LEXUS
Technical Service Information Bulletin

ECU Flash Reprogramming With Security Signature

Service Category	General		
Section	Outline-General	**Market**	USA and Mexico

Toyota Supports
ASE Certification ASE

Applicability

YEAR(S)	MODEL(S)	ADDITIONAL INFORMATION
2022	LS500, LS500H, LX600, NX250, NX350, NX350H, NX450H+	

Introduction

Flash reprogramming allows the Electronic Control Unit (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 TIS and the Calibration Update Wizard (CUW). To ensure the correct ECU software is installed, ECUs will require a Security Signature before the ECU will initialize the flash reprogramming sequence. This bulletin also details the process for acquiring a Security Signature from TIS during the Techstream ECU flash reprogramming process.

Warranty Information

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

Parts Information

PART NUMBER	PART NAME	QTY
00451-00001-LBL	Authorized Modifications Labels	1

> **NOTE**
> - The ECM (PCM) should NOT be replaced as part of the Repair Procedure.
> - Authorized Modifications Labels may be ordered in packages of 25 from the Materials Distribution Center (MDC) through Dealer Daily – Parts – Dealer Support Materials Orders.

ECU Flash Reprogramming With Security Signature

Required Tools & Equipment

REQUIRED EQUIPMENT	SUPPLIER	PART NUMBER	QTY
Techstream ADVI*	ADE	TSADVUNIT	1
Techstream 2.0		TS2UNIT	
Techstream Lite		TSLITEPDLR01	
Techstream Lite (Green Cable)		TSLP2DLR01	

*Essential SST.

> **NOTE**
> - Only ONE of the Techstream units listed above is required.
> - Software version 17.10.012 or later is required.
> - Additional Techstream units may be ordered by calling Approved Dealer Equipment (ADE) at 1-800-368-6787 (USA) or 01-55-50103041 (Mexico).
> - 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
Battery Diagnostic Tool*	DCA-8000P T	1

*Essential SST.

> **NOTE**
> Additional SSTs may be ordered by calling 1-800-933-8335 (USA) or 01-800-504-5330 (Mexico).
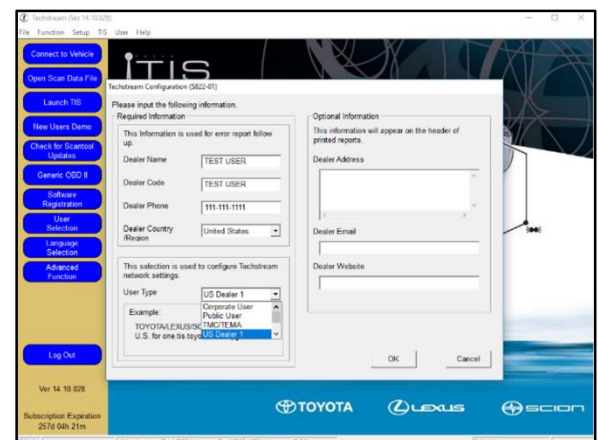
Techstream Preparation

Select the Correct User Type

The appropriate user type MUST be selected for Techstream to function correctly.

Perform the following:

1. Select Setup from the Techstream main menu screen.

2. Select Techstream Configuration from the Setup dropdown menu.

3. Select the area and language.

4. Input information and select US Dealer 1 from the dropdown menu.

Figure 1.

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ECU Flash Reprogramming With Security Signature
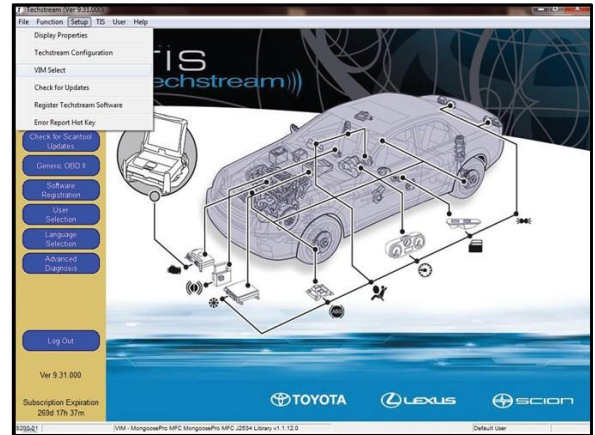
Techstream Preparation (continued)

Select 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 dropdown menu.

Figure 2.

