616631	60000-64000	2AEIM-1616631	20098-1616631

* The in-cabin radar is restricted to factory installation.

The devices listed above comply with Part 15 of the FCC rules and Industry Canada's license-exempt RSS Standard(s) and EU Directive 2014/53/EU.

Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by Tesla could void your authority to operate the equipment.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Radiation Exposure Statement

The products comply with the FCC/ISED RF Exposure for Low Power Consumer Wireless Power Transfer. RF exposure limits are set forth for an uncontrolled environment and are safe for intended operation as described in this manual. The farthest RF exposure demonstrated by compliance was at 20cm and farther from the user's body; set the device to low output power if such function is available.

TCU device has been tested and meets applicable limits for Radio Frequency(RF) exposure. TCU can be installed and is able to operate with a minimum distance of 1 inch (25mm) between the radiator and human body.

Cet équipement est conforme aux limites d'exposition aux rayonnements ISED établies pour un environnement non contrôlé.

Déclaration d'exposition aux radiations

Le produit est conforme à l'exposition RF ISED pour le transfert de puissance sans fil de consommateurs de faible puissance. La limite d'exposition RF fixée pour un environnement non contrôlé est sans danger pour le fonctionnement prévu tel que décrit dans ce manuel. L'exposition RF supplémentaire que la conformité a été démontrée à 20cm et plus de séparation du corps de l'utilisateur ou de mettre l'appareil à la puissance de sortie inférieure si une telle fonction est disponible.

Mexico

IFT-008-SCFI-2015 / NOM-208-SCFI-2016



TPMS, model: 1472547G, IFT#: RCPTE1421-4384

TPMS, model: 1849171, IFT#: TETE1823-09546

La operación de este equipo está sujeta a las siguientes dos condiciones:

1. Es posible que este equipo o dispositivo no cause interferencia perjudicial.
2. Este equipo debe aceptar cualquier interferencia, incluyendo la que pueda causar su operación no deseada.

Radio Frequency Information

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician to help.



CAUTION: This equipment and its antennas must not be co-located or operated with another antenna or transmitter.

Canada

CAN ICES-003 (B)/NMB-003(B)

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radioexempts de licence.

L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Cet équipement est conforme aux limites d'exposition aux rayonnements ISED établies pour un environnement non contrôlé.

Déclaration d'exposition aux radiations

Le produit est conforme à l'exposition RF ISED pour le transfert de puissance sans fil de consommateurs de faible puissance. La limite d'exposition RF fixée pour un environnement non contrôlé est sans danger pour le fonctionnement prévu tel que décrit dans ce manuel. L'exposition RF supplémentaire que la conformité a été démontrée à 20cm et plus de séparation du corps de l'utilisateur ou de mettre l'appareil à la puissance de sortie inférieure si une telle fonction est disponible.



Gen 1

Safety Information

Save These Important Safety Instructions

This document contains important instructions and warnings that must be followed when using your Mobile Connector.

