TOYOTA

Toyota Motor North America, Inc.

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

April 23, 2019

DEFECT INFORMATION REPORT

1. Vehicle Manufacturer Name:

Toyota Motor Manufacturing, France, Inc. ["TMMF"]
Parc d'Activites de la Vallee de l'Escaut-Sud, B.P.16 59264 Onnaing, France

Affiliated U.S. Sales Company:

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

Manufacturer of Front Door Wire Harness:

Sumitomo Electric Wiring Systems (Europe), Ltd.
Prospect House Cemetery Road, Silverdale, Newcastle-under-Lyme,
Staffordshire, ST5 6PA, U.K.
Phone: 44-1782-664700

Country of Origin: Egypt

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 / Yaris	2015-2017	TMMF	June 26, 2014 through January 18, 2017

Applicability	Part Number	Part Name	Component Description
MY2015-2017 Toyota Yaris	82151-0DT10 82151-0DT40	Wire, FR Door, RH	Right side front door wire harness
	82152-0DT10 82152-0DT40	Wire, FR Door, LH	Left side front door wire harness

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) Other Toyota or Lexus vehicles sold in the U.S. use front door wire harnesses of a different design or different wire insulation material.

3. Total Number of Vehicles Potentially Involved:

43,221

4. Percentage of Vehicles Estimated to Actually Contain the Defect:
30%
Based on survey results of a non-representative sampling of vehicles in the field in North America, Toyota estimates that approximately 30% of the involved vehicles could contain cracks on the insulation of the wires in the door wire harnesses. However, whether the crack on the insulation of these wires, in each case, will lead to an open circuit of the side airbag sensor wire, creating an unreasonable risk to safety, depends on installation variation of the front door wire harness and each vehicle's operating conditions.

5. Description of Problem:

The subject vehicles are equipped with side airbag sensors installed in each of the front doors. These sensors are connected to the SRS ECU by wire harnesses routed through the doors to the vehicle body. There is a possibility that, over time and with normal door use, a crack could develop on the insulation of these wires. If combined with water intrusion resulting from installation variation of the front door wire harness, these wires can corrode. This could result in an open circuit that could lead to the SRS warning light illuminating. In addition, the front seat side airbags could be deactivated and the curtain shield airbags may not deploy as intended. The non-deployment or improper deployment of these airbags can increase the risk of injury in the event of a crash.

6. Chronology of Principal Events:

March, 2016 – November, 2016

In March 2016, Toyota received a field technical report from the Japan market identifying an inoperative power window due to a broken wire in the door harness that connects the power window master switch to the main body ECU. This harness contains wires for the electrical components in the door, including the power window and door locks, and is routed from the door panel to the body through a protective grommet. Based on the inspection at the dealer and analysis of the recovered parts by the supplier, it was reported that the core wire of the power window wire was broken and had fatigue damage that was suspected to be caused by wire bending. It was also discovered that cracks occurred on other wiring insulation within the door wire harness and moisture was observed around the broken portion of these wires.

In July 2016, Toyota received a field report from the Canadian market indicating intermittent illumination of the SRS warning light when operating the door. During the dealer diagnosis, the dealer found that the SRS ECU was not receiving a signal from the side airbag sensor installed in the front door. For vehicles equipped with this sensor, the sensor wires are part of the aforementioned wire harness containing the wires for the other electrical components. The report indicated that the core wire for the side airbag sensor was broken, signs of corrosion in that location were observed, and cracks on other wiring insulation in the same wire harness were present. Toyota was not able to further investigate because the part was not returned to Toyota.

To investigate potential factors causing these issues, Toyota started a review of the design change and manufacturing history and process of the front door wire harness. During this design change review, it was found that the wire insulation material was changed from halogen free polypropylene (PP) to polyvinyl chloride (PVC) for certain wires at the time of model change in 2014. The difference of these two types of insulation materials was investigated and, based on the result of bending endurance evaluation testing, it was determined that the PVC coated wires have a lower bending endurance than PP coated wires. Additionally, the PVC coated wires were more susceptible to reduced bending endurance due to cold temperatures. Reduced bending endurance may allow cracks in the wire insulation to develop more easily.

