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By Recall Management division at 9:22 am, Feb 12, 2014

**Toyota Motor Engineering &  
Manufacturing North America, Inc.**

Vehicle Safety & Compliance  
Liaison Office  
Mail Code: S-104  
19001 South Western Avenue  
Torrance, CA 90501

February 12, 2014

Ms. Nancy Lummen Lewis  
Associate Administrator for Enforcement  
National Highway Traffic Safety Administration  
Attn: Recall Management Division (NVS-215)  
1200 New Jersey Ave, SE  
Washington, D.C. 20590

Re: Certain Toyota and Lexus vehicles  
Part 573, Defect Information Report

Dear Ms. Lewis:

In accordance with the requirements of the National Traffic and Motor Vehicle Safety Act of 1966 and 49 CFR Part 573, on behalf of Toyota Motor Corporation ["TMC"], we hereby submit the attached Defect Information Report concerning a voluntary safety recall of certain Lexus RX350, Toyota RAV4 and Toyota Tacoma vehicles to address an issue with the brake actuator assembly.

Should you have any questions about this report, please contact me directly.

Sincerely,



Abbas Saadat  
Vice President  
Toyota Motor Engineering & Manufacturing  
North America, Inc.

Enclosures  
Part 573, Defect Information Report

## DEFECT INFORMATION REPORT

1. Vehicle Manufacturer Name:

Toyota Motor Manufacturing Canada Inc. ["TMMC"]  
1055 Fountain Street North, Cambridge, Ontario, Canada N3H 5K2

Toyota Motor Manufacturing Texas Inc. ["TMMTX"]  
1 Lone Star Pass, San Antonio, TX 78264

Toyota Motor Manufacturing De Baja California, S. De R.L. De C.V. ["TMMBC"]  
Carretera Libre Tijuana, Tecate #33143, Tijuana, Baja California, Mexico CP 36102

Affiliated U.S. Sales Company

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

Manufacturer of the Brake Actuator Assembly containing the involved Terminal

ADVICS Manufacturing Ohio, Inc.  
1650 Kingsview Drive, Lebanon, OH 45036  
Telephone: (513) 932-7878

Country of Origin: U.S.

2. Identification of Involved Vehicles:

Based on production records, we have determined the affected vehicle population as in the table below.

Make/ Car Line	Model Year	Manufac- turer	VIN		Production Period
			VDS	VIS	
Lexus/ RX350	2012- 2013	TMMC	*K1BA	CC083528 – CC154367	March 23, 2012 through December 11, 2012
				DC085865 – DC187061	
Toyota/ Rav4	2012	TMMC	**4DV	CW015254 – CW268355	March 23, 2012 through December 10, 2012
Toyota/ Tacoma	2012- 2013	TMMBC	*U4*N	CM032856 – CM138846	March 28, 2012 through December 20, 2012
				DM034054 – DM144836	
		TMMTX	**4*N	CX001421 – CX048792	
				DX001522 – DX062059	

Note: Although the involved vehicles are within the above VIN ranges, not all vehicles within these ranges were sold in the U.S.

No other Toyota or Lexus vehicles use the terminal assembly from the same supplier as in the subject vehicles.

Lexus RX350 vehicles equipped with VDIM (Vehicle Dynamics Integrated Management) produced within the range above are not affected. These vehicles do not use the same terminal from the same supplier as in the involved vehicles.

3. Total Number of Vehicles Involved:

Lexus RX350:	54,010
Toyota Rav4:	107,052
Toyota Tacoma:	100,052
Total:	261,114

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

Unknown

5. Description of Problem:

In the subject vehicles, the brake system contains a brake actuator that adjusts the fluid pressure of each wheel cylinder. Within the actuator is an electrical terminal that connects the brake actuator motor and the circuit board of the skid control electronic control unit (ECU). Due to manufacturing variation, there could be a reduction in contact force between the two components of the terminal, causing oxide film to increase resistance. A larger than normal increase in resistance can cause the illumination of various warning lights, including those for the skid control (Vehicle Stability Control or VSC) system, Antilock Brake System (ABS), and Traction Control system. If this occurs, these systems could become inoperative, which could increase the risk of a crash.

6. Chronology of Principal Events:

July 2012 - December 2012

Toyota received a field report from the US market indicating illumination of the ABS warning light on a 2012MY Lexus RX vehicle produced at TMMC. Investigation on the returned brake actuator assembly with the skid control ECU from the vehicle revealed that a diagnostic code related to a motor circuit malfunction had been stored, but bench testing of the actuator showed no abnormalities.

Toyota received additional field reports and continued to investigate returned brake actuators but was unable to duplicate the motor circuit malfunction and could not identify the cause of the warning light illumination. In most of the cases, the warning lights turned off after one key ignition cycle and VSC, ABS and Traction Control functions resumed. The phenomenon occurred only on the subject vehicles.

Toyota began a comparative investigation between similar actuators installed in vehicles which experienced the phenomenon and those that did not. The hybrid terminal, which is a two-piece type terminal that connects the brake actuator motor and the circuit board of the skid control ECU, was being produced by different suppliers in Japan and the US, and the phenomenon was only occurring on the actuators with terminals being supplied by the US sourced supplier. Although Toyota had not been able to identify differences in the terminals, production was changed in December 2012 so that only the Japan sourced terminal was used.

#### January 2013 - early February 2014

Toyota began recovering brake actuators from in-use vehicles. Comparison of returned failed parts and recovered in-use parts revealed a very small gap at the riveted portion on failed parts that created a reduction in contact force between the two components of the terminal. Toyota theorized that, if the rivet was insufficiently punched during manufacture, contact force between pieces of the terminal would become unstable with temperature variation.

Thermal shock cycle testing using a terminal containing a small gap at the riveted portion confirmed that voltage applied to the motor increased beyond the motor voltage threshold for detection of abnormality in the motor circuit, indicating a higher than normal resistance. Toyota also theorized that electrical contact resistance could increase as oxide film normally develops and remains on the surface of terminal pieces as a result of reduction in contact force. It was confirmed that this oxide film is partly removed by voltage applied to the motor during activation of ABS or VSC, but it is not completely removed in terminals with unstable contact force.

Toyota reviewed the terminal production process history and found that the riveting process used by the U.S. supplier was changed in March 2012, causing the rivet hole to become slightly bigger. It was determined that insufficient rivet punch in the hybrid terminals produced between March 2012 and December 2012 could lead to momentary electrical contact failure with temperature variation due to higher than normal resistance, causing a motor circuit malfunction to be detected and resulting in illumination of various warning lights, including those for the VSC, ABS, and Traction Control. Hybrid terminals produced before March 2012 and terminals produced by the Japan supplier and used after December 2012 are not affected.

#### February 6, 2014

Toyota decided to conduct a voluntary safety recall campaign on the subject vehicles to update the software for the skid control ECU with additional logic to remove oxide film in the hybrid terminal by applying voltage when the resistance in the terminal momentarily becomes high.

7. Description of Corrective Repair Action:

All owners of the subject vehicles will be notified by first class mail. Toyota and Lexus dealers will update the software for the Skid Control ECU.

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:

The owner notification schedule will be provided at a later time. The draft owner notice will be submitted for review in accordance with the regulations.

9. Distributor/Dealer Notification Schedule:

The distributor/dealer notification will be provided at a later time. Copies of all notices will be provided when issued.