

September 2, 2021

## DEFECT INFORMATION REPORT

1. Vehicle Manufacturer Name:

Toyota Motor Manufacturing, Texas, Inc. ["TMMTX"]  
1 Lone Star Pass, San Antonio, TX 78264-3413

Affiliated U.S. Sales Company:

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

Manufacturer of Wire Harness:

SEWS NA  
1018 ASHLEY STREET BOWLING GREEN, KY 42103  
Phone: (270) 782-7397

Country of Origin: Philippines

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 / Tundra	2018-2021	TMMTX	June 6, 2017 through March 24, 2021

Applicability	Part Number	Part Name	Component Description
MY2018-2021 Toyota Tundra	82111-0CQ50-A	WIRE, ENGINE ROOM MAIN	Engine Room Main Wire Harness
MY2018-2021 Toyota Tundra	82111-0CQ60-A		
MY2018-2021 Toyota Tundra	82111-0CQ70-A		
MY2018-2021 Toyota Tundra	82111-0CQ80-A		
MY2018-2021 Toyota Tundra	82111-0CK01-A		
MY2018-2021 Toyota Tundra	82111-0CK11-A		
MY2018-2021 Toyota Tundra	82111-0CK21-A		
MY2018-2021 Toyota Tundra	82111-0CK31-A		
MY2018-2021 Toyota Tundra	82111-0CK41-A		
MY2018-2021 Toyota Tundra	82111-0CK51-A		
MY2018-2021 Toyota Tundra	82111-0CK61-A		
MY2018-2021 Toyota Tundra	82111-0CK71-A		
MY2018-2021 Toyota Tundra	82111-0CK81-A		

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 recall applies to the aforementioned Tundra vehicles equipped with halogen headlamps that were designed incorrectly to allow the circuits for both the high and low beam bulb filaments to be energized simultaneously when the high beams are switched on. Tundra vehicles with non-halogen headlamps are not affected. Other Toyota and Lexus vehicles sold in the U.S. are not equipped with the headlamp electrical circuit described below.

3. Total Number of Vehicles Potentially Involved:

Toyota Tundra: 158,489

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

Unknown. Although all of the subject vehicles equipped with halogen headlamps contain the incorrectly designed headlamp electrical circuit described below, whether the issue in each case will lead to a fire that may propagate to other parts of the vehicle depends on the customer usage pattern.

5. Description of Problem:

The subject vehicles are equipped with halogen headlamp electrical circuits that were designed incorrectly to allow the circuits for both the high and low beam bulb filaments to be energized simultaneously when the high beams are switched on. If the high beams are subjected to repeated extended use (e.g., continuously switched “on” in a commercial setting when the vehicle is idling or driving at low speed for extended periods of time and not allowing air flow to cool the headlamp connector), excess heat over multiple days could lead to degradation of the bulb insulation and eventually the bulb connector. This can cause an open headlamp circuit, leading to an inoperative headlamp that can be noticed by the driver and repaired. However, if an open circuit does not occur, there is a possibility that the connector could continue to overheat, resulting in an increased risk of a fire that may propagate to other parts of the vehicle.

6. Chronology of Principal Events:

April 2020 – September 2020

In early April 2020, Toyota received the first field report alleging a thermal event at the headlamp connector on a subject vehicle. The report alleged the headlamp caught on fire. Toyota inspected the vehicle and observed a melted headlamp assembly and headlamp connector. However, the damage did not appear to propagate beyond the headlamp assembly. The parts were recovered and were sent to the respective suppliers for investigation. The bulb supplier investigated the internal structure of the bulb and could not identify any interior shorts or abnormalities within the bulb. The wire harness supplier investigated the recovered parts and observed that the wire harness had been damaged but could not determine what may have caused the damage or if it was related to the allegation. Based on the investigation described above of the recovered parts, the suppliers reported that the aforementioned thermal event was not caused by a manufacturing defect, but were unable to determine the cause of the thermal event.

October 2020 – December 2020

By October, Toyota had received multiple field reports, a majority of which alleged an inoperative bulb and/or a melted headlamp connector; a few alleged a flame at the headlamp assembly. A number of the reports were for commercially used fleet vehicles in Midland, Texas. Toyota hypothesized that there may be unique road conditions or customer usage conditions, so Toyota undertook a field investigation in Midland to conduct various tests on headlamps of customer and Toyota fleet vehicles, including temperature evaluations. Toyota surveyed some of these customers’ driving patterns and conducted duplication testing. During that testing (i.e., following the drive patterns described during the customer surveys which included parking the vehicle with the high beams illuminated for extended periods of time (~1 hour)), Toyota observed that, after approximately 30 minutes of idling the vehicle with the high beams turned on, the temperature of the connector exceeded the maximum design specification temperature of the headlamp connector. At this point, it was unknown what was causing this to occur.

