Techstream ECU Flash Reprogramming Procedure

Service Category Engine/Hybrid System

Section Engine Control   **Market** USA

Toyota Supports
ASE Certification

Applicability

YEAR(S)	MODEL(S)	ADDITIONAL INFORMATION
2001 – 2011	4Runner, Avalon, Camry, Camry HV, Celica, Corolla, Echo, FJ Cruiser, Highlander, Highlander HV, Land Cruiser, MR2 Spyder, Matrix, Prius, Prius PHV, RAV4, Sequoia, Sienna, Solara, Tacoma, Tundra, Venza, Yaris	

TSB SUPERSESSION NOTICE

The information contained in this TSB supersedes TSB No. SS002-07.

- **Applicability has been updated to include 2009 – 2011 model year Toyota vehicles.**

- **A new section, Techstream Preparation, has been added.**

- **Techstream Lite has been added as an option in Required Tools & Materials.**

- **Process Overview and Operation Procedure sections have been updated.**

TSB No. SS002-07 is Obsolete and any printed versions should be discarded. Be sure to review the entire content of this service 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.

Techstream ECU Flash Reprogramming Procedure

Introduction (Continued)

> **ECU**
>
> **Electronic Control Unit (ECU) is a Toyota 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 Toyota specific control unit**

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.**

Required Tools & Equipment

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

> **NOTE**
>
> **Additional TIS Techstream units may be ordered by calling Approved Dealer Equipment (ADE) at 1-800-368-6787.**

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

* Essential SST.

Techstream ECU Flash Reprogramming Procedure

Required Tools & Equipment (Continued)

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

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.

Techstream ECU Flash Reprogramming Procedure

Techstream Preparation

Selecting the TIS Techstream VIM or the Mongoose MFC VIM.

Techstream software requires a VIM selection before you can use the Mongoose MFC VIM. If using TIS Techstream, no changes are needed.

Perform the following:

1. Select *Setup* from the Techstream Main Menu screen.

2. Select *VIM Select* from the Setup drop down menu.

Figure 1.
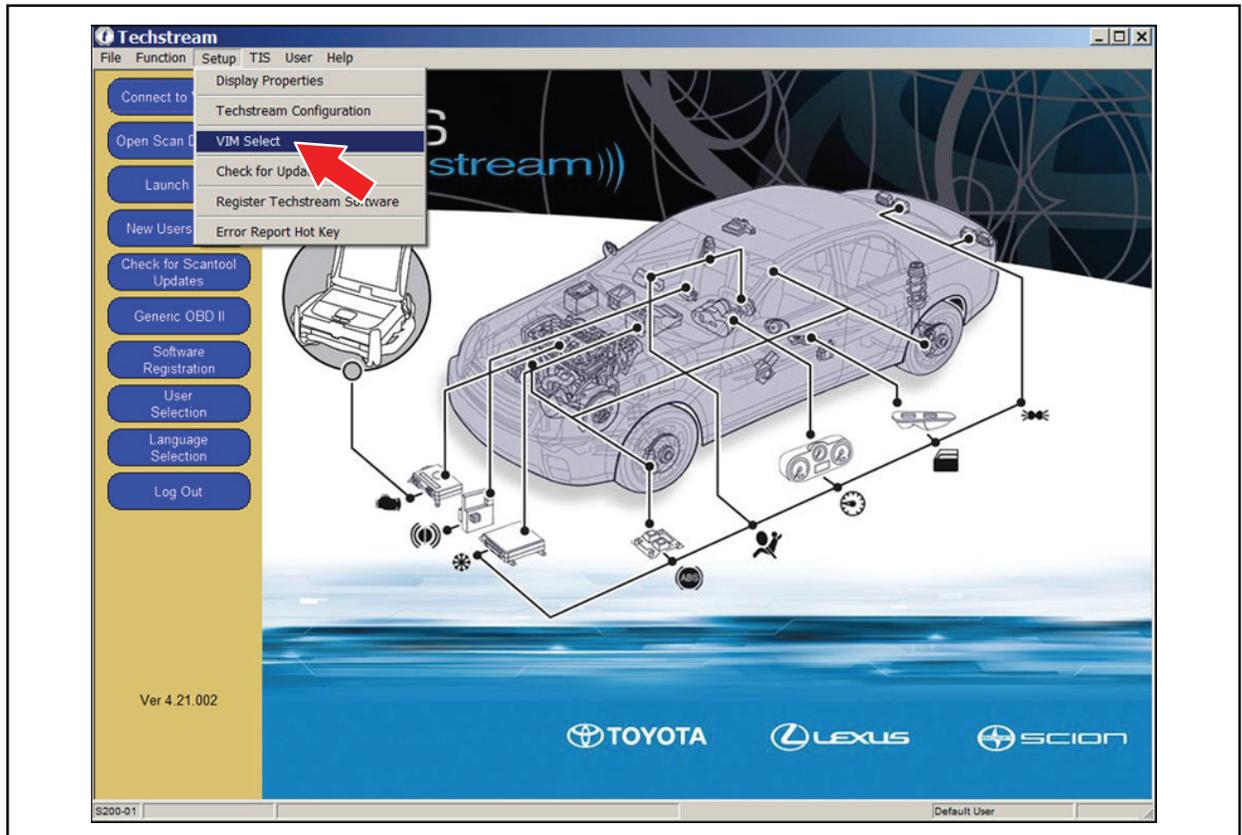
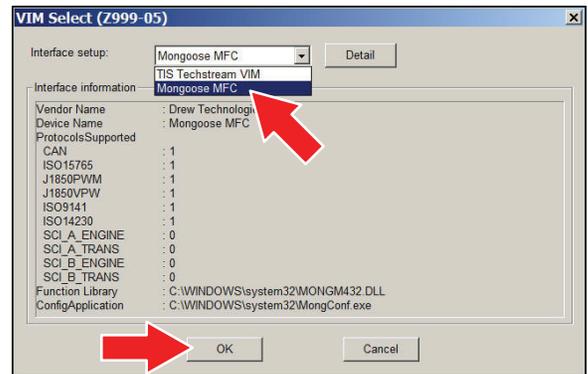# Techstream ECU Flash Reprogramming Procedure

Techstream Preparation (Continued)

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

   - If using Techstream Lite, select *Mongoose MFC*.

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

Figure 2. Select Mongoose MFC to Use Techstream Lite

   - If using TIS Techstream, select *TIS Techstream VIM* (this is the default).

Figure 3. Select TIS Techstream VIM (default) to Use TIS Techstream
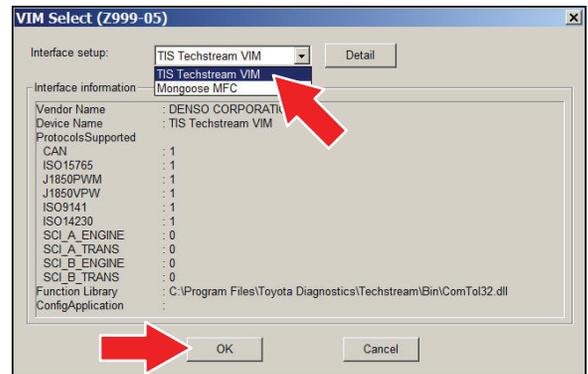
4. Click *OK*.