3. Select the correct interface setup from the dropdown list.
   - If using Techstream ADVi, select MongoosePro MFC2.
   - If using Techstream 2.0, select MongoosePro MFC.
   - If using Techstream Lite, select Mongoose MFC (blue or updated clear case) or MongoosePro MFC2 (green case) 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.

4. Click OK.

ECU Flash Reprogramming With Security Signature

Process Overview

Techstream ECU flash reprogramming is a four-step process:

1. Verify the vehicle's applicability for recalibration and locate the 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 if the PC is connected to the network (see figures below). Calibration file links can be found embedded in the corresponding Service Bulletin.

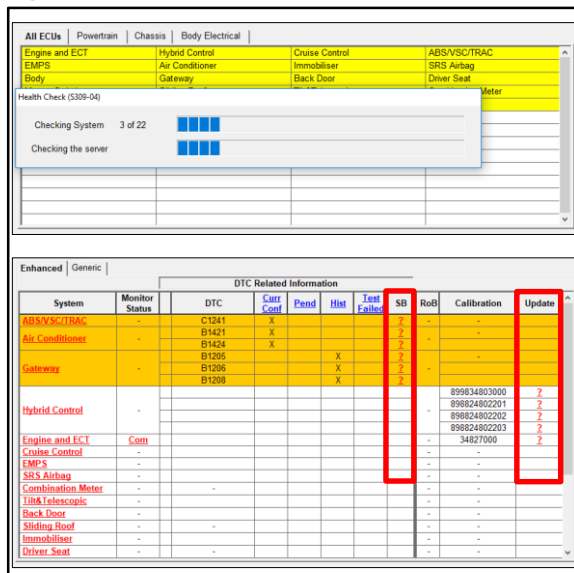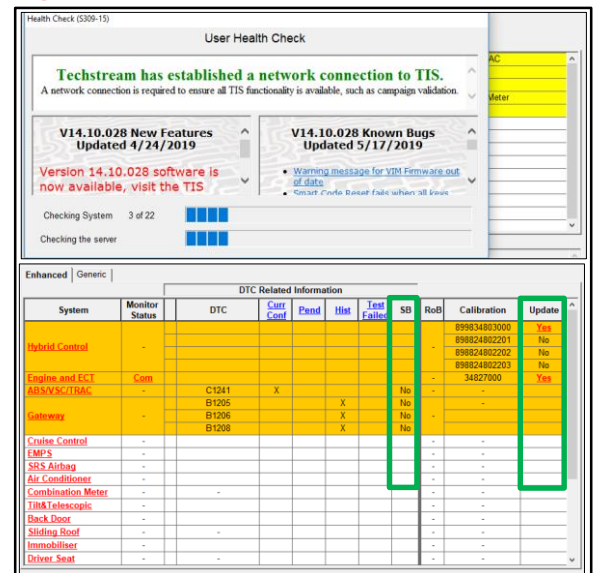**Figure 3. Not Connected to a Network**   **Figure 4. Connected to a Network**

2. Connect the DCA-8000 battery diagnostic tool using Power Supply Mode ONLY.

   The DCA-8000 battery diagnostic tool includes a power supply mode to help maintain battery voltage at 13.5V during ECU reprogramming.

> **NOTICE**
> - **ECU damage may occur if the correct battery charger mode setting is NOT used.**
> - **Refer to _Vehicle Reprogramming Tips_ for other approved chargers, located at _TIS – Diagnostics – Reprogramming – Reference Documents._**

3. Locate the appropriate calibration ID and reprogram the vehicle ECU with Techstream.

   Techstream uses the CUW application to open calibration files and facilitate the ECU flash reprogramming process.

4. Attach the Authorized Modifications Label.

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

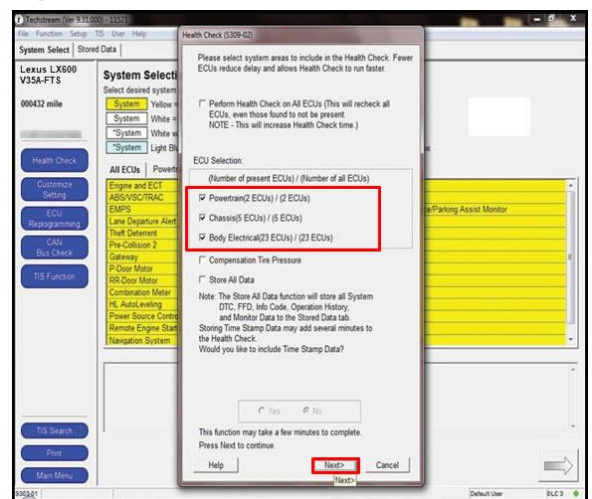# ECU Flash Reprogramming With Security Signature

