Techstream ECU Flash Reprogramming Procedure

Service Category Engine/Hybrid System

Section Engine Control **Market** USA

Lexus Supports ASE Certification

Applicability

YEAR(S)	MODEL(S)	ADDITIONAL INFORMATION
2001 – 2014	CT200H, ES300, ES300H, ES330, ES350, GS300, GS350, GS430, GS450H, GS460, GX460, GX470, HS250H, IS F, IS250, IS250C, IS300, IS350, IS350C, LFA, LS430, LS460, LS600H, LX470, LX570, RX300, RX330, RX350, RX400H, RX450H, SC430	

REVISION NOTICE

January 23, 2013 Rev2:

- **Applicability has been updated to include additional 2013 and 2014 model year vehicles.**
- **The entire bulletin has been updated to include information for Techstream 2.0.**

March 15, 2012 Rev1:

- **Applicability has been updated to include 2012 – 2013 model year Lexus vehicles.**

Any previous printed versions of this bulletin should be discarded.

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Techstream ECU Flash Reprogramming Procedure

SUPERSESSION NOTICE

The information contained in this bulletin supersedes SB No. SS002-07.

- **Applicability has been updated to include 2009 – 2011 model year Lexus vehicles.**
- **A new section, Techstream Preparation, has been added.**
- **Techstream Lite has been added as an option in Required Tools & Equipment.**
- **Process Overview and Operation Procedure sections have been updated.**

Service Bulletin No. SS002-07 is Obsolete and any printed versions should be discarded. Be sure to review the entire content of this bulletin before proceeding.

Introduction

Flash reprogramming allows the ECU software to be updated without replacing the ECU. Flash calibration updates for specific vehicle models/ECUs are released as field-fix procedures described in individual Service Bulletins. This bulletin details the Techstream ECU flash reprogramming process and outlines use of the Technical Information System (TIS) and the Calibration Update Wizard (CUW). Flash calibration updates can only be applied to the vehicle/ECU combination for which they are intended. ECUs have internal security that will not allow them to be programmed with another ECU's information.

ECU

Electronic Control Unit (ECU) is a Lexus term used to describe integrated computerized devices responsible for managing the operation of a system or subsystem. For the purposes of this bulletin, the term "ECU" is used as a generic label for the following SAE J1930 standard references:

- **Powertrain Control Module (PCM)**
- **Engine Control Module (ECM)**
- **Transmission Control Module (TCM)**
- **Or any other Lexus specific control unit**

Warranty Information

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

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Techstream ECU Flash Reprogramming Procedure

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.

Required Tools & Equipment

REQUIRED EQUIPMENT	SUPPLIER	PART NUMBER	QTY
Techstream 2.0*	ADE	TS2UNIT	1
TIS Techstream		TSPKG1	
Techstream Lite		TSLITEDLR01	

NOTE

- **Only ONE of the Techstream units listed above is required.**
- **Software version 7.31.003 or later is required.**
- **Additional Techstream units may be ordered by calling Approved Dealer Equipment (ADE) at 1-800-368-6787.**
- **The Diagnostic Tester is NOT recommended for flash reprogramming. Please use Techstream or an approved J2534 interface to perform flash reprogramming updates. Visit techinfo.toyota.com for more information regarding J2534 reprogramming.**

SPECIAL SERVICE TOOLS (SST)	PART NUMBER	QTY
GR8 Battery Diagnostic Station*	00002-MCGR8	1

NOTE

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

* Essential SST

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Techstream ECU Flash Reprogramming Procedure

Techstream Preparation

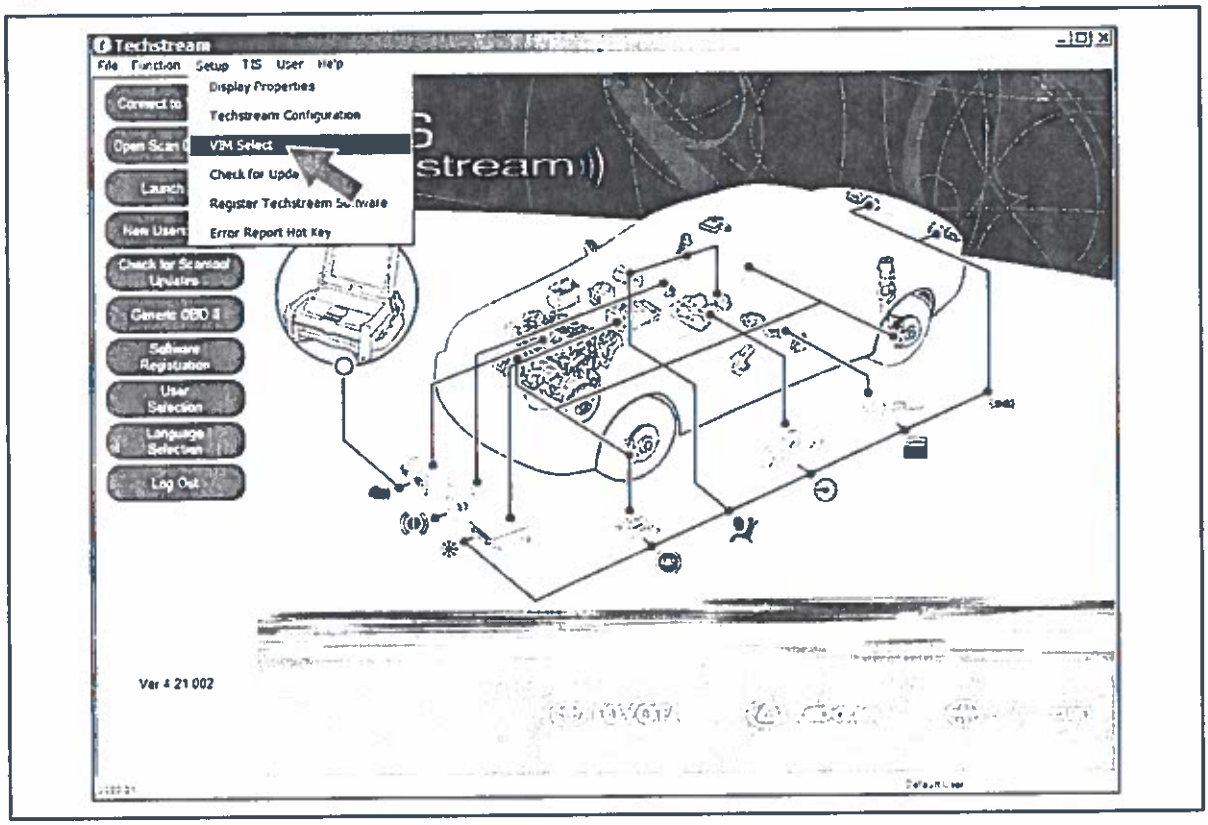
Selecting the Correct VIM.

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.



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Techstream ECU Flash Reprogramming Procedure

Techstream Preparation (Continued)

3. Select the correct Interface Setup from the drop down list.
   - If using Techstream 2.0, select *"MongoosePro MFC"*.
   - If using Techstream Lite, select *"Mongoose MFC"* or *"MongoosePro MFC"* (depending on the cable being used).

   > NOTE
   > **Mongoose Driver MUST be installed before Mongoose selections will be available.**
   > **See *TIS – Diagnostics – Scantool* page for additional information.**

   - If using TIS Techstream, select *"TIS Techstream VIM"*.
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. Locate appropriate calibration ID and reprogram the vehicle ECU with Techstream.

