**LEXUS**
*Technical Service Information Bulletin*

# GTS+ ECU Flash Reprogramming With Security Signature

**Service Category** General

**Section** Outline-General

**Market** USA and Mexico

Toyota Supports
ASE Certification

## Applicability

| YEAR(S) | MODEL(S) | ADDITIONAL INFORMATION |
|---|---|---|
| 2024 - 2025 | GX550, RZ300E, TX350, TX500H, TX550H+ | |
| 2022 - 2025 | LS500, LS500H, LX600, NX250, NX350, NX350H, NX450H+ | |
| 2025 | LX700H, UX300H | |
| 2023 - 2025 | RX350, RX350H, RX450H+, RX500H, RZ450E | |

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**REVISION NOTICE**

**February 10, 2025 Rev2:**

- **Applicability has been updated to include 2025 model year LS 500, LS 500h, LX 600, LX 700h, NX 250, NX 350, NX 350h, NX 450h+, RX 350, RX 350h, RX 450h+, RX 500h, RZ 450e, TX 350, TX 500h, TX 550h+, and UX 300h and 2024 – 2025 model year GX 550 and RZ 300e vehicles.**
- **The Introduction, GTS+ Preparation, Process Overview, and Operation Procedure sections have been updated.**
- **The Parts Information section has been removed.**

**August 14, 2023 Rev1:**

- **Applicability has been updated to include 2023 – 2024 model year LS 500, LS 500h, LX 600, NX 250, NX 350, NX 350h, NX 450h+, RX 350, RX 350h, RX 450h+, RX 500h, RZ 450E and 2024 model year TX 350, TX 500h, and TX 550h+ vehicles.**
- **The Introduction, Parts Information, GTS+ Preparation, Process Overview, and Operation Procedure sections have been updated.**

**Any previous printed versions of this bulletin should be discarded.**

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# GTS+ ECU Flash Reprogramming With Security Signature

**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 Global Techstream+ (GTS+) ECU flash reprogramming procedures and outlines use of the Technical Information System (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 GTS+ ECU flash reprogramming process.

> **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

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# GTS+ ECU Flash Reprogramming With Security Signature

**Warranty Information**

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

**Required Tools & Equipment**

| 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 1-800-368-6787 (USA) or 01-800-504-5330 (Mexico) or by visiting *Home – Service Resources – Lexus Special Service Tools (SSTs)*.

| 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 2024.04.004.02 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) or by visiting *TIS – Diagnostics – Tools & Equipment – Techstream Order Portal*.
> - Use Techstream or an approved J2534 interface to perform flash reprogramming updates. Visit techinfo.toyota.com for more information regarding J2534 reprogramming.

# GTS+ ECU Flash Reprogramming With Security Signature

**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.**
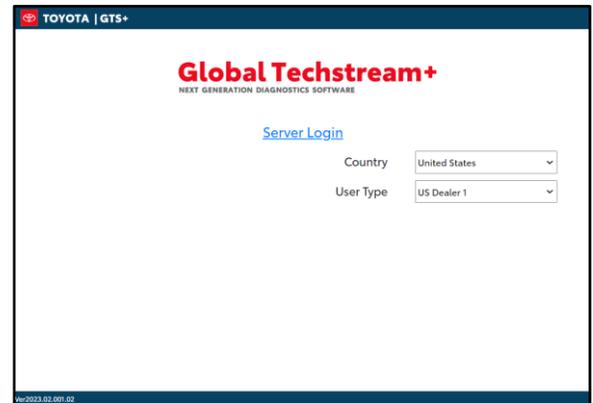
## GTS+ ECU Flash Reprogramming With Security Signature

