

February 14, 2018

## DEFECT INFORMATION REPORT

1. Vehicle Manufacturer Name:

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

Affiliated U.S. Sales Company:

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

Manufacturer of High Pressure Fuel Pump

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
Lexus/ GS F	2016 - 2018	TMC	July 14, 2015 through December 6, 2017
Lexus/ LC500	2018		October 11, 2016 through December 5, 2017
Lexus/ RC F	2015 - 2018		June 10, 2014 through December 8, 2017

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) The involved vehicles are equipped with a 5.0L V8 2UR-GSE gasoline engine, which contains two high pressure fuel pumps of a specific design. Other Toyota or Lexus vehicles sold in the U.S. are not equipped with these high pressure fuel pumps.

Applicability	Part Number	Part Name	Component Description
All Models	23221-36020	Pump Sub-assembly, Fuel	High Pressure Fuel Pump

3. Total Number of Vehicles Potentially Involved:

Lexus GS F : 1,917  
Lexus LC500 : 3,315  
Lexus RC F : 4,673  
Total : 9,905

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 damage of the pulsation damper and the pump cover, creating an unreasonable risk to safety, depends on each vehicle's operating conditions.

5. Description of Problem:

The subject vehicles are equipped with a 5.0L V8 2UR-GSE gasoline engine with two high pressure fuel pumps. There is a possibility that the pulsation damper in one of the high pressure fuel pumps could become damaged due to resonance of the fuel pressure under specific operating conditions. This damage can lead to abnormal noise/vibration and, over time, can cause the pump cover to develop a fatigue crack. If the vehicle is operated continuously under these conditions, the crack could expand and fuel may leak. A fuel leak in the presence of an ignition source can increase the risk of a vehicle fire.

6. Chronology of Principal Events:

May 2017 – Mid-June 2017

In May 2017, Toyota received a dealer report from the U.S. market indicating fuel leakage from a high pressure fuel pump installed in the right side cylinder bank. The high pressure fuel pump was returned and investigated. A crack was found through the pump cover. In addition, the pulsation damper, which is assembled in the high pressure fuel pump to reduce fuel pressure pulsation (and also absorb the initial fuel pressure), had worn and developed a crack through the contact portion of the outer circumference of the damper (damper collar) to the damper fixing brackets. Detailed observation of the cracks revealed that both the pump cover and pulsation damper cracks had expanded from the inside and their fracture surfaces had shown fatigue failure. Toyota began investigation of the cause of the wear and crack on the damper, and also the effect of the damaged damper on the pump cover.

### June 2017-Early February 2018

The initial investigation involved measurement of the pressure applied to the pulsation damper. It was confirmed that, because this engine is equipped with two high pressure fuel pumps (one on each right and left cylinder bank), the fuel pressure in the fuel pump could resonate under a certain engine speed, causing the fuel pressure pulsation to become larger. This larger fuel pressure pulsation could cause the damper collar to slide between upper and lower fixing bracket and wear. However, during the durability testing, the through crack observed in the damper of the returned part was not duplicated under the larger fuel pressure pulsation measured during the aforementioned confirmation.

In parallel, various investigations were conducted to determine whether the pump cover could develop a crack due to the damaged damper. It was found that, if the pulsation damper assembled in the high pressure fuel pump for the right side cylinder bank has damage, the damper will lose its fuel pressure absorbing function, and the high fuel pressure generated by the pump will be applied directly to the pump cover. If unabsorbed high fuel pressure is generated repeatedly, the pump cover could develop a fatigue crack. This condition was found to effect only the right side high pressure fuel pump. The high pressure fuel pump for the left side cylinder bank is closer to the diverging point of the fuel pipe, and it was confirmed that the high fuel pressure can be released toward the fuel tank and absorbed without fatigue by the rubber hose located immediately behind the diverging point of the fuel pipe. Therefore, the left side fuel pump cover would not develop a fatigue crack as a result of a pulsation damper being damaged by the resonance of the fuel pressure pulsations.

The investigation also found that the fuel volatility may affect the fuel pressure pulsations. During various testing, it was confirmed that the fuel pressure pulsation could become unexpectedly large if high-volatile fuel was used at low temperature, causing the damper collar to develop a crack.

### February 8, 2018

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

As of February 6, 2018, based on a diligent review of records, Toyota's best engineering judgment is that there are 4 Toyota Field Technical Reports (including 1 unconfirmed Field Technical Report) and 12 warranty claims (including 5 unverified claims) that have been received from U.S. sources that relate to or may relate to the high pressure fuel pump failure caused described above.

### 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 Lexus dealer. The dealers will replace the high pressure fuel pumps with improved ones.

Reimbursement Plan for pre-notification remedies

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

8. Recall Schedule:

Notifications to owners of the affected vehicles will occur by Early April, 2018. A copy of the draft owner notification letter will be submitted as soon as available.

9. Distributor/Dealer Notification Schedule:

Notifications to distributors/dealers were sent on February 13, 2018. Copies of dealer communications will be submitted as they are issued.

10. Manufacturer's Campaign Number:

[Interim]/[Final]: J2B/JLB