Operation Procedure

1. Verify the vehicle's applicability for recalibration and locate the desired calibration file.

   A. Connect Techstream and establish a vehicle connection.

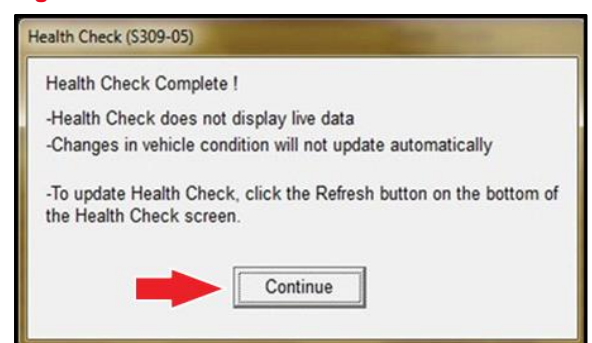   B. Click the Health Check button on the System Select tab.

Figure 5.
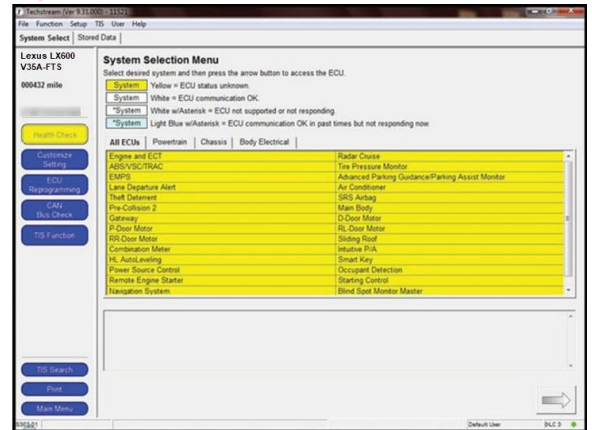
   C. Choose the desired ECU group(s) in the Health Check dialog box, then click Next.

Figure 6.

   D. Click Continue to view the Health Check results.

Figure 7.

Health Check (S309-05)

Health Check Complete !

-Health Check does not display live data
-Changes in vehicle condition will not update automatically

-To update Health Check, click the Refresh button on the bottom of the Health Check screen.

Continue

ECU Flash Reprogramming With Security Signature

Operation Procedure (continued)

E. Available calibration updates are indicated by a **<u>Yes</u>** link in the Calibration Update column.

Click the **<u>Yes</u>** link to access the appropriate Service Bulletin on TIS.

> **NOTE**
> - Note ANY DTCs stored in systems that will be flash reprogrammed.
> - Clicking the <u>Yes</u> link will automatically launch TIS and perform a calibration search.

Figure 8.

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

G. 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 other authorized users may access calibration files.

Figure 9.

ECU Flash Reprogramming With Security Signature

Operation Procedure (continued)

2. Connect the DCA-8000 battery diagnostic tool.

> **NOTE**
>
> Refer to *Vehicle Reprogramming Tips* for other approved chargers, located at *TIS – Diagnostics – Reprogramming – Reference Documents.*

A. Connect the DCA-8000 battery diagnostic tool to the vehicle and turn it ON.

B. Select Power Supply Mode.

> **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 13.5V while flash reprogramming the vehicle.**
> - **For details on how to use the battery diagnostic tool, refer to the *DCA-8000 Instruction Manual* located at *TIS – Diagnostics – Tools & Equipment – Battery Diagnostics.***

ECU Flash Reprogramming With Security Signature

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. Review the selected Service Bulletin 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 the calibration file information.