**GTS+ Preparation (continued)**

### Confirm 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.**
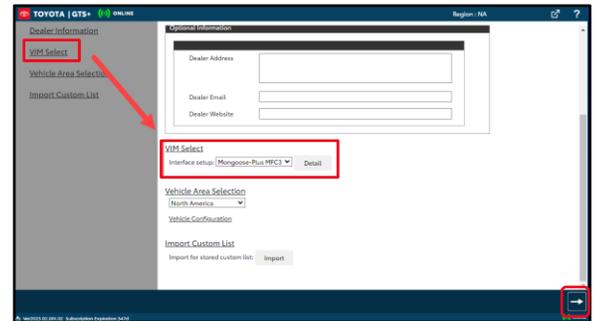


> **NOTE**
>
> The Mongoose driver MUST be installed before Mongoose selections will be available. For additional information, see
> *TIS – Diagnostics – Scantool.*

4. Click the arrow in the bottom right corner.

## GTS+ ECU Flash Reprogramming With Security Signature

**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 the figures below).
> - Calibration file links can be found embedded in the corresponding Service Bulletin.

**Figure 3.**
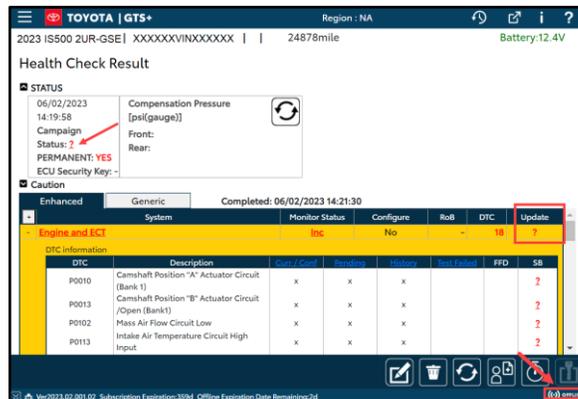


**Figure 4.**
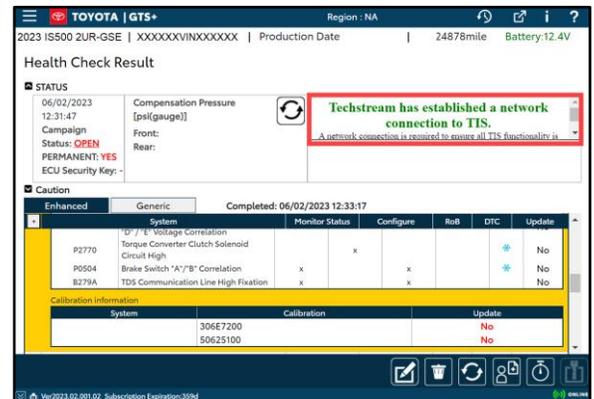


2. Connect the DCA-8000 battery diagnostic tool using "Power Supply Mode" ONLY.

   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+ ECU Flash Reprogramming With Security Signature

