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Service Bulletin

PRELIMINARY INFORMATION

Subject: Spark EV New Model Features and Service Guide

Models: 2014 Chevrolet Spark EV

This is a special bulletin to introduce the new 2014 Chevrolet Spark EV. The purpose of this bulletin is to familiarize dealership service personnel with the vehicle's features and describe the actions the Service Department will need to take to ensure they are able to fully service this exciting new model

SAFETY PRECAUTIONS

Danger: To reduce the risk of severe shock and burns, treat all high voltage cables and connectors as though they are energized until it can be verified that they are not. Always perform the High Voltage Disabling procedure prior to servicing any High Voltage component or connection. Personal Protection Equipment (PPE) and proper procedures must be followed.

The High Voltage Disabling procedure will perform the following tasks:

- Identify how to disable high voltage.
- Identify how to test for the presence of high voltage.
- Identify condition under which high voltage is always present and personal protection equipment (PPE) and proper procedures must be followed.

Before working on any high voltage system, be sure to wear the following Personal Protection Equipment:

- Safety glasses with appropriate side shields when within 50 feet of the vehicle, either indoors or outdoors.
- Certified and up-to-date Class "0" Insulation gloves rated at 1000V with leather protectors.
  - Visually and functionally inspect the gloves before use.
  - Wear the Insulation gloves at all times when working with the high voltage battery assembly, whether the system is energized or not.

Failure to follow the procedures exactly as written may result in serious injury or death.

About the Vehicle

The 2014 Chevrolet Spark EV is building on the technology and innovation momentum Volt has brought to Chevrolet. There is no gasoline engine and no gasoline fuel system. It is a five door, four passenger vehicle. The vehicle is built in Korea and shipped to the United States and Canada. The Spark EV is only sold in California and Oregon in the United States. In Canada the Spark EV will be available through the GM fleet program to fleet customers at three locations in Vancouver, Toronto and Montreal.

Electrical Architecture

Global Diagnostic system (GDS2)

Global Diagnostic system (GDS2)

The 2014 Spark EV is utilizing GM's Global A electrical architecture, which is common with the Chevrolet Camaro, Cruze, Equinox, Volt, Sonic, Malibu (2013) and Orlando (Canada). This requires the use of the Global Diagnostic System (GDS2) software and the Multi Diagnostic Interface (MDI) module. Training courses 16048.30W-R2, H (U.S) and 16039.16H (Canada) cover the use of the MDI and GDS2 for diagnostics.

Dealerships requiring assistance in the process of installing GDS2 and the MDI should contact the Techline Customer Support Center@1-800-828-6860 (English) or 1-800-503-3222 (French).

Transmission and High Voltage Battery

Transmission General Description (MME — 1ET35)

The Chevy Spark EV is a fully electric vehicle. The propulsion of the vehicle is achieved by an electric drive transmission. The Transmission is a fully automatic, front wheel differential drive transaxle, variable-speed, electronic-controlled transmission. It consists primarily of an 85kW drive motor, 1 planetary gear set, high voltage electric auxiliary transmission fluid pump and housing, 1 differential gear set, and 2 axles.

The planetary gear set provides the fixed forward and reverse ratio. Changing speed and torque is fully automatic and is accomplished through the use of a drive motor generator power inverter control module located under hood. The drive motor generator power inverter control module receives and monitors various electronic sensor inputs and uses this information to vary the torque output to the drive axles based on throttle position.

This transmission will be on exchange during the launch period. Please refer to the latest Exchange PI or #PIP5131 for details.

Spark EV Transmission Gear Ranges

The transmission may be operated in any of the following gear ranges:

PARK (P)

This position locks the wheels and prevents the vehicle from rolling either forward or backward. PARK is the best position to use when starting the propulsion system for the vehicle. Because the transmission utilizes a shift lock control system, it is necessary to fully depress the brake pedal before shifting out of PARK. For safety reasons, use the electronic (EPB) parking brake in addition to the PARK position.

REVERSE (R)

This position allows the vehicle to be operated in a rearward direction by reversing the rotation of the electric drive motor.

NEUTRAL (N)

This position allows the vehicle to be moved without the park pawl engaged.

