RAV4 EV ECU Flash Reprogramming Procedure

Service Category Engine/Hybrid System

Section Hybrid/Battery Control System **Market** USA

Toyota Supports ASE Certification

Applicability

YEAR(S)	MODEL(S)	ADDITIONAL INFORMATION
2012 – 2013	RAV4 EV	

Introduction

Flash reprogramming allows the ECU software to be updated without replacing the ECU. Flash calibration updates for the RAV4 EV are released as field-fix procedures described in individual Service Bulletins. This bulletin details the ECU flash reprogramming process and outlines use of the Techstream Health Check Function and the Tesla Powertrain Service Diagnostics program.

NOTE

Flash reprogramming of the RAV4 EV ECU can only be performed with the Tesla Powertrain Service Diagnostics program.

Warranty Information

OP CODE	DESCRIPTION	TIME	OFP	T1	T2
N/A	Not Applicable to Warranty	–	–	–	–

Parts Information

PREVIOUS PART NUMBER	CURRENT PART NUMBER	PART NAME	QTY
00451-00001-LBL	Same	Authorized Modification Labels	1

NOTE

Authorized Modification Labels may be ordered in packages of 25 from the Materials Distribution Center (MDC) through Dealer Daily – Dealer Support Materials Orders.

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Required Tools & Equipment

REQUIRED EQUIPMENT	SUPPLIER	PART NUMBER	QTY
Techstream 2.0*	ADE	TS2UNIT	1

NOTE

- **Only Techstream 2.0 should be used for this update.**
- **Techstream Software version 8.00.034 or later is required.**
- **Tesla Powertrain Service Diagnostic Software version 0.5.23 or later is required.**
- **Additional Techstream units may be ordered by calling Approved Dealer Equipment (ADE) at 1-800-368-6787.**

SPECIAL SERVICE TOOLS (SST)	PART NUMBER	QTY
GR8 Battery Diagnostic Station*	00002-MCGR8	1
EV HV Powertrain Diagnostic Cable Kit**	82824-36150-01	1

NOTE

Additional SSTs may be ordered by calling 1-800-933-8335.

* Essential SST.

** Special order.

RAV4 EV ECU Flash Reprogramming Procedure

Techstream Preparation

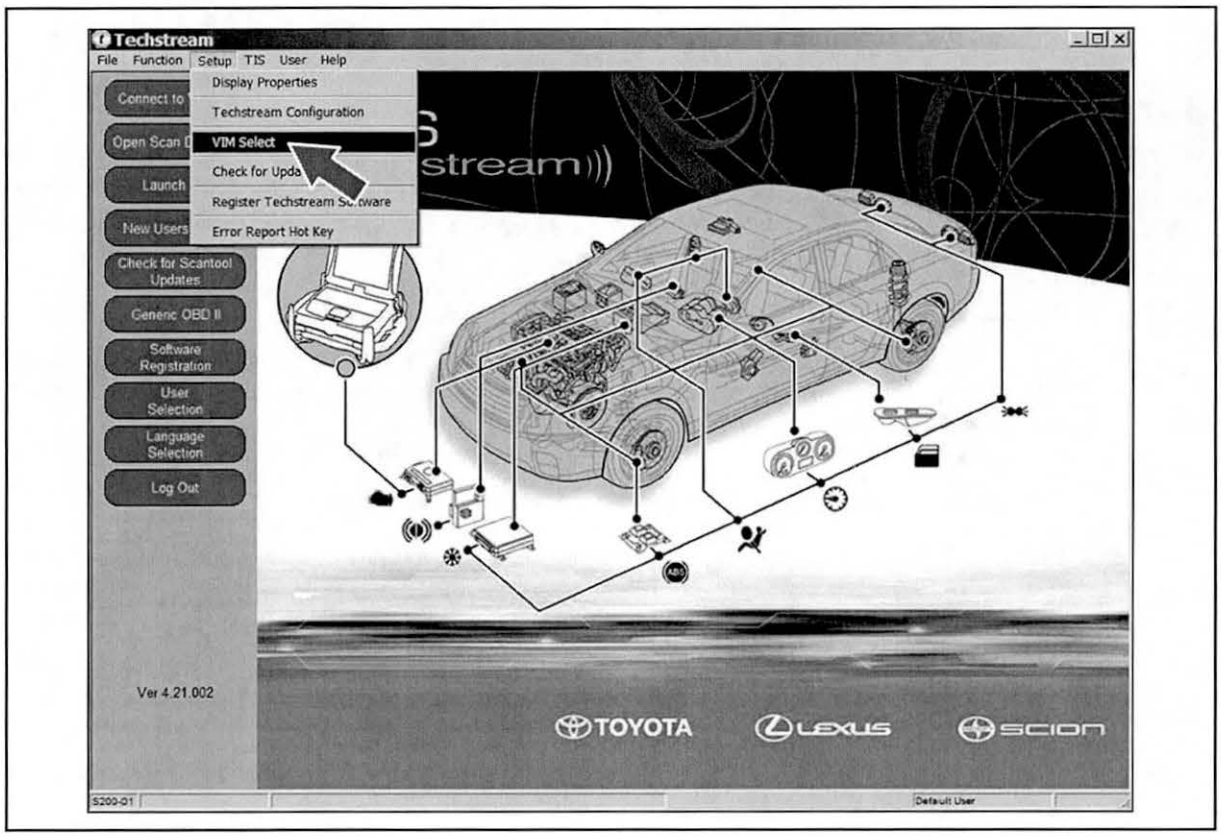
Selecting the Correct VIM.

