TOYOTA

Toyota Motor Engineering & Manufacturing North America, Inc.

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

December 13, 2018

DEFECT INFORMATION REPORT

1. Vehicle Manufacturer Name:

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 Brake Master Cylinder

ADVICS North America, Inc.
1650 Kingsview Drive
Lebanon, Ohio 45036

Country of Origin: U.S.A.

2. Identification of Involved Vehicles:

Make/Car Line	Model Year	Manufacturer	Production Period
Toyota / Tacoma	2018-2019	TMMTX & TMMBC	February 20, 2018 through November 14, 2018

Applicability	Part Number	Part Name	Component Description
MY2018-2019 Tacoma	47201-04170 47201-04180	Cylinder Sub-Assy, Brake Master	Brake Master Cylinder

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) Only vehicles in the above production range which were assembled with master cylinders cast in the supplier's Japan facility and machined in its U.S. facility are involved.
(3) No other Toyota vehicles were built with master cylinders produced using the affected casting and machining process combinations. Master cylinders produced before the affected part range were cast and machined in the supplier's Japan facility using different machining processes. Master cylinders produced after the affected part range were cast at the supplier's Mexico facility, using a different casting process, and then machined at its U.S. facility.

3. Total Number of Vehicles Potentially Involved:

44,121

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

90% Toyota estimates that at least 90% of the involved vehicles have potential to develop the failed seal condition over the lifetime of the vehicle, which could lead to the unreasonable risk to safety described below.

5. Description of Problem:

The subject vehicles contain a brake master cylinder that includes a rubber seal which seals the brake fluid within the housing as the master cylinder piston moves. Due to combinations of improper part machining operations at one supplier facility and casting variations of master cylinders at another of its facilities, there is a possibility that a master cylinder could have an edge that does not have the correct chamfer where the rubber seal is retained. If this were to occur, over time, this edge could damage the rubber seal, causing an internal fluid leak. If the vehicle continues to be operated in this condition, the brake pedal feel could change, and front brake performance could be suddenly reduced. Reduced front braking performance could increase the vehicle stopping distance and may increase the risk of a crash.

6. Chronology of Principal Events:

June 2018 – September 2018

In June, Toyota received three field reports on 2018 Tacoma vehicles which described the brake pedal traveling to the floor and reduced braking ability. All three of these vehicles had less than 600 miles. The brake master cylinders were recovered and sent to the part supplier for investigation.

In August, Toyota received additional field reports of this condition. These master cylinders were also recovered and sent to the supplier for investigation.

In September, the part supplier began providing its preliminary analysis based on some of the recovered parts. Their preliminary analysis indicated that an internal leak existed which was caused by a cut rubber seal. The supplier observed in these cases that the channel within the bore of the master cylinder, which is designed to retain the rubber seal, had an edge that did not

have the correct chamfer. The supplier also completed durability testing of three of the recovered master cylinders, rebuilt with new seals, to determine whether the edge that did not have the correct chamfer in these recovered parts could lead to a cut seal. This testing showed that the incorrect chamfer in these three recovered parts could cut the seal.

As a result, the supplier sought to determine whether there was a possibility that other parts produced at its facilities could contain incorrect chamfers and whether those incorrect chamfers could lead to cut seals in the brake master cylinder. The supplier hypothesized that the edges with incorrect chamfers could have been partially caused by potential improper machining processes of the master cylinder bore. Thus, the supplier began testing to examine different combinations of machining processes and evaluate whether certain combinations could result in the creation of edges in the brake master cylinder with an incorrect chamfer.

October 2018 – Early December 2018

The part supplier reported that their testing had identified multiple improper processes that were completed at the U.S. machining facility. When some combination of these improper processes at the U.S. machining facility are applied to non-concentric castings from the supplier casting facility in Japan, there is a possibility of producing master cylinders with edges at the channel of the bore with varying levels of incorrect chamfer. It was also determined that the creation of an edge with an incorrect chamfer would only occur on parts cast in the supplier's Japan facility and machined at the supplier's U.S. facility, because the machining processes used at the Japan machining facility account for varying levels of concentricity that exists on the cast parts from the Japan casting facility as a result of the mold design.

Based on the supplier's finding that there were multiple combinations of improper machining processes and certain castings that could create edges with varying level of incorrect chamfer, the supplier did additional testing on newly machined master cylinders with edges of different incorrect chamfers, including a part which contained an edge that has no chamfer, and a variety of parts which had insufficient chamfers. In all of these variations, the supplier evaluated these newly machined parts against a variety of durability tests. The supplier reported that the seals in a number of these tests were damaged and may eventually result in an internal leak. Any parts which were cast in the supplier's Japan facility and machined in the supplier's U.S. facility, up to the point of production with parts cast at a different facility using a different casting process, may have some level of incorrect chamfer which may damage the seal. A damaged seal would cause brake fluid to leak internally, causing the brake pedal feel to change, and front brake performance could be suddenly reduced.

December 7, 2018

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

As of December 3, 2018, based on a diligent review of records, Toyota's best engineering judgment is that there are 5 Toyota Field Technical Reports (3 unconfirmed reports) and 37 warranty claims (28 unverified 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 involved vehicles will be notified via first class mail to return their vehicles to a Toyota dealer. Toyota dealers will replace the brake master cylinder 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 begin by late January, 2019. 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 December 13, 2018. Copies of dealer communications will be submitted as they are issued.

10. Manufacturer's Campaign Number:

[Interim / Remedy]: J16 / J06