   Techstream uses the Calibration Update Wizard (CUW) application to open calibration files and facilitate the ECU flash reprogramming process.

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.

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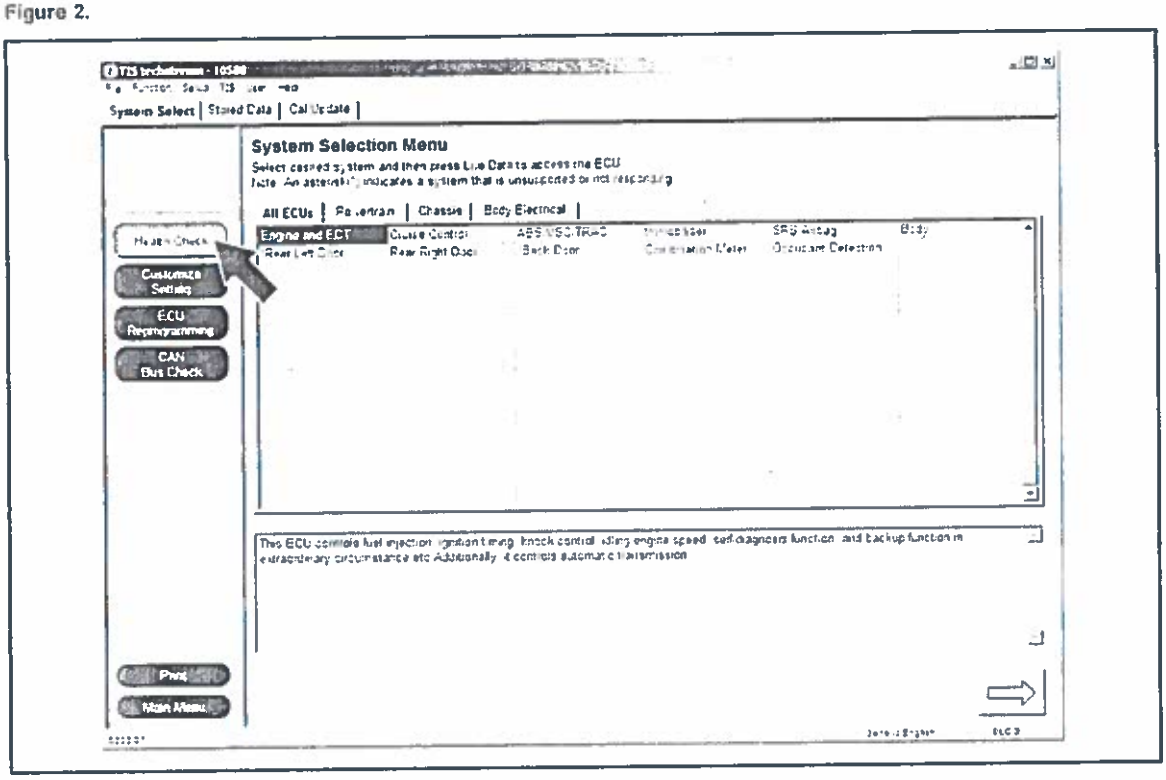
Techstream ECU Flash Reprogramming Procedure

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.



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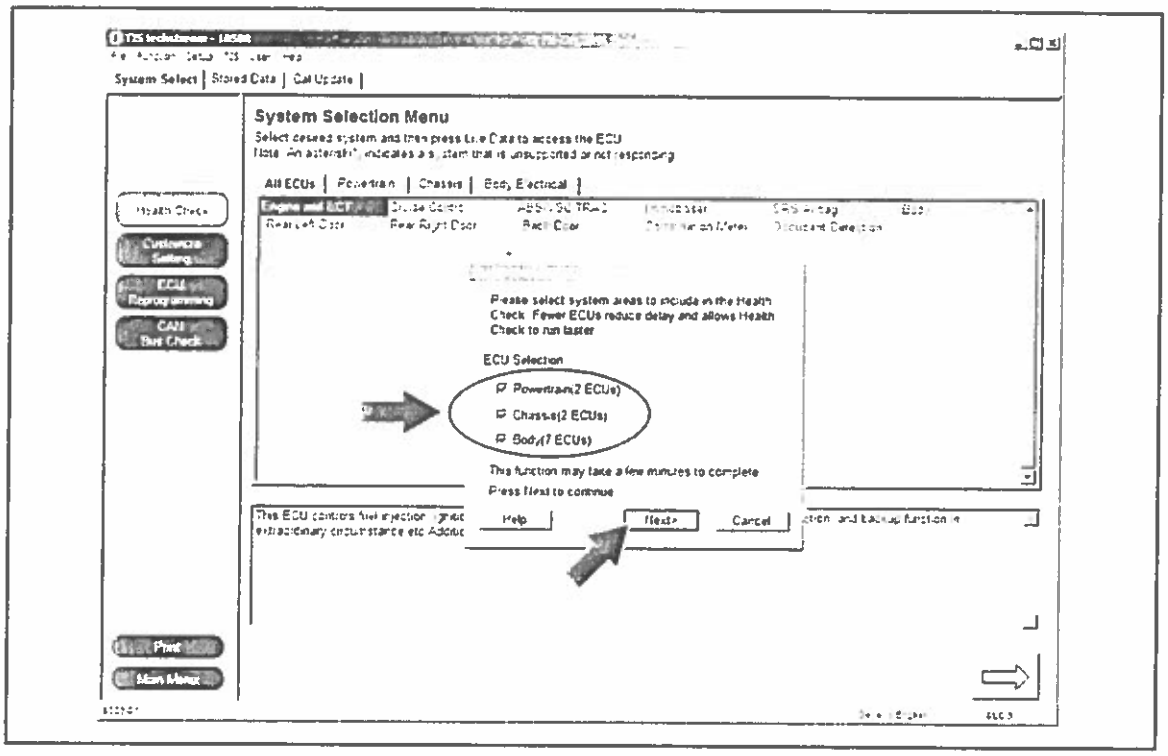
Techstream ECU Flash Reprogramming Procedure

Operation Procedure (Continued)

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

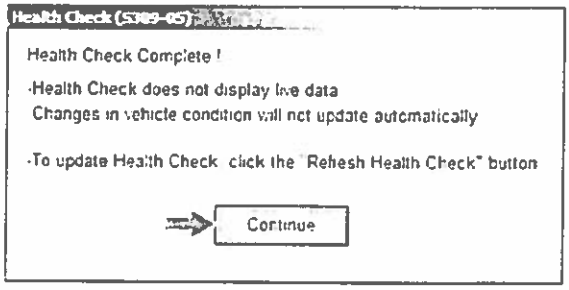
Figure 3.



D. Click *"Next"*.

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

Figure 4.



