GTS+ Techstream ECU Flash Reprogramming Procedure

Service Category   Engine/Hybrid System

Section   Emission Control

Market USA and Mexico

Lexus Supports ASE Certification

Applicability

YEAR(S)	MODEL(S)	ADDITIONAL INFORMATION
2011 - 2017	CT200H	
2021 - 2024	ES250, LC500C	
2013 - 2024	ES300H	
2004 - 2006	ES330, RX330	
2007 - 2024	ES350	
2016 - 2020	GS F	
2016 - 2017	GS200T, IS200T, RC200T	
2001 - 2006, 2018 - 2019	GS300	
2007 - 2011, 2013 - 2020	GS350	
2001 - 2007	GS430, LX470	
2007 - 2011, 2013 - 2018	GS450H	
2008 - 2011	GS460	
2010 - 2023	GX460	
2003 - 2009	GX470	
2010 - 2012	HS250H	
2008 - 2014	IS F	
2006 - 2015	IS250	
2010 - 2015	IS250C, IS350C	
2001 - 2006	IS300, LS430	
2016 - 2024	IS300	
2006 - 2024	IS350	
2022 - 2024	IS500	
2018 - 2024	LC500, LC500H, RC300	
2012	LFA	
2007 - 2017	LS460	
2018 - 2021	LS500, LS500H, NX300	
2008 - 2016	LS600H	
2008 - 2011, 2013 - 2021	LX570	
2015 - 2017	NX200T	
2015 - 2021	NX300H	
2015 - 2024	RC F, RC350	
2001 - 2003	RX300	
2007 - 2022	RX350	
2006 - 2008	RX400H	
2010 - 2022	RX450H	
2002 - 2010	SC430	
2019 - 2022	UX200	
2019 - 2024	UX250H	

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REVISION NOTICE

August 14, 2023 Rev2:

- **Applicability has been updated to include 2001 – 2003 model year ES 300, RX 350, RX 450h, and UX 200; 2021 – 2023 model year GX 460; 2021 – 2024 model year ES 250, LC 500c, ES 300h, IS 300, IS 350, LC 500, LC 500h, RC 300, RC F, RC 350, and UX 250h; 2021 model year LS 500, LS 500h, NX 300, LX570; and NX300h and 2022 – 2024 model year IS 500 vehicles.**
- **Applicability has been updated to remove 2001 – 2002 and 2010 – 2020 model year GX 470; 2001 – 2003 and 2007 – 2020 model year ES 330; RX 330, 2001 – 2005 model year IS 350; 2001 – 2005 and 2009 – 2020 model year RX 400h; 2001 – 2005 and 2016 – 2020 model year IS 250; 2001 – 2006 model year RX 350; 2001 – 2006 and 2012 model year GS 350; 2001 – 2006, 2012, and 2019 – 2020 model year GS 450h; 2001 – 2006 and 2018 – 2020 model year LS 460; 2001 – 2007 and 2012 – 2020 model year GS 460; 2001 – 2007 and 2012 model year LX 570; 2001 – 2007 and 2014 – 2020 model year LS 600h; 2001 – 2007 and 2015 – 2020 model year IS F; 2001 – 2010 and 2018 – 2020 model year CT 200h; 2001 – 2009 model year GX 460 and RX 450h; 2001 – 2009 and 2013 – 2020 model year HS 250h; 2001 – 2009 and 2016 – 2020 model year IS 250c and IS 350c; 2001 – 2011 and 2013 – 2020 model year LFA; 2001 – 2012 model year ES 300h; 2001 – 2014 model year NX 300h, RC 350, and RC F; 2001 – 2014 and 2018 – 2020 model year NX 200t; 2001 – 2015 model year GS F and IS 300; 2001 – 2015 and 2018 – 2020 model year GS 200t, IS 200t, and RC 200t; 2001 – 2017 model year LC 500, LC 500h, LS 500, LS 500h, NX 300, and RC 300; 2001 – 2018 model year UX 200 and UX 250h; 2001 and 2011 – 2020 model year SC 430; 2004 – 2020 model year RX 300; 2007 – 2017 and 2020 model year GS 300; 2007 – 2020 model year IS 300 and LS 430; and 2008 – 2020 model year GS 430 and LX 470 vehicles.**
- **The Introduction, GTS+ Preparation, Process Overview, and Operation Procedure sections have been updated.**
- **The market indicator has been updated to include the Mexico market.**

July 01, 2019 Rev1:

- **Applicability has been updated to include 2019 – 2020 model year Lexus vehicles.**
- **The Techstream Preparation and Process Overview sections have been updated.**

Any previous printed versions of this bulletin should be discarded.

