

ECU Flash Reprogramming With Security Signature

Service Category Engine/Hybrid System

Section Engine Control

Market USA

Toyota Supports
 ASE Certification 

Applicability

YEAR(S)	MODEL(S)	ADDITIONAL INFORMATION
2021	RAV4 Prime, Sienna HV, Venza HV	

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	OFF	T1	T2
N/A	Not Applicable to Warranty	–	–	–	–

Parts Information

PART NUMBER		PART NAME	QTY
PREVIOUS	NEW		
		Computer, Engine Control (ECM/PCM)	–
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 15.20.016 or later is required.
- Additional Techstream units may be ordered by calling Approved Dealer Equipment (ADE) at 1-800-368-6787.
- 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.

Techstream Preparation

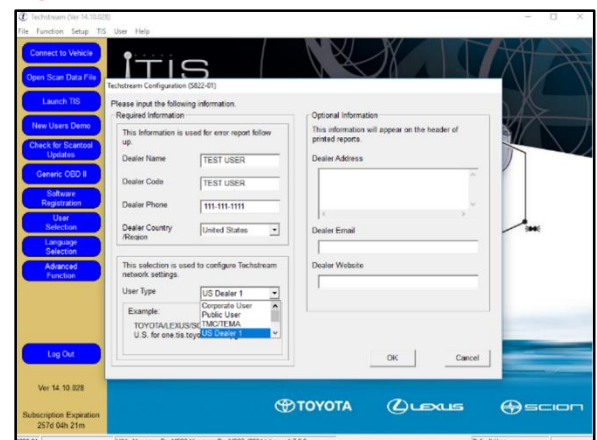
Select the Correct User Type

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.



ECU Flash Reprogramming With Security Signature

Techstream Preparation (continued)

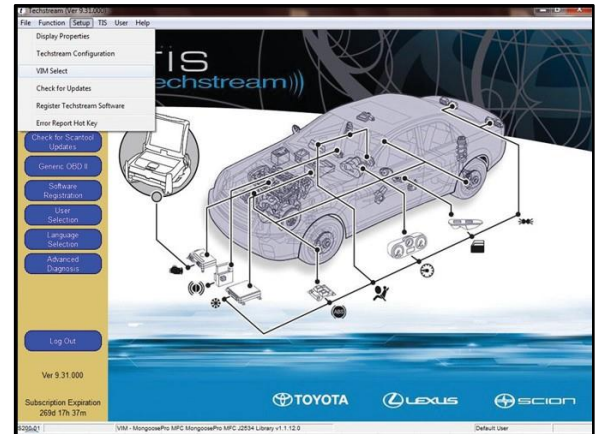
Select the Correct VIM

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

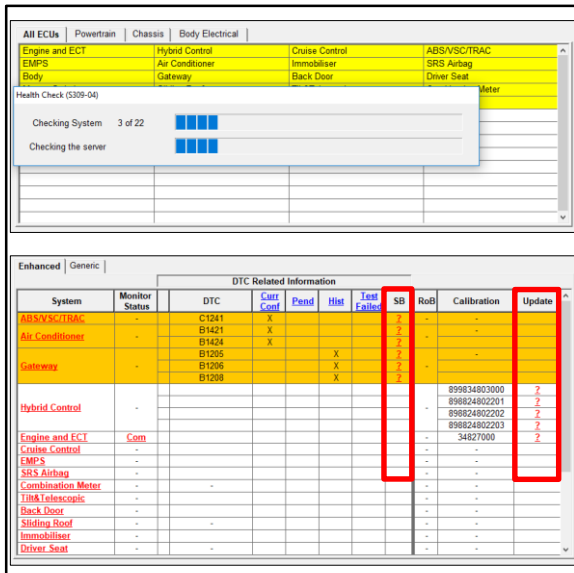
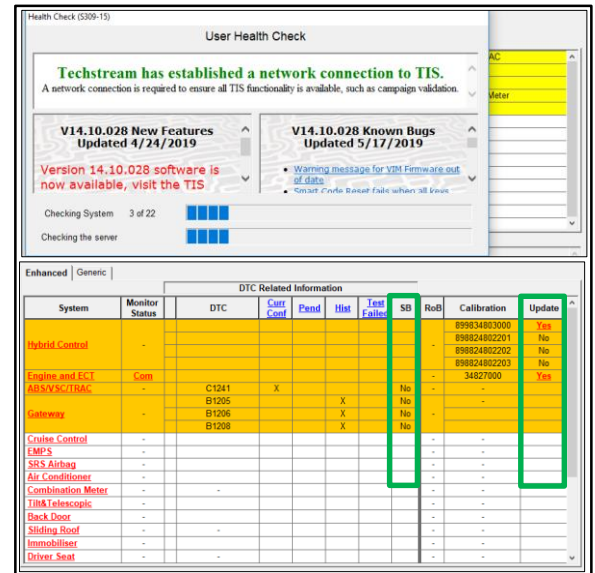


