

July 20, 2017

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 Sales, USA, Inc. ["TMS"]
19001 South Western Avenue, Torrance, CA 90501

Manufacturer of Drive Shaft Assembly

GKN Driveline
6400 Durham Road, Timberlake, North Carolina 27583
Telephone: +1-336-364-76200

Country of Origin: USA

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/ Camry HV Avalon HV	2016	TMMK	January 20, 2016 through February 3, 2016

Part Number	Part Name	Component Description
43410-06A20	Shaft Assy, FR Drive, RH	Front Driveshaft
43420-06A70	Shaft Assy, FR Drive, LH	

- 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) Only vehicles equipped with certain drive shafts (part number 43410-06A20, 43420-06A70) produced on January 15, 2016 at the supplier may be affected; other vehicles are not affected.
- (3) Although only vehicles equipped with the certain drive shafts produced on January 15, 2016 may be affected, the beginning date of the vehicle production period reflects the earliest possible arrival of the parts to TMMK and the end was identified by determining the final vehicle which could potentially contain the last part from the suspect shipping container from the supplier.

3. Total Number of Vehicles Potentially Involved:

671

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

Unknown

5. Description of Problem:

The front drive shaft assembly of the subject vehicles contains a tripod joint that is pressed into position and secured with a snap ring. The drive shaft assembly may have been misassembled, which could result in the dislocation of the snap ring. If this occurs, the vehicle may experience a vibration and subsequently the tripod joint could separate, causing a loss of propulsion while driving and an inoperative transmission park system. Loss of propulsion while driving at higher speeds could increase the risk of a crash. Additionally, if the driver exits the vehicle without applying the parking brake, the vehicle could roll away with the transmission in park, increasing the risk of a crash.

6. Chronology of Principal Events:

May 2016 - September 2016

In May 2016, Toyota received a field technical report from the U.S. market indicating a Toyota Avalon Hybrid had vibration when accelerating and when slowing down. The dealer conducted a test drive. During the test drive, the vehicle began to lose power. Further, after

putting the vehicle into “Park” and releasing the brake, the vehicle began to roll backwards. The vehicle was inspected, and it was found that the snap ring (“C” shape clip) that holds the joint on the drive shaft had dislodged, allowing the joint to separate.

Toyota recovered the parts from this vehicle and began an investigation of the parts and the vehicle assembly process. Toyota was unable to identify any abnormalities in that assembly process. The production history of the parts at the supplier was also investigated. However, no issues were identified that could have caused the snap ring to dislodge from the drive shaft. Because it was unclear how the part was handled by the dealer during part recovery and Toyota had not received reports of any similar incidents, Toyota decided to monitor the field.

October 2016 - March 2017

In October 2016, Toyota received a report from a dealer describing noise, no vehicle propulsion, and vehicle rolling while in “Park”. The production date of this vehicle was the same as the first reported vehicle. Toyota recovered the subject parts for further investigation. Toyota requested the supplier to begin an investigation of the recovered parts and their production process.

Toyota received information from the supplier confirming that the two recovered parts were built within 4 pieces of one another. It was also determined that a component (tripod joint) was installed upside down during the supplier’s assembly process. In addition to the tripod joint being installed upside down, it was found that a subsequent process in the assembly of the parts may have used worn tooling that could have deformed the snap ring. Although there was a possibility of snap ring damage, these production issues (i.e., the upside down tripod and the worn tooling) could not cause the snap ring to dislodge. If the snap ring remained attached due to tension in the assembly, these production issues would not result in the observed field conditions discussed in the previous reports from the field.

Upon further study of the supplier’s production history, it was determined that a new team member was training on the tripod joint installation process. The training logs indicated that the team member was involved in the production of 54 drive shafts. However, for the reasons cited above, it was still undetermined at this point whether the snap ring could become dislodged even if it was installed in a drive shaft with an upside down tripod joint assembled with worn tooling.

Toyota requested parts from the supplier, built with the tripod joint installed upside down and assembled with the worn tooling, to perform duplication testing. During the testing, Toyota

theorized that there was a possibility that a deformed snap ring (held together due to tension in the assembly) could have the tension released during the installation of the drive shaft to the transmission. An evaluation of TMMK's process, however, concluded the force applied during the drive shaft installation process did not exceed the supplier's analysis of the amount of force that would be needed to release that tension on the snap ring.

April 2017 - Early July 2017

Toyota identified a range of vehicle production that covers when the suspect 54 drive shafts produced by the new team member in training would have been used during production. Toyota then began to recover parts from vehicles from that range. During the inspection of one of the parts, it was found to have an upside down tripod joint, and the snap ring was dislodged.

During an additional process audit at the supplier, it was discovered that a misalignment of the part in a subsequent operation in the assembly process could release the tension on the deformed snap ring. It was determined that three separate conditions need to occur to dislodge the snap ring and duplicate the observed failure: (1) the tripod joint was installed upside down, (2) the snap ring was deformed by worn tooling during the pull test, and (3) the tension is released on the deformed snap ring. If the snap ring dislodges from the driveshaft, the driver may experience noise and vibration while driving. In some cases, the tripod joint may separate, causing loss of power while driving and potentially roll away when the gear selector is placed in "Park" and the brake pedal is released.

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Based on the results of the above investigation, Toyota decided to conduct a voluntary safety recall campaign of the possible vehicle production range that covers when the misassembled drive shafts would have been used during production. All of the vehicles identified in the suspect range will be inspected to determine if the serial number is included in the affected parts range. Of the suspect 54 drive shafts, twelve were recovered during the course of this investigation. Forty two drive shafts remain in the suspect range of affected parts.

As of July 12, 2017 based on a diligent review of records, Toyota's best engineering judgment is that there is 1 Toyota Field Report and 2 warranty claims that have been received from U.S. sources that 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 affected vehicles, dealers will check the serial number of the drive shafts to determine if the drive shaft is included in the affected range. If the drive shaft is included in the range, it will be replaced with a new one. This remedy will be at no cost to owners.

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 will begin by early-August, 2017. 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 July 20, 2017. Copies of dealer communications will be submitted as they are issued.

10. Manufacturer’s Campaign Number:

H0M