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SUPERSESSION NOTICE

The information contained in this bulletin supersedes Service Bulletin No. L-SB-0021-14.

- **Applicability has been updated to include applicable 2018 models and 2016 – 2018 model year RC 300 and 2015 – 2018 model year RC 350 vehicles.**
- **Applicability has been updated to exclude 2001 – 2003 model year ES 300 vehicles.**

Service Bulletin No. L-SB-0021-14 is obsolete and any printed versions should be discarded.
Be sure to review the entire content of this bulletin before proceeding.

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GTS+ Techstream ECU Flash Reprogramming Procedure

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 the 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.

NOTE

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)
- Any other Lexus-specific control unit

GTS+ Techstream ECU Flash Reprogramming Procedure

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Warranty Information

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

Parts Information

For USA Market

PART NUMBER	PART NAME	QTY
00451-00001-LB L	Authorized Modifications Label	1

> **NOTE**
>
> Authorized Modifications Labels may be ordered in packages of 25 from the Materials Distribution Center (MDC) (portal.toyotamdc.com) under item No. 00451-00001-LBL.

For Mexico Market

PART NUMBER	PART NAME	QTY
00451-00002-MEX	Authorized Modifications Label	1

> **NOTE**
>
> Authorized Modifications Labels may be ordered in packages of 25 from the Materials Distribution Center (MDC) (portal.toyotamdc.com) under item No. 00451-00002-MEX.

GTS+ Techstream ECU Flash Reprogramming Procedure

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.
> - GTS+ software version 2023.02.001.02 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
DSS-5000 Battery Diagnostic Tool*	DSS-5000P T	1
DCA-8000 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).

GTS+ Preparation

Select the Correct User Type

1. Launch GTS+.

2. From the initial login screen select the Country and the User Type.

   > **NOTE**
   > The appropriate User Type MUST be selected for GTS+ to function correctly.

3. Click Server Login.

Figure 1.
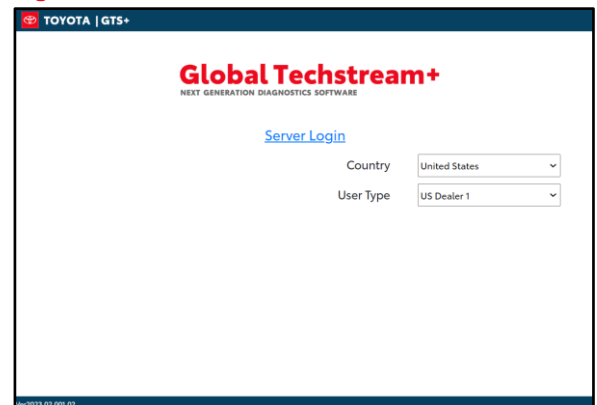
GTS+ Techstream ECU Flash Reprogramming Procedure

GTS+ Preparation (continued)

Select the Correct VIM

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

1. Select GTS+ Settings from the Main Menu screen.

2. Select VIM Select from the GTS+ Settings menu.

3. Select the correct interface setup from the dropdown list.
    - Mongoose-Plus MFC3 VIM:
        - Techstream Lite w/Blue & Black Case w/Detachable Cable
        - Techstream ADVi w/Grey Case
    - MongoosePro MFC2 VIM:
        - Techstream Lite w/Green Case
        - Techstream ADVi w/Black Case
    - MongoosePro MFC VIM:
        - Techstream Lite w/Blue Case
        - Techstream Lite w/Updated Clear Case
        - Techstream 2.0