Figure 4. Connected to a Network



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**.

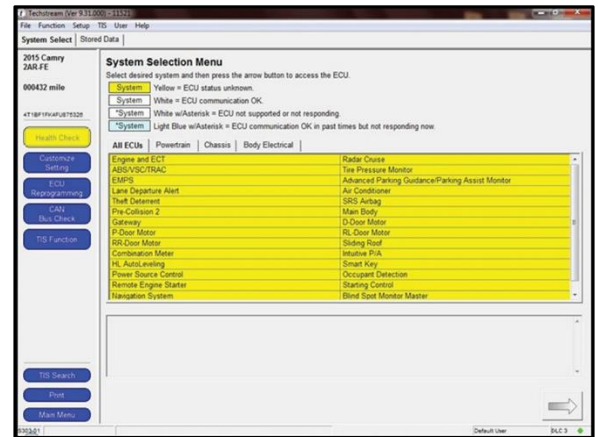
3. Locate the appropriate calibration ID and reprogram the vehicle ECU with Techstream. Techstream uses the CUW application to open calibration files and facilitate the ECU flash reprogramming process.
4. Attach the Authorized Modifications Label. Modifications to ECU calibrations MUST be recorded and properly displayed on the vehicle using the Authorized Modifications Label.

ECU Flash Reprogramming With Security Signature

Operation Procedure

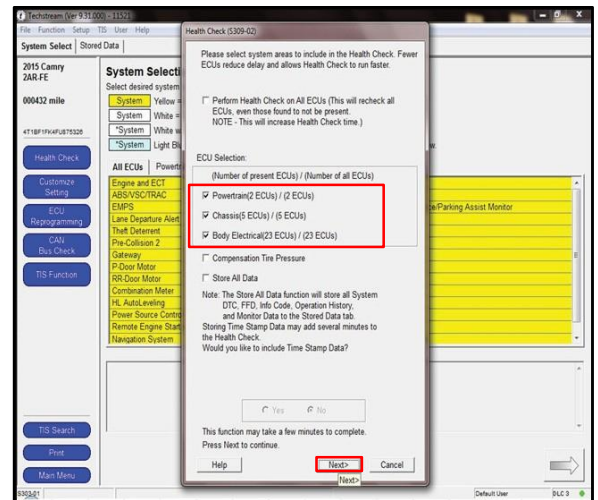
1. Verify the vehicle's applicability for recalibration and locate the desired calibration file.
 - A. Connect Techstream and establish a vehicle connection.
 - B. Click the Health Check button on the System Select tab.

Figure 5.



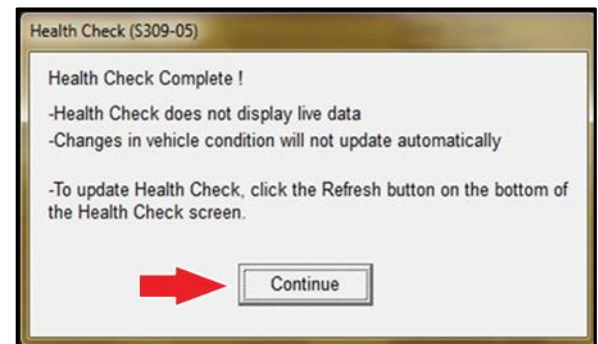
- C. Choose the desired ECU group(s) in the Health Check dialog box, then click Next.

Figure 6.



- D. Click Continue to view the Health Check results.

Figure 7.