Techstream software requires a VIM selection before it can be used for reprogramming.

Perform the following:

1. Select *"Setup"* from the Techstream Main Menu screen.
2. Select *"VIM Select"* from the Setup drop down menu.

Figure 1.



RAV4 EV ECU Flash Reprogramming Procedure

Techstream Preparation (Continued)

3. Select the correct Interface Setup from the drop down list.

   For Techstream 2.0, select *"MongoosePro MFC"*.

> NOTE
>
> **Mongoose Driver MUST be installed before Mongoose selections will be available.**
>
> **Refer to the Technical Information System (TIS), *Diagnostics – Scantool* page for additional information.**

4. Click *"OK"*.

Process Overview

Techstream ECU flash reprogramming is a 4-step process:

1. Verify the vehicle's applicability for recalibration and locate desired calibration file by performing the Techstream Health Check function.

> NOTE
>
> **Techstream will automatically search TIS for the appropriate Service Bulletin using the current Calibration ID from the vehicle. Calibration file links can be found embedded in the corresponding Service Bulletin.**

2. Connect the GR8 Battery Diagnostic Station using "Power Supply Mode" only.

   The GR8 Battery Diagnostic Station includes a Power Supply Mode to help maintain battery voltage at 13.5 volts during ECU reprogramming.

> NOTICE
>
> **ECU damage may occur if the correct battery charger mode setting is NOT used.**

3. Perform the RAV4 EV ECU software update using the Tesla Powertrain Service Diagnostics program.

   Launch the Tesla Powertrain Service Diagnostics program and initiate the update process to complete the reprogramming.

4. Attach the Authorized Vehicle Modification Label.

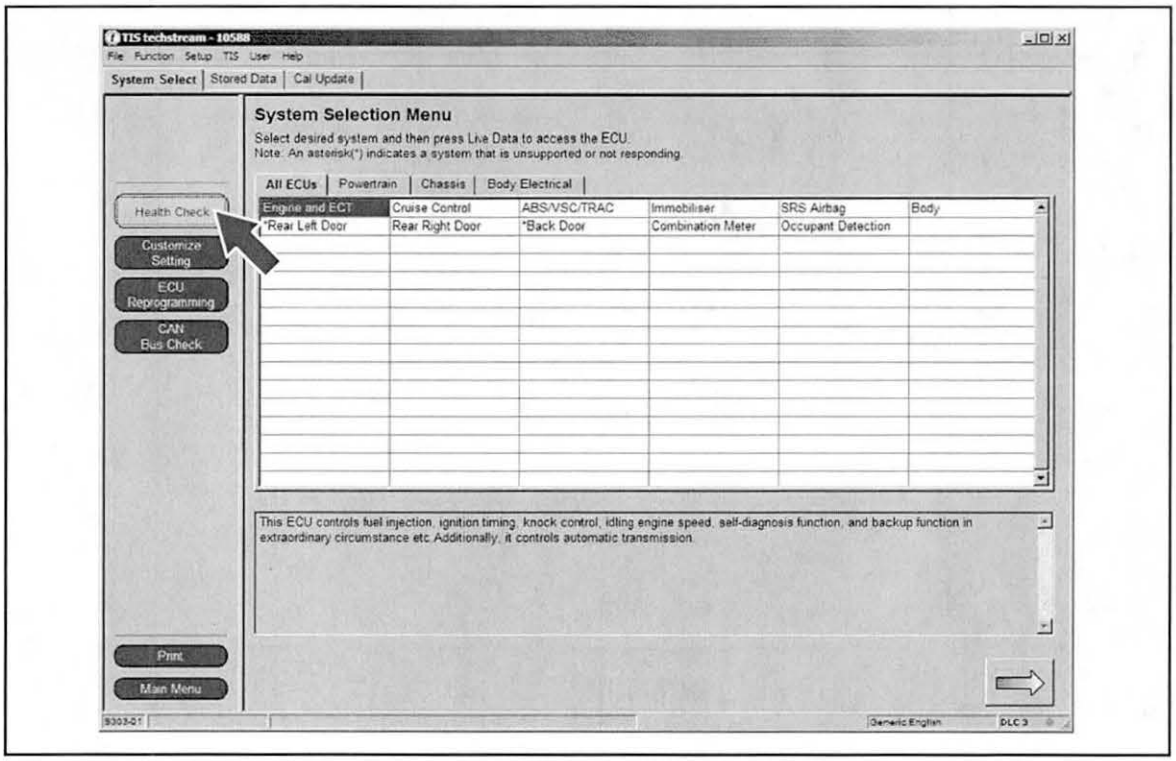
   Modifications to ECU calibrations MUST be recorded and properly displayed on the vehicle using the Authorized Modification Label.