Warnings

-  **WARNING:** Read this entire document before using the Mobile Connector. Failure to do so or to follow any of the instructions or warnings in this document can result in fire, electrical shock, serious injury or death.
-  **WARNING:** Use the Mobile Connector only within the specified operating parameters.
-  **WARNING:** The Mobile Connector is designed only for charging a Tesla vehicle (excluding Tesla Roadster). Do not use it for any other purpose or with any other vehicle or object. The Mobile Connector is intended only for vehicles that do not require ventilation during charging.
-  **WARNING:** Do not use the Mobile Connector's adapters in any outlet for which they are not designed.
-  **WARNING:** Do not use (or discontinue using) the Mobile Connector if it is defective, appears cracked, frayed, broken or otherwise damaged, or fails to operate.
-  **WARNING:** Do not attempt to open, disassemble, repair, tamper with, or modify the Mobile Connector. The Mobile Connector is not user-serviceable. Contact Tesla for any repairs.
-  **WARNING:** Do not use an extension cord, a multi-outlet adapter, a multi-plug, a conversion plug, or a power strip to plug in the Mobile Connector.
-  **WARNING:** Do not disconnect the Mobile Connector from the wall outlet when the vehicle is charging.
-  **WARNING:** Do not plug the Mobile Connector into a damaged, loose or worn power outlet. Ensure that the prongs on the Mobile Connector fit snugly into the wall outlet.
-  **WARNING:** Do not connect the Mobile Connector into a power outlet that is not properly grounded.
-  **WARNING:** Do not expose the Mobile Connector to flammable or harsh chemicals or vapors. Do not use or store the Mobile Connector in a recessed area or below floor level. When using the Mobile Connector in an inside location such as a garage, position the Mobile Connector's main controller at least 18 inches (46 cm) above the floor.
-  **WARNING:** Do not use the Mobile Connector when either you, the vehicle or the Mobile Connector is exposed to severe rain, snow, electrical storm or other inclement weather.
-  **WARNING:** When transporting the Mobile Connector, handle with care to prevent damage to any of its components. Do not subject the Mobile Connector to strong force or impact. Do not pull, twist, tangle, drag or step on the Mobile Connector or any of its components.
-  **WARNING:** Protect the Mobile Connector from moisture, water and foreign objects at all times. If any exist or appear to have corroded or damaged the Mobile Connector, do not use the Mobile Connector.
-  **WARNING:** If rain falls during charging, do not allow rain water to run along the length of charge cable, causing the electrical outlet or charging port to become wet.
-  **WARNING:** Do not plug the Mobile Connector into an electrical outlet that is submerged in water or covered in snow. If, in this situation, the Mobile Connector is already plugged in and needs to be unplugged, turn off the breaker before unplugging the Mobile Connector.
-  **WARNING:** Do not touch the Mobile Connector's end terminals with sharp metallic objects, such as wire, tools or needles. Do not forcefully fold any part of the Mobile Connector or damage it with sharp objects. Do not insert foreign objects into any part of the Mobile Connector.
-  **WARNING:** Do not charge a vehicle that is covered with a non-Tesla approved car cover.
-  **WARNING:** Ensure that the Mobile Connector's charging cable does not obstruct pedestrians or other vehicles or objects.



 **WARNING:** Use of the Mobile Connector may affect or impair the operation of medical or implantable electronic devices, such as an implantable cardiac pacemaker or an implantable cardioverter defibrillator. Before using the Mobile Connector, check with the electronic device manufacturer concerning the effects that charging may have on any such electronic device.

 **WARNING:** Do not use cleaning solvents to clean the Mobile Connector.

Cautions

 **CAUTION:** Do not use private power generators as a power source for charging.

 **CAUTION:** Do not operate the Mobile Connector in temperatures outside its operating range of -22°F to +122°F (-30°C to +50°C).

 **CAUTION:** Store the Mobile Connector in a clean dry place in temperatures between -40°F and +185°F (-40°C and +85°C).

General Information

Specifications

Use only a 120 volt, 208 volt or 240 volt AC supply, 50/60 hertz wall outlet that has a dedicated and properly grounded circuit, and is rated for at least 15 amps.

If possible, use a dedicated receptacle with a single socket. If the receptacle has two sockets, do not plug any other items into the other socket.

The Mobile Connector is 20 feet (6 meters) long. Use an existing outlet or install a new outlet within approximately 13 feet (4 meters) of the vehicle's charge port and at least 18 inches (45 cm) above the ground. The charge port is located on the left side of the vehicle, behind a door that is part of the rear tail light assembly.

 **WARNING:** Do not use an extension cord, a multi-outlet adapter, a multi-plug, a conversion plug, or a power strip to plug in the Mobile Connector.

Charging Time

Charging times vary based on the voltage and current available from the power outlet, subject to various conditions. Charge time also depends on ambient temperature and the vehicle's Battery temperature. If the Battery is not within the optimal temperature range for charging, the vehicle heats or cools the Battery before or during charging.

To estimate the total time it takes to recharge the Battery in hours (from near zero percent to near one hundred percent), divide the battery size (kWh) by power (kW). Different adapters provide different current and power outputs.

While you are charging your vehicle, you can also touch the **Charging** icon to review the charging status information; it displays the time remaining until fully charged at the currently selected charge level.

For more information on how long it takes to charge your Tesla vehicle, go to www.tesla.com/support.

Adapters

The Mobile Connector includes two outlet adapters: one for a standard 120 volt household outlet and a second adapter for a 240 volt outlet. For faster charging, use a 240 volt outlet. Consult an electrician to install a 240 volt outlet where you plan to park your Tesla vehicle.