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	30806000 ←	ZA22C ZA23C
				30801100		
		30801200				
		30801300				
	2004 & 2005	2WD	Sub	30804000	50805000	BA22C BA23C
				50801000		
		50801100				
50803000						
2004 & 2005	4WD	Main	30802000	30807000	BA22C BA23C	
			30802100			
	30802200					
	30802300					
2004 & 2005	4WD	Sub	30805000	50806000	BA22C BA23C	
			50802000			
	50802100					
	50804000					

- 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)

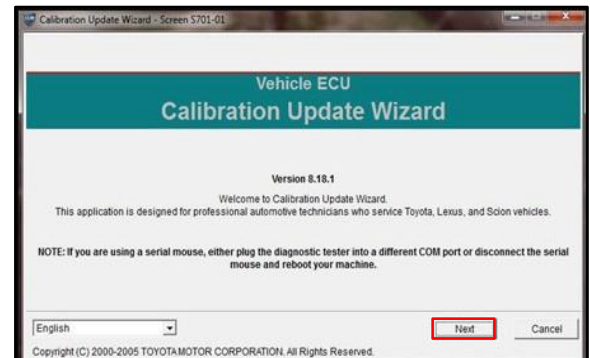
NOTICE

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

- Battery voltage **MUST NOT FALL BELOW 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

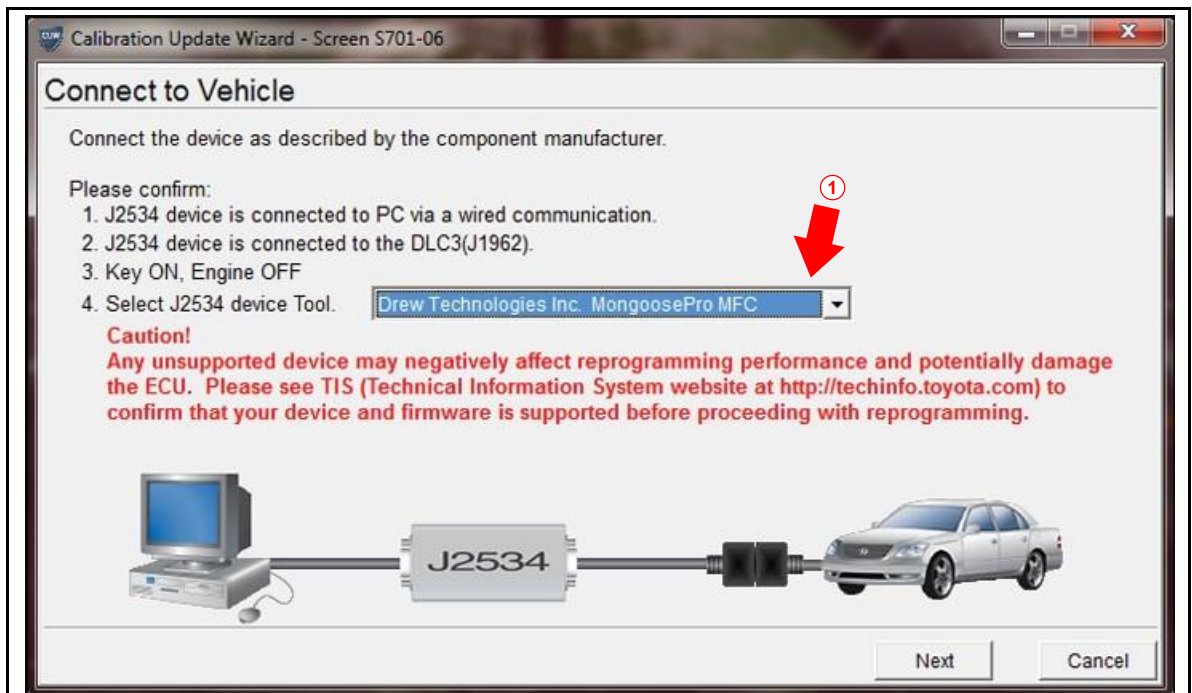
Operation Procedure (continued)

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])
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ECU Flash Reprogramming With Security Signature