RAV4 EV ECU Flash Reprogramming Procedure

Operation Procedure

1. Verify the vehicle's applicability for recalibration and locate desired calibration file.
   A. Connect Techstream and establish a vehicle connection.
   B. Click the *"Health Check"* button on the *"System Select"* tab.

Figure 2.

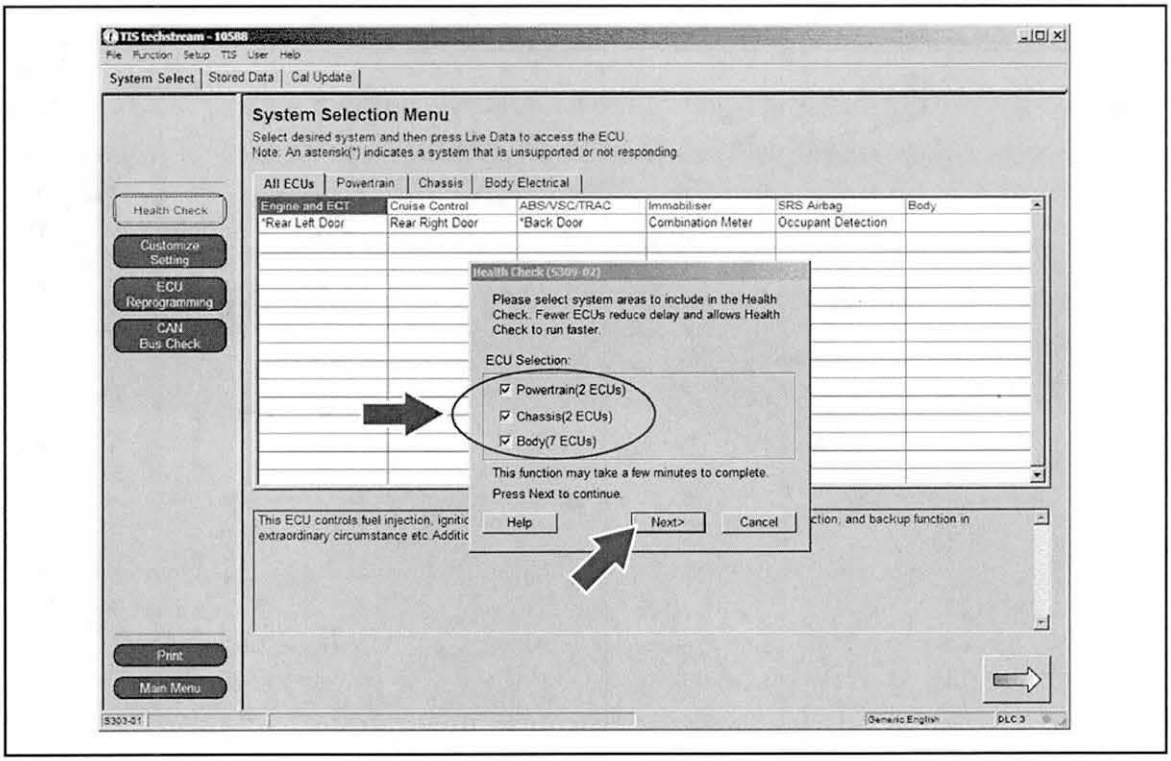


RAV4 EV ECU Flash Reprogramming Procedure

Operation Procedure (Continued)

C. Choose desired ECU group(s) in the *"Health Check"* dialog box.

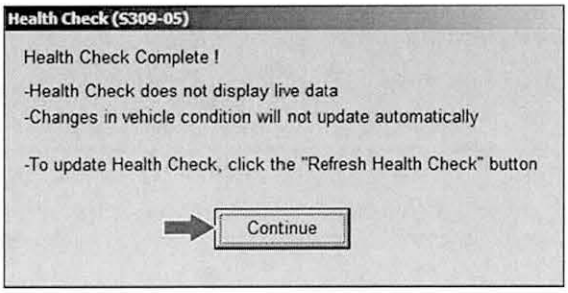
Figure 3.



D. Click *"Next"*.

E. Click *"Continue"* to view Health Check results.

Figure 4.