In addition, in the manufacturing process review conducted at around the same time, it was found that the wire harness might be improperly twisted during assembly. Additional investigation found that the twisting of the harness could cause increased stress on the wires, as well as result in improper positioning of the rubber grommet around the wires, facing the grommet opening upward rather than downward. Based on a water intrusion test, it was confirmed that water (e.g., rainwater) may enter the wire harness from the upward opening of the grommet. In this condition, if a crack occurs on the wire insulation, water which enters the harness through this method could cause the core wire to corrode and eventually break.

Beginning in November 2016, based on the above investigation, a level-up change was phased in to help prevent potential cracking of the insulation. The material of the wire insulation changed back to PP and an improvement to the method of assembling the wire harness was implemented. At this time Toyota had only received two reports indicating SRS warning light illumination from the North American market, both from Canada, and was not able to recover the parts for investigation. Due to the low occurrence rate and only a limited amount of unverified warranty information, Toyota decided to monitor the field. To better understand the condition of the PVC coated wires in the field, Toyota carried out a good part recovery activity in Europe and Japan, where the occurrence rate was higher than North America.

October, 2017 – June, 2018

In October 2017, Toyota received a report from a U.S. dealer indicating that the SRS warning light was illuminated. The dealer inspected the vehicle and found an open circuit of the wire for the front door airbag sensor, but the wire harness was not returned to Toyota and was not able to be investigated.

In February and March 2018, Toyota received one field technical report and one dealer report from the U.S. market indicating SRS warning light illumination. The front door wire harness from one of these two reports was recovered and investigated by the wire harness supplier. The supplier found a broken airbag sensor core wire with corrosion present, which was similar to the broken power window or door lock wire cases in Europe and Japan. The supplier suspected that the wire was broken because it was weakened by corrosion and was subjected to bending from door operation.

July, 2018 – March, 2019

Toyota continued to monitor the field and the occurrence rate remained low with no further field reports in the U.S. market indicating illumination of the SRS warning light. Based on the results of the investigation of good parts recovered from Europe and Japan, it was found that among various wires in the front door wire harness, cracks typically occurred on the insulation of wires of the power window and door lock, which had a larger cross-section area among the wires with PVC insulation. To understand the reason why the front door airbag sensor wires, which have a smaller cross-section area, were broken, Toyota conducted a series of investigations including durability tests. The durability testing of wires with different cross-section areas found that the larger the cross-section area of a single wire, the faster the wire insulation develops cracks.

Toyota continued investigations and did further tests on the side airbag sensor wire in the front door wire harness, which is twisted with two single wires. As a result of the further bending endurance tests, it was discovered that the insulation of the twisted wire tends to develop cracks faster than other single wires in the front door wire harness, such as those for the power windows or door locks, due to an increased bending strain because of a larger combined cross-section area than other single wires. In addition, if the front door wire

harness was twisted and the grommet improperly positioned during assembly, the results of the aforementioned water intrusion test showed that water (e.g., rain) could enter at the wire harness and cause the core wire to corrode. Despite the low number of confirmed cases in the U.S., this analysis showed that the possible future occurrence rate would increase over time and, with vehicle use, could result in an open circuit that could lead to the SRS warning light illuminating. After reviewing the design, it was confirmed that in the condition of open circuit of the airbag sensor wire, the front seat side airbags could be deactivated and the curtain shield airbags may not deploy as intended.

April 17, 2019

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

As of April 16, 2019, based on a diligent review of records, Toyota's best engineering judgment is that there is one Toyota Field Technical Report and 7 warranty claims (including 3 unverified claims) that have been received from U.S. sources that relate to the side airbag sensor wire breakage investigated in this chronology 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. Based on production records, the dealers will replace the front door wire harness assembly in one or both front doors as necessary, with an improved one at no cost.

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 mid-June, 2019. A copy of the draft owner notification will be submitted as soon as it is available.

9. Distributor/Dealer Notification Schedule:

Notifications to distributors/dealers will be sent on April 23, 2019. Copies of dealer communications will be submitted as they are issued.

10. Manufacturer's Campaign Number:

[Interim / Remedy] K1F / K0F