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 4.
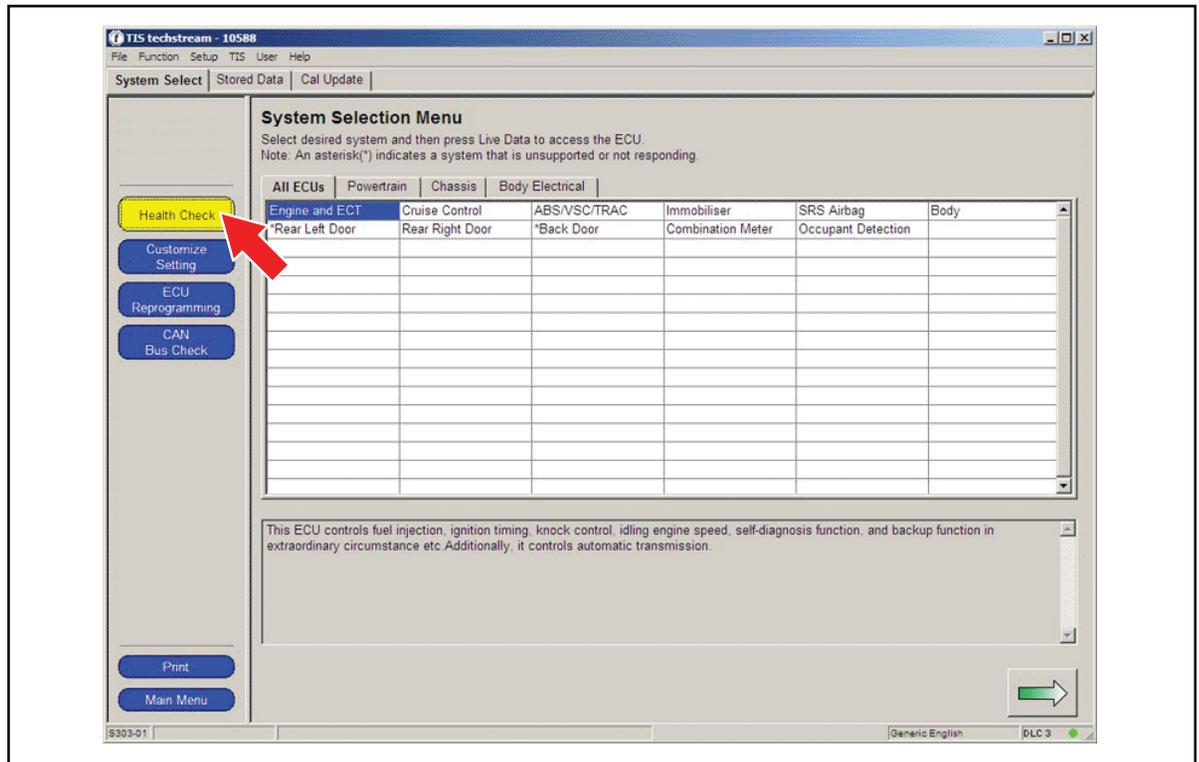
Techstream ECU Flash Reprogramming Procedure

Operation Procedure (Continued)

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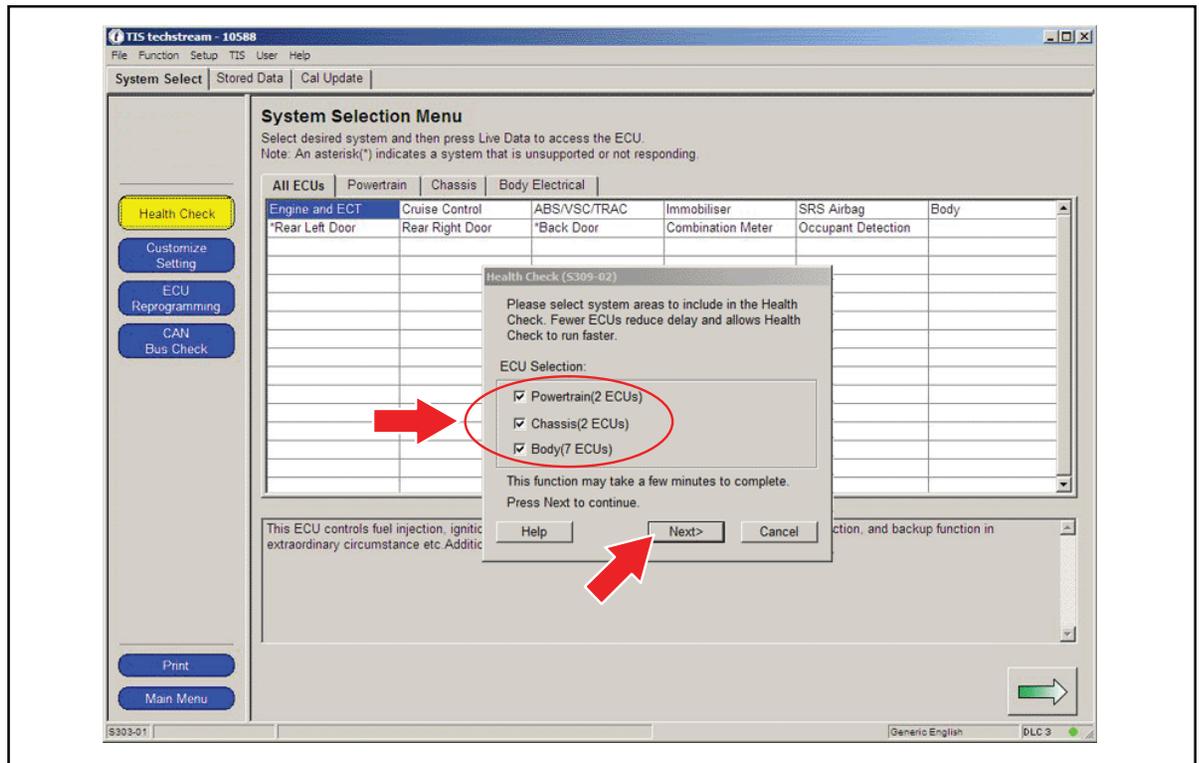
D. Click *Next*.

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

Figure 6.