    > **NOTE**
    > Techstream downloads 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.
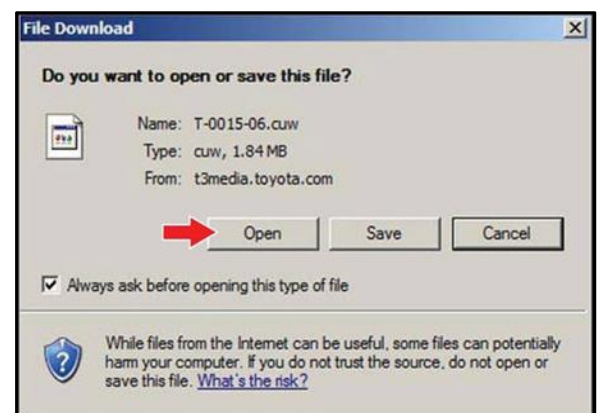
ECU Flash Reprogramming With Security Signature
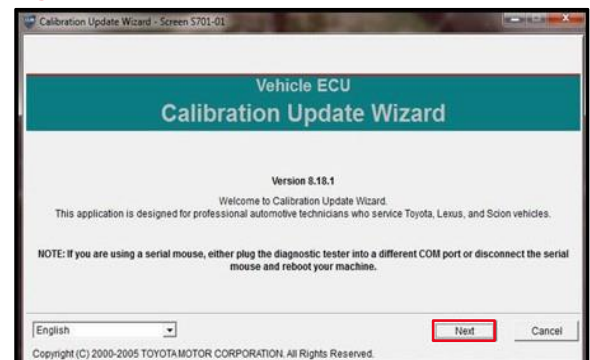
Operation Procedure (continued)

NOTICE

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

- **Battery voltage <u>MUST NOT FALL BELOW</u> 11.8V during reprogramming. Confirm battery voltage is higher than 11.8V but be sure voltage DOES NOT RISE ABOVE 16.0V during reprogramming.**
- **Turn OFF ALL vehicle accessories (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 (SOC) or capacity is in question, test with SST No. *DSS-5000P T* (Battery Diagnostic Tool) and follow the *DSS-5000 Instruction Manual* located at *TIS – Diagnostics – Tools & Equipment – Battery Diagnostics.***
- **The DCA-8000 battery diagnostic tool MUST be used in Power Supply Mode to maintain battery voltage at 13.5V while flash reprogramming the vehicle.**
- **For details on how to use the DCA-8000 battery diagnostic tool, refer to the *DCA-8000 Instruction Manual* located at *TIS – Diagnostics – Tools & Equipment – Battery Diagnostics.***

C. Click Next to start the calibration update process.

Figure 12.

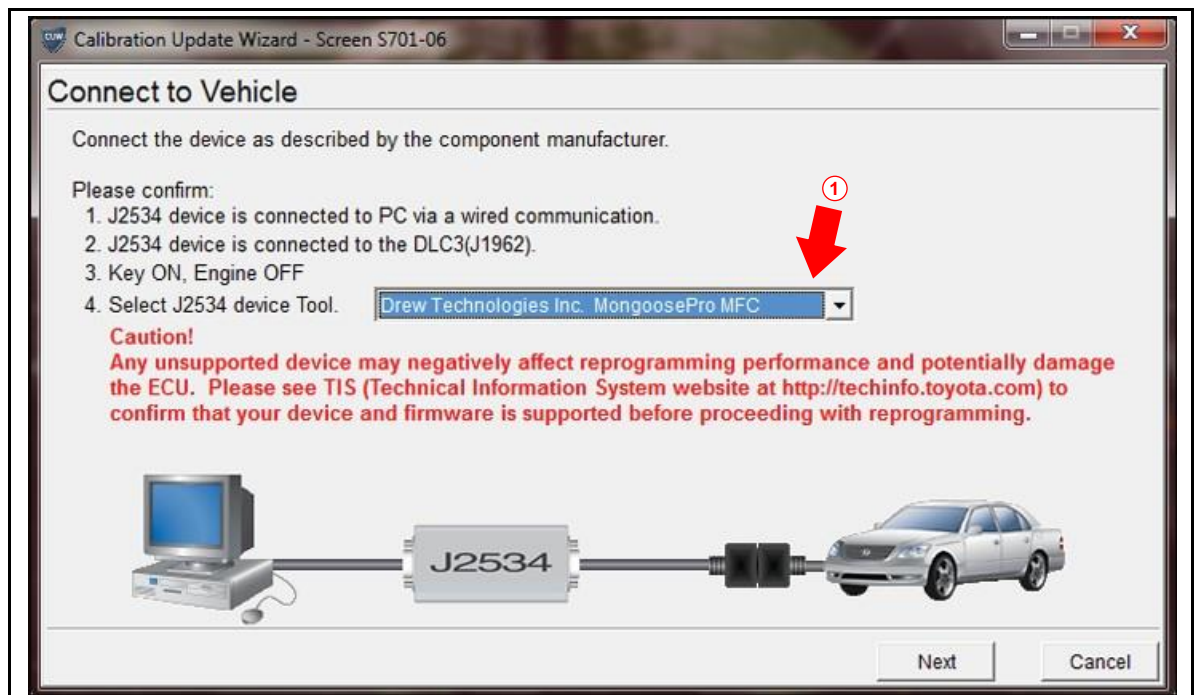# ECU Flash Reprogramming With Security Signature

