

October 21, 2015

## **DEFECT INFORMATION REPORT**

1. Vehicle Manufacturer Name:

Toyota Motor Corporation ["TMC"]

1, Toyota-cho, Toyota-city, Aichi-pref., 471-8571, Japan

Toyota Motor Manufacturing, Kentucky, Inc. ["TMMK"]

1001 Cherry Blossom Way Georgetown, KY, 40324

Toyota Motor Manufacturing Canada Inc. ["TMMC"]

1055 Fountain Street North, Cambridge, Ontario, Canada N3H 5K2

Toyota Motor Manufacturing, Indiana, Inc. ["TMMI"]

4000 Tulip Tree Dr., Princeton, IN, 47670-4000

Toyota Motor Manufacturing, Texas, Inc. ["TMMTX"]

1 Lone Star Pass San Antonio, Texas 78264-3413 USA

New United Motor Manufacturing, Inc. ["NUMMI"]

45500 Fremont Blvd., Fremont, CA, 94538

Toyota Motor Manufacturing Northern Kentucky, Inc. ["TMMNK"]

25 Atlantic Ave., Erlanger, Kentucky, 41018

Affiliated U.S. Sales Company

Toyota Motor Sales, USA, Inc. ["TMS"]

19001 South Western Avenue, Torrance, CA 90501

General Motors Corporation Global Headquarters ["GM"]

100 Renaissance Center Drive, P. O. Box 100 Detroit, MI 48265

Manufacturer of Power Window Master Switch Assembly:

TRAM, Inc.

47200 Port Street Plymouth, Michigan 28170, U.S.A

Telephone: +1-734-254-8500

Country of Origin: USA

or

TOKAI RIKA CO., LTD.

3-260 Toyota, Oguchi-cho, Niwa-gun, Aichi-pref. 480-0195, Japan

Telephone: +81-587-95-5211

Country of Origin: Japan

2. Identification of Involved Vehicles:

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, Camry HV	2007, 2009	TMC	TBD
		TMMK	
		TMMNK	
Toyota / RAV4	2006 - 2011	TMC	TBD
	2009 - 2011	TMMC	
Toyota / Corolla	2009 - 2011	TMC	TBD
		TMMC	
		NUMMI	
Toyota / Corolla Matrix	2009 - 2011	TMMC	TBD
Toyota / Tundra	2009 - 2011	TMMI	TBD
		TMMTX	
Toyota / Sequoia	2009 - 2011	TMMI	TBD
Toyota / Highlander, Highlander HV	2008 - 2011	TMC	TBD
	2010 - 2011	TMMI	

Toyota / Yaris	2006 - 2010	TMC	TBD
Toyota / Scion xB	2009 - 2011	TMC	TBD
Toyota / Scion xD	2009 - 2010	TMC	TBD
Pontiac / Vibe	2009 - 2010	NUMMI	TBD

Note: (1) Only the involved vehicles equipped with a Power Window Master Switch (PWMS) containing a sliding electrical contact module which was manufactured with a spray-type grease application at the above-mentioned supplier during the above production periods are included in this recall.

(2) The same models, which have the same sliding electrical contact module with a different type of grease application and which were manufactured between the above-mentioned two periods are involved in recall 12V-491 for a similar condition.

(3) Other Toyota and Lexus vehicles are equipped with PWMS's that either do not contain sliding electrical contact modules, contain sliding electrical contact modules that are of a different design or are manufactured at a different supplier.

3. Total Number of Vehicles Potentially Involved:

Toyota Camry, Camry HV	:	TBD
Toyota RAV4	:	TBD
Toyota Corolla	:	TBD
Toyota Corolla Matrix	:	TBD
Toyota Tundra	:	TBD
Toyota Sequoia	:	TBD
Toyota Highlander, Highlander HV	:	TBD
Toyota Yaris	:	TBD
Scion xB	:	TBD
Scion xD	:	TBD
Pontiac Vibe	:	TBD
Total	:	Approx. 2,000,000

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

Unknown

5. Description of Problem:

The subject vehicles are equipped with a driver's side Power Window Master Switch (PWMS) containing sliding electrical contact modules. These modules are lubricated with a sprayed-on grease that may have been applied inconsistently during the manufacturing process, not providing sufficient coverage. During normal operation, debris caused by wear from the electrical contact points can accumulate between the terminals where the grease was insufficiently applied, and a short circuit could form between the contact points by the debris and conductive moisture that may enter the module. If a short circuit occurs, the switch assembly may overheat and melt. A melting switch may produce smoking and, potentially, lead to a fire.