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 7.
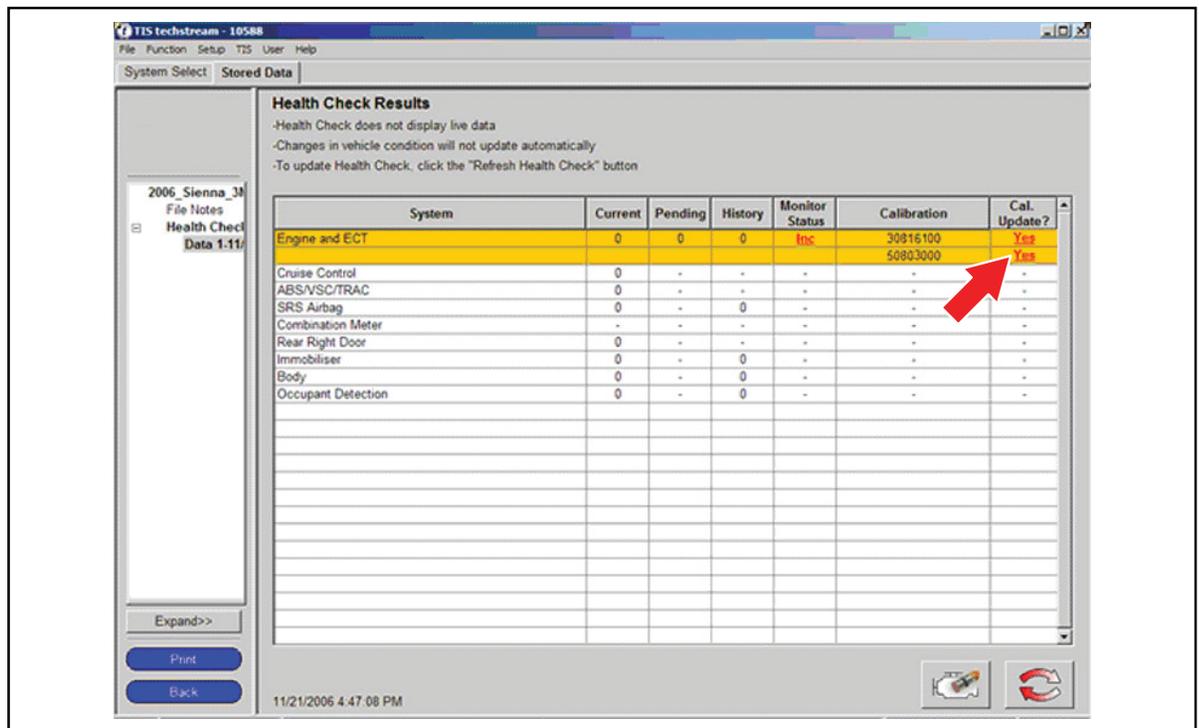
G. Log in to TIS. (If already logged in, skip this step.)

Techstream ECU Flash Reprogramming Procedure

Operation Procedure (Continued)

H. To review the TSB 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 8.
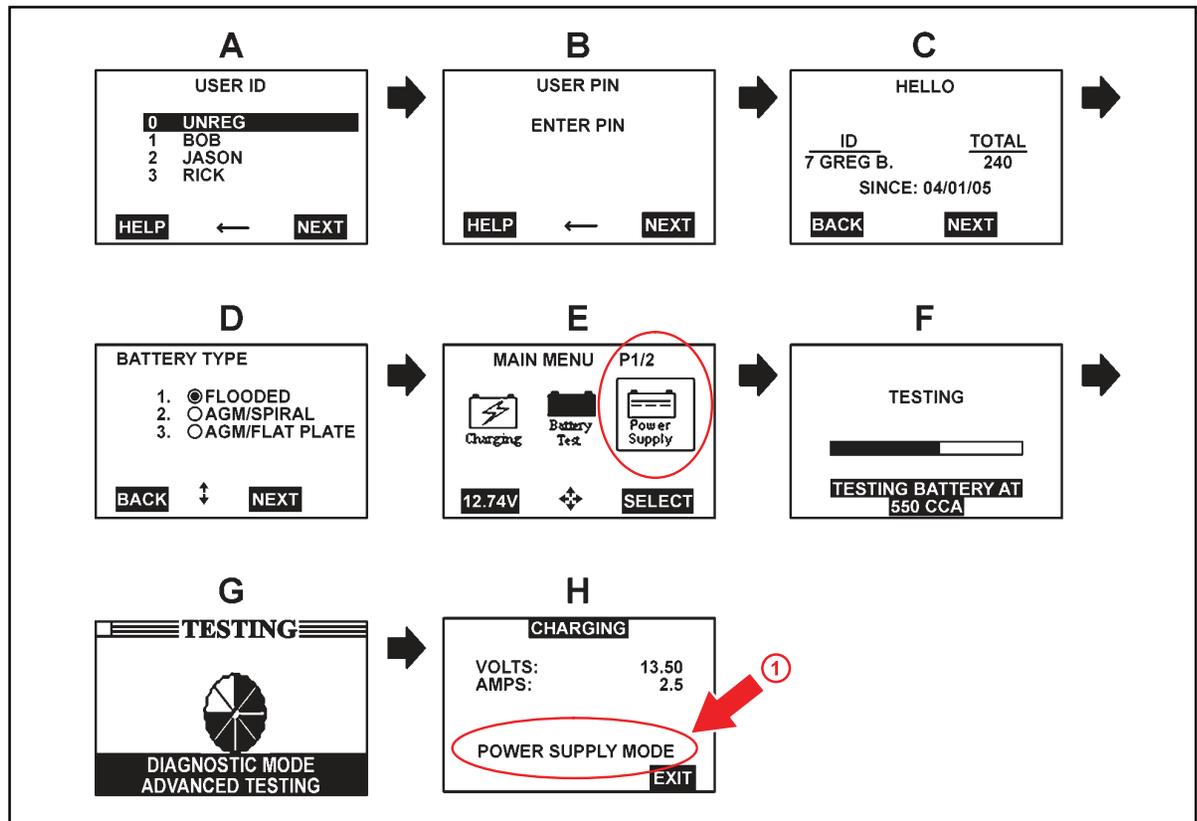
Techstream ECU Flash Reprogramming Procedure

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 9.

1	Confirm Power Supply Mode Is Selected

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 TSB, 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 TSB carefully.**

Figure 10.

ECM CALIBRATION: SHIFT FEELING ENHANCEMENT – TC007-03 Revised   November 7, 2003

Calibration Identification Chart

MODEL YEAR	MODEL	ECM (CPU)	PREVIOUS CALIBRATION ID	NEW CALIBRATION ID	VDS
2004 & 2005	2WD	Main	30801000 30801100 30801200 30801300 30804000	30806000	ZA22C ZA23C
		Sub	50801000 50801100 50803000	50805000	
	4WD	Main	30802000 30802100 30802200 30802300 30805000	30807000	BA22C BA23C
		Sub	50802000 50802100 50804000	50806000	

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 11.
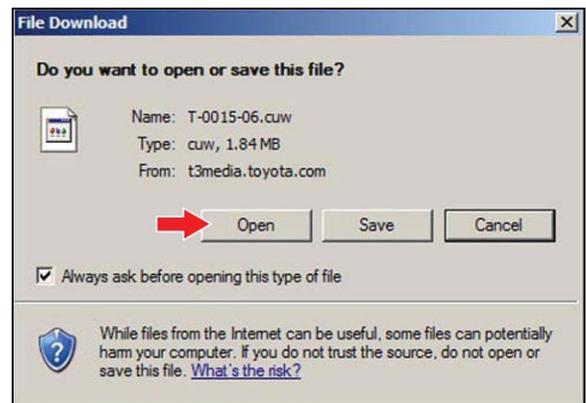
Techstream ECU Flash Reprogramming Procedure
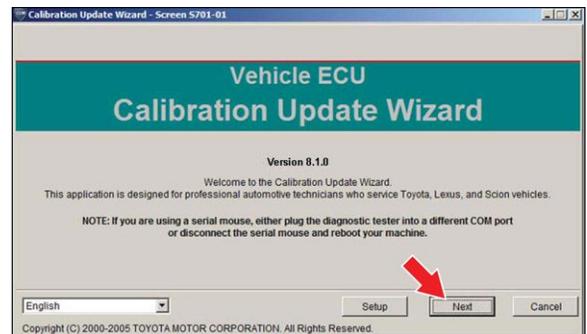
Operation Procedure (Continued)

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 TSB 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 12.