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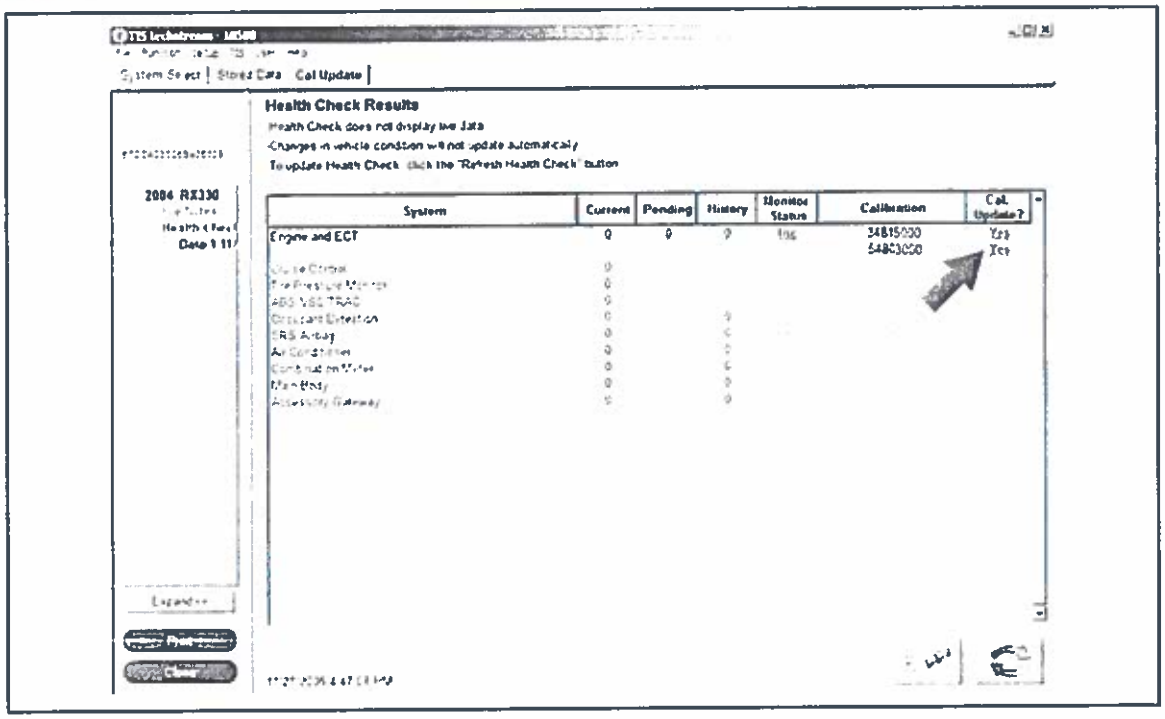
Techstream ECU Flash Reprogramming Procedure

Operation Procedure (Continued)

F. Available calibration updates are indicated by a *Yes* link in the *"Cal. 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.)

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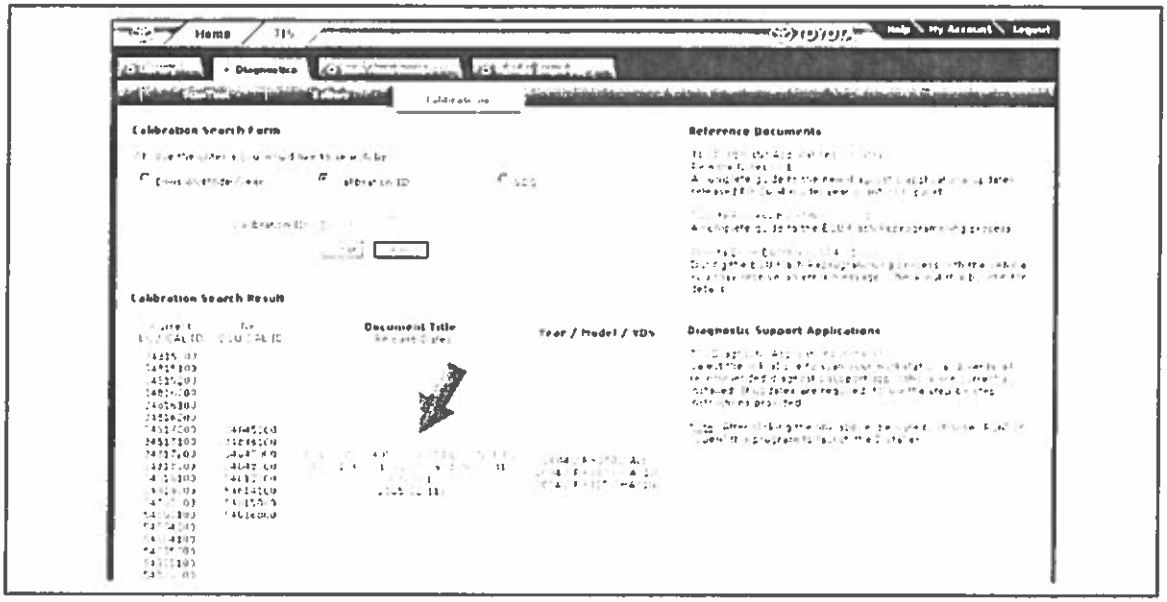
Techstream ECU Flash Reprogramming Procedure

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 Lexus Certified Technicians and above may access calibration files.**

Figure 6.



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Techstream ECU Flash Reprogramming Procedure

Operation Procedure (Continued)

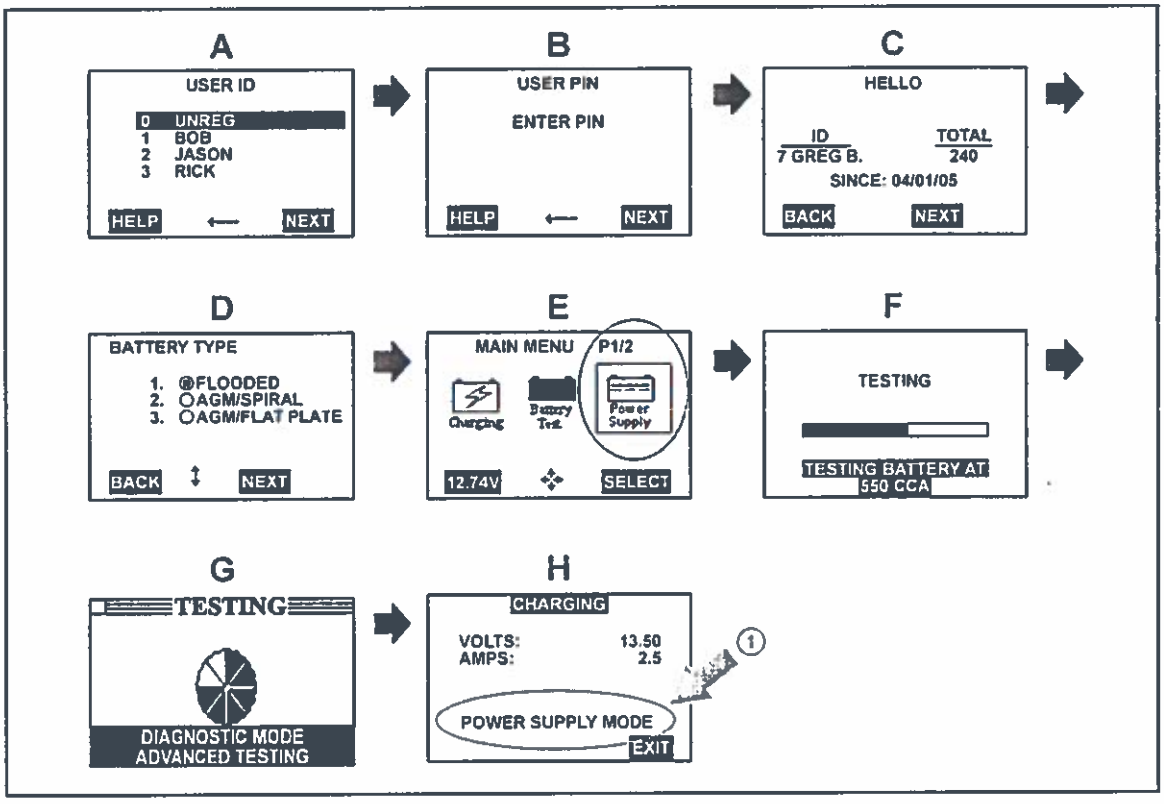
2. Connect the GR8 Battery Diagnostic Station.