RAV4 EV ECU Flash Reprogramming Procedure

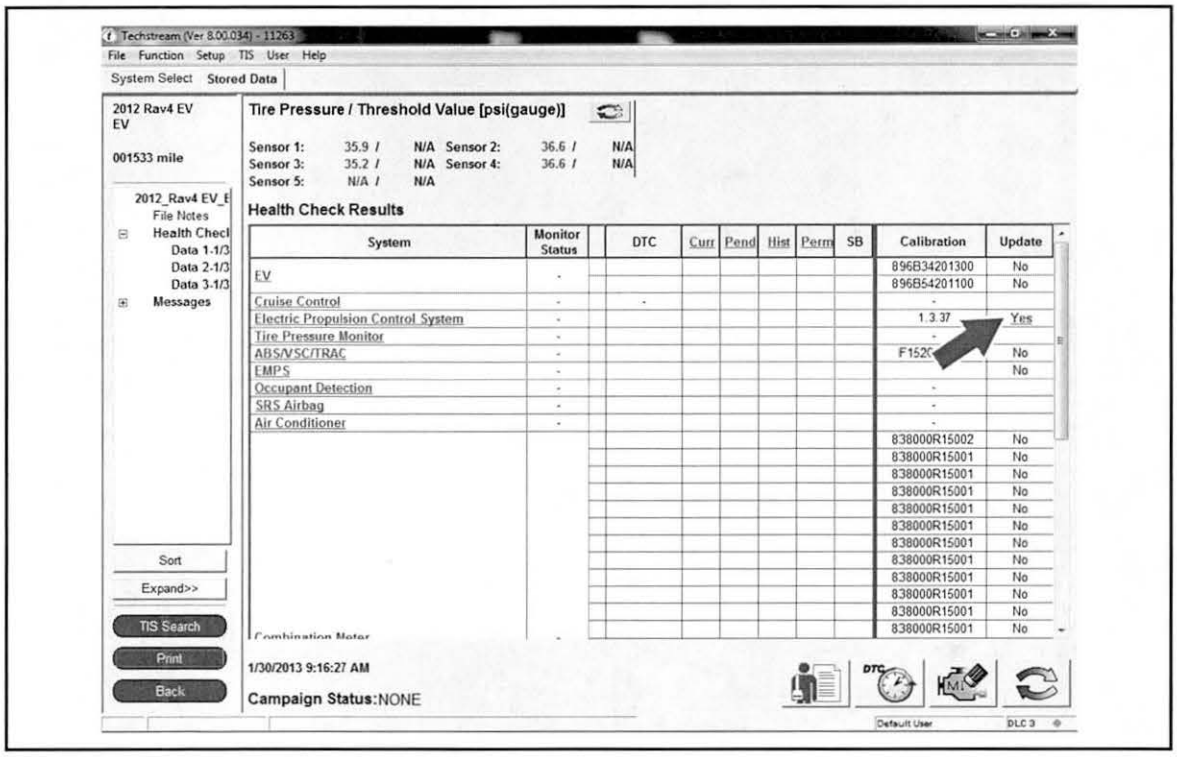
Operation Procedure (Continued)

F. Available calibration updates are indicated by a *Yes* link in the *"Update"* column. Click the *Yes* link to access the appropriate Service Bulletin on TIS.

NOTE

- **Note any DTCs stored in systems that will be flash reprogrammed.**
- **Clicking the *Yes* link will automatically launch TIS and perform a calibration search.**

Figure 5.



G. Log in to TIS. (If already logged in, skip this step.)

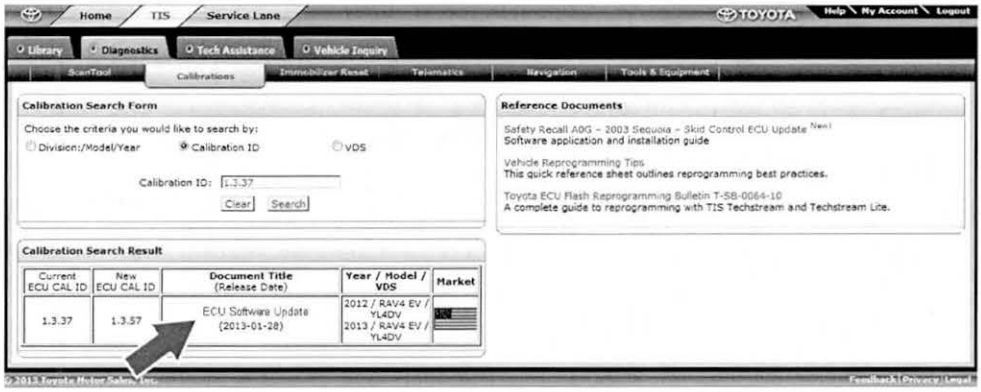
RAV4 EV ECU Flash Reprogramming Procedure

Operation Procedure (Continued)

H. To review the Service Bulletin and access the calibration file, click the Service Bulletin link in the *"Document Title"* column of the *"Calibration Search Result"* portlet.

> NOTE
>
> **Only Toyota Certified Technicians and above may access calibration files.**

Figure 6.