DRIVE (D)

Drive range should be used for all normal driving conditions for maximum efficiency and range economy. Drive range allows the drive unit to operate in a forward direction by electrically varying the output torque and speed of the electric drive motor.

LOW (L)

This position is used for the “feel” of engine braking and can be used for the slowing of the vehicle once the throttle is lifted. While in the position the vehicle will slow quicker and use the motor to more aggressively collect energy during a regenerative braking event.

High Voltage Battery — 360V

Drive Motor Battery System

The heart of the Spark EV’s Electric Propulsion system is its advanced LiIon Drive Motor Battery System. This HV battery is liquid cooled for long life and optimum performance. The battery is covered by an 8 yr 100,000 mile (160,000 km) warranty. The HV battery contains 336 cells with a nominal system voltage of 360V direct current. The battery cell groups are joined to form 4 equal sections.

The hybrid/EV battery energy control module will diagnose its own systems and determine when a fault condition is present. Diagnostics and system status is communicated from the hybrid/EV battery energy control module to the hybrid/EV powertrain control module 2 through serial data. The hybrid/EV powertrain control module 2 is the host controller for diagnostic trouble code (DTC) information.

The high voltage drive motor battery is located beneath the vehicle above the rear axle. The battery energy control module, hybrid battery interface control modules 1-8, hybrid battery interface control module 9 or also known as the current sensor module, heater control module, and high voltage contactors are located within the hybrid battery assembly. The hybrid powertrain control module 2 is located under the front driver seat.

The Spark EV’s high voltage drive motor battery will be on exchange through Technical Assistance from June 14th, 2013 thru December 14th, 2013 or the launch period, whichever is longer. The exchange program is designed to gain important feedback on this new High Voltage LiIon battery assembly including validating the service diagnostics, repairs, and requalification procedures. As more repairs are allowed, internal to the high voltage battery pack, the exchange P/I will be updated. Refer to the #PIP5112 for details.

Unique Characteristics and Normal Operation Conditions

Drivers of the Chevrolet Spark EV may experience some operating characteristics that are unique to this vehicle. Due to the quiet nature of the Spark EV Populsion system, certain sounds that may have been masked by the engine's natural harmonics will be apparent. Among them is the electric engine cooling fan, coolant pumps, the air conditioning compressor and the HVAC blower. In addition to those sounds, the drive motor battery cooling system may be operational during charging or when the vehicle is powered down. This may be more evident when charging or during remote cabin conditioning.

12V Operation

The Chevrolet Spark EV uses the 12V battery to "wake up" and initialize control modules. If the vehicle does not power-up, ensure the 12v battery is sufficiently charged to allow for all of the control modules to "wake up" and initialize.

- To prevent excessive drain on the 12 volt system and a potential no start condition, it is recommended that customers allow the vehicle to remain in "run" condition when listening to the radio for extended periods of time.
- It is also important that when exiting the vehicle, ensure the system is powered “off” by verifying the instrument cluster is no longer active and there is no power steering.

Note: The 12 volt battery is located in the front compartment. The battery is an Absorbed Gas Mat (AGM) Absorbed Gas Mat type battery that requires different charging voltages than conventional lead acid batteries. The essential tool (GR-8) EL-50313 has this algorithm built in. When using the GR-8, you must select AGM when prompted or damage to the battery will result.

Brake Pedal Feel and Brake Pedal Vibration

- The Spark EV has a unique brake pedal feel. This is because the hydraulic system is not the lone provider of vehicle deceleration. The electric system blends in regenerative and hydraulic braking forces depending upon vehicle conditions. Over several braking events, the customer may perceive that they are applying a consistent brake force and yet the vehicle may decelerate at slightly different rates. This is a normal operating characteristic to maximize battery efficiency.
- The Spark EV utilizes a braking system that employs a high-speed electric motor/pump. Pump operation can sometimes be heard and felt in the brake pedal as the system sometimes builds pressure.

Whine Sound During Electric Operation

Due to the electric nature of the vehicle, the electric motor may be heard as the vehicle moves. This is a normal operating characteristic.

Hatch Release

There is no rear hatch release switch in the cabin of the Spark. To release the rear hatch use the door unlock feature on the Key Fob or use the key to unlock the hatch. Press the electric switch located directly beneath the Chevrolet Bowtie on the cross car center of the rear hatch lid.