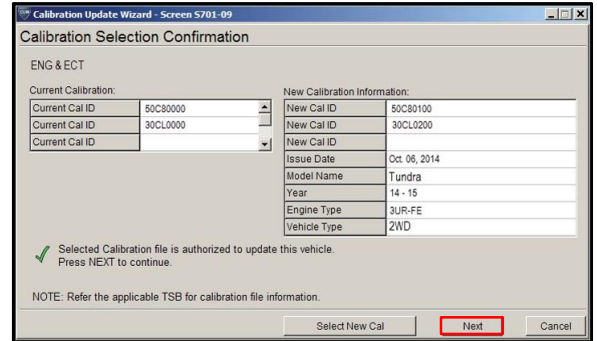
Operation Procedure (continued)

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

NOTICE

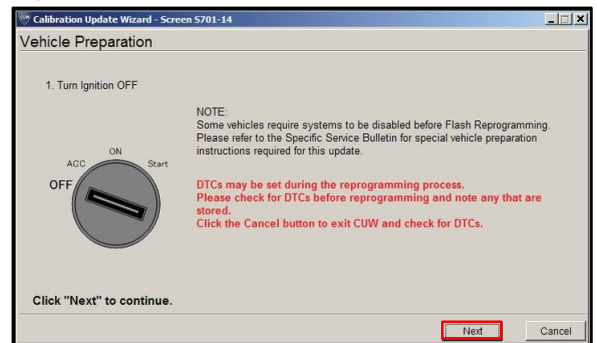
- The total number of calibration IDs in the calibration file corresponds to the number of reprogrammable processors in the ECU.
- Each calibration file may contain up to three separate calibrations.
- Figure 15 shows an example of the update procedure for a two-processor ECU.

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.

NOTICE

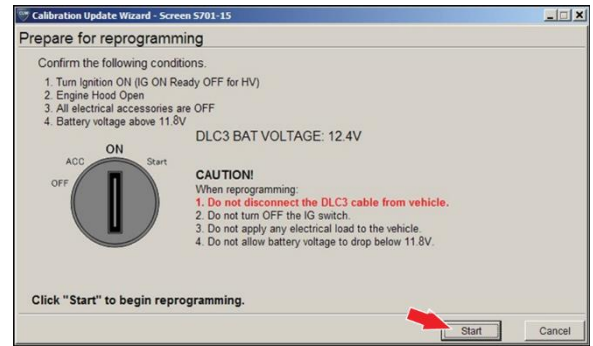
Verify the vehicle is connected to a battery charger before continuing. If battery voltage falls below 11.8V, ECU damage may occur.

Then, click Start.

NOTE

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

Figure 16.