Figure 2.
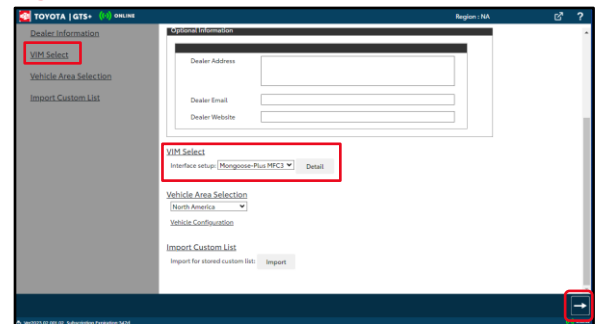
> **NOTE**
>
> The Mongoose driver MUST be installed before Mongoose selections will be available. For additional information, see
> *TIS – Diagnostics – Scantool*.

4. Click the arrow in the bottom right corner.

GTS+ Techstream ECU Flash Reprogramming Procedure

Process Overview

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

> **NOTE**
> - GTS+ 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.
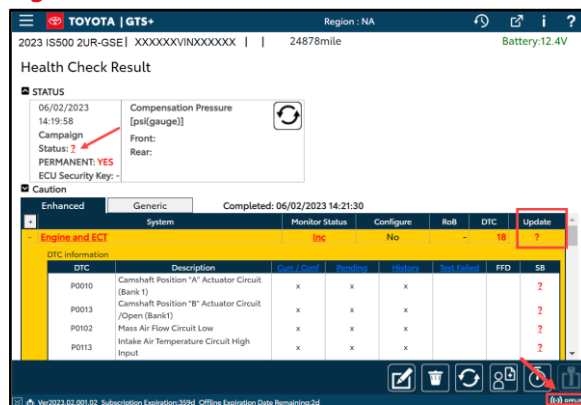
Figure 4.
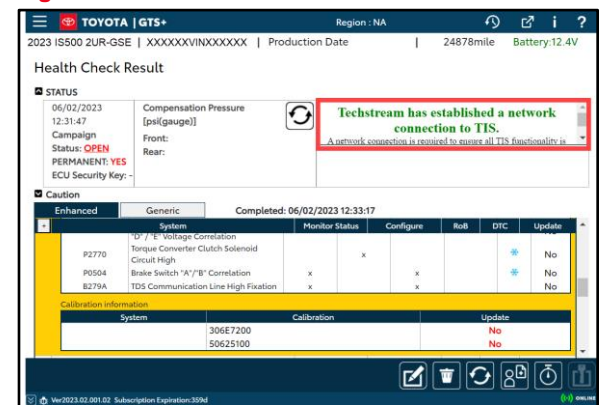
2. Connect the DCA-8000 battery diagnostic tool using "Power Supply Mode" ONLY.

   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*.**
> - **The 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 battery diagnostic tool, refer to the *DCA-8000 Instruction Manual* located at *TIS – Diagnostics – Tools & Equipment – Battery Diagnostics*.**

GTS+ Techstream ECU Flash Reprogramming Procedure

Process Overview (continued)

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

   GTS+ 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.
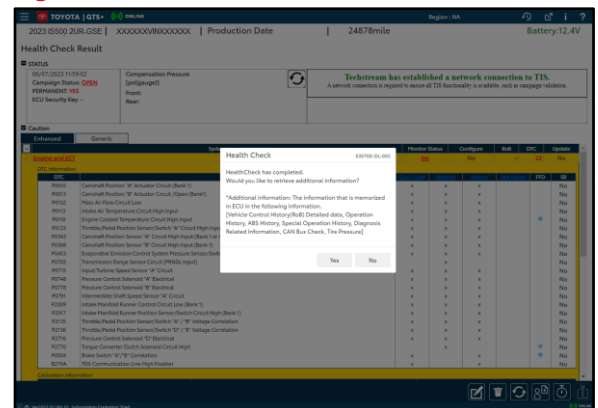
Operation Procedure

