

December 20, 2023

DEFECT INFORMATION REPORT

1. Vehicle Manufacturer Name:

Toyota Motor Manufacturing Canada Inc. ["TMMC"]
1055 Fountain Street North, Cambridge, Ontario, Canada N3H 5K2

Toyota Motor Manufacturing, Indiana, Inc. ["TMMI"]
4000 Tulip Tree Drive, Princeton, IN 47670-4000

Toyota Motor Manufacturing, Kentucky, Inc. ["TMMK"]
1001 Cherry Blossom Way, Georgetown, KY, 40324

Toyota Motor Manufacturing Mississippi, Inc. ["TMMMS"]
1200 Magnolia Way, Blue Springs, MS 38828

Affiliated U.S. Sales Company:

Toyota Motor North America, Inc. ["TMNA"]
6565 Headquarters Drive, Plano, TX 75024

Manufacturer of OCS sensor:

Aisin Electronics Illinois, LLC
11200 Redco Drive Marion, IL 62959
Phone: +1-618-997-9800

Country of Origin: U.S.A.

2. Identification of Involved Vehicles and Affected Components:

Based on production records, we have determined the involved vehicle population as in the table below.

Make/Car Line	Model Year	Manufacturer	Production Period
Toyota / Avalon	2020-2021	TMMK	July 2, 2020 through April 20, 2021
Toyota / Avalon Hybrid			July 6, 2020 through May 7, 2021
Toyota / Camry	2020-2022	TMMK	July 1, 2020 through November 9, 2021
Toyota / Camry Hybrid			July 6, 2020 through September 21, 2021
Toyota / Corolla	2020-2021	TMMMS	May 29, 2020 through March 3, 2021
Toyota / Highlander	2020-2021	TMMI	May 20, 2020 through September 30, 2021
Toyota / Highlander Hybrid			June 4, 2020 through September 29, 2021
Toyota / RAV4	2020-2021	TMMC	June 8, 2020 through May 25, 2021
Toyota / RAV4 Hybrid			June 8, 2020 through November 12, 2021
Toyota / Sienna Hybrid	2021	TMMI	October 13, 2020 through March 30, 2021
Lexus / ES250	2021	TMMK	August 5, 2020 through April 16, 2021
Lexus / ES350	2020-2021		July 2, 2020 through April 16, 2021

Lexus / ES300h (Hybrid)	2020-2022		July 6, 2020 through September 21, 2021
Lexus / RX350	2020-2021	TMMC	June 12, 2020 through March 5, 2021
Lexus / RX450h (Hybrid)			June 15, 2020 through March 4, 2021

Applicability	Part Number	Part Name	Component Description
MY2020-2021 Toyota / Avalon, Avalon Hybrid, Corolla, Highlander, Highlander Hybrid, RAV4, RAV4 Hybrid Lexus / RX350, RX450h	89105-0E040	SENSOR SUB- ASSY, WEIGHT DETECTOR, FR IN	OCS sensor
MY2020-2022 Toyota / Camry, Camry Hybrid Lexus / ES250, ES350, ES300h			
MY2021 Toyota / Sienna Hybrid			
MY2020-2021 Toyota / Avalon, Avalon Hybrid, Corolla, Highlander, Highlander Hybrid, RAV4, RAV4 Hybrid Lexus / RX350, RX450h	89107-0E040	SENSOR SUB- ASSY, WEIGHT DETECTOR, RR IN	
MY2020-2022 Toyota / Camry, Camry Hybrid Lexus / ES250, ES350, ES300h			
MY2021 Toyota / Sienna Hybrid			

- Note: (1) Although the involved vehicles are within the above production period range, not all vehicles in this range were sold in the U.S.
- (2) This issue only affects the vehicles equipped with a front passenger seat that contains Occupant Classification System (OCS) sensors which may have been manufactured in a specific period at a certain supplier described in this report. Other Toyota or Lexus vehicles sold in the U.S. are not equipped with those OCS sensors.

3. Total Number of Vehicles Potentially Involved:

Toyota Avalon	: 9,078
Toyota Avalon Hybrid	: 5,762
Toyota Camry	: 202,513
Toyota Camry Hybrid	: 27,093
Toyota Corolla	: 92,746
Toyota Highlander	: 134,861
Toyota Highlander Hybrid	: 58,054
Toyota RAV4	: 249,772
Toyota RAV4 Hybrid	: 76,750
Toyota Sienna Hybrid	: 35,297
Lexus ES250	: 5,374
Lexus ES350	: 20,252
Lexus ES300h Hybrid	: 7,554
Lexus RX350	: 63,766
Lexus RX450h Hybrid	: 11,029
Total	: 999,901

4. Percentage of Vehicles Estimated to Actually Contain the Defect:

Based on the supplier investigation of its manufacturing process, it is estimated that approximately 0.2% of the affected parts could have been manufactured with a cracked capacitor as described in Section 5 below. However, as the NHTSA manufacturer portal requires an integer value be entered, Toyota has entered the value “1” in response to this question in the portal. For the purpose of this report, “1” means “0.2%”.