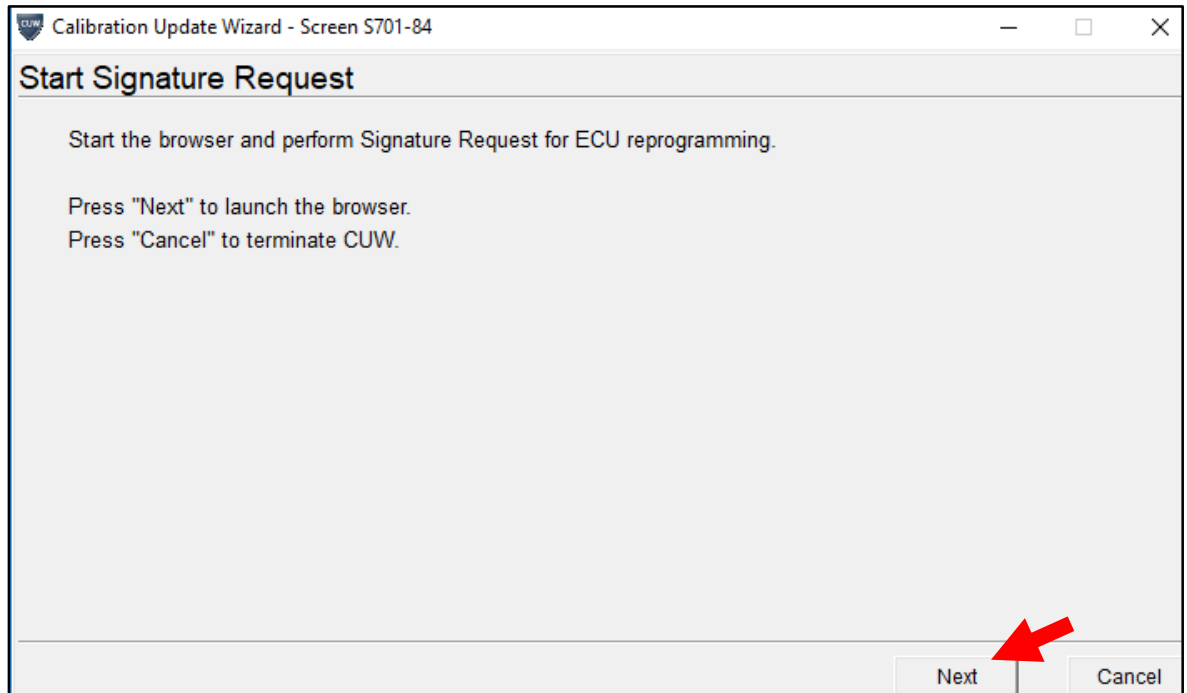


ECU Flash Reprogramming With Security Signature

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.

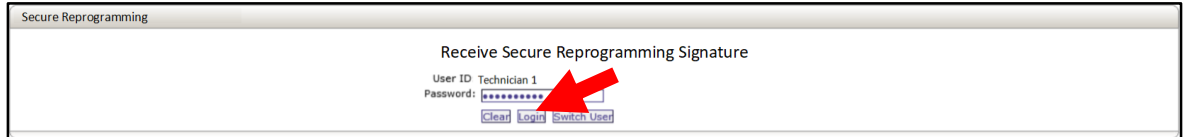


ECU Flash Reprogramming With Security Signature

Operation Procedure (continued)

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

Figure 19.



Secure Reprogramming

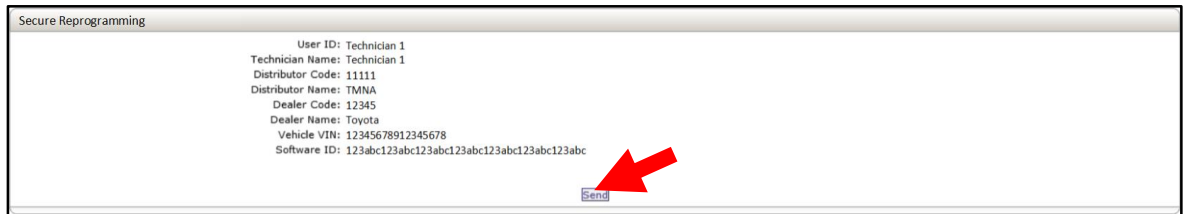
Receive Secure Reprogramming Signature

User ID: Technician 1

Password: [masked]

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: Toyota

Vehicle VIN: 12345678912345678

Software ID: 123abc123abc123abc123abc123abc123abc

L. Copy the Signature from TIS.

Figure 21.



Secure Reprogramming

Signature calculation result

Input below signature to Calibration Update Wizard and press "Next".

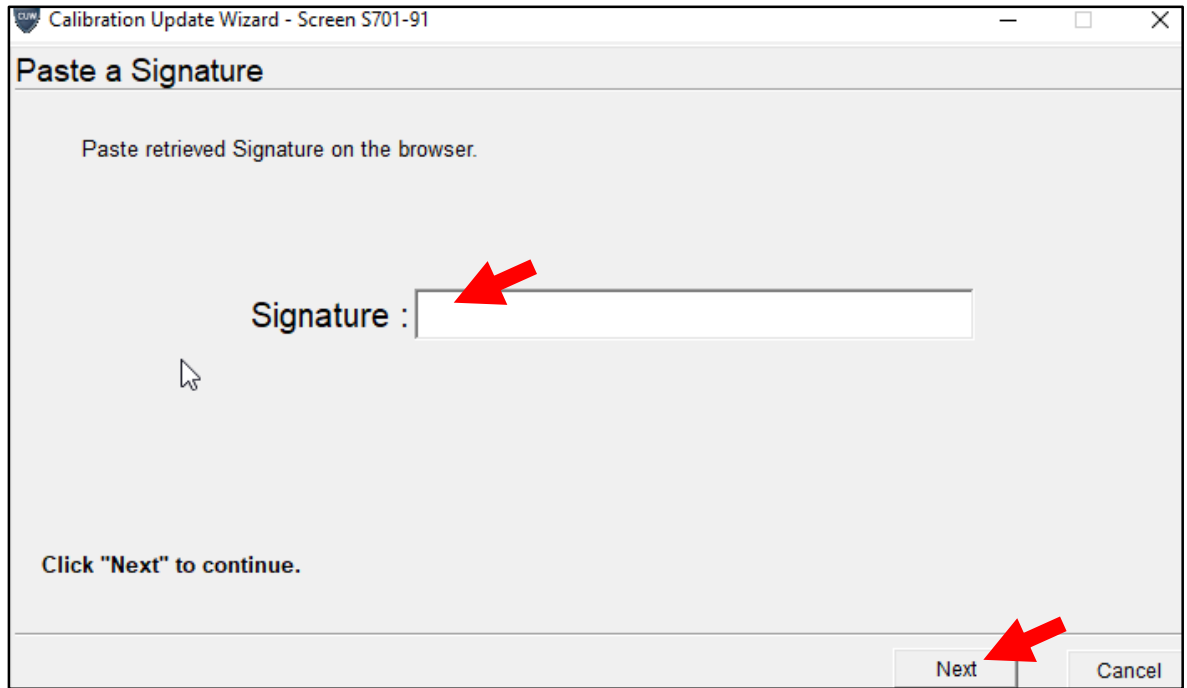
Signature: [long alphanumeric string]