NEMA 5-15 Adapter



NEMA 14-50 Adapter

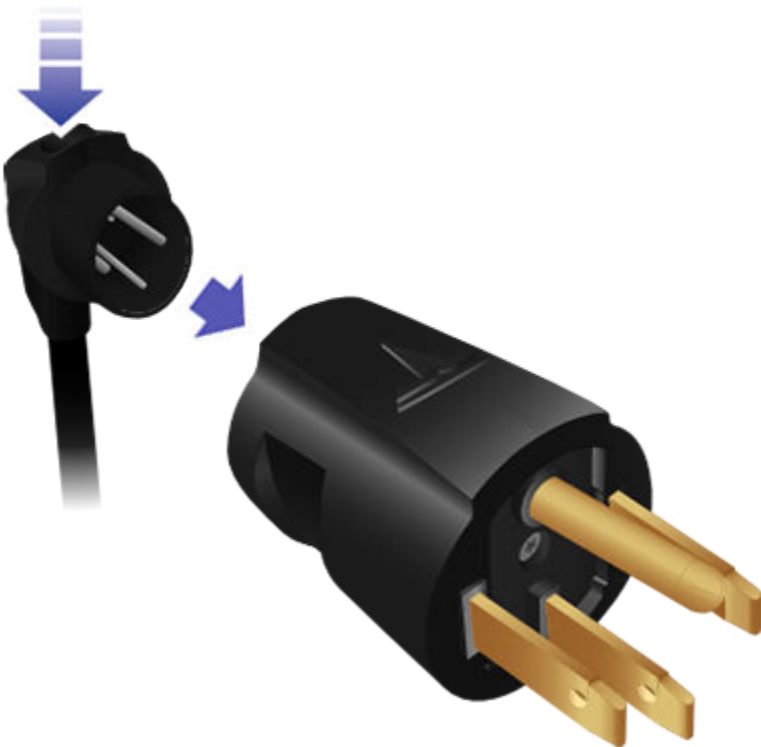


Additional adapters are available for purchase. For details, go to: shop.tesla.com.

NOTE: Images in this document are for demonstration purposes only.

Removing the Adapter

To remove an adapter, push the button on the Mobile Connector's charge cable and pull the adapter from its socket.

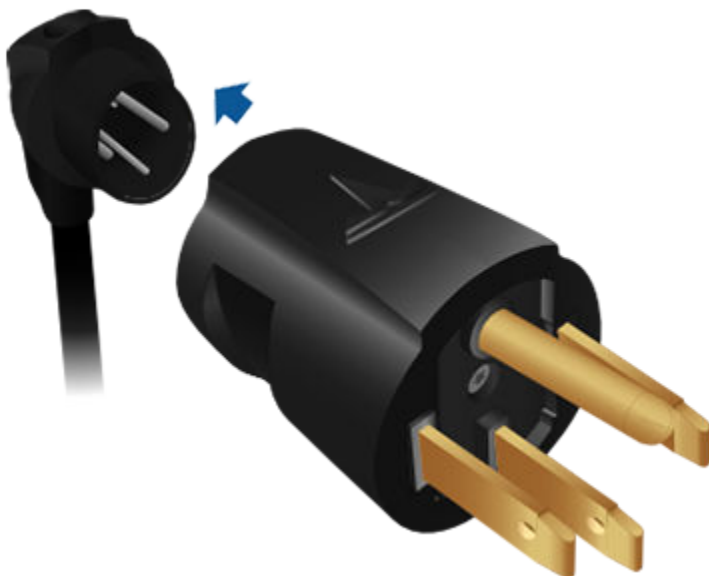


Attaching the Adapter

To attach an adapter, line up the adapter with the Mobile Connector's charge cable and push until it snaps into place.



Mobile Connector



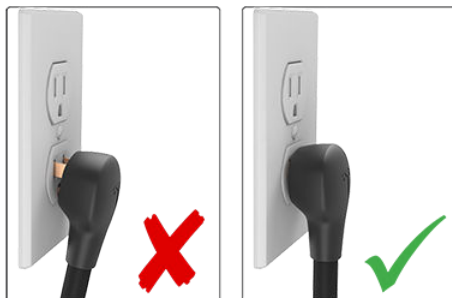
How to Charge

Plugging In

CAUTION: Always inspect the Mobile Connector and adapter for damage prior to each use.