**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.**
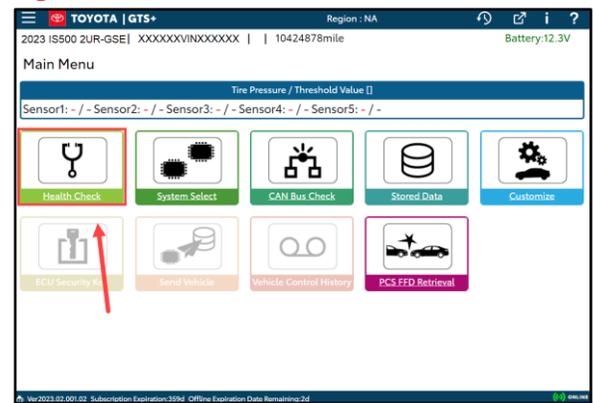
   

   C. A Health Check completed window opens. To continue, click either Yes or No.

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

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

   **Figure 6.**
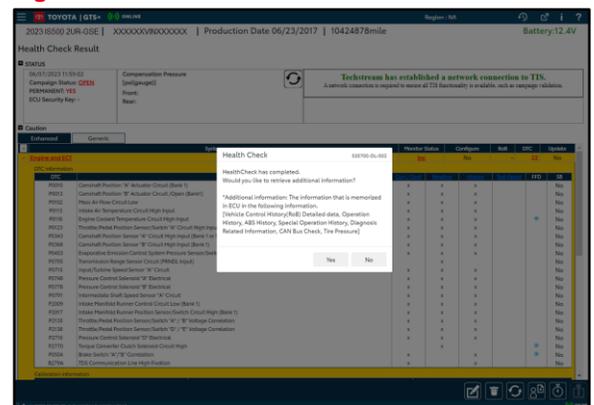
# GTS+ ECU Flash Reprogramming With Security Signature

**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.**
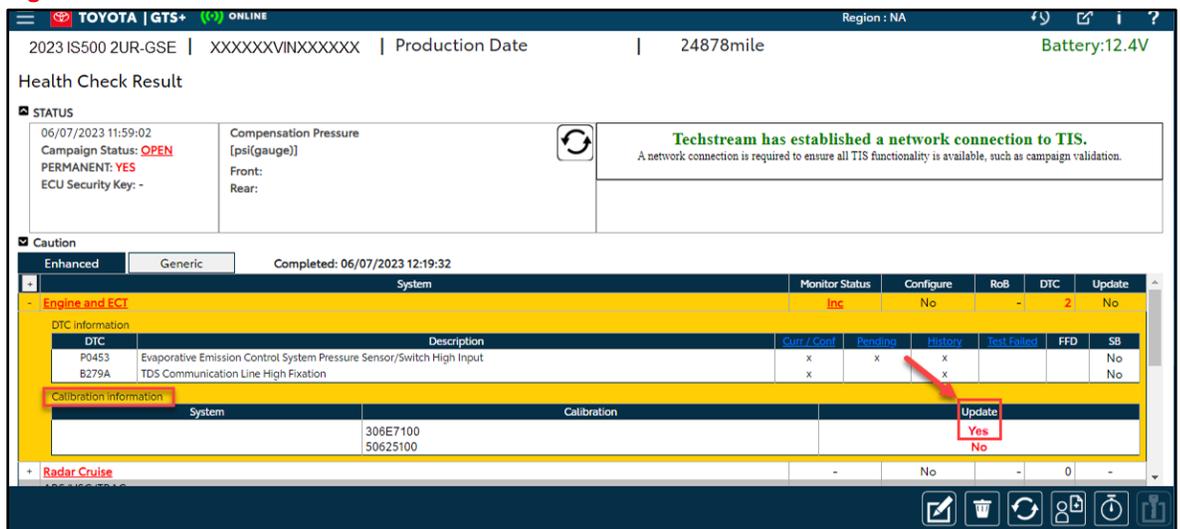


E. Login to TIS.

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

# GTS+ ECU Flash Reprogramming With Security Signature

**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+ ECU Flash Reprogramming With Security Signature

**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.**



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### Surging/Bucking Condition When Applying Throttle of Less Than 20 Percent

**Calibration Information**

| MODEL YEAR | DRIVETRAIN | CALIBRATION ID | |
| --- | --- | --- | --- |
| | | PREVIOUS | NEW |
| 2021 | 2WD | 8966350Q0000 | 8966350Q0100 |
| 2021 | 4WD | 8966350Q7000 | 8966350Q7100 |
| 2022 | 2WD | 8966350J0000 | 8966350J0100 |
| 2022 | 4WD | 8966350M0000 | 8966350M0100 |