   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

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Techstream ECU Flash Reprogramming Procedure

Operation Procedure (Continued)

3. Click the appropriate calibration ID and reprogram the vehicle's ECU with Techstream.

   A. After reviewing the procedures outlined in the selected Service Bulletin, click the appropriate calibration ID link by matching the vehicle's current calibration ID to the Previous Calibration ID in the Calibration Identification Chart.

> NOTE
> - **Calibration files are embedded as live links in the Service Bulletin.**
> - **Some vehicles require special preparation — please review the selected Service Bulletin carefully.**

Figure 8.

M.I.L. "ON" DTC P0031, P0051, P2238, AND/OR P2241 – EG002 05 Revised February 9, 2005

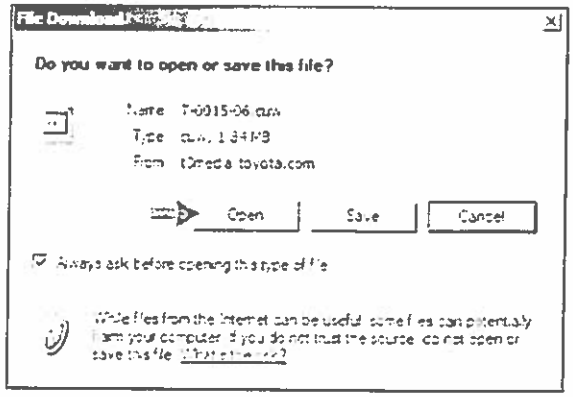
Calibration Identification Chart

MODEL	ECM (CPU)	PREVIOUS CALIBRATION ID	NEW CALIBRATION ID
2004 RX 330 FF (2WD) Sequential Shift (SS) Transmission	Main	34815000 34815100 34815200	
	Sub	54803000 54803100	
2004 RX 330 FF (2WD) Gate Shift (GS) Transmission	Main	34816000 34816100 34816200	
	Sub	54804000 54804100	
2004 RX 330 (4WD) Sequential Shift (SS) Transmission	Main	34817000 34817100 34817200	
	Sub	54805000 54805100	
2004 RX 330 (4WD) Gate Shift (GS)	Main	34818000 34818100 34818200	

   B. Click *Open* to load calibration file information.

> NOTE
> **Techstream pulls calibration files as needed to ensure the latest calibration file is used. Do NOT save calibrations locally on the hard drive or other media.**

Figure 9.



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Techstream ECU Flash Reprogramming Procedure

Operation Procedure (Continued)

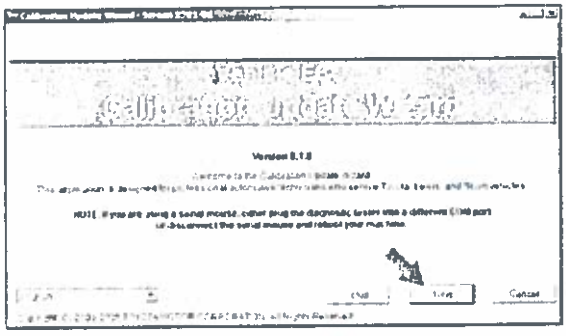
NOTICE

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 the hood is open and ensure under hood temperature does NOT exceed 158°F (70°C).**
- **Confirm cable connections between the vehicle and Techstream are secure.**
- **Do NOT disconnect or turn off Techstream or vehicle ignition during reprogramming.**
- **Set parking brake.**
- **Complete ALL flash calibration updates provided for each ECU.**
- **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.***

C. Click *"Next"* to start the calibration update process.

Figure 10.



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Techstream ECU Flash Reprogramming Procedure

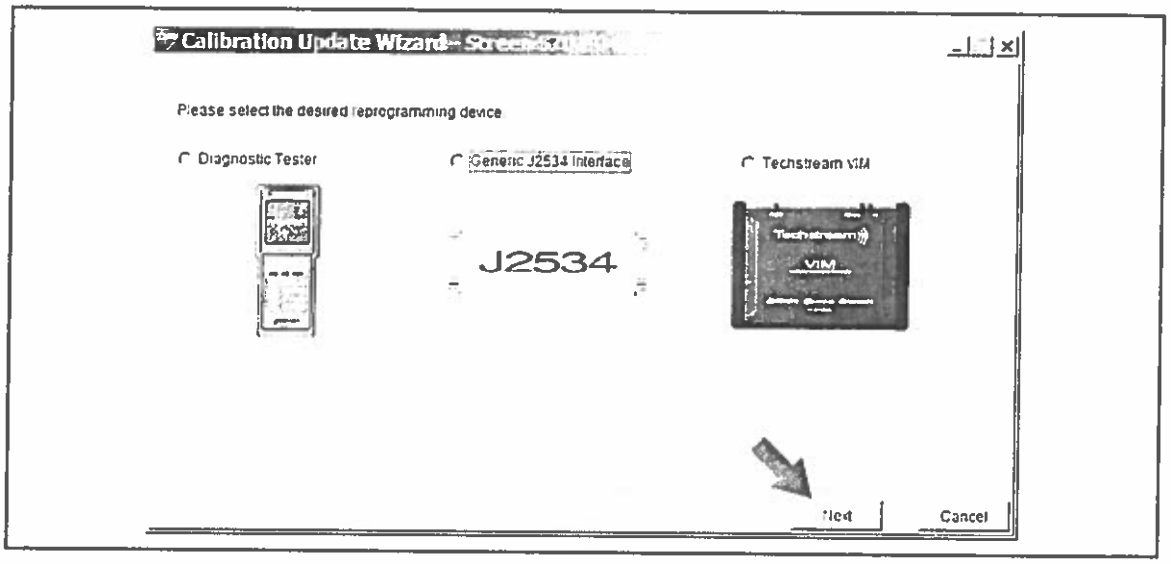
Operation Procedure (Continued)

D. Select the correct reprogramming device.

- If using Techstream 2.0, select *"Generic J2534 Interface"*.
- If using Techstream Lite, select *"Generic J2534 Interface"*.
- If using Techstream, select *"Techstream VIM"*.

Then click *"Next"*.

Figure 11.



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Techstream ECU Flash Reprogramming Procedure

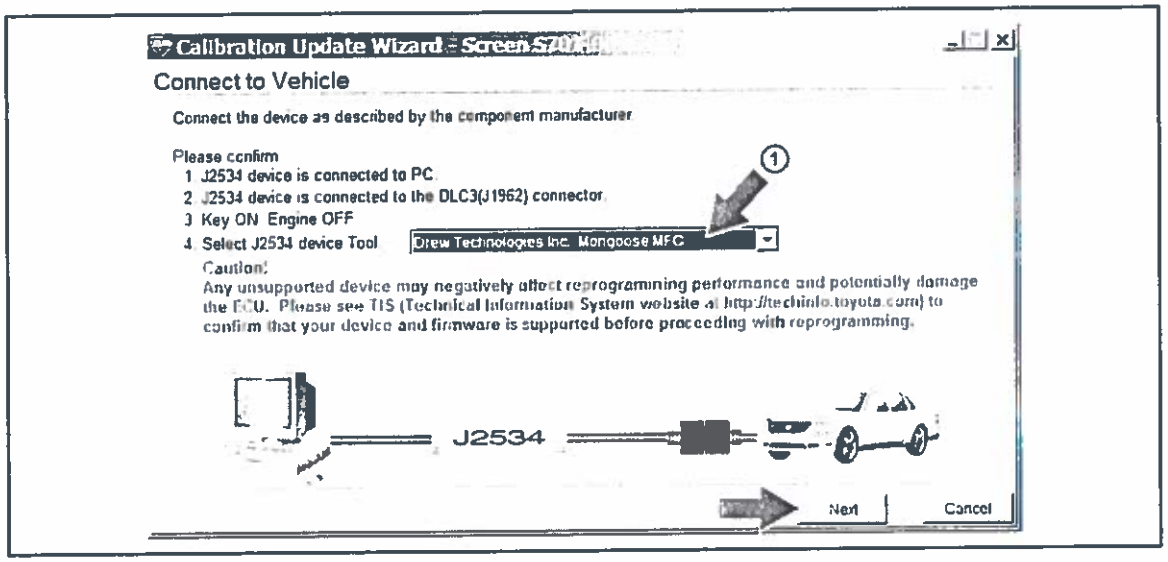
Operation Procedure (Continued)

E. Confirm the following:

- PC is connected to VIM.
- VIM is connected to DLC3 connector.
- Ignition is ON and engine is OFF or "READY" OFF (hybrid vehicles).