5. Description of Problem:

The subject vehicles are equipped with a front passenger seat that contains Occupant Classification System (OCS) sensors which provide input to the Supplemental Restraint System (SRS) to determine the deployment strategy of the front passenger airbag, depending on the occupant load. There is a possibility that, during the production process in a specific period at a certain supplier, the OCS sensor Printed Circuit Board (PCB) became deformed, causing a crack to form in a capacitor, which can allow moisture to enter the capacitor over time and result in a short circuit. If this occurs, the SRS warning lamp will illuminate, the “Passenger Airbag OFF” lamp will illuminate, Multi-Information Display (MID) message will display, and the front passenger airbag may not deploy in certain crashes as designed, increasing the risk of injury to an occupant in the seat.

6. Chronology of Principal Events:

Late November 2020 – May 2021

Toyota received three dealer reports indicating SRS malfunction was detected. In each case, the technicians found diagnostic trouble codes related to an OCS sensor malfunction.

Toyota was able to recover and inspect two sets of parts at the supplier. For one set, the supplier did not find any issues with the part. On the other set, the supplier found a front OCS sensor had a short circuit which the supplier indicated may have been caused by items being shoved under the seat, damaging the sensor.

June 2021 – March 2022

Toyota received additional field reports and warranty claims about SRS malfunctions related to an OCS sensor. Parts from these vehicles were recovered and sent to the supplier for further investigation. The supplier found that the sensors had developed a crack in a specific capacitor on the PCB. The production dates of these boards corresponded with a temporary PCB material change at a sub-supplier due to a natural disaster. It was hypothesized that this material change could affect board rigidity. The supplier performed stress analysis tests on the subject parts and confirmed a difference in board rigidity between the original PCB and the PCB with the different material.

In parallel with the analysis of board rigidity, available field data were reviewed. It was determined that the OCS malfunctions were occurring in parts produced by the supplier at the North American manufacturing plant only, even though the same temporary boards were used at a manufacturing plant in Japan. The supplier began investigating the two OCS sensor manufacturing processes, and differences relating to the hot-melt process, which covers the PCB with resin, were found. The process settings in the North America plant had a lower resin temperature and a higher resin injection speed that could affect the amount of PCB strain induced during the process and result in a cracked capacitor that is not detectable at the supplier's final inspection.

April 2022 – May 2022

The supplier performed environmental tests to identify the mechanism of how the cracked capacitor could lead to a short circuit. It was found that the resin on the PCB can absorb moisture over time, which could enter the cracked portion, resulting in a short circuit.

The supplier then initiated studies to determine how many failures were likely to continue to occur in the field. The supplier's failure rate estimate predicted that the number of failures would be small considering the vehicle population, and most OCS sensors produced with the cracked capacitor had already failed in the field and had been covered by warranty. Based on the supplier's testing and estimate, Toyota continued field monitoring and parts collection for further analysis.

June 2022 – July 2022

As a result of additional field occurrences and further analysis of collected parts, the supplier observed that PCB thickness had a larger variation than what was known during the original estimate, which could increase the boards' susceptibility to a cracked capacitor. Based on these observations, refinements were made to the estimate. Considering this second analysis, Toyota still believed the OCS malfunction was one of early failure, with nearly all failures occurring within the warranty period, and continued field monitoring and parts collection for further analysis.

August 2022 – December 2023

As the warranty claims continued to increase and were nearing the number of estimated failures, Toyota continued to inspect recovered parts and confirm that the failures were due to the cracked capacitor with a short circuit resulting from moisture intrusion. As the failure rate in the field was projected to exceed the supplier's estimates, it was judged the OCS malfunctions may not all be early failures.

December 14, 2023

Based on the results of the above investigation and the field monitoring, Toyota decided to conduct a voluntary safety recall campaign for the vehicles identified above.

As of December 14, 2023, based on a diligent review of records, Toyota's best engineering judgement is there are 27 Toyota Field Technical Reports (received between June 2, 2021, and June 16, 2023) and 1,194 warranty claims that have been received from U.S. sources that relate or may relate to this condition which were considered in the decision to submit this report.

7. Description of Corrective Repair Action:

All known owners of the subject vehicles will be notified by first class mail to return their vehicles to Toyota and Lexus dealers. The dealers will inspect the OCS sensors and, if necessary, replace them with an improved one at no cost.

Reimbursement Plan for pre-notification remedies

The owner letter will instruct vehicle owners who have paid to have this condition remedied prior to this campaign to seek reimbursement pursuant to Toyota's General Reimbursement Plan.

8. Recall Schedule:

Notifications to owners of the affected vehicles will occur by February 18, 2024. A copy of the draft owner notification will be submitted as soon as it is available.

9. Distributor/Dealer Notification Schedule:

Notifications to distributors/dealers will be sent on December 20, 2023. Copies of dealer communications will be submitted as they are issued.

10. Manufacturer's Campaign Number:

Toyota [Interim / Remedy] 23TB15 / 23TA15

Lexus [Interim / Remedy] 23LB03 / 23LA03