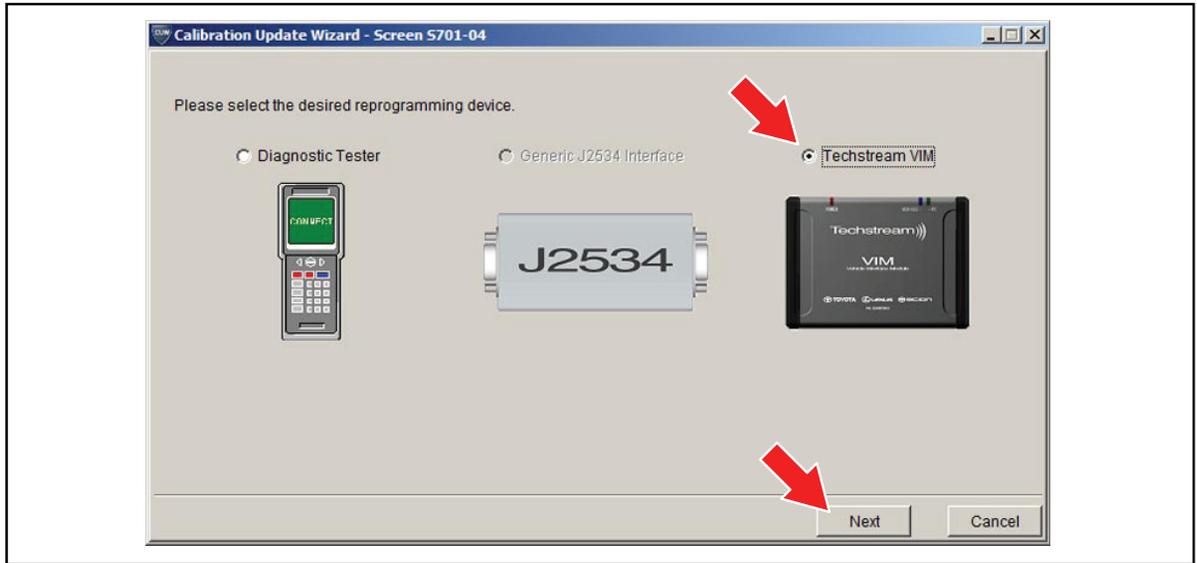# Techstream ECU Flash Reprogramming Procedure
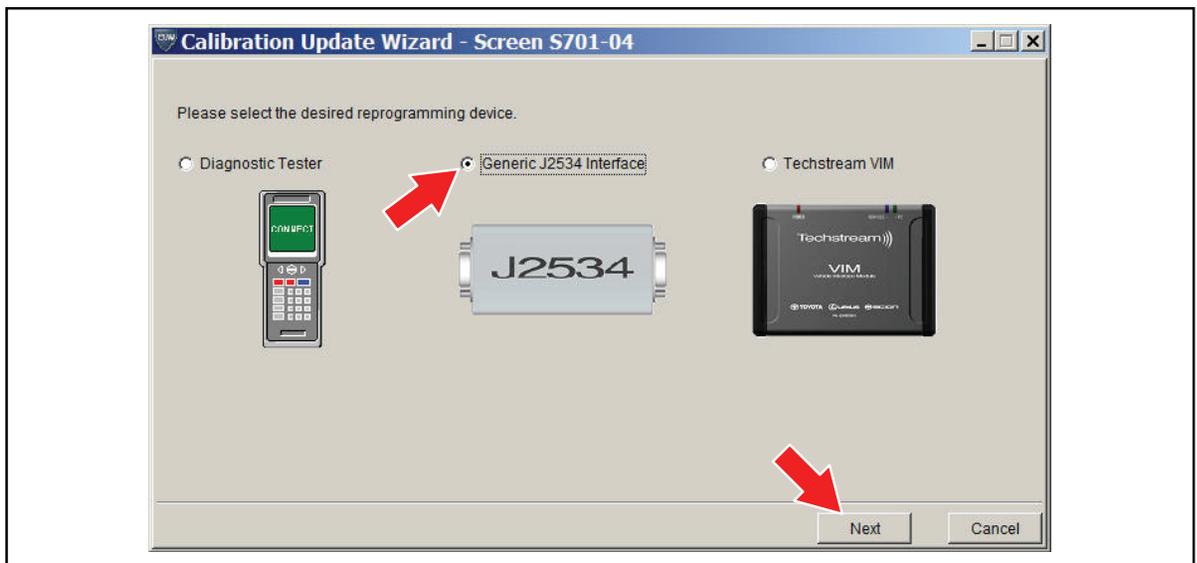
Operation Procedure (Continued)

D. When using TIS Techstream, select *Techstream VIM* as the desired programming device. Then click *Next*.

Figure 13.

When using Techstream Lite, select *Generic J2534 Interface*. Then click *Next*.

Figure 14.