Then click *"Next"*.

Figure 12. Using Techstream 2.0 or Techstream Lite



1	**Select Correct Device Tool (*"Mongoose MFC"* or *"MongoosePro MFC"*)**

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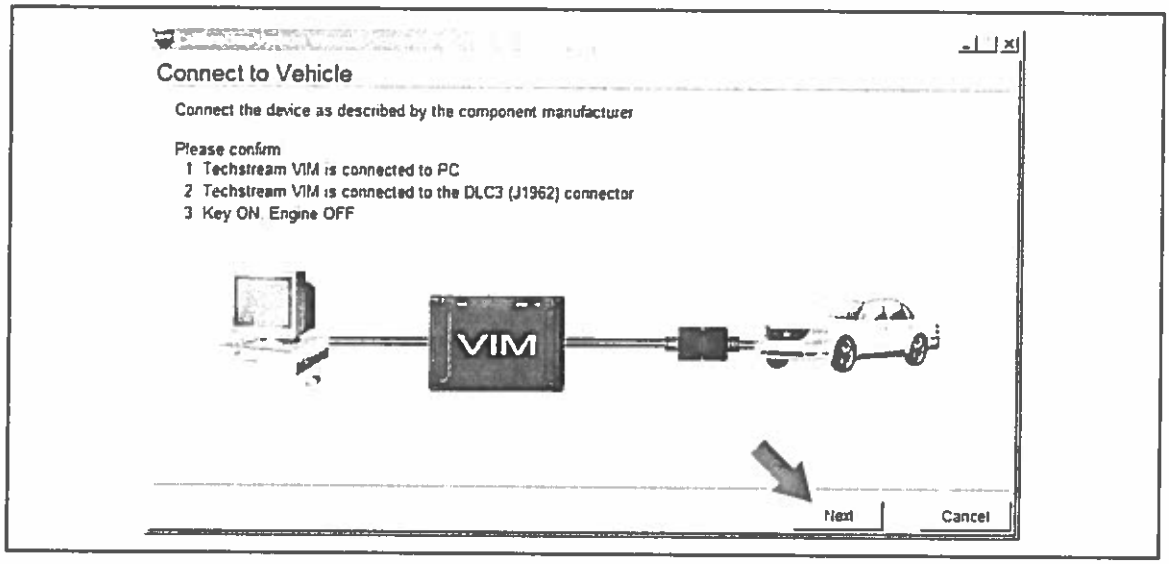
Techstream ECU Flash Reprogramming Procedure

Operation Procedure (Continued)

Figure 13. Using TIS Techstream



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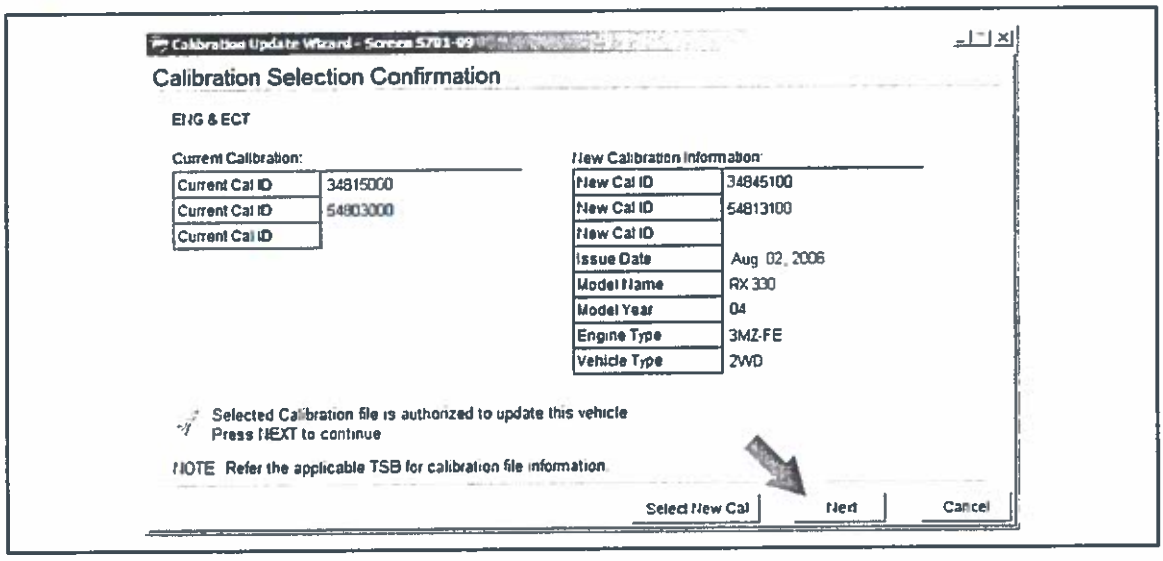
Techstream ECU Flash Reprogramming Procedure

Operation Procedure (Continued)

F. Verify correct current calibration and new calibration information. Then click *"Next"*.

NOTE
- **The total number of calibration IDs in the calibration file corresponds to the number of reprogrammable processors in the ECU.**
- **Each calibration file may contain up to three separate calibrations.**
- **Figure 14 shows an example of the update procedure for a two-processor ECU.**

Figure 14.



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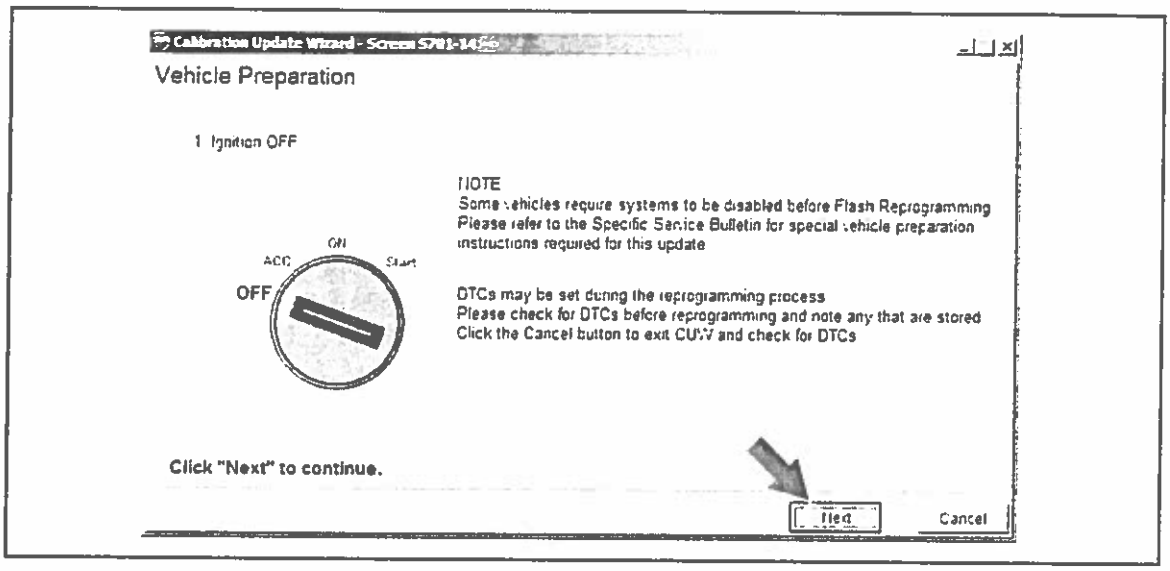
Techstream ECU Flash Reprogramming Procedure

Operation Procedure (Continued)

G. Turn ignition OFF. Then click *"Next"*.

Figure 15.