1. Ensure that the Mobile Connector's adapter matches the outlet you want to use.
2. Plug the Mobile Connector's adapter into the power outlet. The adapter should be inserted completely into the power outlet.

NOTE: Second generation adapter shown.



3. With your vehicle unlocked, press the button on the top of the Mobile Connector handle. The charge port door opens.



NOTE: Your vehicle is unlocked when the key is nearby and automatic unlocking is enabled. You can also open the charge port door using any of these methods:



4. Plug the Mobile Connector handle into your vehicle's charge port.
5. When you plug the Mobile Connector into your vehicle, the charge port indicator light pulses green during charging, and the vehicle displays charging information. The display turns off after you close all doors, and the charge port indicator light stops pulsing shortly after you lock the vehicle.

Unplugging

When charging is complete, the light stops pulsing and turns solid green.

1. With the vehicle unlocked, press and hold the button on the Mobile Connector handle, wait for the charge port indicator light to turn white, and then pull the Mobile Connector out of the charge port.

NOTE: To prevent unauthorized unplugging of the charge cable, the vehicle must be unlocked or able to recognize a key nearby before you can disconnect the charge cable.

NOTE: When the latch in the charge port retracts, the Mobile Connector stops supplying power and you can safely unplug it from the vehicle.

2. The charge port door automatically closes after you remove the charge cable.

NOTE: If your vehicle is not equipped with a motorized charge port door, you may need to push the charge port door closed.

Tesla recommends leaving the Mobile Connector plugged into the wall outlet to reduce wear and tear from day-to-day use. If you do not plan to use the Mobile Connector for a while (such as when you leave for vacation), unplug it, and store it in an appropriate location.

For More Information

For more detailed information on how to charge your vehicle (adjust charge settings, view charging status, etc.), refer to the charging section in the vehicle Owner's Manual.

Troubleshooting

Gen 1 Mobile Connector Status Lights

Under normal conditions, when charging is in progress, the Mobile Connector's lights illuminate sequentially, and the red light is off. Identify problems by paying attention to these lights.

NOTE: In some cases, you may need to reset the device by pressing the **RESET** button located on the back.

Front



Back





Mobile Connector

Green Lights	Red Light	What it means	What to do
All lights streaming	Off	Charging is in progress	Nothing. The Mobile Connector is successfully charging.
All on	Off	Power on. Mobile Connector is powered, but not charging, or scheduled charging is enabled	Make sure the Mobile Connector is plugged into the vehicle.
Off	1 flash	Ground fault. Electrical current is leaking through a potentially unsafe path	This should automatically reset in 15 minutes. If not, ensure no one is touching or inside the vehicle, then press the RESET button.
Off	2 flashes	Self check failed	Unplug the Mobile Connector from the vehicle and press the RESET button. Plug the Mobile Connector back into the vehicle. If the error persists, unplug the Mobile Connector from both the vehicle and the power outlet, then plug it back in. When plugging back in, always plug it into the outlet first.
Off	3 flashes	Contact failed	Unplug the Mobile Connector from the vehicle and wait 10 seconds. If the error persists, contact your closest Service Center (https://www.tesla.com/findus).
Off	4 flashes	The ground assurance monitoring circuit has detected loss of ground	Make sure the power outlet is properly grounded. Consider connecting to a different outlet. If uncertain, ask your electrician.
Off	5 flashes	Sense circuit fault	Make sure the Mobile Connector's adapter is attached properly.
Off	6 flashes	Thermal fault	Consider charging in a cooler area, such as indoors or in the shade.
Off	More than 6 flashes	The Mobile Connector may need repair	Contact your closest Service Center (https://www.tesla.com/findus).
Off	Off	Power lost	Unplug the Mobile Connector and check that the power outlet has power.

Questions?

ChargingInstallation@tesla.com

For 24/7 technical support: 1-877-79TESLA (1-877-798-3752)

For home charging installation inquiries: 1-650-681-6133

Gen 2

Safety Information

Save These Important Safety Instructions

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Warnings



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WARNING: The Mobile Connector is designed only for charging a Tesla vehicle (excluding Tesla Roadster). Do not use it for any other purpose or with any other vehicle or object. The Mobile Connector is intended only for vehicles that do not require ventilation during charging.