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

   A. Connect GTS+ and establish a vehicle connection.

   B. Click the Health Check button on the Main Menu.

   Figure 5.
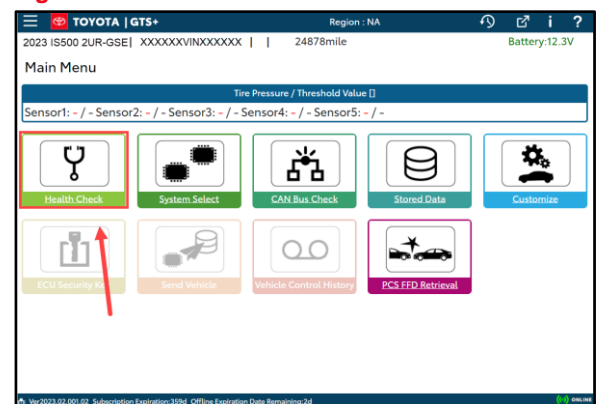
   C. A Health Check completed window opens. To continue, click either Yes or No.

   (1) Click Yes to include additional information in the Health Check.

   (2) Click No if additional information is NOT desired.

   Figure 6.

GTS+ Techstream ECU Flash Reprogramming Procedure

Operation Procedure (continued)

D. Available calibration updates are indicated by a Yes in the Calibration Update column. Click the Yes link in the calibration information section 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.

E. Login to TIS.

> **HINT**
> If already logged in, skip this step.

GTS+ Techstream ECU Flash Reprogramming Procedure

Operation Procedure (continued)

F. 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 other authorized users may access calibration files.

Figure 8.
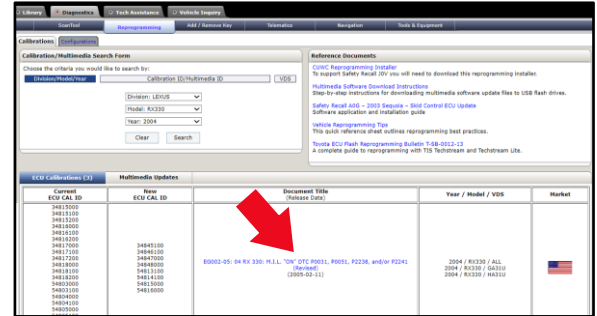
2. Connect the DCA-8000 battery diagnostic tool.

> **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.**
> - **The 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 battery diagnostic tool, refer to the DCA-8000 Instruction Manual located at *TIS – Diagnostics – Tools & Equipment – Battery Diagnostics*.**

GTS+ Techstream ECU Flash Reprogramming Procedure

Operation Procedure (continued)

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

   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 9.

GTS+ Techstream ECU Flash Reprogramming Procedure

Operation Procedure (continued)

B. Click Open to load the calibration file information. If prompted to choose GTS or GTS+, select GTS+.
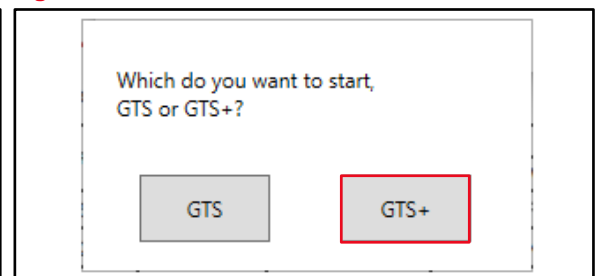
> **NOTE**
> - GTS+ downloads calibration files as needed to ensure the latest calibration file is used.
> - Do NOT save calibrations locally on the hard drive or other media for future use.

Figure 10.
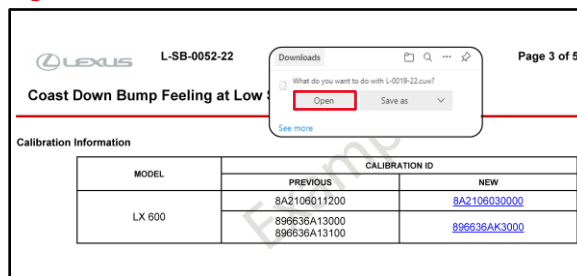
Figure 11.

