TOYOTA

Toyota Motor North America, Inc.

Vehicle Safety & Compliance
Liaison Office
Mail Stop: W4-2D
6565 Headquarters Drive
Plano, TX 75024

March 19, 2020

DEFECT INFORMATION REPORT

1. Vehicle Manufacturer Name:

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

Affiliated U.S. Sales Company:

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

Manufacturer of Engine Control Unit (ECU):

DENSO International America, Inc.
24777 Denso Drive, Southfield, Michigan 48086 U.S.A.
Phone: +1-248-350-7500

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 / Highlander	2020	TMMI	June 24, 2019 through March 4, 2020

Applicability	Part Number	Part Name	Component Description
MY2020 Toyota Highlander	89661-0EB60(FWD) 89661-0EB80(AWD)	Computer Assy, Engine Control	Engine Control Unit (ECU)

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) Other Toyota or Lexus vehicles sold in the U.S. do not use the same engine control unit (ECU) that contains this implementation of the engine stop and start feature with the programming error described below.

3. Total Number of Vehicles Potentially Involved:

38,810

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

100% of the involved vehicles contain an engine control unit (ECU) with this implementation of the engine stop and start feature that has the programming error, described below. Whether the issue in each case will lead to a vehicle stall while driving at higher speeds depends on the driving patterns and vehicle conditions.

5. Description of Problem:

The subject vehicles are equipped with a 3.5 L, V6 (2GR-FKS) gasoline engine that contains a feature that stops and restarts the engine and cuts the fuel supply under certain driving conditions. Due to a programming error arising from the implementation of this feature in the subject vehicles, under certain driving patterns and vehicle conditions, the fuel may not be correctly supplied to the engine resulting in a vehicle stall without warning to the driver. If a vehicle stall occurs, an audible chime will sound and multiple warning indicators will illuminate indicating the engine has stopped. In some instances, a vehicle stall could occur while driving at higher speeds, increasing the risk of a crash.

6. Chronology of Principal Events:

Late January 2020 – Late February 2020

In late January 2020, Toyota received four technical assistance calls from four dealers related to alleged vehicle stalls while driving at lower speeds by customers on 2020MY

Highlander vehicles. Toyota received two additional calls during the first week of February 2020 and received vehicle data (freeze frame data and/or service connect data) from those vehicles. Toyota reviewed the data and observed that it indicated the vehicles had stalled while driving at lower speeds, but based on these data, what may have caused the stall condition could not be determined. Further, all six dealers were unsuccessful in duplicating the alleged stall condition during test drives of those vehicles.

Through February, Toyota continued to monitor this issue and received additional technical assistance calls from dealers. Toyota recovered additional vehicle data (Data Communication Module (DCM) data) from some of the vehicles about which it received technical assistance calls. Toyota observed in the DCM data recovered that a fuel injection stop flag had set prior to the stall condition. Further investigation was needed to determine why a fuel injection stop flag was being activated in these cases. Toyota hypothesized that it could generally be related to the vehicles' drive pattern and/or the fuel injection system. The technical assistance calls received up until this time involving this issue suggested that it occurs mostly at lower speeds. However, one case reported that a vehicle had stalled at a higher speed.

In late February, Toyota received two additional technical assistance calls from dealers in California alleging vehicle stalls at lower speed. Toyota was able to conduct an inspection and test drive these vehicles. During the test drive for one of the vehicles, Toyota followed the drive pattern and route as described by the customer and was able to duplicate the stall condition in the same location the customer alleged a stall. Toyota was also able to duplicate the stall condition on the second vehicle. The data from the vehicle systems being monitored during the test drives and inspections were collected for further investigation.

In parallel with the aforementioned data collection, Toyota reviewed the software programming logic related to the fuel injection stop flag. Taking into account the additional information from the vehicle inspections in California, based on the review of the software programming logic, Toyota hypothesized that the stall condition could be related to the programming for the stop and start feature within the engine control unit (ECU). Toyota then conducted a series of tests to understand under what conditions a stall could occur.

Late February 2020 to Early March 2020

From late February to Early March, Toyota conducted vehicle tests on a dynamometer as well as actual vehicle test drives and was able to duplicate the stall condition using a specific series of steps that were related to the stop and start feature in the vehicle. During these tests, Toyota activated the first stop and start sequence (after ignition on) using the brake and interrupted that sequence by no longer applying the brake and instead applying the accelerator pedal. Afterwards, the next pedal application of accelerator pedal "off" or brake pedal "on" would activate a fuel cut request and turn on the fuel injection stop flag. In these tests, the next accelerator pedal "on" or engine rpm change turned the fuel cut request off but the fuel injection stop flag remained on (due to the programming error

causing the fuel injection amount to be wrongly calculated as zero). As a result, fuel was not supplied to the engine and this resulted in a vehicle stall without warning to the driver. When the vehicle stall occurred, an audible chime sounded and multiple warning indicators illuminated indicating the engine has stopped.

Based on this information, Toyota reviewed the previous cases reported through the technical assistance dealer calls and identified that the condition duplicated in the aforementioned testing may also occur while driving at higher speeds.

March 13, 2020

Based on the results of the above investigation, Toyota decided to conduct a voluntary safety recall campaign.

As of March 9, 2020 based on a diligent review of records, Toyota's best engineering judgement is that there are 8 Toyota Field Technical Reports and 0 warranty claims 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:

All known owners of the subject vehicles will be notified by first class mail to return their vehicles to a Toyota dealer. For all involved vehicles, the dealer will reflash the engine control unit (ECU) at no cost.

Reimbursement Plan for pre-notification remedies

As the owner notification letters will be mailed out well within the active period of the Toyota New Vehicle Limited Warranty ("Warranty"), all involved vehicle owners for this recall would have been provided a repair at no cost under Toyota's Warranty.

8. Recall Schedule:

Notifications to owners of the affected vehicles will occur by May 18, 2020. 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 by March 19, 2020. Copies of dealer communications will be submitted as they are issued.

10. Manufacturer's Campaign Number:

20TA06