ECU Flash Reprogramming With Security Signature

Operation Procedure (continued)

M. Paste the Signature into Techstream and select Next.

Figure 22.

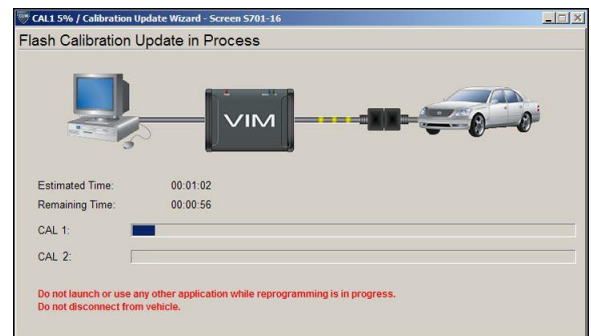


Do NOT disturb the vehicle during flash reprogramming.

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).

Figure 23.



Does the vehicle require ONLY ONE calibration update?

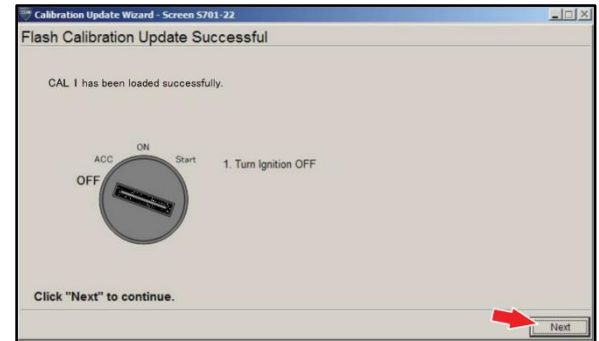
- **YES** — Go to substep Q.
- **NO** — If the vehicle requires a SECOND calibration update, continue as follows:
 - For serial communication vehicles, continue to substep N.
 - For CAN communication vehicles, go to substep P.

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.

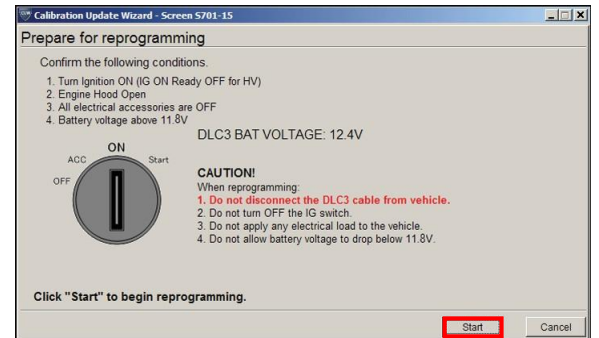


- O. Turn the ignition to the ON position, then click Start.