Keys

Due to the uniqueness of the Spark EV ignition/door lock key, special equipment is required to cut a key. If you do not have the required equipment, a cut/coded key can be ordered through GM CC&A. Refer to the latest version of Corporate Bulletin Number 09-00-89-029 (Key Cutting Procedure for Obtaining Replacement Key) for additional information. The remote control transmitter and the key shank are not serviced separately.

Air Conditioning

The Air Conditioning (A/C) system uses R1234YF refrigerant and POE oil, and is similar to conventional vehicles with the exception of an electric compressor and a drive motor battery chiller. The compressor is driven by a high voltage electric motor and provides the necessary refrigerant pressures to meet cooling demands. During conditions with high ambient temperatures and high humidity, the driver may notice a unique high-pitched sound from the compressor. This is considered a normal characteristic, and may be heard when the vehicle is stopped or at low speeds.

Starting the Spark EV

START: With the vehicle in Park or Neutral, press the brake pedal and then press the POWER button to turn on the car.

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The POWER push-button switch is located on the center console just below left of the infotainment screen. The Instrument Cluster and Infotainment Center will light up once the vehicle turns on.

Note: The transmitter must be in the vehicle to turn on the vehicle. If the transmitter battery is weak or in certain zones (especially military zones due to frequency interference), there will be a NO REMOTE DETECTED or PLACE KEY IN TRANSMITTER POCKET when you try to start the vehicle. The REPLACE BATTERY IN REMOTE KEY message may also display at this time.

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To start the vehicle remove the rubber cap on the right side of the steering column and insert the key into the slot and try to restart the vehicle.

Note: Some cell phone chargers may interfere with the operation of the keyless start system and should not be plugged in when starting.

Important: The vehicle will not shift out of Park and will display a Charge Cord Connected message if the vehicle is still plugged in.

Stop/Power Down: Shift to Park and press the POWER button to turn off the car. Power to the audio system and windows will stay active for 10 minutes or until any door is opened.

Charging the Spark EV

The Spark EV is powered by a 21.4 kilowatt hour (kW/h) lithium-ion high voltage battery pack. The high voltage battery is located beneath the vehicle and straddles the rear axle.

It is recommended to keep the vehicle plugged in when temperatures are below 32°F (0°C) or above 90°F (32°C). A CHARGE SOON message indicates that the driving range is getting low and the vehicle needs to be charged. Fully charge the battery at each charge event.

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There are currently two ways to charge the Spark EV; 120v and 240v outlet. Later this year a DC fast charge vehicles will be available.

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The provided 120-volt AC portable vehicle charge cord is located in the storage compartment under the cargo floor.

0.1. With the vehicle parked, press the **Leaf** button on the center stack to review the Charge Level Preference on the touch screen for selected Charge Mode. Select the Change Charge Level screen button if an increased charging level is desired. Use the reduced charge level until a qualified electrician inspects your electrical circuit capacity, or if the electrical circuit or socket capacity is not known. Once the charge level is selected, turn off the vehicle.

Note: The Charge Level selection returns to the reduced level (8 amps) each time the vehicle is cycled on/off.

0.2. Plug the AC charge cord into an electrical outlet. DO NOT USE AN EXTENSION CORD. Charge cord indicators should be green. Where possible, secure the charge cord to the wall.

0.3. Push and release the rear edge of the charge port door, located just in front of the driver’s door, to open the door.

0.4. Plug the charge cord into the vehicle’s charge port.

0.5. The Charge Status Indicator on top of the instrument panel will illuminate green and the horn will chirp when properly connected.

Note: To change the horn chirp setting, go to Charging Alerts in the Vehicle Settings menu.

If the vehicle is locked with the RKE transmitter, the charge cord theft alert is armed automatically after 30 seconds.

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The provided 120-volt portable vehicle charge cord is located in the storage compartment under the cargo load floor. Store the 120–volt portable charger face down and tightly wrapped to ensure the lid will completely close to prevent unwanted noises from entering the cabin.

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- 240V — Stationary mounted to a wall, hard wired by a certified electrician.