> **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 12V during reprogramming. Confirm battery voltage is higher than 12V 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 the 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._**

GTS+ Techstream ECU Flash Reprogramming Procedure

Operation Procedure (continued)

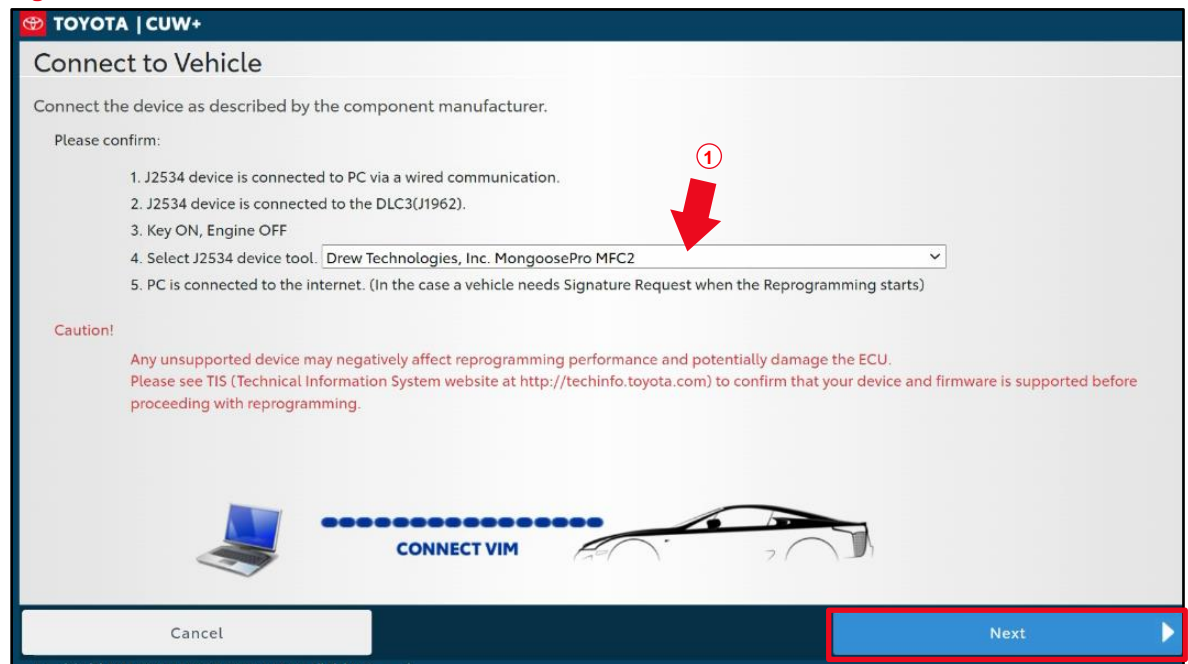C. Click Next to start the calibration update process.

Figure 12.
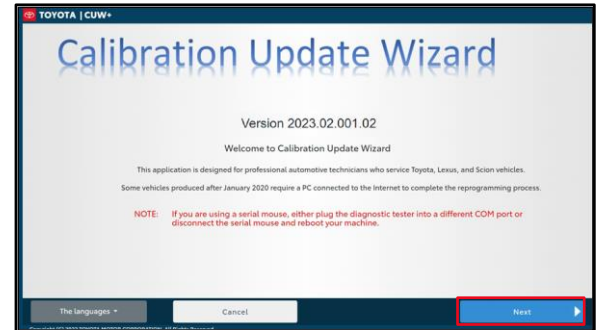
D. Confirm the following:
   - The PC is connected to VIM.
   - The VIM is connected to DLC3 connector.
   - The Ignition is ON and the engine is OFF or READY-OFF (hybrid vehicles).

Then, click Next.

Figure 13.

1	Select the Correct Device Tool ("MongoosePro MFC," "MongoosePro MFC2," or "Mongoose-Plus MFC3" VIM)

GTS+ Techstream ECU Flash Reprogramming Procedure

Operation Procedure (continued)

E. Verify the 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.**
> - **The figure to the right shows an example of the update procedure for a two-processor ECU.**

Figure 14.
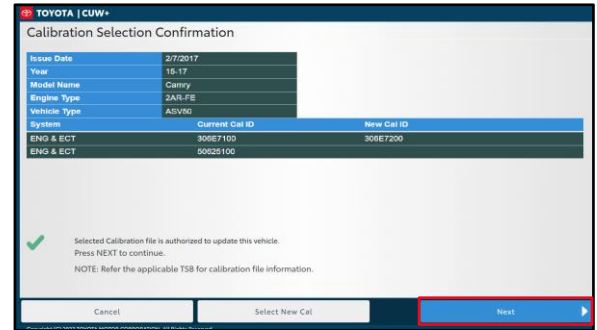
F. Turn the ignition OFF, click Next, and wait at least 10 seconds before proceeding.