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).
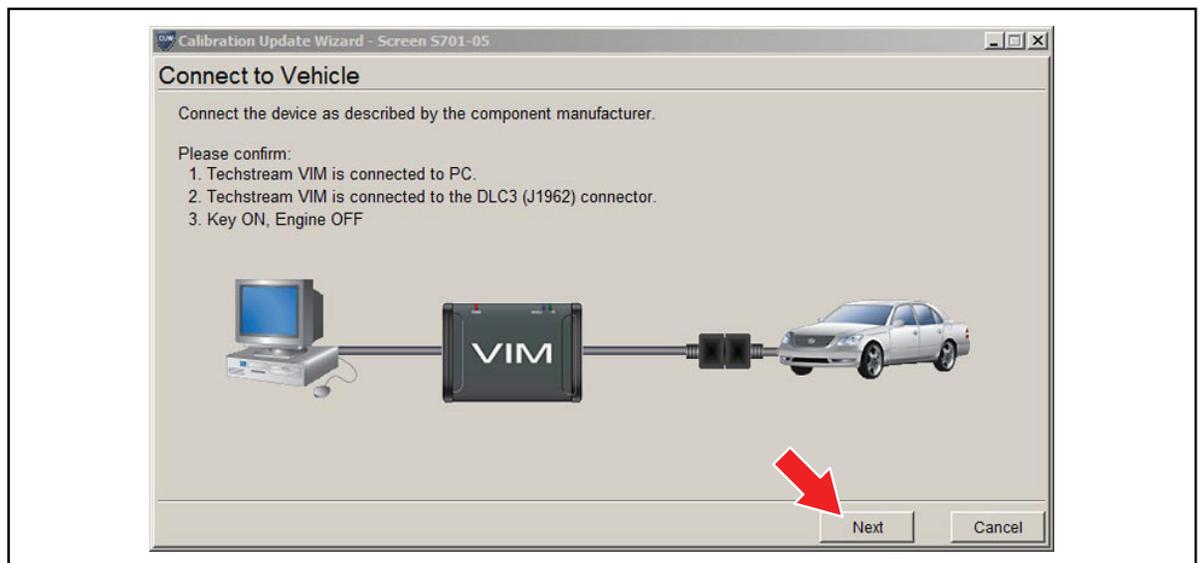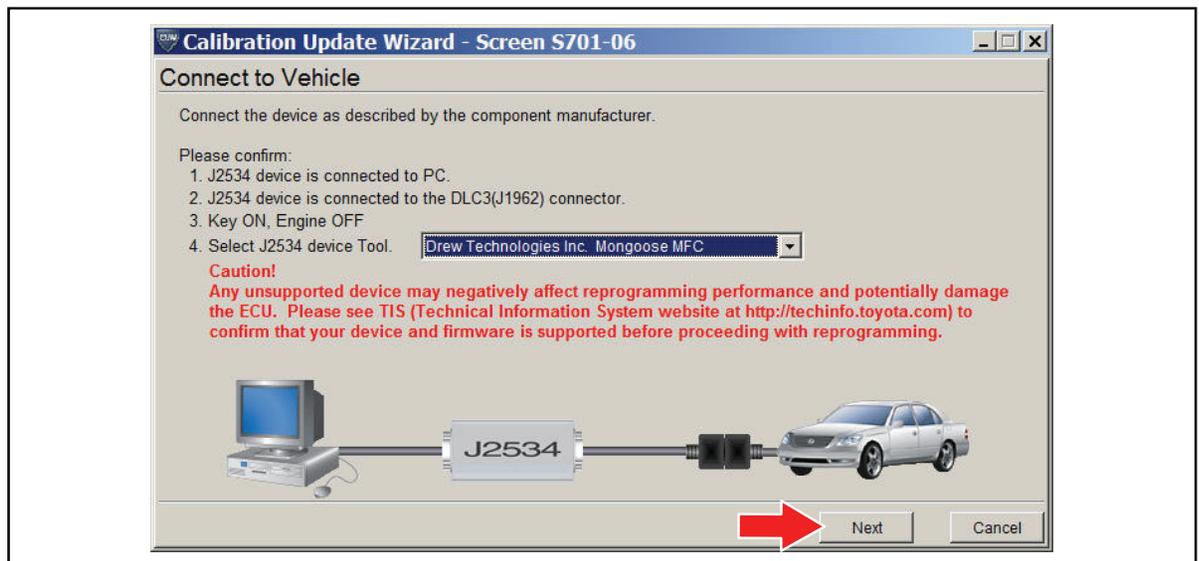
Then click *Next*.

Figure 15. Using TIS Techstream

Figure 16. Using Techstream Lite

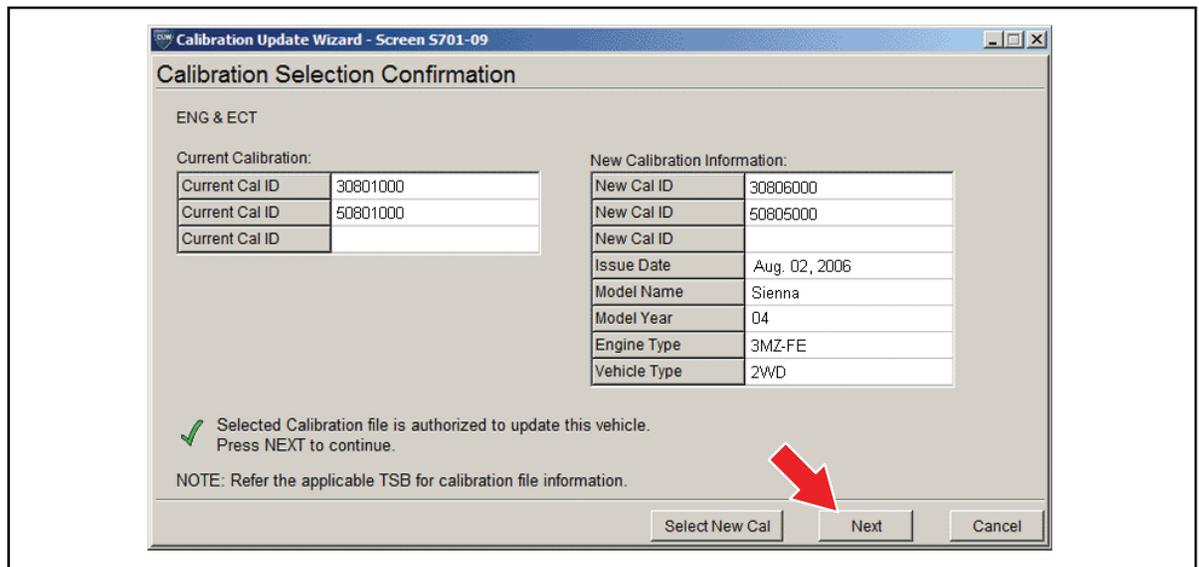# Techstream ECU Flash Reprogramming Procedure

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.**

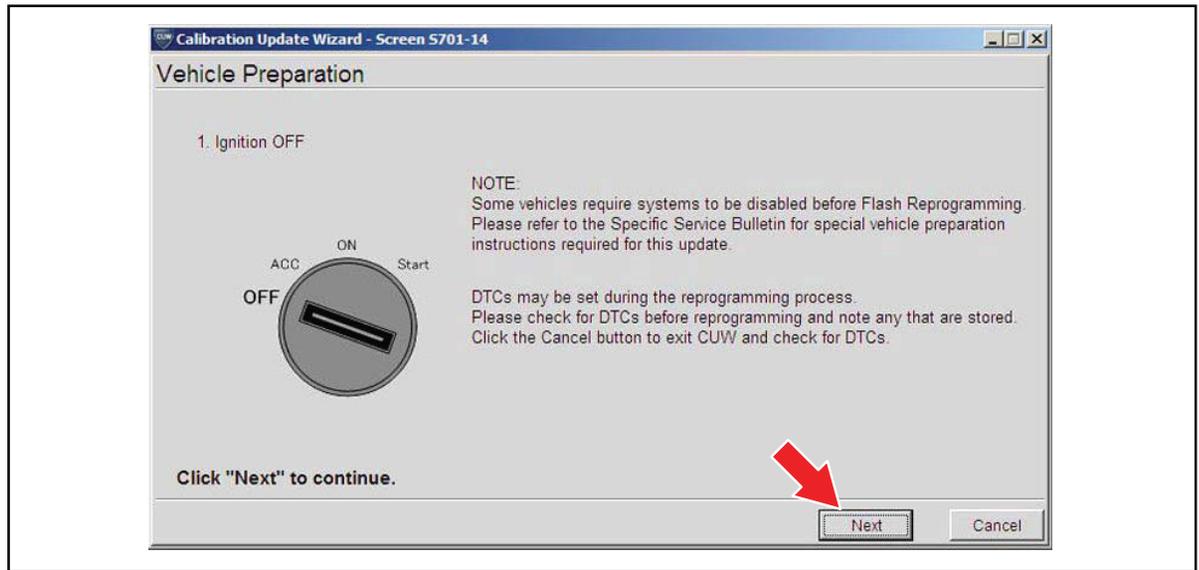- **Figure 17 shows an example of the update procedure for a two-processor ECU.**

Figure 17.