RAV4 EV ECU Flash Reprogramming Procedure

Operation Procedure (Continued)

2. Connect the GR8 Battery Diagnostic Station.

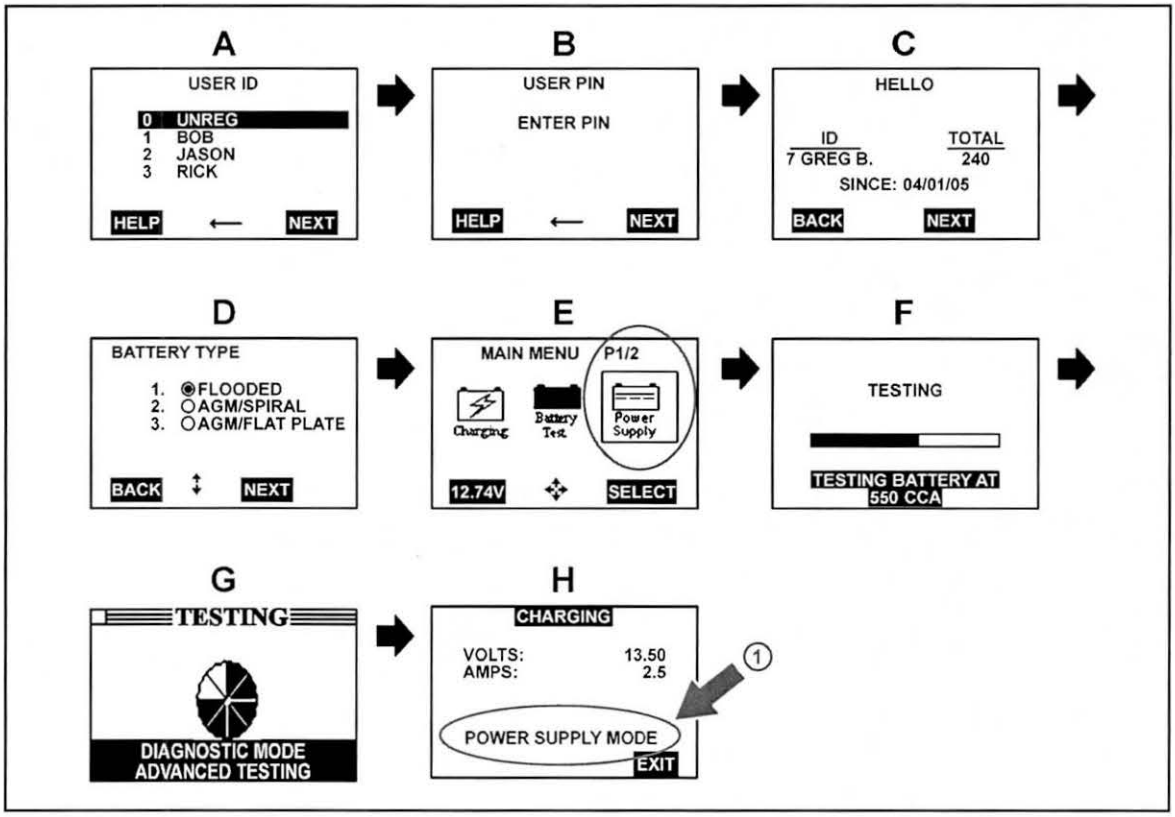
   A. Connect the GR8 Battery Diagnostic Station to the vehicle and turn it ON.

   B. Select Power Supply Mode by following the screen flow below.

NOTICE

- **ECU damage may occur if the correct battery charger and mode setting are NOT used.**
- **Power Supply Mode is used to maintain battery voltage at 13.5 volts while flash reprogramming the vehicle.**
- **For details on how to use the GR8 Battery Diagnostic Station, refer to the GR8 Instruction Manual located on TIS, *Diagnostics – Tools & Equipment – Battery Diagnostics.***

Figure 7.



1	Confirm "Power Supply Mode" Is Selected

RAV4 EV ECU Flash Reprogramming Procedure

Operation Procedure (Continued)

3. Perform the RAV4 EV ECU software update using the Tesla Powertrain Service Diagnostics program.

   After reviewing the procedures outlined in the selected Service Bulletin, launch the Tesla Powertrain Service Diagnostics program.

   NOTE

   The vehicle may require special preparation — please review the selected Service Bulletin carefully.

   A. Click *"Start"*.

   B. Click *"All Programs"*.

   C. Click *"Tesla Powertrain Service Diagnostics RAV4"*.

Figure 8.

RAV4 EV ECU Flash Reprogramming Procedure

Operation Procedure (Continued)

NOTICE

Errors during the flash reprogramming process can permanently damage the vehicle ECU. Minimize the risk by following the steps below.

