

January 13, 2020

DEFECT INFORMATION REPORT

1. Vehicle Manufacturer Name:

Toyota Motor Corporation ["TMC"]
1, Toyota-cho, Toyota-city, Aichi-pref., 471-8571, Japan

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

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

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

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

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

Toyota Motor Manufacturing de Baja California, S. de R. L. de C.V. ["TMMBC"]
Carretera Tijuana Tecate Kilometro 143 y 144
Tijuana, Baja California C. P. 22550

Affiliated U.S. Sales Company

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

Manufacturer of Fuel Pump Assembly:

DENSO CORPORATION
1-1, Showa-cho, Kariya-city, Aichi-pref., 448-8661, Japan
Phone: +81-566-25-5511

Country of Origin: Japan

2. Identification of Involved Vehicles:

Make/ Car Line	Model Year	Manufacturer	Production Period
Toyota/4Runner	2018-2019	TMC	August 1, 2018 through January 31, 2019
Toyota/Avalon	2019	TMMK	
Toyota/Camry	2018-2019	TMMK	
Toyota/Corolla	2019	TMMC, TMMMS	
Toyota/Highlander	2018-2019	TMMI	
Toyota/Land Cruiser	2018-2019	TMC	
Toyota/Sequoia	2018-2019	TMMI	
Toyota/Sienna	2018-2019	TMMI	
Toyota/Tacoma	2018-2019	TMMBC/TMMTX	
Toyota/Tundra	2018-2019	TMMTX	
Lexus/ES	2019	TMC/TMMK	
Lexus/GS	2018-2019	TMC	
Lexus/GX	2018-2019	TMC	
Lexus/IS	2018-2019	TMC	
Lexus/LC	2018-2019	TMC	
Lexus/LS	2018-2019	TMC	
Lexus/LX	2018-2019	TMC	
Lexus/NX	2019	TMC	
Lexus/RC	2018-2019	TMC	
Lexus/RX	2018-2019	TMC/TMMC	

- NOTE: (1) Although the involved vehicles are within the above production period, not all vehicles in this range were sold in the U.S.
- (2) This recall applies to vehicles with specific fuel pumps produced by Denso in which an increased rate of fuel pump failure is observed. Some hybrid models are equipped with the same fuel pump produced by Denso during this production period; however, if fuel pump failure occurs, these vehicles will enter a fail-safe mode, resulting in illumination of warning lights and reduced motive power in which the vehicle can still be driven for certain distances. This condition does not present an unreasonable risk to safety. Toyota intends to conduct a customer satisfaction campaign for these vehicles in the future. Other Toyota and Lexus vehicles are not equipped with same fuel pumps produced in the same production period or are equipped with different pumps.

Applicability	Part Number	Part Name	Component Description
MY2018-2019 Toyota/4Runner	23220-31430	23220- : Pump Assy, Fuel w/Filter 23221- : Pump Assy, Fuel	Fuel Pump Assembly
MY2019 Toyota/Avalon	23220-0P240		
MY2018-2019 Toyota/Camry	23220-0P240		
MY2019 Toyota/Corolla	23220-0T201		
MY2018-2019 Toyota/Highlander	23221-31130		
MY2018-2019 Toyota/Land Cruiser	23220-50271		
MY2018-2019 Toyota/Sequoia	23220-0S011		
MY2018-2019 Toyota/Sienna	23221-31130		
MY2018-2019 Toyota/Tacoma	23220-0P240 23220-0C301		
MY2018-2019 Toyota/Tundra	23220-0S011		
MY2019 Lexus/ES	23220-31330 23220-0P240		
MY2018-2019 Lexus/GS	23220-38041 23221-31130		
MY2018-2019 Lexus/GX	23220-31430		
MY2018-2019 Lexus/IS	23221-31130		
MY2018-2019 Lexus/LC	23221-31130		
MY2018-2019 Lexus/LS	23221-31130		
MY2018-2019 Lexus/LX	23220-50271		
MY2019 Lexus/NX	23221-36030		
MY2018-2019 Lexus/RC	23221-31130		
MY2018-2019 Lexus/RX	23221-31130 23220-31600 23220-0P240		

