

March 28, 2018

DEFECT INFORMATION REPORT

1. Vehicle Manufacturer Name:

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

Affiliated U.S. Sales Company:

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

Manufacturer of Engine Piston

Aisin Automotive Casting Tennessee, Inc.
221 Frank L Diggs DR Clinton, Tennessee 37716
Phone: +1-865-457-4581

Country of Origin: USA

2. Identification of Involved Vehicles:

Make/Car Line	Model Year	Manufacturer	Production Period
Toyota / Camry	2018	TMMK	December 21, 2017 through January 11, 2018

Applicability	Part Number	Part Name	Component Description
MY2018 Toyota Camry	13211-F0010	Piston	Engine Piston

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 2.5L, 4 cylinder A25A-FKS engine, which contains the piston(s) produced at a supplier in the U.S. during a specific period with larger diameter than the specification. Some 2018MY Camry vehicles produced in Japan and exported to the U.S. are equipped with the same engine which contains pistons produced at a supplier in Japan that were produced with the correct diameter specification. Other Toyota or Lexus vehicles sold in the U.S. are not equipped with the same engine.

3. Total Number of Vehicles Potentially Involved:

1,730

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

No more than 19%. There are 328 pistons produced during the affected shifts which are suspected in the population of vehicles potentially involved. It is probable that there are vehicles with more than one out-of-specification piston per engine and also probable that there are vehicles with no out-of-specification pistons at all.

5. Description of Problem:

The subject vehicles are equipped with a 2.5L, 4 cylinder A25A-FKS engine. During a routine quality confirmation (requiring machining tool repositioning) at the supplier plant for the pistons used in these engines, a machining tool was not returned to the correct position, resulting in pistons being produced with a diameter larger than the design specification. Engines assembled with pistons larger than the specified diameter can cause the vehicle to run rough, create an abnormal sound, emit smoke from the exhaust, and/or illuminate warning lights and messages. This condition may also result in a reduction of power or stopping of the engine. A vehicle's engine which stops while driving at higher speeds can increase the risk of a crash.

6. Chronology of Principal Events:

January 2018

Between January 2nd and 4th, TMMK, the vehicle assembly plant, found sixteen Camry vehicles equipped with A25A-FKS engines built at TMMWV that had smoke emitting from the exhaust, rough idling, and/or specific cylinder misfire diagnostic trouble codes (DTCs). (Engines for Camry models are built at both TMMK and TMMWV, a separate engine production facility.) Based on the symptoms and DTCs, the engines were inspected, and damage was found on some cylinders and pistons, with pistons produced on specific shifts of December 18-19, 2017.

Three pistons, produced during the affected shifts, were returned to the supplier for investigation. It was confirmed that piston diameters were larger than the specification. It was theorized that thermal expansion of these oversized pistons during operation of the engine could reduce the clearance between the piston and cylinder to a point that would create interference with the cylinder. A line side dimension check was implemented at both TMMWV and TMMK engine plants for all pistons being installed, as well as a dimension check of all pistons prior to shipment from the piston supplier. In addition, vehicles which could have the engines with the suspect pistons and were still in the control of Toyota were held for inspection of the piston production date codes.

A review of the piston machining process was conducted to identify the potential cause of the oversized pistons. Regularly collected piston dimension audit data was reviewed from the shifts before and after the affected production shifts. If a machining tool is not correctly repositioned following a routine quality check which requires offsetting the machining tool, pistons can be machined with an oversized diameter (repositioning of the tool is a manual data entry process by the tool operator). It was determined that only pistons from the second shift of December 18th and the first shift of December 19th on one production line may have the oversized condition due to incorrect repositioning of the machine tool.

Part orders and records of shipments to the engine assembly plants were reviewed. A suspect engine production range was created based on when the affected parts were believed to have been used in engine assembly. At this time, only engines assembled at TMMWV were suspect. Using the suspect engine range in reference to vehicle production records, a suspect affected VIN population was established.

Late January to Mid-March 2018

On January 25, based on a dealer report, Toyota identified a 2018 Camry with an A25A-FKS engine built at TMMK, which had an illuminated engine oil warning light caused by low oil level. Later inspection of the vehicle found that the low oil level was due to oil consumption caused by cylinder wear created by oversized pistons produced during the affected shifts. Further analysis of the suspected engine production population was conducted, and it was concluded that TMMK-built engines may have also been assembled with oversized pistons. Any vehicles built with engines from the expanded suspect population, which had not yet been delivered to dealers, were held for inspection. Engines were replaced in vehicles which had pistons produced during the affected shifts.

To ensure the associated production error would not reoccur, on February 8th, the piston supplier developed an automated process to ensure the machining tool would be correctly repositioned following the routine quality checks.

An analysis of the potential consequences of the use of oversized diameter pistons was also undertaken. From a sampling of pistons produced during the affected shifts, the four largest pistons were installed in an engine to simulate what was believed to be a worst-case engine. Bench testing was conducted to understand what conditions would result from an engine operated with oversized pistons and how the conditions would progress. Conditions observed from the testing included oil consumption, rough running, smoke from the exhaust, and noise.

On February 25, a Field Technical Report was received which documented an engine stopping without the ability to restart. An inspection of the vehicle confirmed that it was built with an engine assembled with three pistons from the affected production shifts. Two of the cylinders had significant damage and compression too low for engine operation. This was the first case in which an engine failure condition had been confirmed in the field on a vehicle containing the affected oversized pistons.

Based on the investigation and field information, it was concluded that the oversized piston could interfere with the cylinder due to the thermal expansion of the piston during the operation of the engine, causing the cylinder and piston to wear. If this were to occur, oil consumption increases, leading to illumination of the oil warning light, smoke being emitted from the exhaust, the engine running roughly, and the creation of abnormal noise. The cylinder and piston may become significantly damaged, and compression may become too low for engine operation, resulting in stopping of the engine.

March 22, 2018

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

As of March 12, 2018, based on a diligent review of records, Toyota's best engineering judgment is that there are 5 Toyota Field Technical Reports and 1 warranty claim (with 4 additional claims expected to be received regarding the other field reports) that have been received from U.S. sources that relate to or may relate to engine issues caused by pistons with oversized diameters.

7. Description of Corrective Repair Action:

All known owners of the involved vehicles will be notified via first class mail to return their vehicles to a Toyota dealer. Toyota dealers will inspect the piston production date code and, if an engine contains a piston from the affected production period, the engine assembly will be replaced with a new one.

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 the end of May, 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 will be sent on March 28, 2018. Copies of dealer communications will be submitted as they are issued.

10. Manufacturer's Campaign Number:

[Interim]/[Final]: J1M/J0M