WARNING: Do not use the Mobile Connector's adapters in any outlet for which they are not designed.



-  **WARNING:** Do not use (or discontinue using) the Mobile Connector if it is defective, appears cracked, frayed, broken or otherwise damaged, or fails to operate.
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-  **WARNING:** Do not connect the Mobile Connector into a power outlet that is not properly grounded.
-  **WARNING:** Do not expose the Mobile Connector to flammable or harsh chemicals or vapors. Do not use or store the Mobile Connector in a recessed area or below floor level. When using the Mobile Connector in an inside location such as a garage, position the Mobile Connector's main controller at least 18 inches (46 cm) above the floor.
-  **WARNING:** Do not use the Mobile Connector when either you, the vehicle or the Mobile Connector is exposed to severe rain, snow, electrical storm or other inclement weather.
-  **WARNING:** When transporting the Mobile Connector, handle with care to prevent damage to any of its components. Do not subject the Mobile Connector to strong force or impact. Do not pull, twist, tangle, drag or step on the Mobile Connector or any of its components.
-  **WARNING:** Protect the Mobile Connector from moisture, water and foreign objects at all times. If any exist or appear to have corroded or damaged the Mobile Connector, do not use the Mobile Connector.
-  **WARNING:** If rain falls during charging, do not allow rain water to run along the length of charge cable, causing the electrical outlet or charging port to become wet.
-  **WARNING:** Do not plug the Mobile Connector into an electrical outlet that is submerged in water or covered in snow. If, in this situation, the Mobile Connector is already plugged in and needs to be unplugged, turn off the breaker before unplugging the Mobile Connector.
-  **WARNING:** Do not touch the Mobile Connector's end terminals with sharp metallic objects, such as wire, tools or needles. Do not forcefully fold any part of the Mobile Connector or damage it with sharp objects. Do not insert foreign objects into any part of the Mobile Connector.
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-  **WARNING:** Ensure that the Mobile Connector's charging cable does not obstruct pedestrians or other vehicles or objects.
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-  **CAUTION:** Store the Mobile Connector in a clean dry place in temperatures between -40°F and +185°F (-40°C and +85°C).



Mobile Connector

General Information

Mobile Connector Component Overview



1. Handle
2. Button on handle
3. Cable
4. NEMA 5-15 Adapter
5. NEMA 14-50 Adapter (if equipped)
6. Mobile Connector controller
7. Status lights

Specifications

Use only a 120 volt, 208 volt or 240 volt AC supply, 50/60 hertz wall outlet that has a dedicated and properly grounded circuit, and is rated for at least 15A.



If possible, use a dedicated receptacle with a single socket. If the receptacle has two sockets, do not plug any other items into the other socket.

The Mobile Connector is 20 feet (6 meters) long. Use an existing outlet or install a new outlet within approximately 13 feet (4 meters) of the vehicle's charge port and at least 18 inches (45 cm) above the ground. The charge port is located on the left side of the vehicle, behind a door that is near the rear tail light assembly.



WARNING: Do not use an extension cord, a multi-outlet adapter, a multi-plug, a conversion plug, or a power strip to plug in the Mobile Connector.

Specifications Reference

Description	Specifications
Voltage	100-240 volt AC single-phase
Maximum Current	32A maximum; controlled by the appropriate adapter
Grid Frequency	50 or 60 Hz
Cable Length	20 ft (6 m) with adapter installed
Mobile Connector Controller Dimensions	Height: 7.1 in (179.8 mm) Width: 3.2 in (81.7 mm) Depth: 1.9 in (47.3 mm)
Weight	5.2 lbs (2.4 kg)
Operating Temperature	-22°F to +122°F (-30°C to +50°C)
Enclosure Type	4X
Ventilation	Not Required

Charging Time

Charging times vary based on the voltage and current available from the power outlet, subject to various conditions. Charge time also depends on ambient temperature and the vehicle's Battery temperature. If the Battery is not within the optimal temperature range for charging, the vehicle heats or cools the Battery before or during charging.