Volts	Charging Time
120	Greater than 20 Hrs
240	7 hrs

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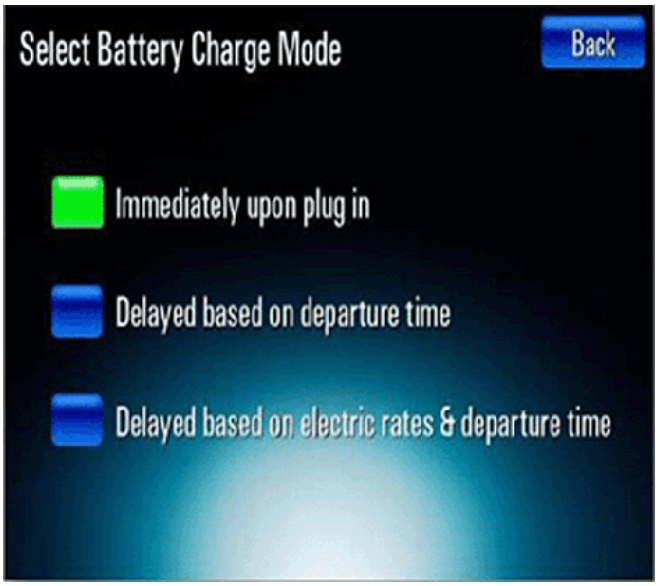
Volts	Charging Time
480	80% in 20 minutes

Programmable Charging Modes

There are three different charge modes:



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0.1. Immediate - The vehicle starts charging as soon as it is plugged in.

0.2. Delayed based on departure time - The vehicle estimates the charging start time considering the programmed departure time for the current day of the week.

0.3. Delayed based on Electric Rate & Departure Time -The vehicle estimates the charging start time based on the utility rate schedule, utility rate preference, and the programmed departure time for the current day of the week. The vehicle will charge during the least expensive rate periods to achieve a full battery charge by the departure time.

To change charge modes, press the leaf button and touch the charging tab at the bottom of the display screen.

Important: To start charging immediately when on delayed mode plug charge cord into the vehicle, unplug and re-plug within 10 seconds.

Charge Status Indicator (Green is Good!)

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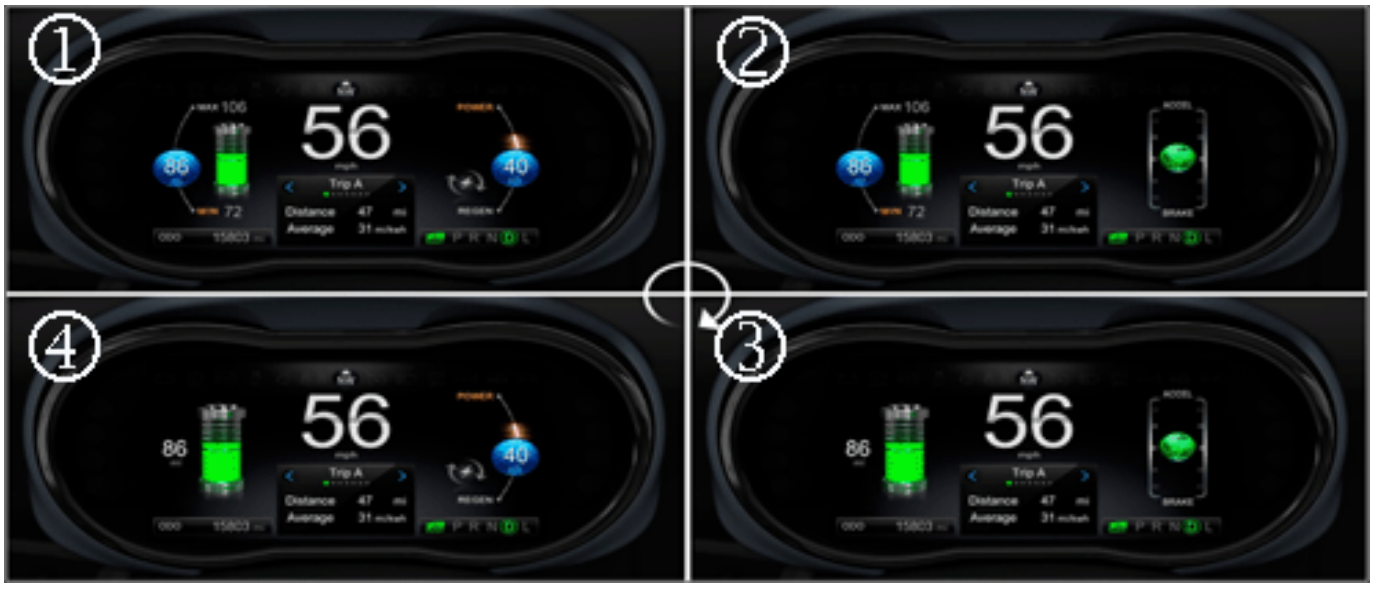
The status of charging events is communicated through visual indications and horn chirps. The charge status indicator is located on the vehicle dash, and glows green or yellow to display the charging status. If there is no indicator, the drive motor battery charger cable is not working properly or not connected.