Operation Procedure (continued)

D. 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 13. Using Techstream 2.0 or Techstream Lite

| 1	Select Correct Device Tool ("Mongoose MFC," "MongoosePro MFC," or "MongoosePro MFC2" [Green])

ECU Flash Reprogramming With Security Signature

Operation Procedure (continued)

E. Verify correct current and NEW calibration information, then click Next.

> **NOTICE**
> - **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 15 shows an example of the update procedure for a two-processor ECU.**

Figure 14.
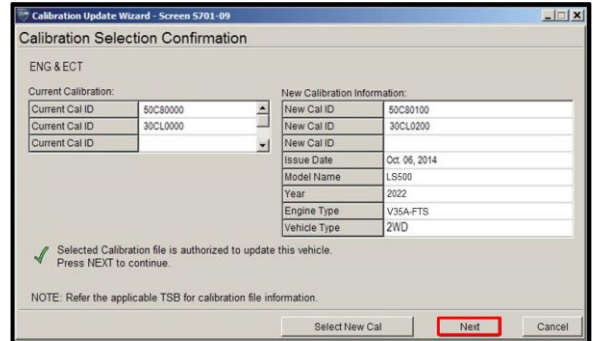
F. Turn ignition OFF, then click Next.

Figure 15.
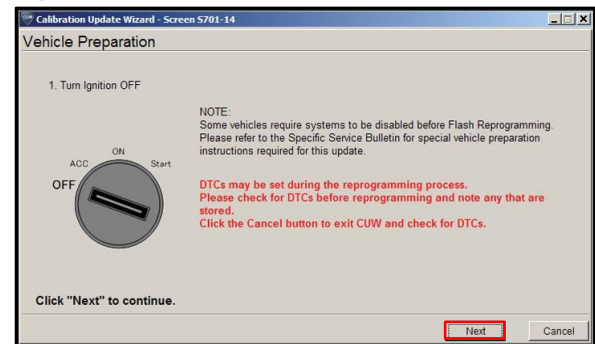
ECU Flash Reprogramming With Security Signature

Operation Procedure (continued)

G. Confirm the following:

- PC is connected to VIM.
- Ignition is ON and engine is OFF or READY OFF (hybrid vehicles).
- Hood is open.
- ALL accessories are OFF.
- Battery voltage is above 11.8V.

Figure 16.