Techstream ECU Flash Reprogramming Procedure

Operation Procedure (Continued)

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

Figure 18.

Techstream ECU Flash Reprogramming Procedure

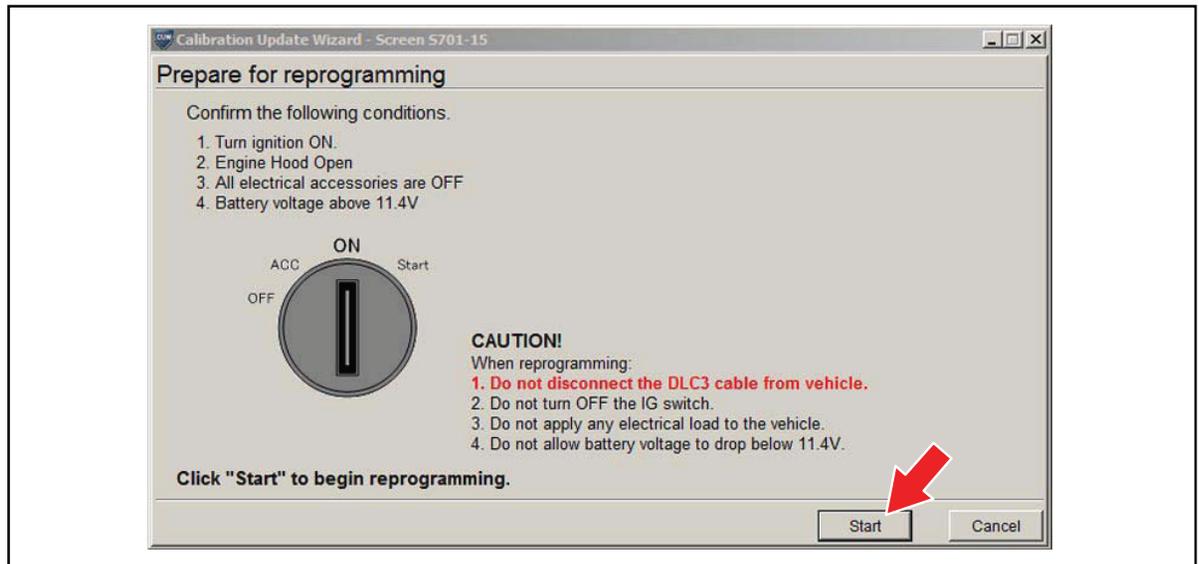**Operation Procedure (Continued)**

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 19.

NOTE

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

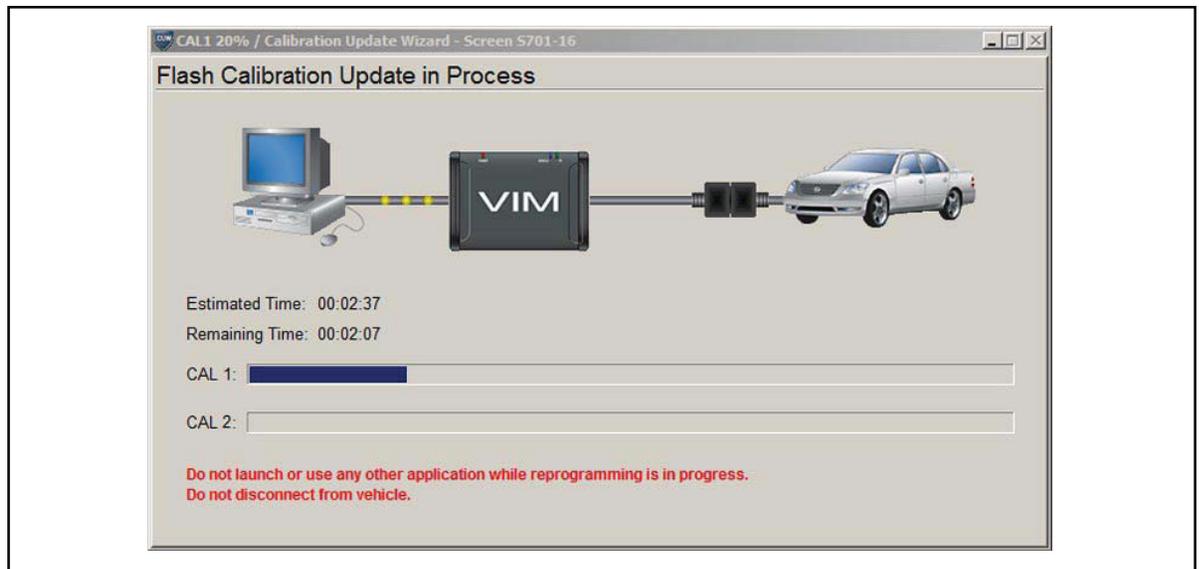# Techstream ECU Flash Reprogramming Procedure

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).**
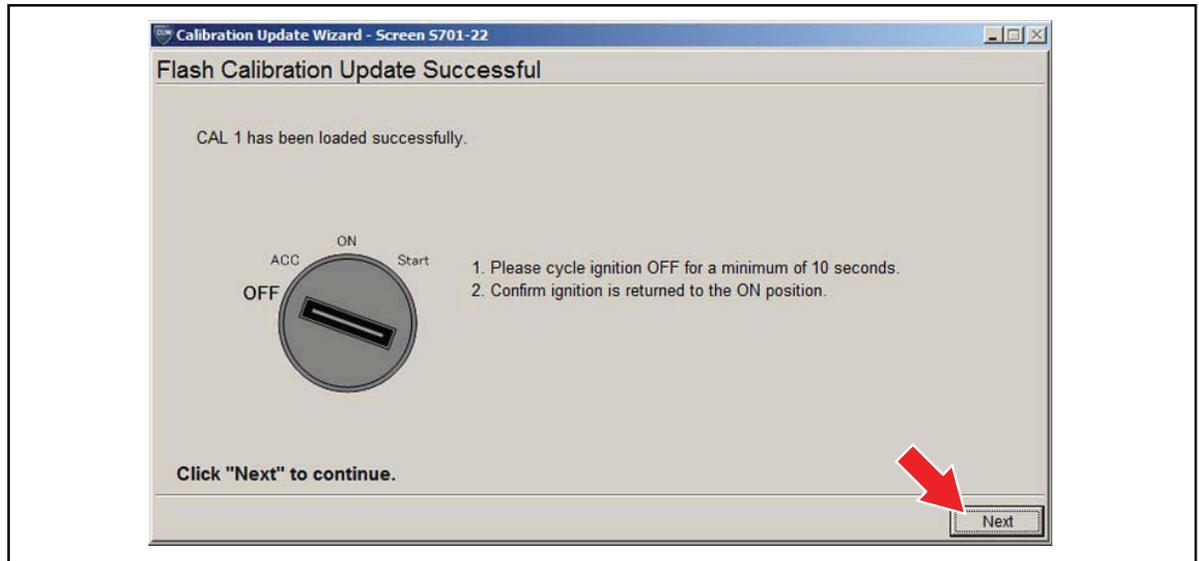
Figure 20.

