TOYOTA

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Toyota Motor Engineering & Manufacturing North America, Inc.

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

November 14, 2012

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 Prius and FCHV-adv Vehicles Water Pump
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 Toyota Prius and FCHV-adv vehicles to address an issue with the water pump assembly.

Should you have any questions about this report, please contact me at (310) 468-8551.

Sincerely,

V. Venugopal

Vinnie Venugopal
General Manager
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-shi, Aichi 471-8571, Japan

Affiliated U.S. Sales Company

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

Manufacturer of Water Pump Assembly:

AISAN INDUSTRY CO., LTD.
1-1-1 Kyowa-cho, Obu-shi, Aichi 474-8588 Japan
Telephone: +81-562-48-6933

Country of Origin: Japan

2. Identification of Affected 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	
Toyota/ Prius	2004 - 2009	TMC	KB2*U	40001175 – 50133248 53000027 – 93546425 57004347 – 97894047	August 6, 2003 through March 30, 2009
Toyota/ FCHV-adv	2009 - 2011		GX**A	9A000101 – BA000204	December 12, 2008 through September 13, 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 hybrid vehicles use the water pump for the hybrid system manufactured on the same coiling manufacturing line at the same supplier.

Certain vehicles within the above VIN range are subject to a Customer Satisfaction Campaign (CSC) that began in December 2010 for replacement of the hybrid system water pump due to slow pump actuation; vehicles which have received the replacement of the water pump are not involved in this recall. Replacement parts for the CSC were manufactured after improvements were made to the manufacturing process as described below.

3. Total Number of Vehicles Potentially Affected:

Prius : 350,563
FCHV-adv : 99

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

Unknown

5. Description of Problem:

In the hybrid system of the subject vehicles, there is an electrically driven water pump assembly which circulates coolant through the hybrid components, including the inverter assembly, to provide cooling. There is a possibility that the coil wire of the electric motor installed in the water pump may have been scratched during the coiling manufacturing process at the supplier. In this condition, the coil wire may corrode at the scratched portion and in some cases break. If this occurs, the water pump could stop, leading to illumination of various warning lights in the instrument panel in the Prius or a reduced motive power mode in the FCHV vehicles. In limited instances, a short circuit can occur between adjacent coil wires, resulting in an open fuse for the electric power supply circuit. If the fuse is open, the hybrid system will stop while the vehicle is being driven, which may increase the risk of an accident.

6. Chronology of Principal Events:

November 2009 – May 2010

Toyota received a field report from the Japan market indicating a vehicle had stalled while driving on a local road. Investigation of the returned part confirmed that the resistance in the motor coil of the water pump was low and a portion of the coil had evidence of a short circuit and corrosion. Toyota suspected that the short circuit could be attributed to damage to the coil wire's coating, leading to deterioration of the insulation over time.

Examination of the water pump manufacturing process conducted by Toyota and the supplier confirmed that there was a possibility that the coating on the coil wire could have been damaged during the coiling process. The coiling process was improved to reduce the possibility of damage to the coil wire in April 2010. In addition, the coating on the coil wire was changed to a more durable coating to further reduce the possibility of damage to the coil wire. The improved parts were incorporated into vehicle production in May 2010.

June 2010 – September 2011

Toyota and the supplier began replication testing using a water pump with the motor coil wire intentionally damaged. In September 2010, Toyota received a field report on a failed water pump from the U.S. market reporting that the malfunction indicator light and master warning light had illuminated in the vehicle due to a diagnostic trouble code for an inverter cooling system malfunction. Investigation of the returned part confirmed evidence of a short circuit on the coil wire, which was corroded in some areas.

Toyota and the supplier continued to conduct testing using a water pump with an intentionally damaged motor coil in order to replicate the subject condition; however, the phenomenon could not be duplicated at this time. Toyota then recovered working water pumps from vehicles in the field to examine the condition of the coil wire. Investigation of recovered parts confirmed there were notches and chlorine on the coil wire.

October 2011 – July 2012

Based on results of the investigation of the recovered parts, Toyota and the supplier conducted replication testing using a water pump with a notched motor coil wire. Although some corrosion occurred in the coil wire, resistance of the coil wire was not affected, and a short circuit or breakage of the coil wire did not occur. Further replication testing was conducted under various test conditions consistent with actual vehicle operating conditions. As a result of this testing, it was found that corrosion occurred in the notched area of the coil wire, causing the resistance of the coil wire to increase. Toyota determined that the breakage of the coil wire may be attributed to corrosion in the notched area of the coil wire caused by chlorine in the oil used within the press process of the stator (one of the motor components) and water penetrating from the coolant path through the resin housing. The breakage of the coil wire could lead to illumination of the malfunction indicator light, master warning light, and hybrid warning light in the instrument panel on Prius vehicles and a reduced motive power mode on FCHV vehicles. The failure mode for a short circuit between adjacent wires was not yet identified at this time.

August 2012 – Early November 2012

Toyota continued to conduct replication testing to identify the mechanism for a short circuit on the coil wire. It was determined that, during the process of coil wire breakage due to corrosion, resistance of the coil wire may increase and heat could be generated due to overcurrent flow through the coil. This could cause the coating on the wire to come off, increasing the risk of a short circuit between adjacent coil wires. If a short circuit occurs, various warning lights, including the malfunction indicator light, master warning light, and hybrid system warning light, could illuminate. In rare instances, the fuse for the electric power supply could open, causing the hybrid system to stop while the vehicle is being driven.

November 9, 2012

Toyota decided to conduct a voluntary safety recall campaign to replace the electric water pump with an improved one on the subject vehicles.

7. Description of Corrective Repair Action:

All known owners of the subject affected vehicles will be notified by first class mail to return their vehicles to a Toyota dealer for replacement of the electric water pump for the hybrid system 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 is currently developing the notification schedule for owners. A schedule will be submitted to the agency along with a draft of the owner notification as soon as they are available.

9. Distributor/Dealer Notification Schedule:

Toyota is currently preparing the remedy. A notification schedule will be provided as soon as it is available. Copies of dealer communications will be submitted as they are issued.