To estimate the total time it takes to recharge the Battery in hours (from near zero percent to near one hundred percent), divide the battery size (kWh) by power (kW). Different adapters provide different current and power outputs.

While you are charging your vehicle, you can also touch the **Charging** icon to review the charging status information; it displays the time remaining until fully charged at the currently selected charge level.

For more information on how long it takes to charge your Tesla vehicle, go to www.tesla.com/support.

Charging Rate Reference

Adapter	Current	Power at 120 Volts
5-20	16A	1.7 kW
5-15	12A	1.3 kW

Adapter	Current	Power at 240 Volts
14-50, 6-50	32A	7.6 kW
14-30, 10-30	24A	5.7 kW



Mobile Connector

Adapter	Current	Power at 240 Volts
6-20	16A	3.8 kW
6-15	12A	2.8 kW

Adapters

The Mobile Connector includes two outlet adapters: one for a standard 120 volt household outlet and a second adapter for a 240 volt outlet. For faster charging, use a 240 volt outlet. Consult an electrician to install a 240 volt outlet where you plan to park your Tesla vehicle.

NOTE: Depending on date of manufacture, your Mobile Connector may not include the NEMA 14-50 adapter. However, one can be purchased from Tesla.

NEMA 5-15 Adapter



NEMA 14-50 Adapter



Additional adapters may be available for purchase. For details, go to: shop.tesla.com.

Removing the Adapter

To remove an adapter, firmly grasp the adapter and pull it from its socket.





Mobile Connector

Attaching the Adapter

To attach an adapter, line up the adapter with the controller of the Mobile Connector and push it into the socket until it snaps into place.

NOTE: The Mobile Connector automatically detects the attached adapter and sets the appropriate current draw.



How to Charge

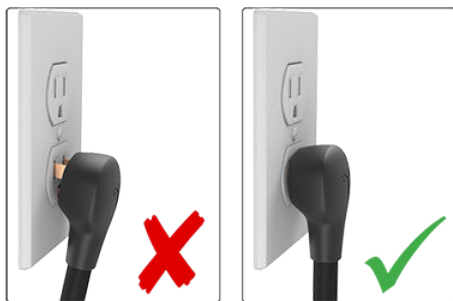
Plugging In



CAUTION: Always inspect the Mobile Connector and adapter for damage prior to each use.

1. Ensure that the Mobile Connector's adapter matches the outlet you want to use.
2. Plug the Mobile Connector's adapter into the power outlet. The adapter should be inserted completely into the power outlet.

NOTE: Second generation adapter shown.



3. With your vehicle unlocked, press the button on the top of the Mobile Connector handle. The charge port door opens.



NOTE: Your vehicle is unlocked when the key is nearby and automatic unlocking is enabled. You can also open the charge port door using any of these methods:

4. Plug the Mobile Connector handle into your vehicle's charge port.
5. When you plug the Mobile Connector into your vehicle, the charge port indicator light pulses green during charging, and the vehicle displays charging information. The display turns off after you close all doors, and the charge port indicator light stops pulsing shortly after you lock the vehicle.



Unplugging

When charging is complete, the light stops pulsing and turns solid green.

1. With the vehicle unlocked, press and hold the button on the Mobile Connector handle, wait for the charge port indicator light to turn white, and then pull the Mobile Connector out of the charge port.

NOTE: To prevent unauthorized unplugging of the charge cable, the vehicle must be unlocked or able to recognize a key nearby before you can disconnect the charge cable.

NOTE: When the latch in the charge port retracts, the Mobile Connector stops supplying power and you can safely unplug it from the vehicle.

2. The charge port door automatically closes after you remove the charge cable.

NOTE: If your vehicle is not equipped with a motorized charge port door, you may need to push the charge port door closed.

Tesla recommends leaving the Mobile Connector plugged into the wall outlet to reduce wear and tear from day-to-day use. If you do not plan to use the Mobile Connector for a while (such as when you leave for vacation), unplug it, and store it in an appropriate location.

For More Information

For more detailed information on how to charge your vehicle (adjust charge settings, view charging status, etc.), refer to the charging section in the vehicle Owner's Manual.

Troubleshooting

Gen 2 Mobile Connector Status Lights

Under normal conditions, when charging is in progress, the Tesla logo lights illuminate sequentially, and the red light is off. Identify problems by paying attention to these lights.