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Techstream ECU Flash Reprogramming Procedure

Operation Procedure (Continued)

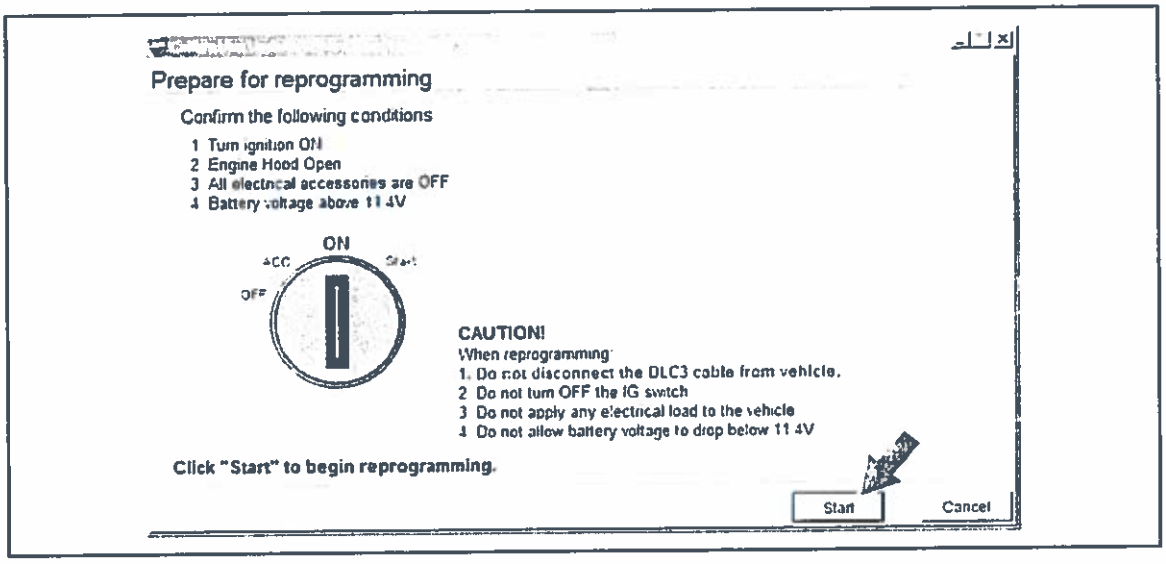
H. Confirm the following:

- Ignition is ON and engine is OFF or "READY" OFF (hybrid vehicles).
- Hood is open.
- All accessories are OFF.
- Battery voltage is above 11.4 volts.

> NOTICE
> **Verify the vehicle is connected to a battery charger before continuing — If battery voltage falls below 11.4 volts, ECU damage may occur.**

Then click *"Start"*.

Figure 16.



> NOTE
> **If key cycle is NOT done properly, reprogramming will stop at 10% and Cal 1 will fail to load.**

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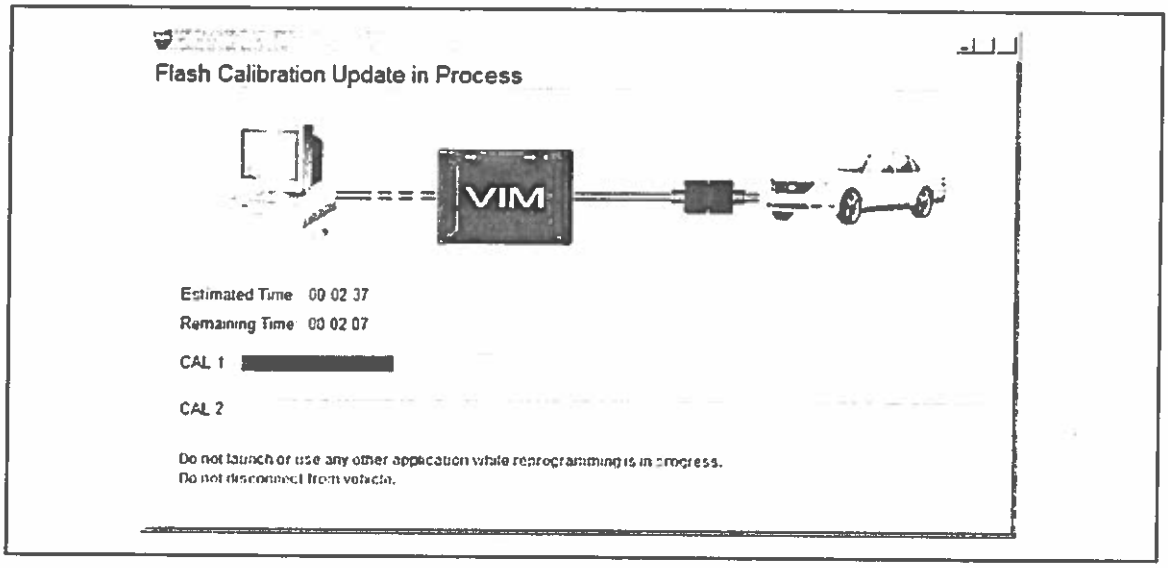
Techstream ECU Flash Reprogramming Procedure

Operation Procedure (Continued)

I. Do NOT disturb the vehicle during flash reprogramming.

NOTE
- **ECU flash reprogramming may take anywhere from 3 – 30 minutes per calibration file.**
- **Reprogramming time will vary depending on model and ECU communication protocol. Vehicles using CAN communication protocol will reprogram much faster (2 – 7 minutes).**

Figure 17.