> **NOTICE**
>
> **Verify the vehicle is connected to a battery charger before continuing. If battery voltage falls below 11.8V, ECU damage may occur.**
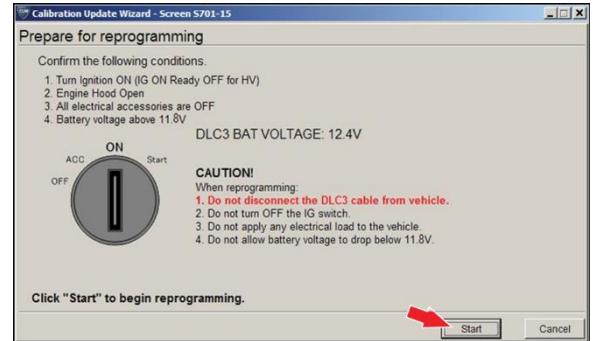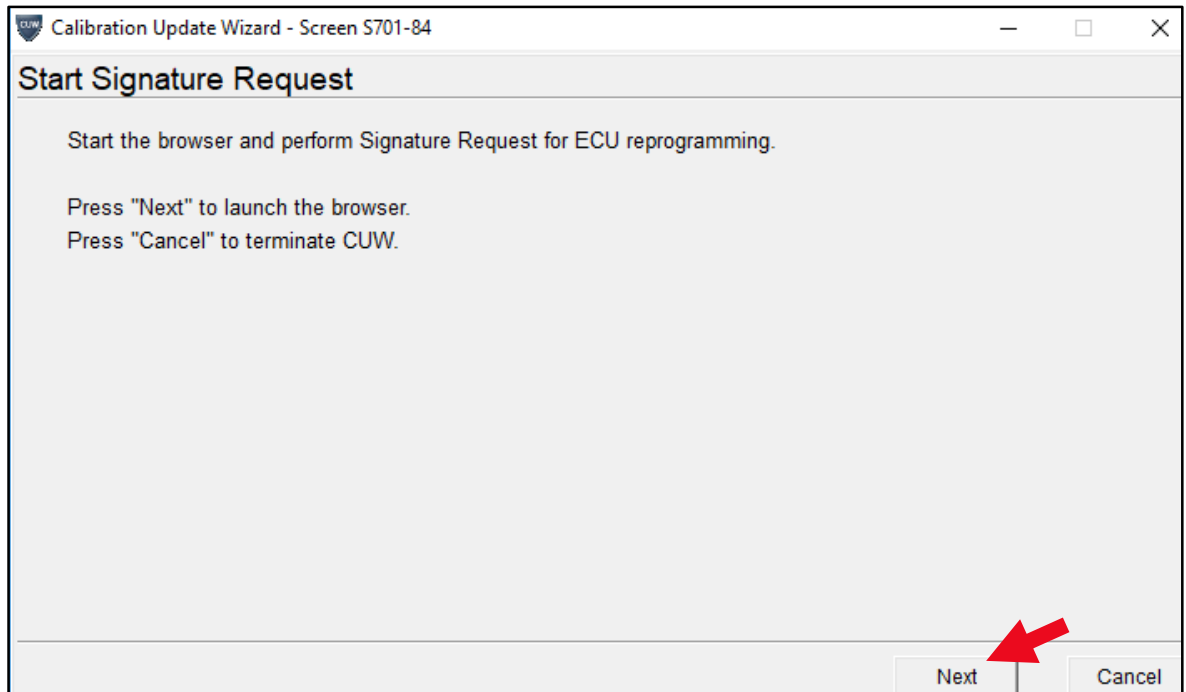
Then, click Start.

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

ECU Flash Reprogramming With Security Signature

Operation Procedure (continued)

H. This vehicle is equipped with additional security measures requiring a Signature from TIS. Select Next to open TIS and retrieve the Signature.

Figure 17.

I. Input TIS login credentials and select Login.

Figure 18.

ECU Flash Reprogramming With Security Signature

Operation Procedure (continued)

J. Input TIS login credentials for secondary authentication and select Login.

Figure 19.

Secure Reprogramming
Receive Secure Reprogramming Signature
User ID Technician 1
Password: ●●●●●●●●●
Clear Login Switch User

K. Select Send.

Figure 20.

Secure Reprogramming
User ID: Technician 1
Technician Name: Technician 1
Distributor Code: 11111
Distributor Name: TMNA
Dealer Code: 12345
Dealer Name: Lexus
Vehicle VIN: 12345678912345678
Software ID: 123abc123abc123abc123abc123abc123abc
Send

L. Copy the Signature from TIS.

Figure 21.

Secure Reprogramming
Signature calculation result
Input below signature to Calibration Update Wizard and press "Next".
Signature: 48B...DEFA6DDEF6C6979FCB0C6123AC290032F312143DE1AC6CC130C54409B871B964FDA6A6E589193467F8037C033945845872018C77A6C2FAE1232FF52348B6D6B8556EBF490A9F2FC49
Copy to Clipboard

ECU Flash Reprogramming With Security Signature

Operation Procedure (continued)

M. Paste the Signature into Techstream and select Next.
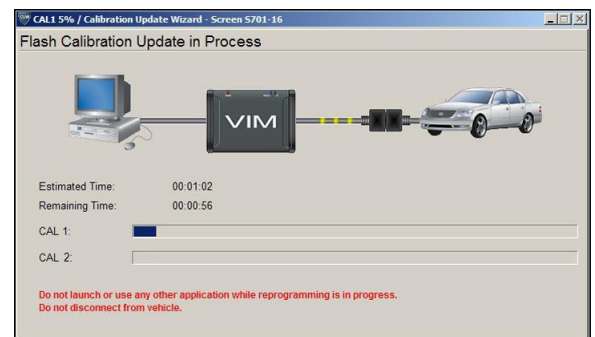
Figure 22.

Do NOT disturb the vehicle during flash reprogramming.