> **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.**

Techstream ECU Flash Reprogramming Procedure

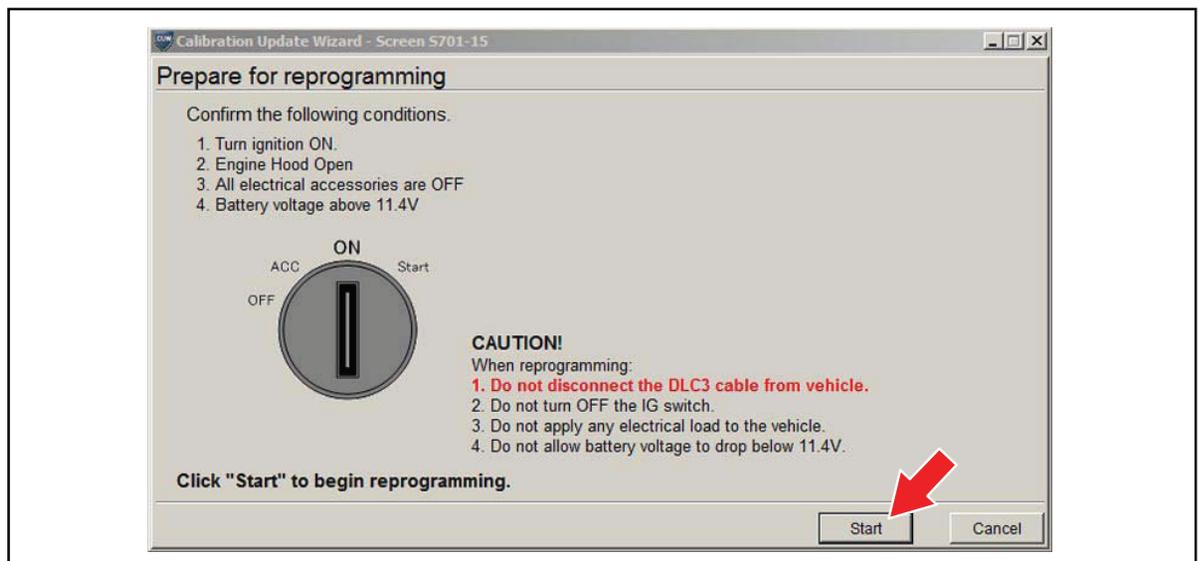**Operation Procedure (Continued)**

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

Figure 21.

    K. Turn ignition to the ON position. Then click *Start*.
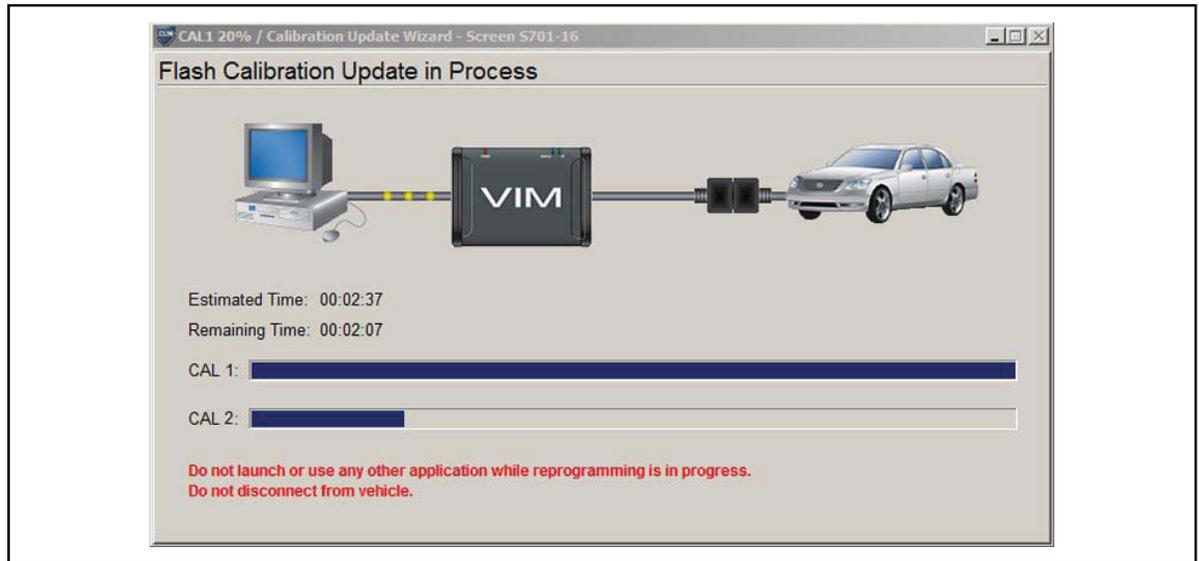
Figure 22.

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

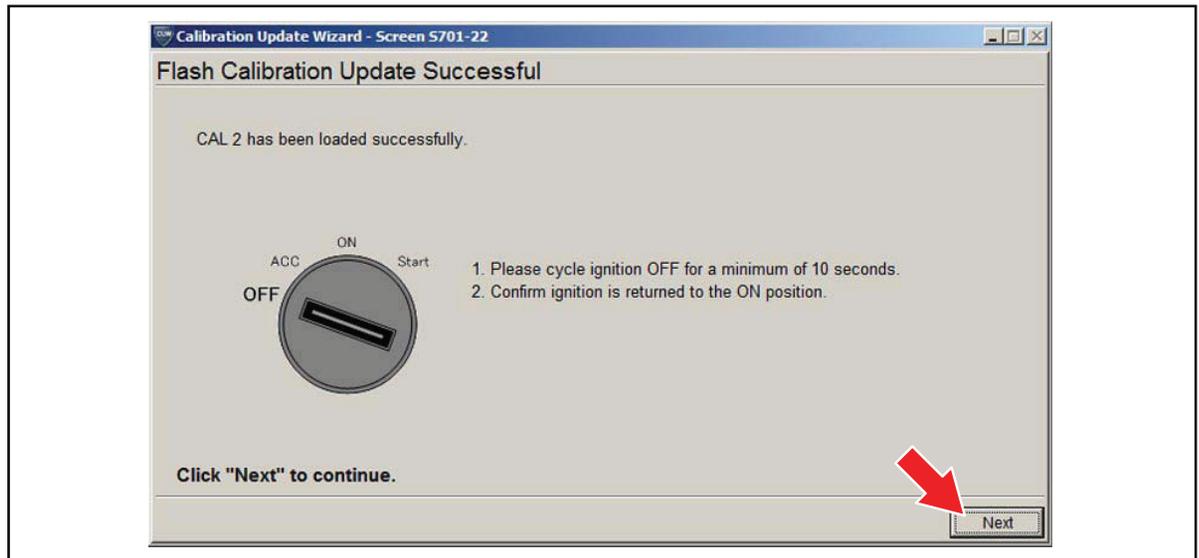# Techstream ECU Flash Reprogramming Procedure

Operation Procedure (Continued)

L. Do NOT disturb the vehicle during flash reprogramming.

Figure 23.