NOTE
- **If vehicle requires only ONE calibration update, then proceed to step N in this bulletin.**
- **If vehicle requires a SECOND calibration update, then continue as follows:**
  - **For serial communication vehicles, go to step J.**
  - **For CAN communication vehicles, go to step L.**

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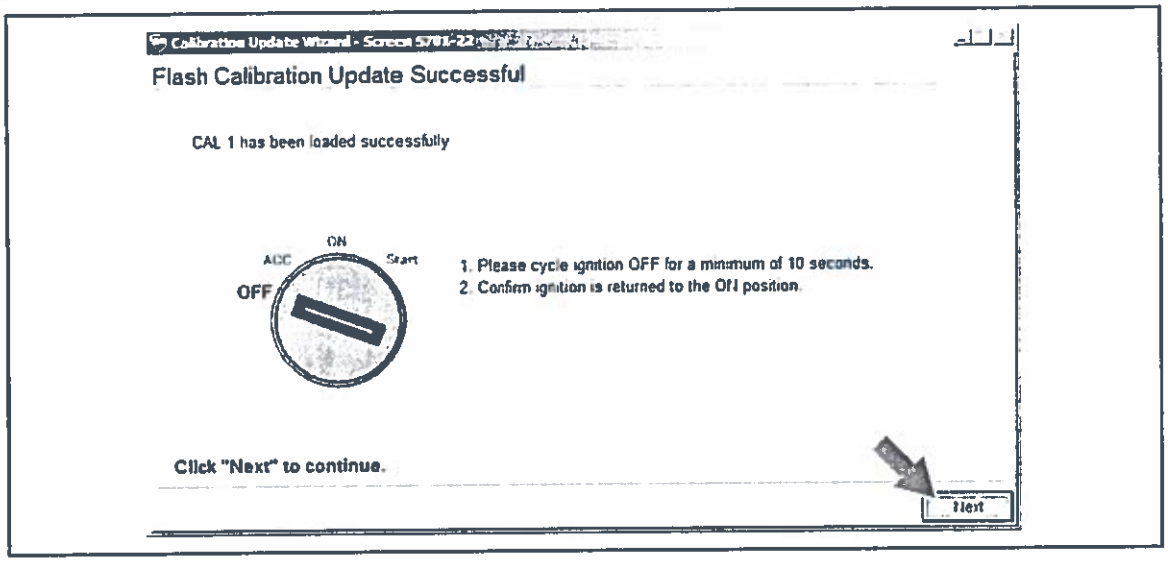
Techstream ECU Flash Reprogramming Procedure

Operation Procedure (Continued)

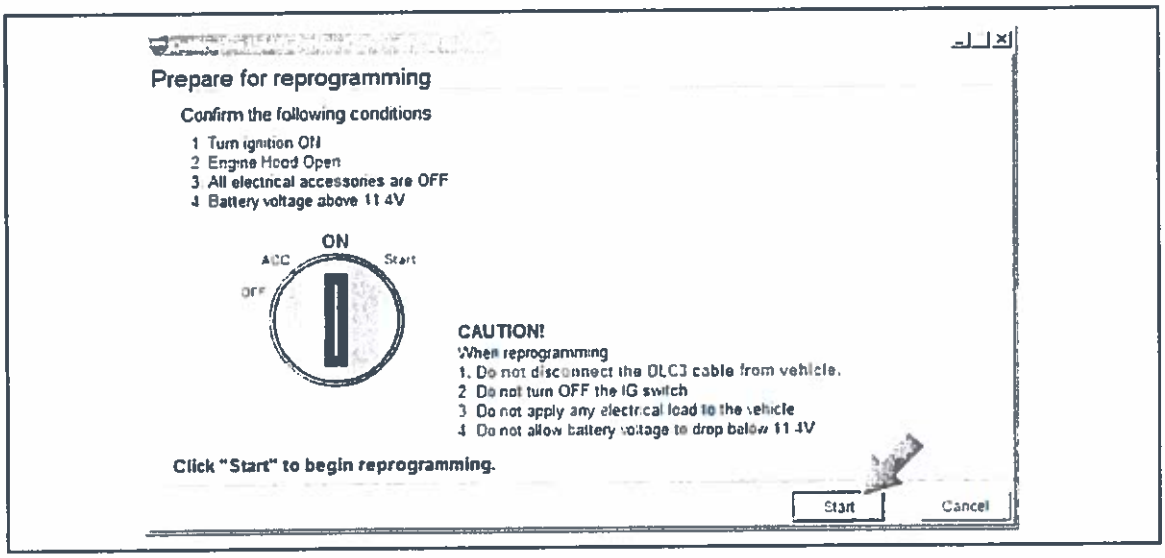
J. When Cal 1 has completed the update process, turn ignition OFF for a minimum of 10 seconds. Then click *"Next"*.

Figure 18.



K. Turn ignition to the ON position. Then click *"Start"*.

Figure 19.



NOTE

If key cycle is NOT done properly, reprogramming will stop at 10% and Cal 2 will fail to load.

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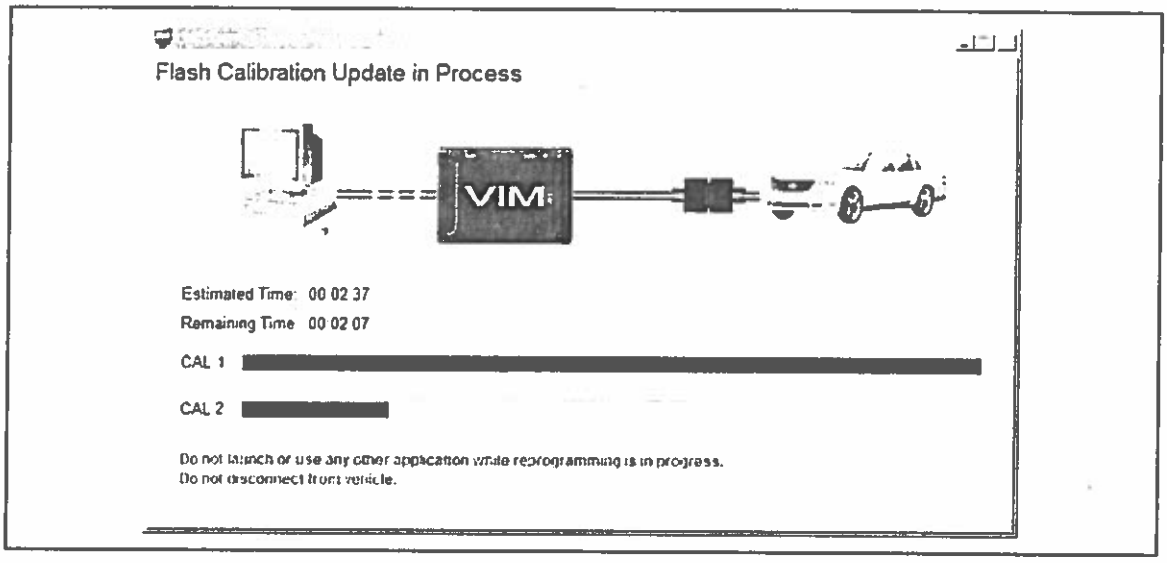
Techstream ECU Flash Reprogramming Procedure

Operation Procedure (Continued)

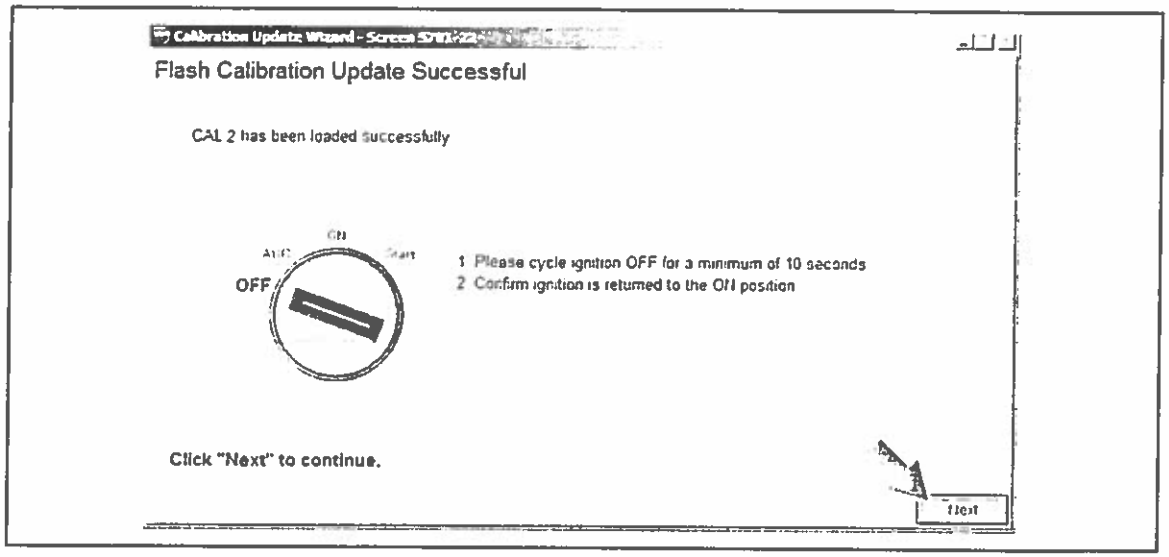
L. Do NOT disturb the vehicle during flash reprogramming.