- Solid green indicates that the vehicle is charging.
- Fast flashing green indicates that charging is delayed.
- Slow flashing green indicates that charging is complete.
- Solid yellow indicates that the vehicle is not able to accept a charge.

Instrument Cluster



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(1) Enhanced with Power

(2) Enhanced with Efficiency

(3) Simple with Efficiency

(4) Simple with Power

The instrument cluster features a configurable LCD screen that can display basic information for EV operation as well as more detailed operating information with additional gauges. To change between the four displays, press the CONFIG button on the left side of Instrument Panel.

The Instrument Cluster also has the Driver Information Center (DIC) menus such as Trip A, Trip B, Vehicle Messages (such as driver door open), Tire Pressure, Units (between Kilometers and Miles), Tutorial Mode (available in Park).

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Turn the Driver Information Center (DIC) controls knob located on the left side of steering wheel on the instrument panel to toggle between the menu options. Push the select button to see details.

Driver Operating Modes

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There are two driver operating modes Normal and Sport mode. The bottom to switch between the two modes is located on the center console behind the shifter. Note: The vehicle will always default to Normal at every key cycle.

Normal (Default)

Use in normal driving conditions for efficient operation; this mode is active each time the vehicle is started.

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Sport Mode

Use the sport mode when more responsive acceleration is desired. When used the efficiency is reduced. To activate the sport mode push the sport mode button. A sport mode light will illuminate on the instrument cluster. Press the button again to return to Normal Mode.

Information Displays

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Leaf Button

The Leaf button displays three tabs: Power Flow, Charging and Energy Information. Press the Leaf button on the center stack and then touch the desired tab at the bottom of the screen to display the information.

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- **Power Flow:** The Power Flow screen shows the power flow between the propulsion battery and the electric drive unit, including Battery Power (Active), Battery Power (Stationary), Regenerative Power Recovery, and Power Off. Each component is highlighted when it is active.

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Figure (1)

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Figure (2)

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Figure (3)

- **Charge Mode:** The Charge Mode screen shows the current charge mode status. The three programmable charge modes are:
  - **Immediately** upon plug-in. Figure (1)
  - Delayed based on **departure time.** Figure (2)
  - Delayed based on electric **rate and departure time** Figure (3)

Note: Charge complete times are estimates and most accurate at moderate temperature.

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- **Energy info:** The Energy Information screen shows how energy is being used since the last full charge, energy use over the last 5 miles (8 km) or 50 miles (80 km), and energy tips to improve energy use and increase economy.

Note: This screen will only reset after the battery has a complete charge.

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Climate Control

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The climate control operates the blower, air delivery modes and discharge temperature based on customer settings and environmental conditions (ambient temperature, sun load, interior temperature). These settings adjust the impact the climate control system has on the vehicle's electric range. The HVAC settings can be adjusted by using the manual control knobs or the infotainment touch screen.

Heated Seats

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The heated seat switches are located under the HVAC control panel on the center console. Push the buttons in to turn on the front seat heaters. Push in to turn off. Heated seats come standard in all Spark EVs.

Note: The seat heaters can be used instead of the cabin heat to keep the occupants warm. The will help increase the efficiency of the battery range.

Infotainment System

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The infotainment system features the MyLink audio system. MyLink features a large 7-inch (178 mm), high-resolution, color touch screen display for most input functionality. The radio integrates selected functionality through voice commands and steering wheel controls. Music, pictures and videos are accessible through the vehicle's display unit. For non-smartphone users, MyLink offers both Bluetooth for phone and Bluetooth audio streaming for music stored on a phone.