6. Chronology of Principal Events:

October 2012

In October 2012, Toyota initiated a voluntary recall campaign (12V-491) concerning PWMS failures on certain 2007-2009MY Toyota and Pontiac Vibe vehicles. These vehicles were equipped with sliding electrical contact modules in the driver's side PWMS which may experience a notchy or sticking feeling during operation caused by extra and uneven squeeze-type application of the grease lubricant. If the grease is not applied evenly, frequent usage of the switch and normal arcing of the contact module terminals may cause the grease lubricant to become carbonized and result in the deterioration of the grease's lubricating properties. In this condition, an electrical contact point may prematurely and abnormally wear, causing a notchy or sticking condition, and result in the switch becoming inoperative. If commercially available cleaning lubricants are applied to the switch to attempt to address the notchy or sticky feel, the switch assembly may overheat and have thermal damage which may produce an abnormal smell and/or smoking, and possibly lead to a fire.

The defect described in 12V-491 involved PWMS's using a squeeze-type grease application. Vehicles using switches lubricated with grease by a spray application were not affected by this defect. At that time, there was no indication that there was a similar trend in PWMS incidents involving switches lubricated by a spray application.

#### December 2012 – October 2014

Toyota received field technical reports from the Japan and the US markets indicating an inoperable front passenger side window when using the PWMS, along with smoke coming from near the PWMS and/or a burnt odor in the occupant compartment. These vehicles were equipped with PWMS's which were manufactured with a spray-type grease application to the sliding electrical contact module.

Toyota investigated returned PWMS's and found evidence of heat generation and insulation deterioration at the electrical contact terminal in the switch. These conditions were similar to those observed in failed PWMS's involved in recall 12V-491. However, abnormal wear on the electrical contact point was not found. In addition, it was confirmed that the amount of grease lubricant applied to the sliding electrical contact module was adequate.

During further investigation, a chemical containing hydrogen-oxygen (OH) was detected on the switch circuit boards and/or switch cases. Toyota theorized that the spillage of drinking water or other beverages on the PWMS's might cause the short circuit at the electrical contact terminals, resulting in thermal damage in the switch.

Toyota investigated failed PWMS's returned from the field. These switches showed similar conditions to those investigated previously, including evidence of a chemical containing the OH group observed inside and/or outside of the switch. However, the failure rate was quite low. Because of this potentially theorized cause of the failure, Toyota continued monitoring the field information.

#### November 2014 – August 2015

Toyota continued to sporadically receive field technical reports and returned failed components which led to reopening the investigation of the PWMS not involved in the 2012 recall. It initiated a part recovery from in-use vehicles, investigated the production process and history, and reexamined the failed PWMS's.

As a result of the inspection of the parts recovered from in-use vehicles, it was found that there was variation in the amount of the grease lubricant applied to the electrical contact terminal. During the review of the production process, it was found that, during the spray-type grease application, as the grease lubricant level in the grease tank was decreasing, more air space was created in the grease tank. This could result in decreased grease lubricant discharge pressure at the spray nozzle and a large variation in the amount of the grease lubricant being sprayed. In this condition, there is a possibility that some portions of the PWMS terminal, especially outside the sliding contact portions, may not be lubricated.

## September 2015 – Mid October 2015

Toyota conducted replication testing using electrical contact modules with less grease lubricant. It was confirmed that, if wear debris, which could be created during normal operation of the switch, and distilled water is added in the contact module to spaces between terminals without grease lubricant, water is not repelled and a short circuit may be created temporarily between terminals without lubricant. In a more severe condition which simulates intrusion of sweat or rain water into the switch, if 1% ammonium chloride liquid was dropped on the terminals without lubricant along with wear debris, thermal damage in the electrical contact module could be replicated.

As a result of the above investigation, Toyota concluded that, during the spray-type grease application process of the sliding electrical contact module, the discharge pressure at the spray nozzles could be unstable due to variation in internal pressure of the grease tank. If the grease lubricant is insufficiently applied to the electrical contact terminals and their vicinity, wear debris created by normal operation of the switch, along with conductive moisture, could create a short circuit between the terminals, causing them to overheat, and result in a risk of fire.

## October 15, 2015

Toyota decided to conduct a voluntary safety recall campaign on the subject vehicles.

As of October 13, 2015, Toyota is aware of 86 Toyota field reports and 27 warranty claims in the U.S. that have been received that relate or may relate to this condition. Multiple counts of the same incident are counted separately.

### 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 or a GM dealer to inspect the PWMS and, if abnormality is found, the PWMS circuit board will be replaced with an improved one. If no abnormality is found, the dealer will apply specialized grease that inhibits heat build-up.

### Reimbursement Plan for pre-notification remedies for Toyota vehicles

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.

### Reimbursement Plan for pre-notification remedies for General Motors vehicles (Pontiac Vibe)

Pursuant to 577.11(e), General Motors will provide reimbursement to owners for repairs completed on or before ten days after GM mails owner letters, pursuant to the plan submitted on May 20, 2015.

8. Recall Schedule:

Notifications to owners of Toyota models will occur by December 20, 2015. A copy of the draft owner notification letter(s) will be submitted as soon as available. General Motors will provide its schedule separately.

9. Distributor/Dealer Notification Schedule:

Notifications to distributors/dealers was sent on October 20, 2015. Copies of dealer communications will be submitted as they are issued.

10. Manufacturer's Campaign Number:

Toyota's Campaign Number: COM