NOTE

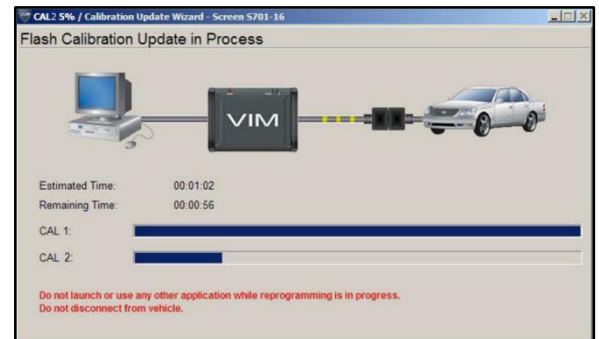
If the key cycle is NOT done properly, reprogramming will stop at 10% and Cal 2 will fail to load.

Figure 25.



- P. Do NOT disturb the vehicle during flash reprogramming.

Figure 26.

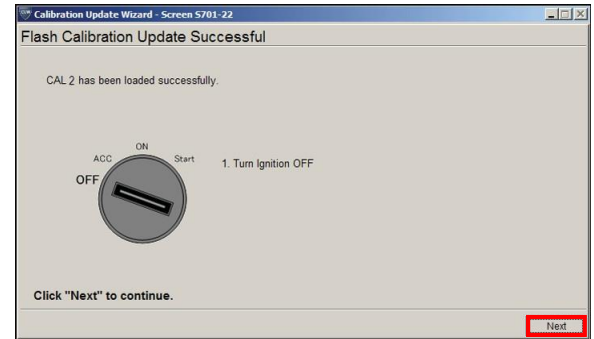


ECU Flash Reprogramming With Security Signature

Operation Procedure (continued)

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

Figure 27.



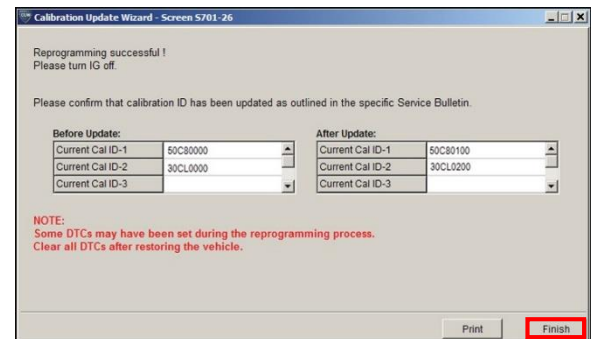
- R. Turn the ignition to the ON position, then click Next.

Figure 28.



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

Figure 29.



NOTE

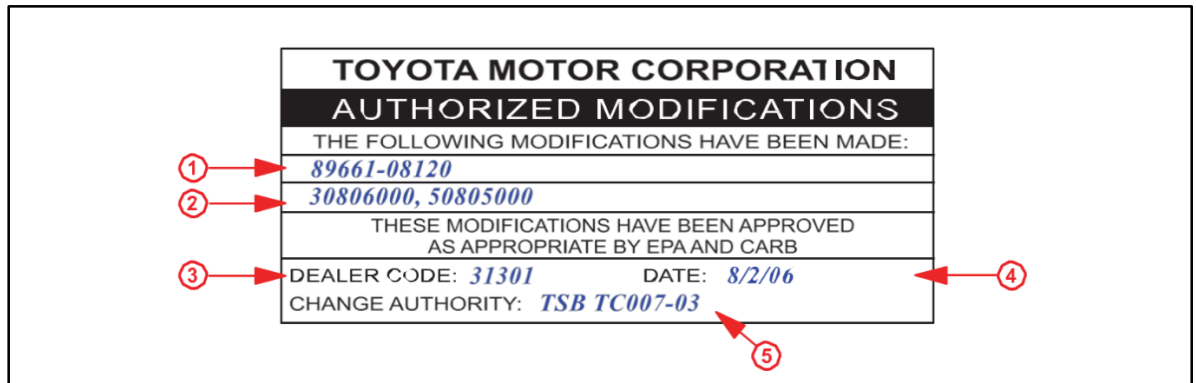
On some models, DTCs may set as a result of reprogramming. If DTCs are present, clear codes and run the Health Check again. Troubleshoot ANY remaining current, pending, or history codes. Permanent codes will NOT be cleared using Techstream. Permanent codes do NOT illuminate the MIL and do NOT require 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
2	Calibration ID(s)
3	Dealer Code

4	Date Completed
5	Service Bulletin or Campaign Number

- 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.