- **Battery voltage MUST NOT FALL BELOW 11.4 volts during reprogramming. Confirm battery voltage is higher than 11.4 volts, but be sure voltage DOES NOT RISE ABOVE 16.0 volts during reprogramming.**
- **Turn OFF all vehicle accessories (e.g. audio system, A/C, interior lights, DRL, etc.). Do NOT add to or significantly change the vehicle's electrical load while reprogramming.**
- **Confirm cable connections between the vehicle and Techstream PC are secure.**
- **Do NOT disconnect or turn off Techstream PC or vehicle ignition, and do NOT close Tesla Powertrain Diagnostic program during reprogramming.**
- **Set parking brake.**
- **If the battery's state of charge or capacity are in question, test with SST. No. 00002-V8150-KIT "*Digital Battery Analyzer*," and follow Service Bulletin No. PG001-06, "*Battery Maintenance for In-Stock Vehicles & Pre-Delivery*", or the appropriate "*Maintenance for HV & Auxiliary Batteries*" Service Bulletin.**
- **The GR8 Battery Diagnostic Station MUST be used in Power Supply Mode to maintain battery voltage at 13.5 volts while flash reprogramming the vehicle. For details on how to use the GR8 Battery Diagnostic Station, refer to the GR8 Instruction Manual located on TIS, *Diagnostics – Tools & Equipment – Battery Diagnostics.***

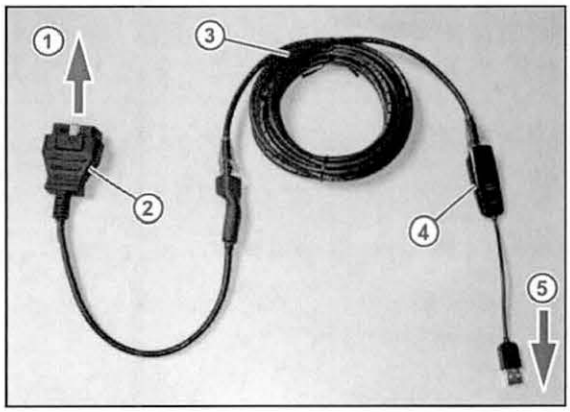
D. Disconnect the Techstream DLC3 connector.

RAV4 EV ECU Flash Reprogramming Procedure

Operation Procedure (Continued)

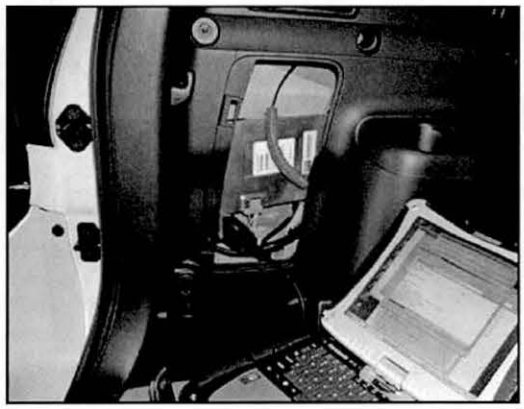
E. Connect the RAV4 EV Diagnostic Cable (DLC3 No. 2 is located in the rear cargo area).

Figure 9.



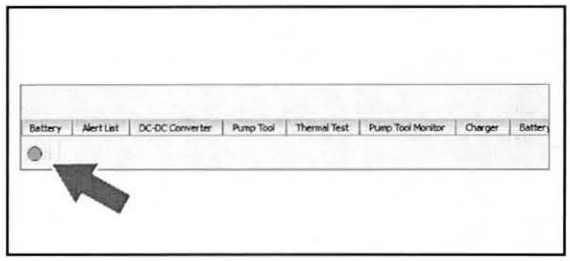
1	To Vehicle
2	DLC3 No. 2
3	CAT 5 Ethernet Cable
4	USB Ethernet Adapter
5	To PC

Figure 10. Diagnostic Cable Connected



F. Confirm the communication light is green.

Figure 11.