In November, Toyota requested the supplier to conduct duplication testing (i.e., 8 hours per day, daily, for less than 1 week) on the headlamp assembly to attempt to match the observations from the aforementioned field investigation. During duplication testing, initially the test results did not match the field investigation observation of an abnormal rise

in temperature of the headlamp connector in approximately 30 minutes. After Toyota reviewed the supplier's test set up, it was observed that the set up only energized either the high or low beams but not both. After a further review of the previously collected field investigation information, it was observed that this supplier test did not match what was observed in the field because, in those field cases, when the high beams were illuminated, both high and low beams were energized and simultaneously illuminated. Toyota requested the supplier to re-run the tests (this time, 8 hours per day, daily, for approximately 2 – 3 weeks) with both the high and low beams energized. As a result of the additional testing, it was observed that the connector temperature did increase and some minor melting damage to the connector occurred, but it did not result in a flame. Toyota reviewed the headlamp specification and determined that the specification was incorrect as the high and low beam circuits for halogen head lamps should not be simultaneously energized.

#### January 2021 – March 2021

At this point, it appeared that the incorrect wiring specification may be contributing to the inoperative headlamp allegations. However, supplier testing thus far had only observed increased temperatures and minor melting damage. Additional testing for more extended periods of time was needed to determine whether the condition resulting from this incorrect wiring specification could produce a flame that could propagate to other areas of the vehicle. As a result, Toyota began a series of studies to understand the other customers use cases which led to the reports of inoperative headlamps and/or melted connectors or alleged flame at the headlamp assembly occurring in the subject vehicles. As a result of these studies, Toyota was able to identify that some customers were using their high beams for extended periods of time during idle or very slow-moving conditions. Toyota used this new information for additional duplication testing to understand the contributing factors for the aforementioned conditions and to understand the possibility of any flame at the headlamp assembly to propagate outside of the assembly.

#### April 2021 – August 2021

In mid-April Toyota began duplication testing using a bench test with the headlamp assembly and the wire harness connector to determine if a flame could be produced from prolonged activation of the high and low beam circuits under conditions modeling the aforementioned information. Toyota energized the bulbs in both the high and low beams for 8 hours per day. During the following 30 business days, Toyota observed the maximum temperature of the bulb and the connector incrementally increased daily.

In June, on the 31<sup>st</sup> business day of testing a flame was produced at the headlamp connector; however, during this first test, the flame was extinguished. Toyota sent some of the test parts to the supplier for evaluation and continued the testing for the additional test pieces.

Toyota continued the aforementioned testing and was unable to produce another flame in the headlamp assembly with the additional test pieces. As Toyota could not create another flame to observe any potential propagation to the headlamp assembly, Toyota decided to conduct a different test by introducing a flame onto the headlamp connector in order to observe potential propagation within the headlamp assembly. Toyota was able to observe that a flame which begins at the headlamp connector could propagate through the headlamp assembly.

#### August 27, 2021

Although this testing was conducted using only the headlamp assembly and connector,

Toyota's engineering judgement based on the flame propagation was that it was possible for the flame to spread to other parts of the vehicle (e.g., front fender, hood, etc.). Based on the results of the above investigation, Toyota decided, out of an abundance of caution, to conduct a voluntary safety recall campaign.

As of August 24, 2021, based on a diligent review of records, Toyota's best engineering judgement is that there are 18 Toyota Field Technical Reports (12 alleging an inoperative headlamp and/or damage to the headlamp connector (e.g., connectors melting), but no apparent flame, and 6 alleging a flame at the headlamp assembly) and 47 warranty claims (44 alleging an inoperative headlamp and/or damage to the headlamp connector (e.g., connectors melting), but no apparent flame, and 3 alleging a flame at the headlamp assembly) that have been received from U.S. sources that relate or may relate to this condition and which were considered in the decision to submit this report.

7. Description of Corrective Repair Action:

For all involved vehicles, Toyota dealers will modify the engine wire harness assembly and inspect the headlight bulb connector, bulb, and headlight assembly. If one or more of these components is found to be damaged due to this overheating condition, the damaged component(s) will be replaced with new ones as needed.

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 November 1, 2021. 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 September 2, 2021. Copies of dealer communications will be submitted as they are issued.

10. Manufacturer's Campaign Number:

[Interim / Remedy] 21TB06 / 21TA06