Chevrolet MyLink

MyLink uses Bluetooth, USB and 3.5 input jack connection to link a compatible smartphone, cell phone, USB flash drive or portable audio player/iPod™ to the touch screen infotainment display. It offers a variety of entertainment options and smartphone apps. For more information, including device compatibility, visit **www.chevrolet.com/mylink** or call 1-855-4-SUPPORT (1-855-478-7767). In Canada, contact Customer Assistance at 1-800-263-3777 or visit www.gm.ca/gm/english/vehicles/chevrolet/infotainment/ (English) and www.gm.ca/gm/french/vehicles/chevrolet/infotainment/ (French).

Some of the currently available apps are described below. Apps must be downloaded (separate purchase may be required) to the smartphone. Connect the smartphone using a USB cable or Bluetooth.

- **Pandora —** Listen to personalized radio stations based on favorite artists or genres (not available in Canada).
- **Stitcher —** Stream favorite podcasts, radio shows and news.
- **TuneIn —** Listen to music, sports and news stations from all over the world.

- **Siri® Eyes Free —** As a feature of the IPhone® 4s and 5, Siri® can be used in the vehicle to send text messages, set reminders and use other IPhone® functions.
- **BringGo —** Display and control full-function navigation and traffic features. Use to plan a route, search for points of interest, view maps, get traffic data, find the nearest charging station and more. (Separate purchase required).

Bluetooth

Spark EV features Bluetooth® connection to link compatible smartphone, cell phone or portable audio player/iPod™ to the touch screen infotainment display. Before using a Bluetooth-enabled device in the vehicle, it must be paired with the in-vehicle Bluetooth system.

To pair a device, on the touch screen, **touch settings > connection settings> Bluetooth settings > pair device**. Start the pairing process on the device and confirm the code.

Notice: To Canadian Service Agents, the following URL link is a United States website that is presented in English only. Canadian carriers are not listed directly, however when identified the phone model functions are similar.

Note: Not all Bluetooth cellular phones are guaranteed to work with the vehicles Bluetooth system. Bluetooth enabled phones will be tested for vehicle compatibility and a feature compatibility list will be provided via the Bluetooth website: www.gmtotalconnect.com/.

Navigation Features

There are two ways to obtain navigational information, OnStar® Way Point Navigation and BringGo:

OnStar® Way Point Navigation

- Way Point Navigation — Lets customers plan trips using OnStar's® Turn-by-Turn Navigation, finds charge stations along the way and recommends when to charge based on how long it takes to reach the desired destination.
- Uses the Driver Information Center to display navigation information.
- The OnStar® Directions and Connections plan is standard for three years on all Spark EV models.

BringGo

- Display and control full-function navigation and traffic features. Use to plan a route, search for points of interest, view map, get traffic data, find the nearest charging station and more.
- BringGo is downloaded to a compatible smartphone and uses Bluetooth to display on the infotainment screen. (Separate purchase required).

Chevrolet RemoteLink

Mobile Onstar® RemoteLink

Mobile Onstar® RemoteLink

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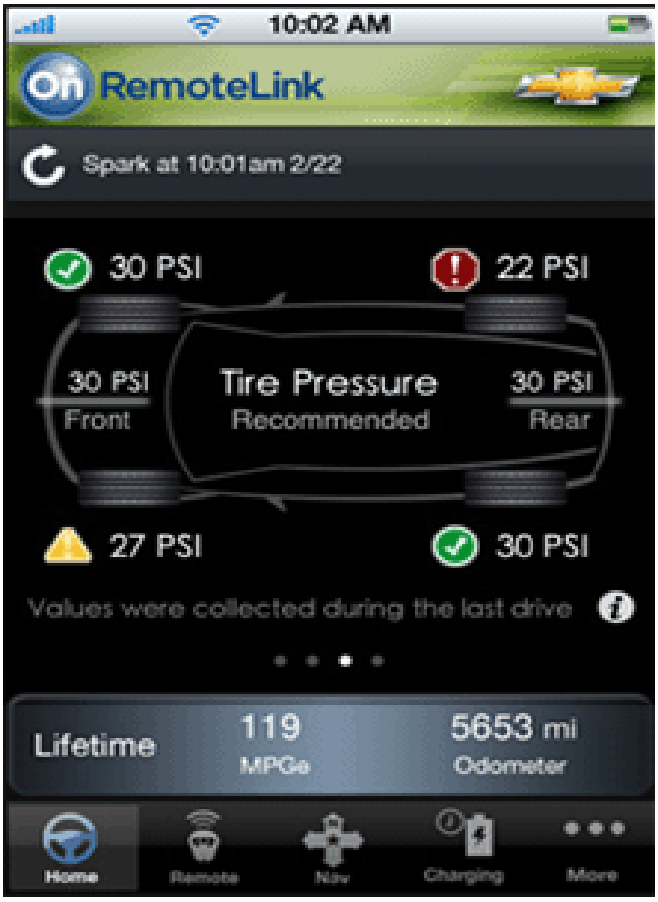