RAV4 EV ECU Flash Reprogramming Procedure

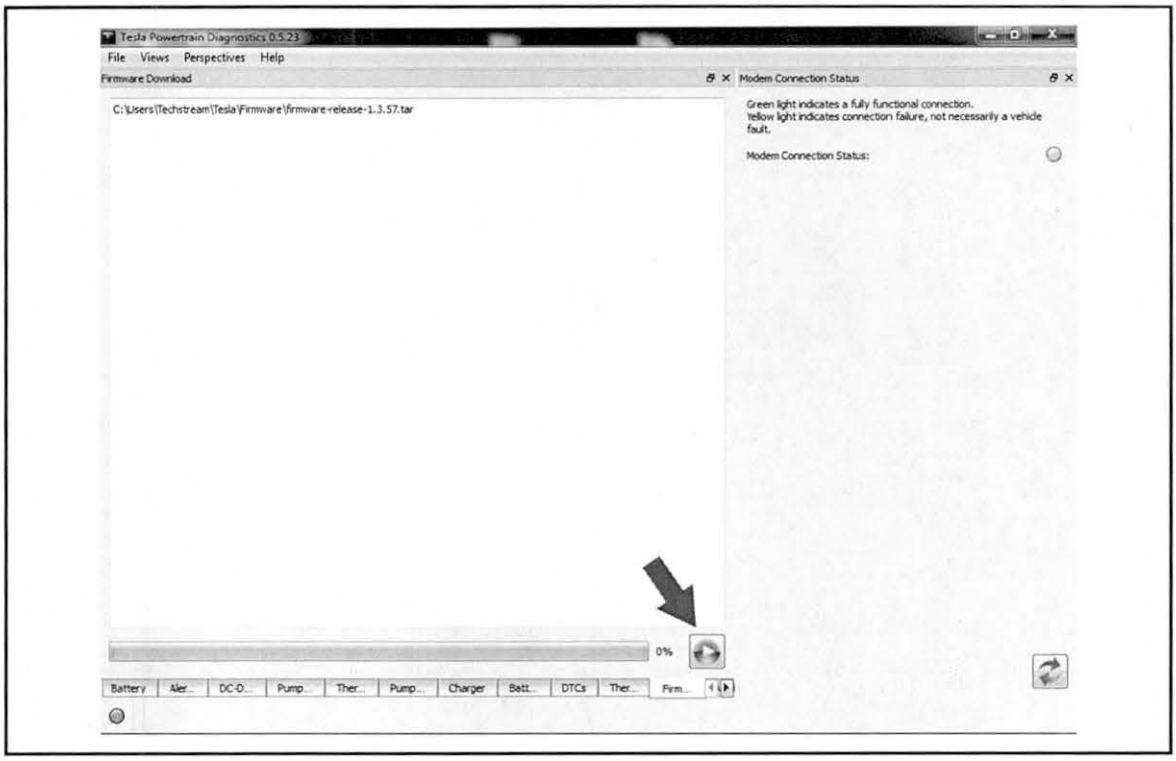
Operation Procedure (Continued)

G. Click on the *"Firmware Download"* tab.

H. Click the "Play" button.

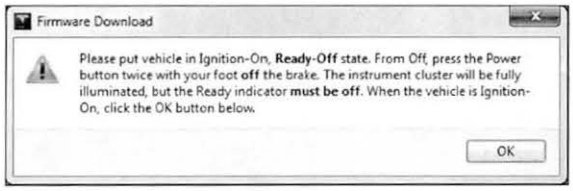
> HINT
>
> **File will automatically download and be displayed on this screen. Please ensure PC is connected to dealership wireless network.**

Figure 12.



I. Verify the information displayed on the warning message before proceeding.

Figure 13.



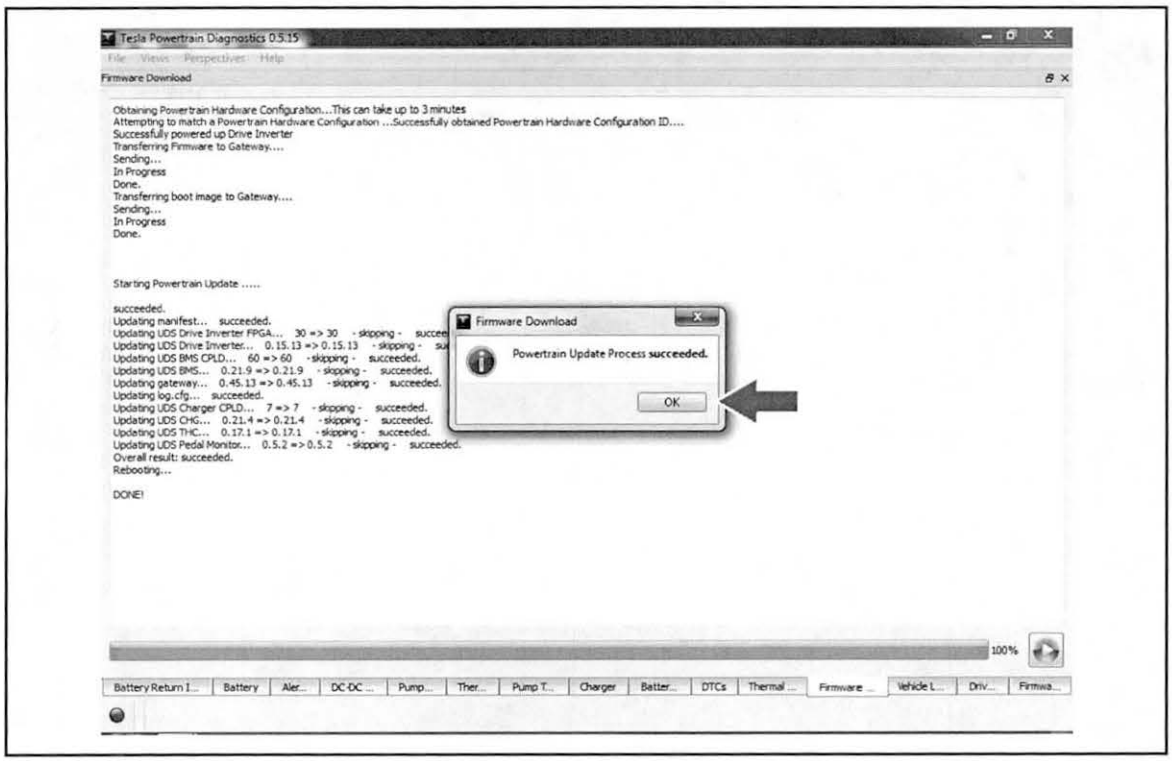
RAV4 EV ECU Flash Reprogramming Procedure