Figure 20.



M. Turn ignition OFF for a minimum of 10 seconds. Then click *"Next"*.

Figure 21.



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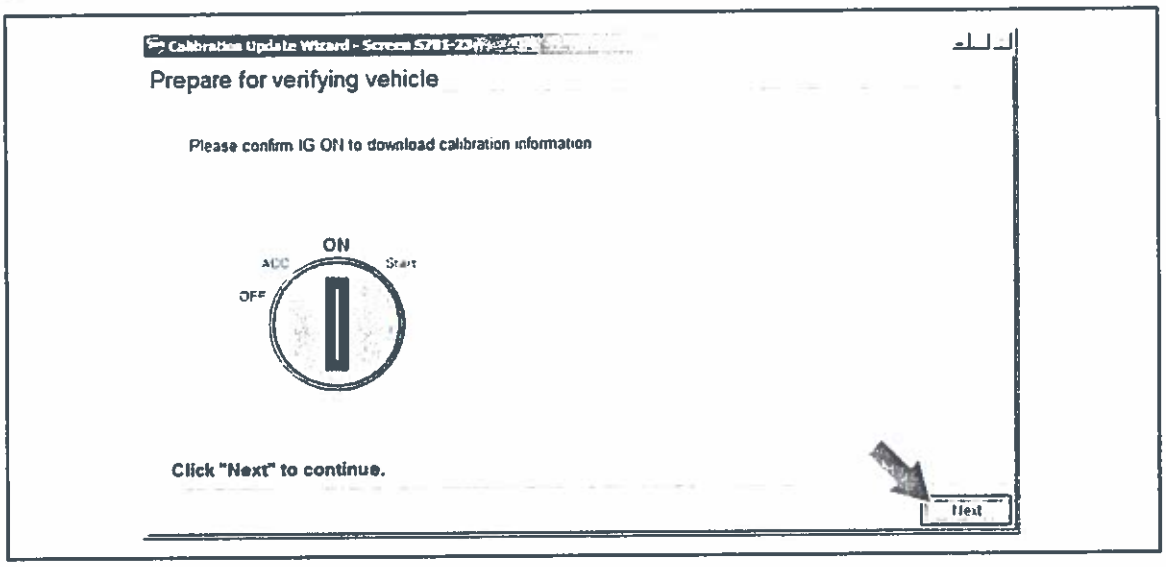
Techstream ECU Flash Reprogramming Procedure

Operation Procedure (Continued)

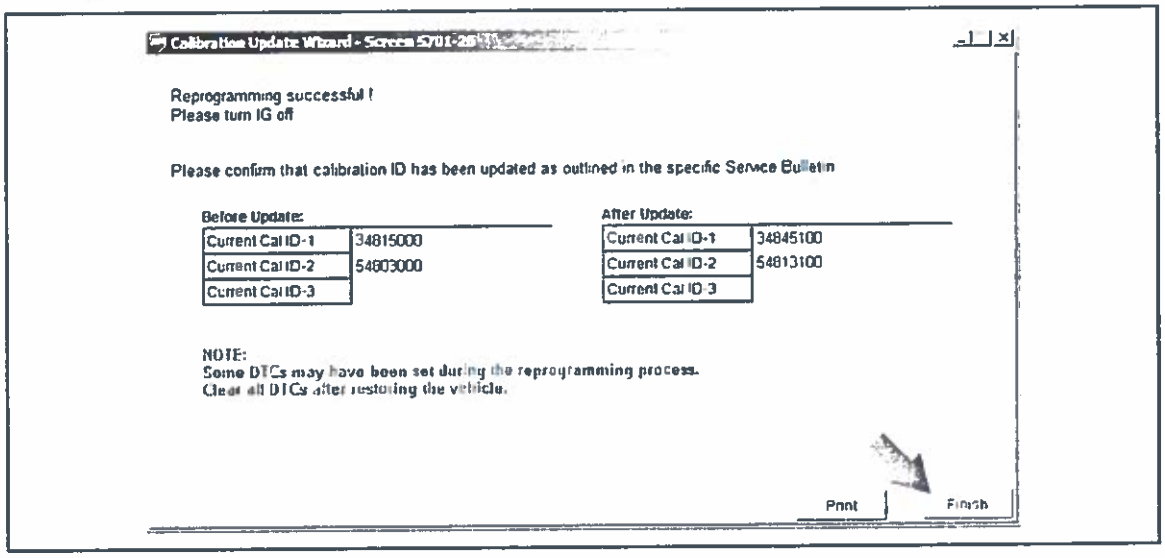
N. Turn ignition to the ON position. Then click *"Next"*.

Figure 22.



O. Confirm all calibrations were updated as specified in the Service Bulletin. Then click *"Finish"*.

Figure 23.



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Techstream ECU Flash Reprogramming Procedure

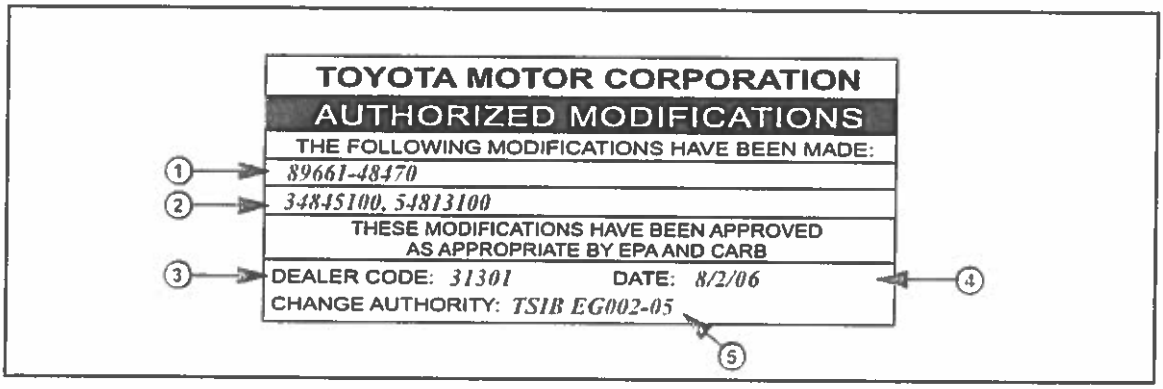
Operation Procedure (Continued)

> NOTE
>
> **On some models, DTCs may set as a result of reprogramming. If DTCs are present, clear codes and run the Health Check again. Troubleshoot any remaining Current, Pending, or History codes. Permanent codes will not be cleared using Techstream. Permanent codes do not illuminate the MIL and do not require troubleshooting. They will clear during normal driving once the Universal Trip Drive Pattern is performed.**

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 24.



1	Replacement ECU Part Number
2	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.**

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