# GTS+ ECU Flash Reprogramming With Security Signature

**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.**
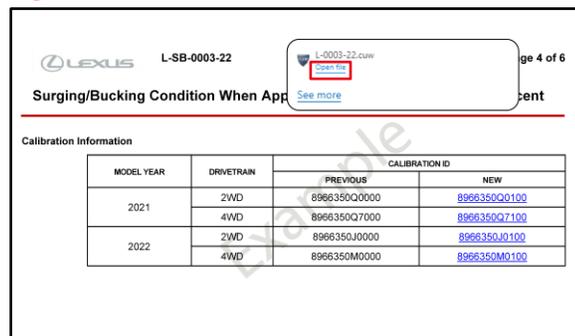
**Figure 11.**
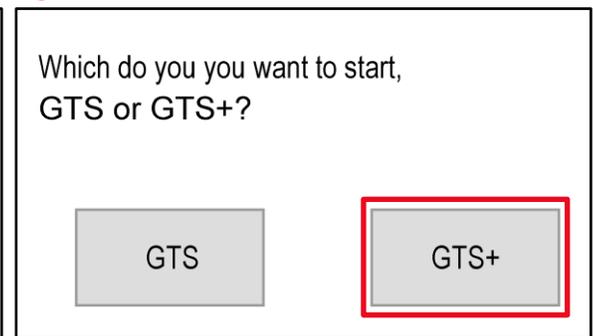
> **NOTICE**
>
> **Errors during the flash reprogramming process can permanently damage the vehicle ECU. Minimize the risk by following the steps below.**
>
> - **Battery voltage MUST NOT FALL BELOW 12V during reprogramming. Confirm battery voltage is higher than 12V but be sure voltage DOES NOT RISE 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+ ECU Flash Reprogramming With Security Signature

**Operation Procedure (continued)**

C.  Click Next to start the calibration update process.

**Figure 12.**
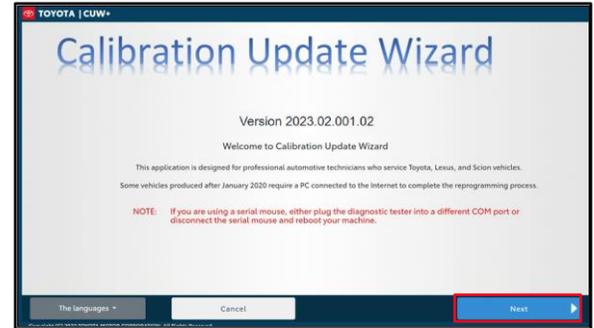


D.  Confirm the following:

- 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.**
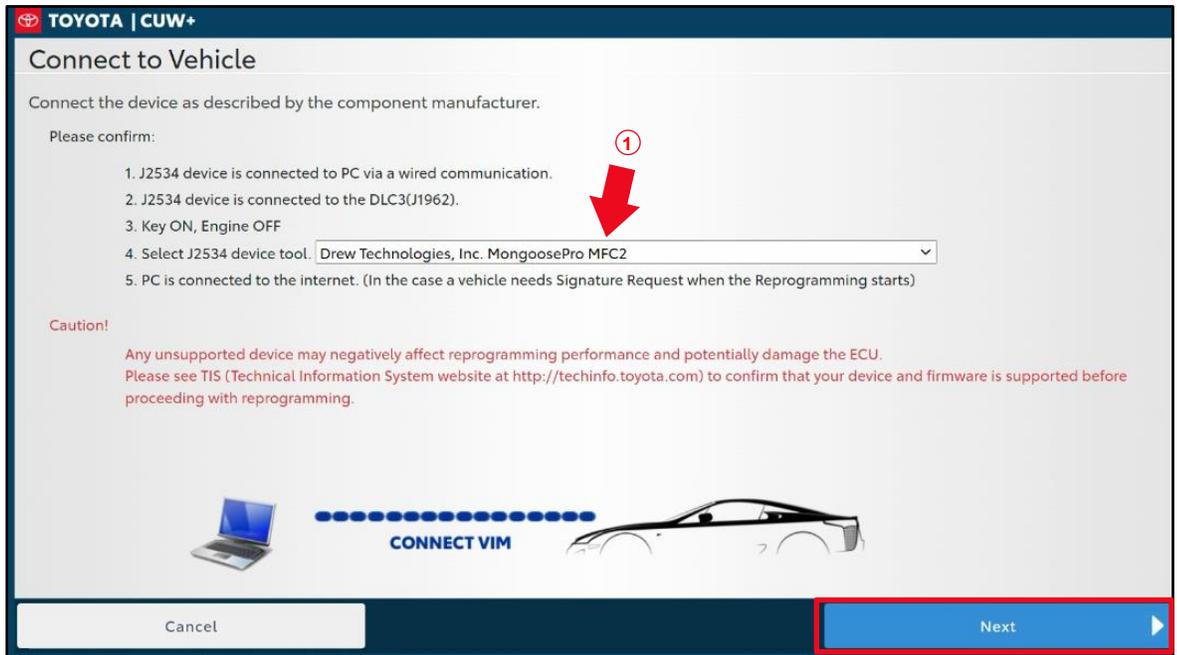


| 1 | Select the Correct Device Tool ("MongoosePro MFC," "MongoosePro MFC2," or "Mongoose-Plus MFC3" VIM) |
|---|---|