Operation Procedure (Continued)

J. The ECU Software Update will begin and take approximately 10 – 20 minutes to complete.

> NOTE
> **Do NOT turn ignition OFF or disconnect the battery charger during this process.**

Figure 14.



K. Click *"OK"*.

RAV4 EV ECU Flash Reprogramming Procedure

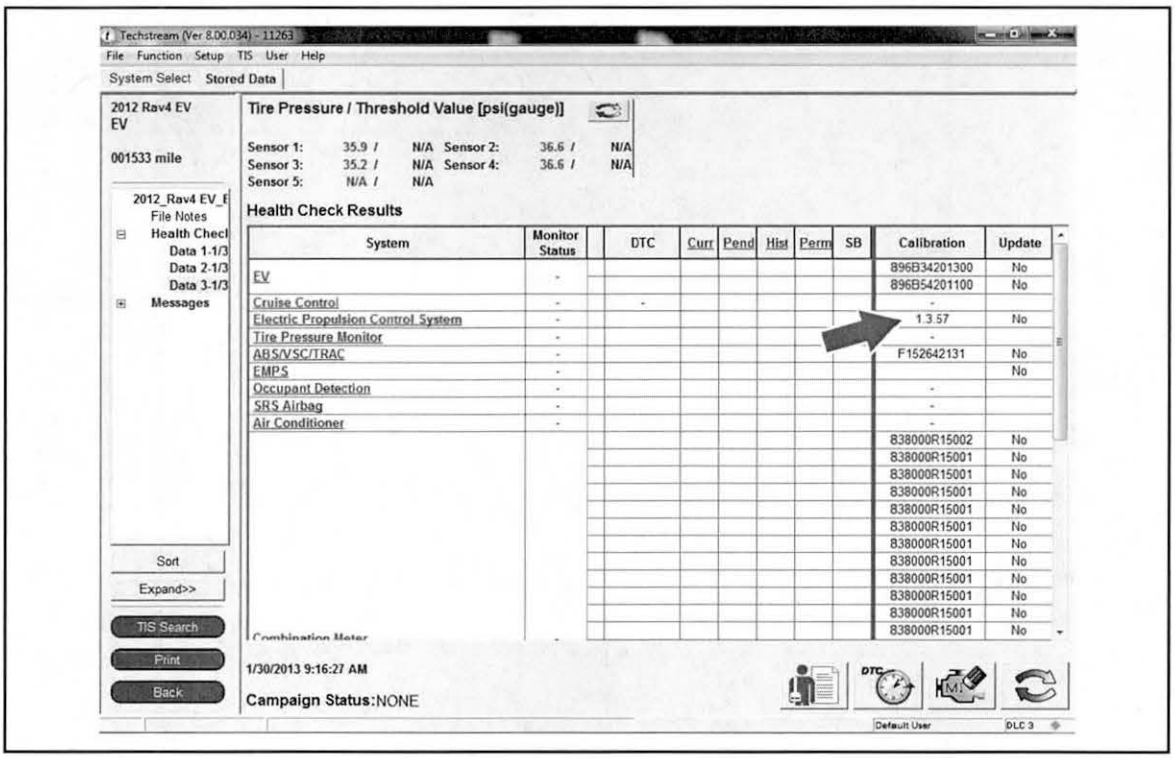
Operation Procedure (Continued)

L. Disconnect the Tesla Powertrain Diagnostic Cable and close the program.

M. Connect the Techstream DLC3 cable to the OBDII connector under the dash.

N. Perform a Health Check to confirm the firmware was installed correctly and to check for DTCs.

Figure 15.



RAV4 EV ECU Flash Reprogramming Procedure

Operation Procedure (Continued)

4. Attach the Authorized Modifications Label.

   A. Using a permanent marker or ball point pen, complete the Authorized Modifications Label and attach to the vehicle. The Authorized Modifications Label is available through the MDC, P/N 00451-00001-LBL.

   Figure 16.

1	Replacement ECU Part Number
2	New Calibration ID(s)
3	Dealer Code

4	Date Completed
5	Service Bulletin or Campaign Number

   B. Attach the label under the hood in the location determined by the specific Service Bulletin or Campaign.

> NOTE
> **Wait 60 – 90 seconds for ink to set before handling.**

   C. Test drive the vehicle to confirm proper operation.