In some cases, you may need to reset the device by unplugging the Mobile Connector from the vehicle or from the power outlet.

Green Lights	Red Light	What it means	What to do
All on for 1 second	Off	Start-up sequence.	Nothing. The Mobile Connector is starting up.
All on	Off	Power on. Mobile Connector is powered and standing by, but not charging.	Make sure the Mobile Connector is plugged into the vehicle.
Streaming	Off	Charging is in progress.	Nothing. The Mobile Connector is successfully charging.



Mobile Connector

Green Lights	Red Light	What it means	What to do
Streaming	1 flash	Charging current is reduced due to high temperature detected in the vehicle connector.	Unplug the Mobile Connector from the vehicle, and then plug it back in. Consider charging in a cooler area, such as indoors or in the shade. If the error persists, contact your closest Service Center (https://www.tesla.com/findus).
Streaming	2 flashes	Charging current is reduced due to high temperature detected in the input plug that connects to the Mobile Connector controller.	Unplug the Mobile Connector from both the vehicle and the wall. Ensure that the adapter is fully inserted, plug the Mobile Connector into the wall, and then plug it into the vehicle. If the error persists, contact your closest Service Center (https://www.tesla.com/findus).
Streaming	3 flashes	Charging current is reduced due to high temperature detected in the Mobile Connector controller.	Unplug the Mobile Connector from the vehicle, and then plug it back in. Consider charging in a cooler area, such as indoors or in the shade. If the error persists, contact your closest Service Center (https://www.tesla.com/findus).
Streaming	4 flashes	Charging current is reduced due to high temperature detected in the wall plug.	Make sure the power outlet is suitable for charging and that the plug is seated correctly. Consider connecting to a different outlet. If uncertain, ask your electrician.
Streaming	5 flashes	Charging current is reduced due to a detected fault in the adapter.	Make sure the Mobile Connector's adapter is attached properly.
Off	1 flash	Ground fault. Electrical current is leaking through a potentially unsafe path.	Unplug the Mobile Connector from the vehicle and then plug it back in. Try a different outlet. If the error persists, contact your closest Service Center (https://www.tesla.com/findus).
Off	2 flashes	Ground loss. The Mobile Connector detects a loss of ground.	Make sure the power outlet is properly grounded. Consider connecting to a different outlet. If uncertain, ask your electrician.
Off	3 flashes	Relay/contactator fault.	Unplug the Mobile Connector from the vehicle and then plug it back in. Try a different outlet. If the error persists, contact your closest Service Center (https://www.tesla.com/findus).
Off	4 flashes	Over- or under-voltage protection.	Make sure the power outlet is suitable for charging and that the plug is seated correctly. Consider connecting to a different outlet. If uncertain, ask your electrician.
Off	5 flashes	Adapter fault.	Make sure the Mobile Connector's adapter is attached properly.
Off	6 flashes	Pilot fault. The pilot level is incorrect.	Unplug the Mobile Connector from the vehicle and then plug it back in. Try a different outlet. If the error persists, contact your closest Service Center (https://www.tesla.com/findus).
Off	7 flashes	Software error or mismatch.	Update the vehicle's software, if available. If an update is not available, contact your closest Service Center (https://www.tesla.com/findus).
Off	On	Self check failed.	Unplug the Mobile Connector from the vehicle then plug it back in. If the error persists, unplug the Mobile Connector from both the vehicle and the power outlet, then plug it back in.
All on	1 flash	Thermal fault.	Consider charging in a cooler area, such as indoors or in the shade. If the error persists, contact your closest Service Center (https://www.tesla.com/findus).
All on	5 flashes	Adapter fault. Charging current is limited to 8A.	Unplug the Mobile Connector from the vehicle. Plug the Mobile Connector back into the vehicle. If the error persists, unplug the Mobile Connector from both the vehicle and the power outlet, then plug it back in.
Off	Off	Power lost.	Unplug the Mobile Connector and check that the power outlet has power.



Questions?

ChargingInstallation@tesla.com

For 24/7 technical support: [1-877-79TESLA \(1-877-798-3752\)](tel:1-877-79TESLA)

For home charging installation inquiries: [1-650-681-6133](tel:1-650-681-6133)



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