M. Turn ignition OFF for a minimum of 10 seconds. Then click *Next*.
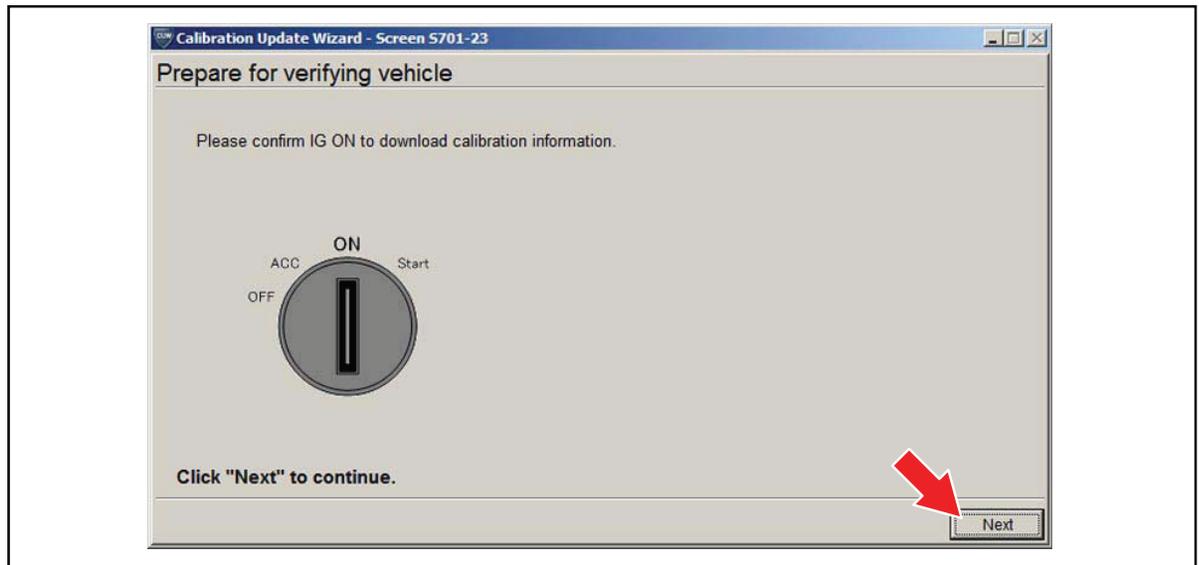
Figure 24.

Techstream ECU Flash Reprogramming Procedure

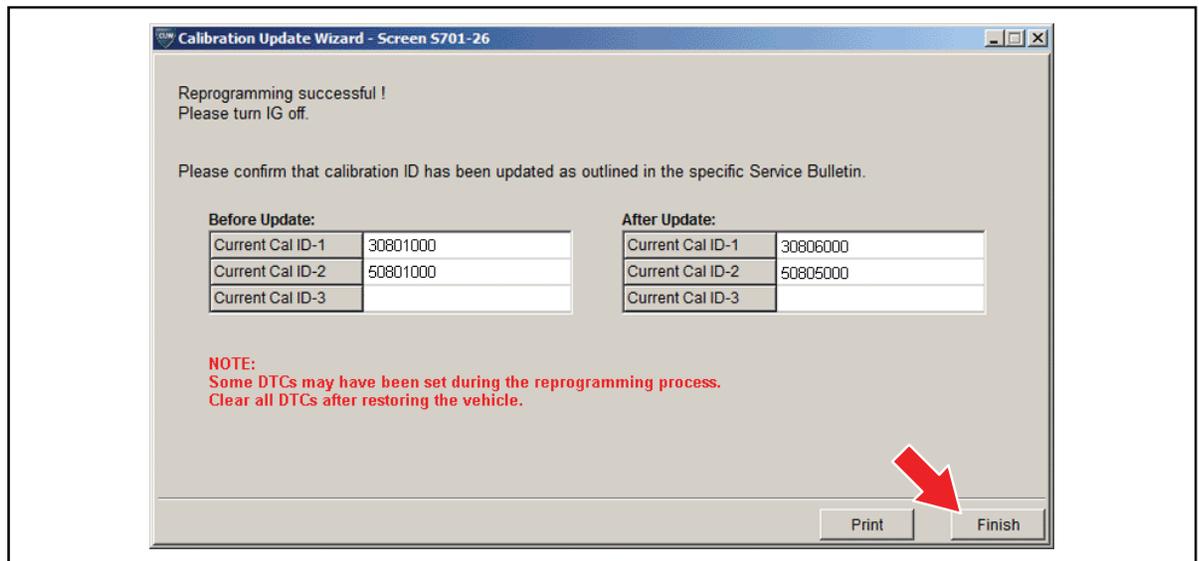**Operation Procedure (Continued)**

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

Figure 25.

O. Confirm all calibrations were updated as specified in the service bulletin. Then click *Finish*.

**Figure 26.**

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 27.
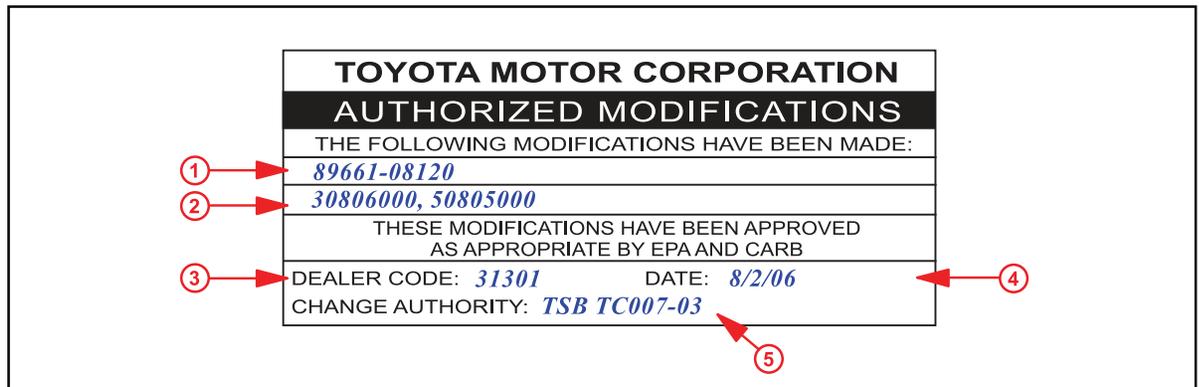
1	Replacement ECU Part Number		4	Date Completed
2	Calibration ID(s)		5	TSB or Campaign Number
3	Dealer Code			

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

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