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By Recall Management Division at 9:07 am, Sep 04, 2013

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

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

September 4, 2013

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 Lexus Intake-Side Variable-Valve Timing (VVT) System
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 vehicles to address an issue with the Intake-side Variable-Valve Timing (VVT) system.

Should you have any questions about this report, please contact me at (310) 468- 8555.

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 Corporation ["TMC"]

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

Affiliated U.S. Sales Company

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

19001 South Western Avenue, Torrance, CA 90501

Manufacturer of intake-side Variable-Valve Timing (VVT) system:

DENSO CORPORATION

1-1, Showa-cho, Kariya-city, Aichi-pref., 448-8661, Japan

Telephone: + 81-566-25-5511

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	Manufac- turer	VIN		Production Period
			VDS	VIS	
Lexus/ GS350	2007 - 2011	TMC	*E**S	70001838-B0054036	June 19, 2006 through July 12, 2011
Lexus/ IS350	2006 – 2011	TMC	*E**2	60001001-B5028032	May 27, 2005 through July 13, 2011
Lexus/ IS350c	2010 – 2011	TMC	FE2C2	A2500004-B2506857	November 25, 2009 through July 19, 2011

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

No other Toyota or Lexus vehicles are affected. Engines installed in other models have camshafts and valve springs which are of a different design specification. Therefore, this condition only occurs in models equipped with the 2GR-FSE engine (the GS450h is not affected due to lower engine speed specifications).

3. Total Number of Vehicles Involved:

Lexus GS350:	58,480
Lexus IS350:	36,989
Lexus IS350c:	6,115
Total:	101,584

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

Unknown

5. Description of Problem:

The subject vehicles are equipped with a Variable-Valve Timing (VVT) system which controls the camshafts to provide optimal valve timing under certain driving conditions. The bolts used to secure the housing and sprocket of the intake-side VVT gear assembly could become loose due to abnormal impacts generated within the gear assembly immediately after a cold start-up. If this occurs, the VVT gear will not control the intake valves correctly. In certain cases, the VVT gear housing and sprocket could separate and result in the engine stopping while the vehicle is being driven, increasing the risk of a crash.

6. Chronology of Principal Events:

September 2008 – July 2009

In September 2008, Toyota received a field technical report from the Japan market on a Lexus GS350 vehicle containing 2GR-FSE engine indicating an illumination of the check engine light and the engine stopping while driving. Toyota inspected the recovered VVT unit and found that all three bolts, which secure the VVT housing to the timing chain sprocket, had fallen out. No abnormalities were found in the components' dimensions. Toyota also investigated the supplier's manufacturing process; however, no abnormality was found.

In July 2009, Toyota received the first field technical report from the U.S. market indicating engine rattle noise and rough idle on a Lexus IS350 vehicle, also containing 2GR-FSE engine. The report indicated that 2 of the 3 bolts that secure the VVT housing to the timing chain sprocket had fallen out. Toyota was unable to recover the parts to conduct further analysis.

August 2009 – March 2011

Toyota theorized that the condition could be related to an engine noise issue at start-up being investigated on GR-series engines. The VVT internal component could rattle when the lock-pin, which latches to the VVT housing and secures the internal components to maintain the camshaft in the most delayed position, unlatches at cold-start. Toyota conducted reproduction testing and was able to duplicate noise but was unable to duplicate the loose bolts condition.

In order to investigate the condition in the field, Toyota began recovering VVT units from in-use vehicles equipped with the GR-series engine. Toyota recovered 169 VVT units; however, the loose bolt condition was not found in any of those units.

Toyota believed that this phenomenon was random at this time, because the phenomenon could not be duplicated and the occurrence ratio was low relative to the high production volume of the GR-series engines.

Toyota continued to conduct reproduction testing and monitor the field for additional occurrences.

April 2011 – December 2011

In April 2011, Toyota received a field technical report from the U.S. market on a Lexus GS350 vehicle indicating loss of vehicle power while driving. Toyota immediately began investigating and recovered the VVT unit from the vehicle. It was confirmed that all three bolts had fallen out from the VVT unit; however, no abnormalities were found in part dimensions.

Additionally, in July 2011, Toyota implemented a modification to the lock-pin of all GR-series engines to address the previously noted engine noise issue.

Toyota recovered an additional 308 VVT units from in-use vehicles containing GR-series engines. No loose bolts were found on any of the VVT units, yet indentation marks were noted on the surface of bolt through-holes of the VVT housing from 5 of 277 recovered VVT units from 2GR-FSE engines. Toyota theorized that the marks were caused by bolt slipping. Loose bolt condition only occurred in 2GR-FSE engines; therefore, Toyota began investigating the differences among GR-series engines in addition to conducting reproduction testing.

January 2012 – August 2012

Through reproduction testing, Toyota confirmed that, with the lock-pin disengaged during a cold engine start, the impact force between the VVT internal component and the housing could become larger if engine oil, which is pumped into the VVT unit to control the position of the camshaft, drains back into the oil pan while parked. In addition, Toyota theorized that the impact force varies in specific engine types of the GR-series engines due to cam profile and intake valve spring load.

Toyota continued its investigation and testing to clarify the relationship between the impact force exerted inside the VVT housing at cold-start and bolt loosening.

September 2012 – August 2013

After investigating differences among engine types, Toyota confirmed that the 2GR-FSE engine has sharper cam shape profiles and greater intake valve spring load compared to the other GR-series engines. The impact force is greater when the internal component collides with the housing under lock-pin released condition during cold-start, and eventually the bolts could become loose. The GS450h, the hybrid model containing the same 2GR-FSE engine, will not generate impact force enough to loosen the bolts because the engine speed during cold-start is lower than the GS350.

Toyota also confirmed that the other GR-series engines have a rounder cam shape and less load on the intake valve spring, so the VVT internal components will not generate large enough impact force to loosen the bolts.

Toyota confirmed that the new lock-pin design implemented in July 2011 for noise reduction is latched and secured to the housing at cold start, and the internal component would not create impact force that causes the bolts to loosen. Therefore, only the 2GR-FSE engines (except ones contained in the hybrid model) produced before the lock-pin design improvement can result in the loose bolts.

August 29, 2013

Based on the above investigation, Toyota decided to conduct a voluntary safety recall campaign on the subject vehicles to replace the VVT unit with an improved one.

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 Lexus dealer for replacement of the VVT unit with an improved one.

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:

Toyota will provide a separate schedule of the owner notification mailing shortly. Copies 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 September 4, 2013. Copies of dealer communications will be submitted as they are issued.