Figure 15.
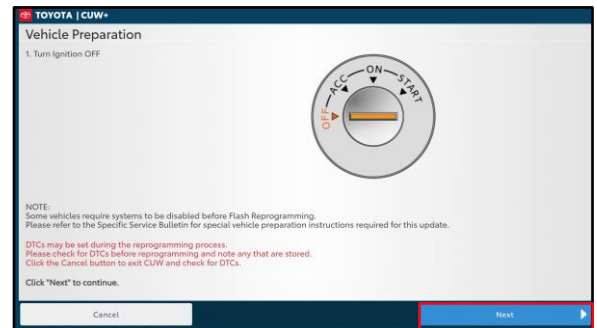
GTS+ Techstream ECU Flash Reprogramming Procedure

Operation Procedure (continued)

G. Turn the Ignition ON (IG ON Ready-OFF for hybrid vehicles).

Figure 16.

H. Confirm the following:
- The PC is connected to VIM.
- The hood is open.
- ALL accessories are OFF.
- Battery voltage is above 12V.

> **NOTICE**
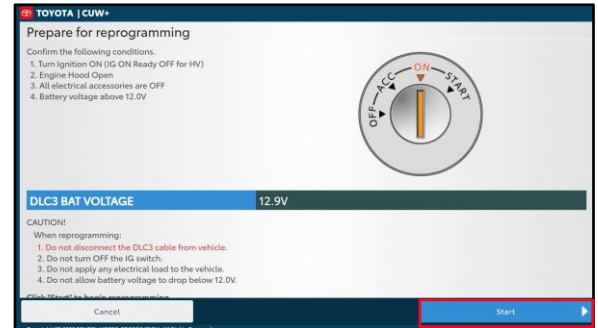>
> **Verify the vehicle is connected to a battery charger before continuing. If battery voltage falls below 12V, ECU damage may occur.**

Then, click Start.

> **NOTE**
>
> If the key cycle is NOT done properly, reprogramming will fail, and an error message will appear prompting you to restart.

I. 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 17.
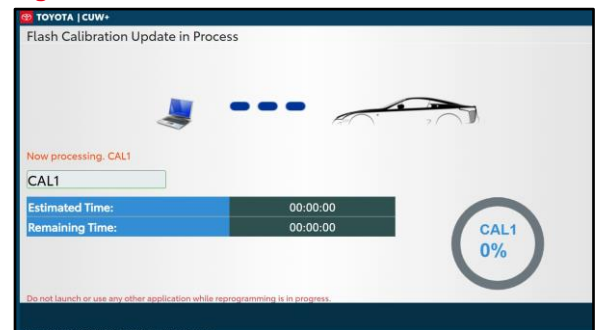
J. Does the vehicle require only ONE calibration update?
- **YES —** Go to sub step P.
- **NO —** If the vehicle requires a SECOND calibration update, continue as follows:
  - For serial communication vehicles, continue to sub step K.
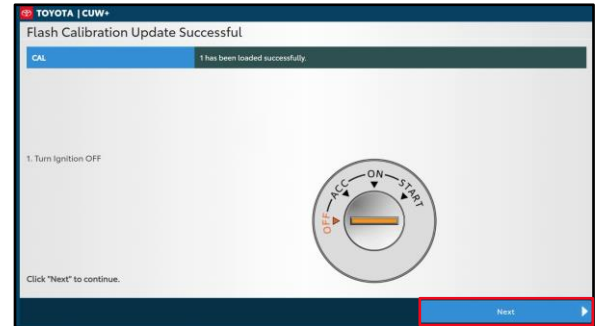 - For CAN communication vehicles, go to sub step M.