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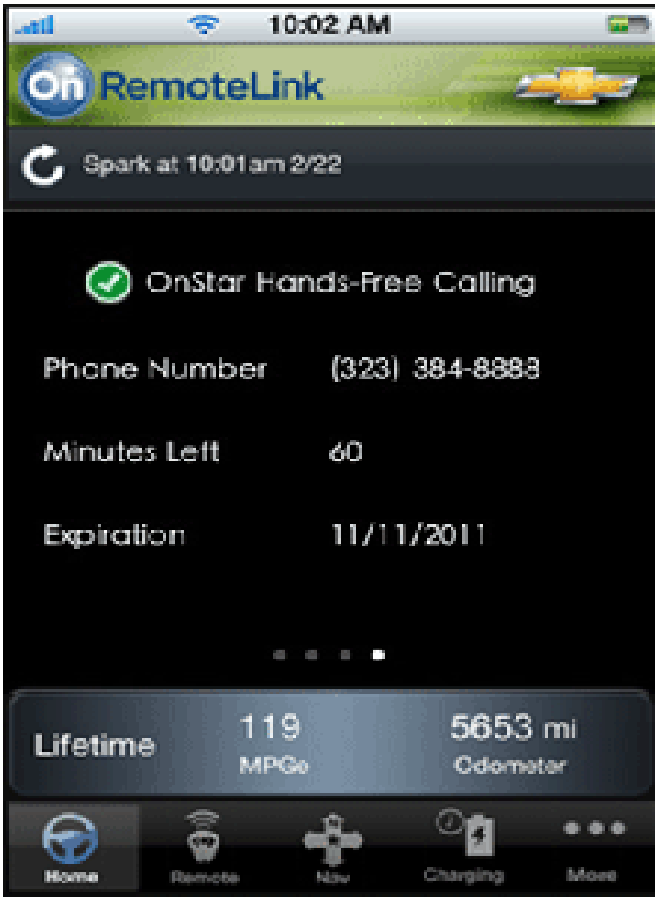

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Spark EV customers will also enjoy a number of OnStar RemoteLink mobile applications first introduced in the Chevrolet Volt. Through the mobile apps, customer can check battery level, range, lifetime miles and miles since last full charge, tire pressure, lock, unlock mode turn by turn navigation and other vehicle details. Review owner's manual for further details.

Personalized Configuration

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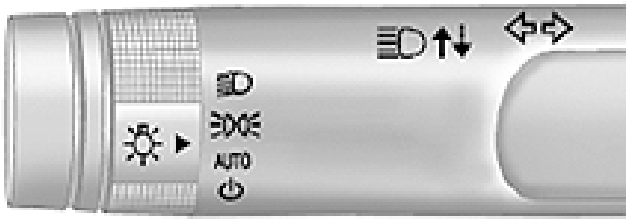
Vehicle features can be customized using the touch screen menus. Personalization menus may include Time & Date Settings, Radio Settings, Connection Settings, Vehicle Settings, Language, Text Scroll, Touch Beep Sound, and Max Startup Volume.

- Press the **Home** button.
- Touch **settings** on the home page.
- Touch the desired screen menu to access the various menus and settings.
- Touch the **BACK** screen button in the upper-left corner to move back within a menu.

Refer to the Owners Manual for complete configuration details.

Pedestrian Friendly Alert Functions (PFAF)



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Manual

- To activate a friendly horn, pull the multifunction switch towards you like you are flashing the headlights.
- The alert will only work in Drive.