# GTS+ ECU Flash Reprogramming With Security Signature

**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.**
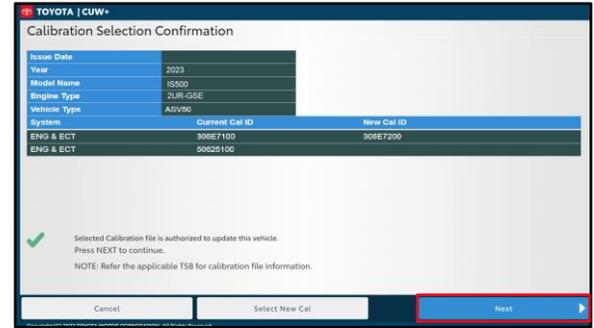


F. Turn the ignition OFF, click Next, and wait at least 10 seconds before proceeding.

**Figure 15.**
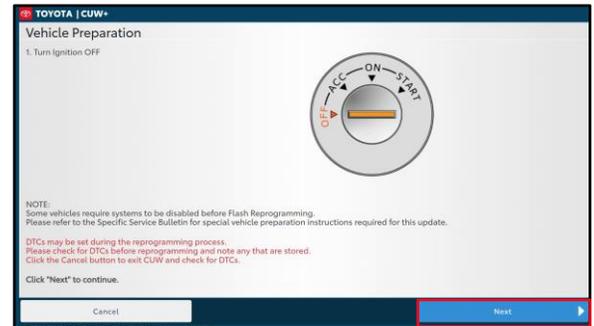
## GTS+ ECU Flash Reprogramming With Security Signature

**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. Based on the version of GTS+ being used, please follow the appropriate steps listed below:

- GTS+ software version 2024.03 or newer, go to sub step P.
- GTS+ software version 2024.02 or older, continue to sub step J.