GTS+ Techstream ECU Flash Reprogramming Procedure

Operation Procedure (continued)

K. When Cal 1 completes the update process, turn the ignition OFF, click Next, and wait a MINIMUM of 10 seconds before proceeding.
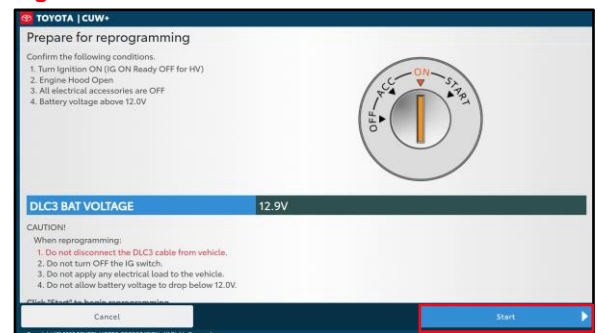
Figure 18.

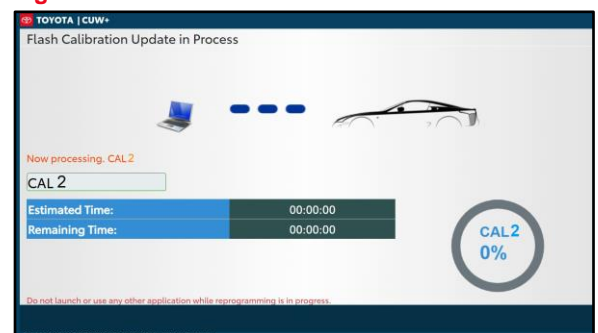L. Turn the ignition to the ON position, then click Start.

> **NOTE**
>
> If the key cycle is NOT done properly, reprogramming may fail, and an error message will appear prompting you to restart Cal 2.

Figure 19.

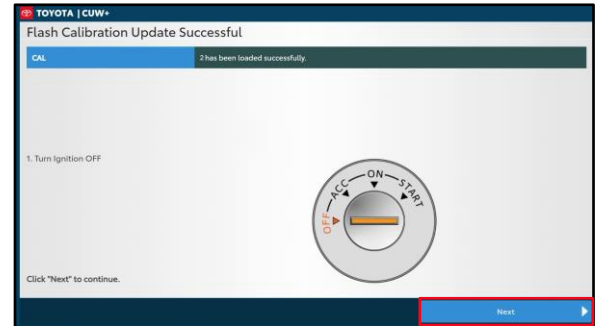M. Do NOT disturb the vehicle during flash reprogramming.

Figure 20.

GTS+ Techstream ECU Flash Reprogramming Procedure
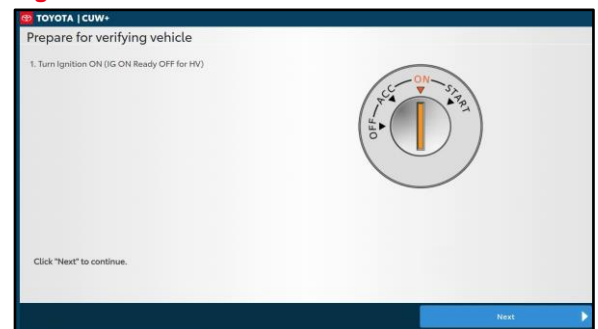
Operation Procedure (continued)

N. Turn the ignition OFF, click Next, and wait a MINIMUM of 10 seconds before proceeding.

Figure 21.
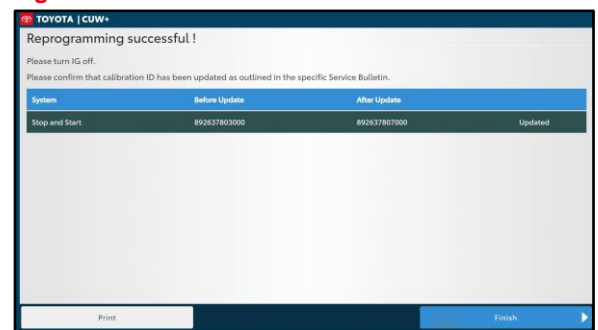

O. Turn the ignition to the ON position, then click Next.

Figure 22.

P. Confirm calibrations were updated and click Finish.

Figure 23.

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.

GTS+ Techstream ECU Flash Reprogramming Procedure

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 (USA) or 00451-00002-MEX (Mexico).

   Figure 24.

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.