

# Part 573 Safety Recall Report

# 21V-035

**Manufacturer Name :** Tesla, Inc.**Submission Date :** MAR 03, 2021**NHTSA Recall No. :** 21V-035**Manufacturer Recall No. :** SB-21-21-001**Manufacturer Information :**

Manufacturer Name : Tesla, Inc.

Address : 3500 Deer Creek Road  
Palo Alto CA 94304

Company phone : 650-413-4000

**Population :**

Number of potentially involved : 134,951

Estimated percentage with defect : 100 %

**Vehicle Information :**

Vehicle 1 : 2012-2018 Tesla Model S

Vehicle Type :

Body Style :

Power Train : NR

**Descriptive Information :** The subject population includes certain Tesla Model S and Model X vehicles equipped with a NVIDIA Tegra 3 processor with an integrated Hynix 8GB eMMC NAND flash memory device (the "eMMC"). It does not include vehicles that have upgraded to the Intel Atom® processor

Production Dates : MAY 31, 2012 - MAR 03, 2018

VIN Range 1 : Begin :

NR

End : NR

 Not sequential

Vehicle 2 : 2016-2018 Tesla Model X

Vehicle Type :

Body Style :

Power Train : NR

**Descriptive Information :** The subject population includes certain Tesla Model S and Model X vehicles equipped with a NVIDIA Tegra 3 processor with an integrated Hynix 8GB eMMC NAND flash memory device (the "eMMC"). It does not include vehicles that have upgraded to the Intel Atom® processor.

Production Dates : SEP 15, 2015 - MAR 03, 2018

VIN Range 1 : Begin :

NR

End : NR

 Not sequential

## Description of Defect :

Description of the Defect : The eMMC flash memory device is rated for an industry-standard 3,000 Program/Erase (“P/E”) cycles. Over time, and depending on usage of the affected component, the eMMC hardware exhausts cycles for each NAND cell. When the eMMC NAND cell hardware reaches lifetime wear, as measured by the number of P/E cycles and remaining available storage capacity, the eMMC controller will no longer be able to maintain the integrity of the filesystem. This wear-out condition can cause failures of the center display software components, and may indirectly cause loss of the rearview camera display, defrost/defog control settings, and exterior turn signal lighting.

FMVSS 1 : NR

FMVSS 2 : NR

Description of the Safety Risk : While we are not aware of any crash, injury, or fatality resulting from this condition, unavailability of the rearview camera display, defrost/defog control settings for purposes of ensuring visibility, and exterior turn signal lighting may increase the risk of a crash. For vehicles for which these functions are not available, drivers can continue to operate the vehicle by performing a shoulder check and using their mirrors when backing, taking care when making turns, and assuring clear visibility when driving.

Description of the Cause : The condition may occur when the eMMC flash memory device reaches the end of its rated life due to regularly accumulated wear.

Identification of Any Warning that can Occur : When the eMMC reaches accumulated lifetime wear, the customer may experience a blank center display. For vehicles operating a firmware older than 2020.48.12, when using reverse, if the rear camera display is not visible, the driver can perform a shoulder check and use the mirrors. If the screen is not visible to control the climate control and defroster settings, the driver will be able to manually clear the windshield. In addition, whenever the customer engages the turn signal stalk, he or she will not observe the visual arrow telltales in the instrument cluster or accompanying audible turn signal.

For most vehicles operating firmware (“FW”) release 2020.48.12 or newer, which as of January 22, 2021, includes 88% of all US vehicles affected by this recall report, customers will receive an alert on the MCU, anywhere from one to six months before the eMMC reaches accumulated lifetime wear, that notifies the customer of the accumulating wear and to schedule a service appointment to replace the eMMC.

## Involved Components :

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Component Name 1 : 8GB eMMC NAND flash memory device

Component Description : NR

Component Part Number : NR

## Supplier Identification :

### Component Manufacturer

Name : SK Hynix Memory Solutions America Inc.