3. Total Number of Vehicles Potentially Involved:

Toyota 4Runner	: 72,734
Toyota Avalon	: 8,229
Toyota Camry	: 7,271
Toyota Corolla	: 136,343
Toyota Highlander	: 113,932
Toyota Land Cruiser	: 1,949
Toyota Sequoia	: 6,101
Toyota Sienna	: 41,532
Toyota Tacoma	: 130,301
Toyota Tundra	: 46,112
Lexus ES	: 23,950
Lexus GS	: 3,042
Lexus GX	: 15,481
Lexus IS	: 7,484
Lexus LC	: 717
Lexus LS	: 3,381
Lexus LX	: 3,476
Lexus NX	: 23,908
Lexus RC	: 2,155
Lexus RX	: 47,443
Total	: 695,541

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

Unknown. Toyota is unable to provide an estimate of the percentage of vehicles to actually contain the defect. Whether the issue in each case will lead to fuel pump failure can depend on many variables, such as vehicle application and geographic location.

5. Description of Problem:

The subject vehicles are equipped with a low-pressure fuel pump, located in the fuel tank, that supplies fuel pressure to the fuel injection system. These fuel pumps contain an impeller that could deform due to excessive fuel absorption. Although the cause is unknown, if impeller deformation occurs, the impeller may interfere with the fuel pump body, and this could result in illumination of check engine and master warning indicators, rough engine running, engine no start and/or vehicle stall while driving at low speed. However, in rare instances, vehicle stall could occur while driving at higher speeds, increasing the risk of a crash.

6. Chronology of Principal Events:

June 2019 – August 2019

In early June 2019, Toyota observed an increase in field reports related to the low pressure fuel pumps produced by the supplier. These reports indicated that customers alleged rough engine running, engine no start, and/or loss of motive power while driving at low speed (less than 20 mph) and occurred more commonly in areas of the southern U.S. with hotter climates.

In mid-June, Toyota began an investigation, including the recovery of failed parts from the field. The supplier began inspection and analysis of the recovered parts and identified impeller deformation inside the fuel pump assembly due to more fuel absorption into the impeller material, with signs of binding/interference between the pump impeller and the pump casing/cover. A further analysis of failed impellers was conducted and it was confirmed that the failed impellers had a lower density. Generally, impellers with lower density are more susceptible to fuel absorption.

As part of ongoing parts analysis, an additional observation was made of cracking to the impeller surface. To understand the relationship between surface cracks and pump failure, Toyota began an investigation to identify factors potentially contributing to cracking.

September 2019 – December 2019

As part of the investigation, Toyota hypothesized that solvent used during the manufacturing process was a factor in fuel pump impeller cracking and began duplication testing. During the testing, cracks occurred on the surface of the impellers as the solvent dried over time. However, the duplication test could not match impeller crack that was observed in the parts recovered from the field.

Toyota also conducted vehicle testing to understand potential failure modes of incidents identified in the field. Starting with a review of operation parameters to support duplication, recovered failed parts were installed in a Toyota fleet vehicle. After confirming that no DTC was initially present, the vehicle was parked for a period of time and then started; low fuel pressure was detected. Shortly thereafter, the check engine light and master warning were displayed. The vehicle was then driven until a rough running condition/loss of power became noticeable, and vehicle speed was gradually reduced until low speed engine stall occurred. The vehicle returned to normal operation immediately after restarting it.

This evaluation suggested that this issue occurs at lower speeds, but Toyota continued to investigate whether this condition could lead to a loss of motive power at higher speeds. As part of this investigation, a manual review of available freeze frame data from all field incidents was done. Based on a detailed analysis of these data, three alleged cases were identified where loss of motive power occurred at higher speed (>20mph).

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While continuing its investigation into the cause of impeller swelling, Toyota could not rule out the possibility of loss of motive power at higher speeds in the subject vehicles. Therefore, the decision was made to conduct a voluntary safety recall campaign.

As of January 7, 2020, based on a diligent review of records, Toyota's best engineering judgment is that there are 66 Toyota Field Technical Reports and 2,571 warranty claims that have been received from U.S. sources that relate to the fuel pump failure investigated in this chronology and which were considered in the decision to submit this report.

7. Description of Corrective Repair Action:

The final corrective repair action is still under study. When the remedy is available, it will be made at no charge to the owners.

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 March 13, 2020. A copy of the draft owner notification letter will be submitted as soon as available.

9. Distributor/Dealer Notification Schedule:

Notifications to distributors/dealers will be sent on January 13, 2020. Copies of dealer communications will be submitted as they are issued.

10. Manufacturer's Campaign Number:

	<u>Interim</u>	<u>Final</u>
Toyota:	20TB02	20TA02
Lexus:	20LB01	20LA01