Figure 23.
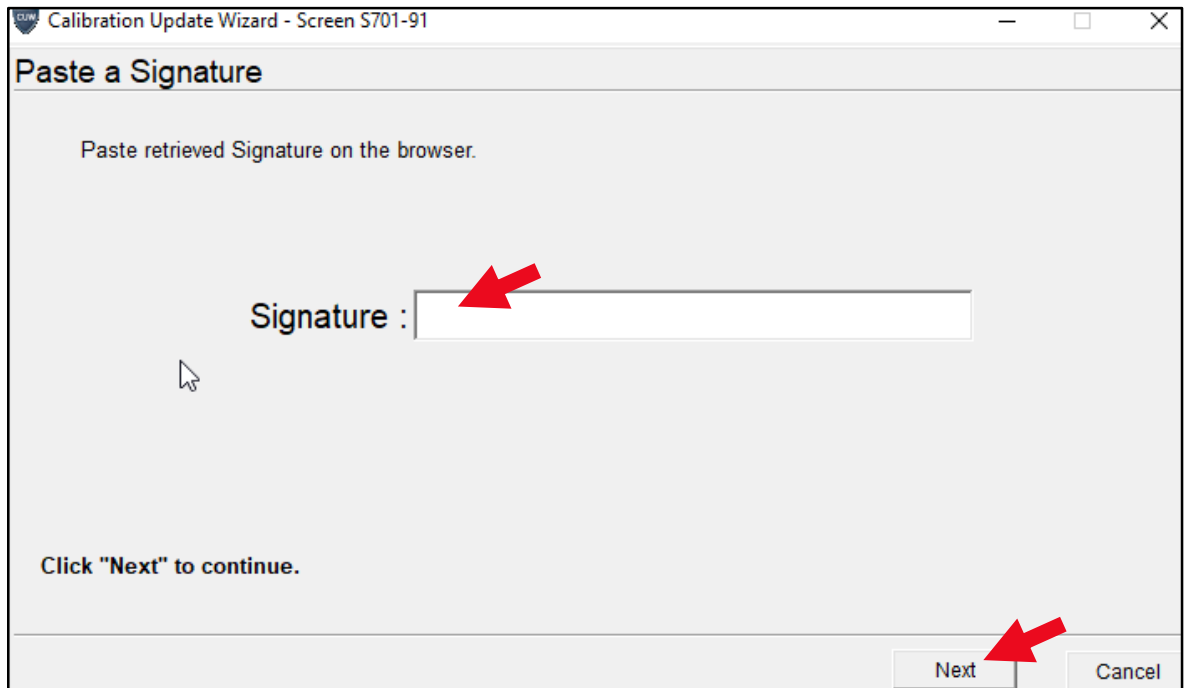
NOTE
- ECU flash reprogramming may take 3 – 30 minutes per calibration file.
- Reprogramming time will vary depending on model and ECU communication protocol. Vehicles using CAN communication protocol will reprogram much faster (2 – 7 minutes).

Does the vehicle require ONLY ONE calibration update?

- **YES —** Go to substep Q.
- **NO —** If the vehicle requires a SECOND calibration update, continue as follows:
  - For serial communication vehicles, continue to substep N.
  - For CAN communication vehicles, go to substep P.

ECU Flash Reprogramming With Security Signature

Operation Procedure (continued)