Address : 3103 North First Street  
San Jose California 95134

Country : United States

## Chronology :

- On June 22, 2020, NHTSA opened a Preliminary Evaluation (PE20-010) to investigate the failure of the touchscreen, resulting in loss of the rearview camera, in certain 2012-2015 Tesla Model S vehicles.
- Over the next few months, as part of the investigation, Tesla responded to information requests from NHTSA and participated in a number of virtual meetings with the agency, during which Tesla shared information from a number of sources, including information about the affected vehicle population, consumer complaints, repair invoices, the capabilities of the eMMC flash memory device, the condition of accumulating wear of the eMMC, the functionalities potentially impacted when the eMMC reaches lifetime wear, and all relevant over-the-air (“OTA”) firmware updates that Tesla released or planned to release to improve the accumulated wear rate and restore functionalities that may be impacted.
- In November 2020, NHTSA upgraded the investigation to Engineering Analysis (“EA”) EA20-003.
- On January 13, 2021, NHTSA tentatively concluded that the condition being investigated constituted a defect and presented a safety risk and requested that Tesla initiate a recall and provide a remedy.
- On January 27, 2021, Tesla responded to NHTSA’s request, explaining its view that the eMMC wear condition neither constitutes a defect nor presents an unreasonable risk to safety.
- In the interest of bringing administrative closure to the investigation and to ensure the best ownership experience for our customers, we decided on January 27, 2021, to voluntarily initiate a recall and provide the remedy described below.

## Description of Remedy :

Description of Remedy Program : In 2020, Tesla deployed several OTA firmware updates to address certain functionalities that may be lost when the eMMC reaches accumulated lifetime wear. Specifically, on vehicles equipped with:

- FW release 2020.24.6.11 or newer, the defrosting/defogging settings will maintain the user's selection for the duration of the drive cycle in which the eMMC wears out. On all subsequent drive cycles, the defrosting/defogging settings will automatically set the ambient cabin temperature to 22 degrees C (71.6 degrees F) and initiate windshield defrosting/defogging to ensure sufficient windshield visibility. In addition, all exterior lighting controls and chimes will continue to function normally after eMMC wear-out.
- FW release 2020.48.12 or newer, the rearview camera display will continue to display on the center display after eMMC wear-out and an alert will now appear on the center display anywhere from one to six months before the eMMC reaches accumulated lifetime wear to notify most consumers of the wear status and to inform them that they should contact Tesla Service.

As of January 22, 2021, 88% of all US vehicles affected by this recall report are operating all the aforementioned FW updates.

Based on the above, Tesla believes that the aforementioned OTA FW updates remedy any potential safety risk presented by the eMMC wear-out condition. However, in the interest of ensuring the best possible ownership experience for affected customers, Tesla will also replace the eMMC on all affected vehicles or reimburse any affected customers who previously paid to replace an eMMC, Visual Compute Module ("VCM") daughterboard, or MCU that was determined to be caused by accumulated wear of the eMMC. The eMMC is a component on the VCM daughterboard within the MCU. To be specific, Tesla will replace the VCM daughterboard that has the Hynix 8GB eMMC with a VCM daughterboard that has an enhanced 64GB Micron eMMC, free of charge.

How Remedy Component Differs from Recalled Component : Upon malfunction of the eMMC due to accumulated wear, vehicles not equipped with the aforementioned FW updates or newer may experience loss of the rearview camera display, defrost/defog control settings, and exterior turn signal lighting, whereas vehicles equipped with the aforementioned FW updates or newer will not experience the loss of these functionalities.

As compared to the Hynix 8GB eMMC, the 64GB Micron eMMC provides improved lifetime wear along with greater storage capacity and processing capability.

**Identify How/When Recall Condition was Corrected in Production :** Tesla introduced all aforementioned OTA FW updates in production at or around when the Company deployed them OTA to the existing customer fleet, such that new vehicles were produced with the FW updates prior to customer delivery. In addition, in March 2018, Tesla discontinued the NVIDIA Tegra 3 processor with a Hynix 8GB eMMC in production and introduced the Intel Apollo Lake processor with a 64GB Micron eMMC.

## Recall Schedule :

**Description of Recall Schedule :** All Tesla stores and service centers will be notified on or shortly after January 29, 2021. Owner notification letters will be mailed in accordance with 49 C.F.R. § 577.7.

**Planned Dealer Notification Date :** FEB 01, 2021 - FEB 01, 2021

**Planned Owner Notification Date :** MAR 30, 2021 - MAR 30, 2021

\* NR - Not Reported