Automatic

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- A speaker is mounted in the front of the vehicle.
- A sound is played to alert hearing impaired pedestrians and is audible to leader dogs.
- This function is active in ‘Drive’ and ‘Reverse’ at speeds below 18 MPH.
- The sound is intended to be barely audible in the cabin.

Tires and Wheels

The 2014 battery electric vehicle features low rolling resistance Bridgestone ECOPIA tires. The sizes are different from front to rear, P185/55R15 are in the front and P195/55R15 in the rear to handle the additional weight from the battery pack. Since the tires are different sizes they cannot be rotated.

If the vehicle will be driven in snow or mud all-season tires are recommended. Both front and rear tires must be replaced with all-season tires.

The Spark EV factory-installed tires are designed to operate satisfactorily with loads up to and including the fully rated load capacity when the tires are inflated to the recommended pressures. Important influences on tire life include:

- Correct tire pressures.
- Correct wheel alignment.
- Proper driving techniques.

The Spark EV wheels are 15” painted aluminum wheels and are standard on all models regardless of trim level. The standard alloy wheels are light weight and along with the low rolling resistance tires help contribute to the energy range of the HV battery.

Tire Inflation Kit

The Spark EV features a tire inflation kit instead of a spare tire. In the event of a flat tire, the tire sealer should be used in combination with the air compressor to inflate the tire. The tire inflation kit is located in the rear hatch under the storage compartment, where the spare tire is normally located. Any tire or wheel damage that is not repairable with the tire sealer and air compressor requires that the vehicle be flat-bed carried to the nearest dealership or tire repair facility.

Towing and jump Starting

Disabled Vehicle Towing

- Vehicle must ONLY be flat-bed towed.
- Proper procedures must be followed to prevent vehicle damage.
- Refer to Owner’s Manual for towing specifications.

For Jump Starting using the 12V Battery Under the Hood

Refer to Owner Manual for towing and jump starting specifications.

Note: The high voltage battery **CANNOT** be jump started with either another vehicle or battery charger.

Roadside Assistance

Spark EV customers are automatically enrolled in the Chevrolet Roadside Assistance program, which provides roadside service for 5 years/100,000 miles (160,000 km) at no expense to them.

Chevrolet's Roadside Assistance toll-free number (U.S. 1-888-811-1926 or Canada 1-800-268-6800) is staffed by a team of trained advisors who are available 24/7 to contact a service provider for light service emergency (jump-starts, flat tire and lock-outs) or make arrangements to tow the vehicle to the nearest Spark EV Authorized Chevrolet dealer.

Spark Technical Support

A specialized Technical Assistance (TAC) team has been established to provide diagnostic support for the Spark EV. Dealers are encouraged to report all issues through TAC. To support TAC a field support process has been established and a letter has been sent to the dealerships in the U.S. Dealers are also encouraged to submit Field Product Reports (FPRs) with pictures (when appropriate). Canadian Dealers should report any product issues via a Product Information Report (PIR).

Warranty Information

Chevrolet continues to provide excellent warranty coverage and peace of mind the competition can't match.

Chevrolet's premium warranty protection includes:

- 3-year/36,000-mile (60,000 km) comprehensive warranty coverage.
- 8-year/100,000-mile (160,000 km) transferable Electric Propulsion warranty (includes HV battery).
- 5-year/100,000-mile (160,000 km) powertrain components warranty.
- 6-year/100,000-mile (160,000 km) rust-through warranty.
- 5-year/100,000-mile (160,000 km) coverage for emergency roadside.
- 5-year/100,000-mile (160,000 km) coverage for emergency roadside assistance and courtesy transportation

Special Tools

Essential tools will be shipped to selling and servicing dealers.

Training

In the U.S., training will consist of the following courses.

In Canada, training will be supplied to the dedicated dealer locations involved in the pilot Fleet distribution program only.

2014 Spark EV Specific Course		
Course Number	**Course**	**Delivery Method**
18430.05W	Battery Electric Vehicle Introduction	Web
18420.02W2	High Voltage Energy Storage Systems 2	Web
18420.04W2	Advance Technology Vehicle Transmission 2	Web
11045.07V	R1234yf Refrigerant Tools and Procedures	VOD