N. When Cal 1 completes the update process, turn the ignition OFF for a minimum of 10 seconds, then click Next.
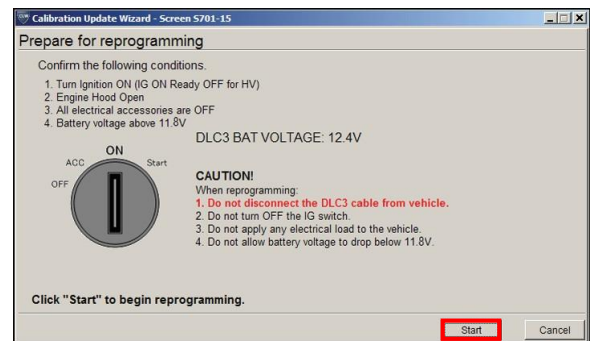
Figure 24.
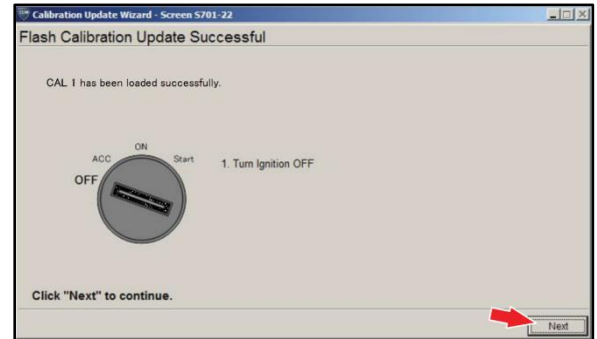
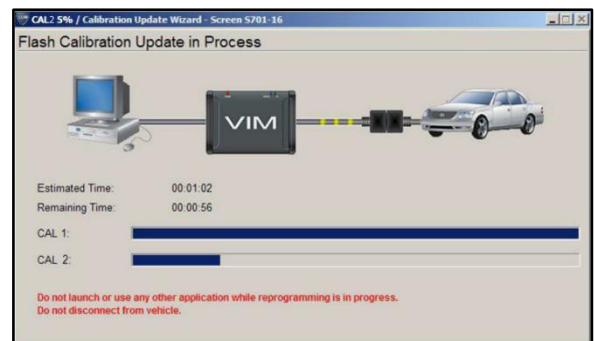O. Turn the ignition to the ON position, then click Start.

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

Figure 25.

P. Do NOT disturb the vehicle during flash reprogramming.
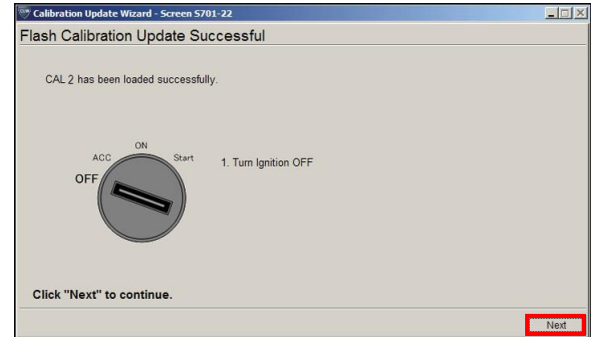
Figure 26.

ECU Flash Reprogramming With Security Signature
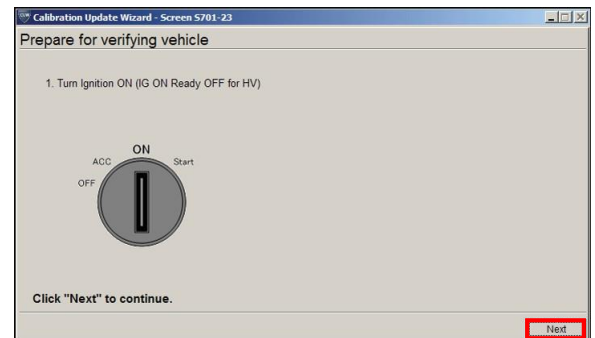
Operation Procedure (continued)

Q. Turn the ignition OFF for a minimum of 10 seconds, then click Next.
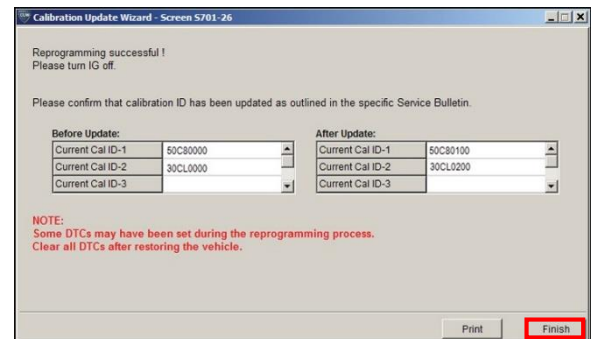
Figure 27.

R. Turn the ignition to the ON position, then click Next.

Figure 28.

S. Confirm ALL calibrations were updated as specified in this Service Bulletin, then click Finish.

Figure 29.

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.

ECU Flash Reprogramming With Security Signature

Operation Procedure (continued)

4. Attach the Authorized Modifications Label.

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

   Figure 30.

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

   B. Attach the Authorized Modifications 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.