# GTS+ ECU Flash Reprogramming With Security Signature

**Operation Procedure (continued)**

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

**Figure 17.**
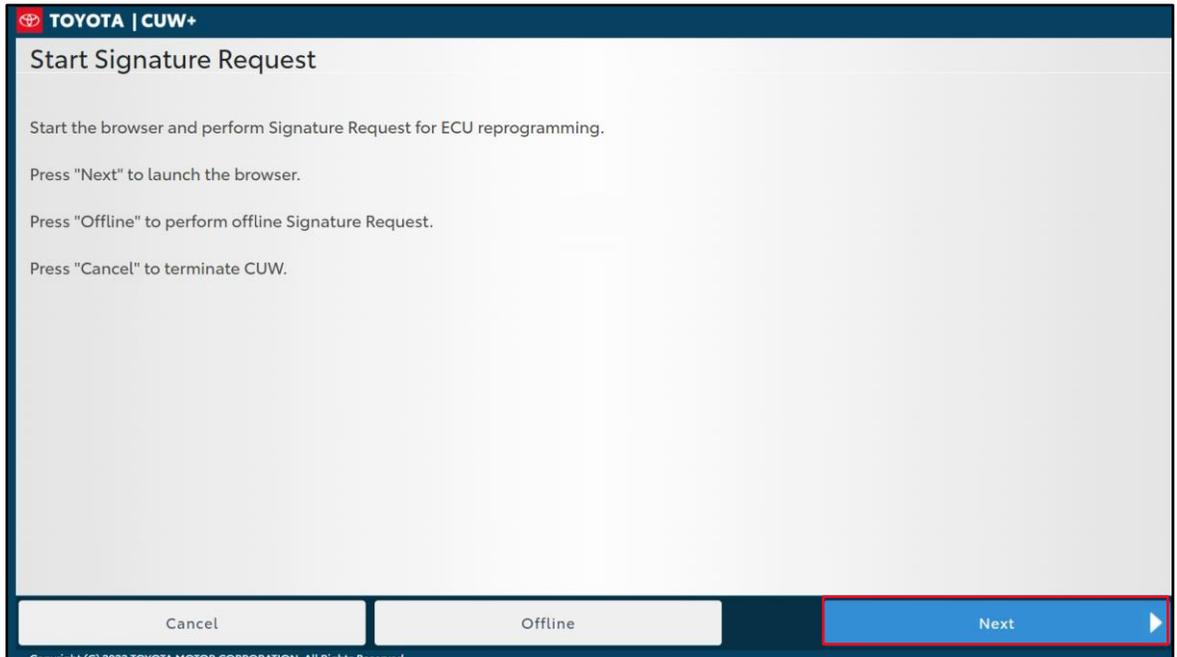


K. Input TIS login credentials and select Login.

**Figure 18.**
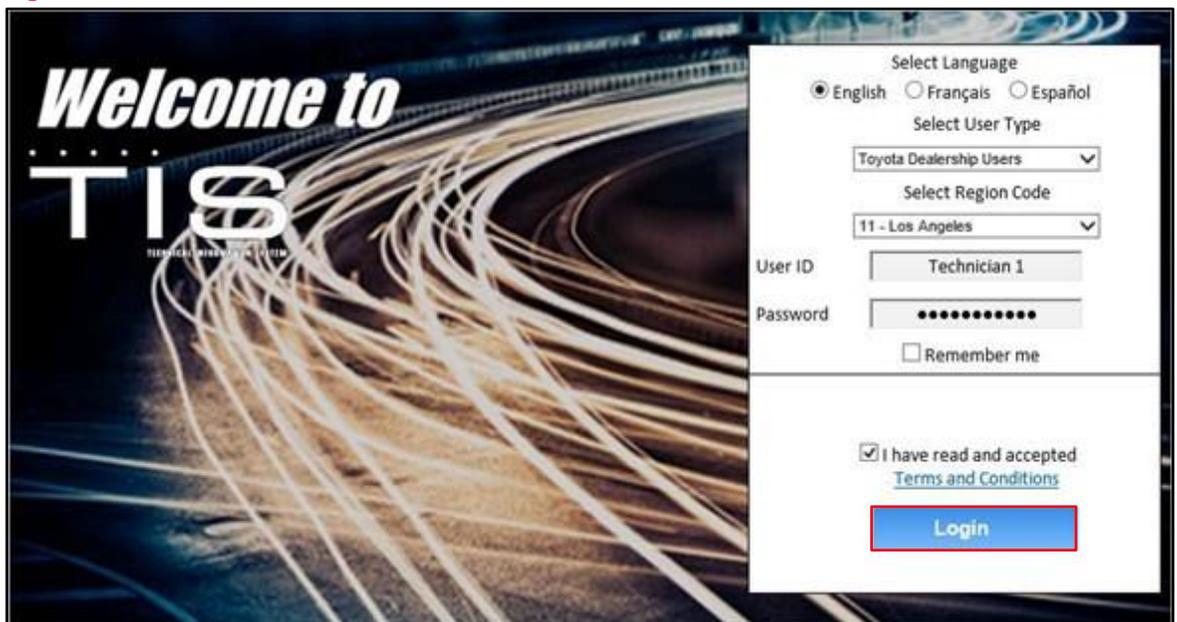
# GTS+ ECU Flash Reprogramming With Security Signature

**Operation Procedure (continued)**

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

**Figure 19.**



M. Select Send.

**Figure 20.**



N. Click Copy to Clipboard to copy the signature from TIS.

**Figure 21.**

# GTS+ ECU Flash Reprogramming With Security Signature

**Operation Procedure (continued)**

O.  Paste the Signature into CUW+ and select Next.

**Figure 22.**



P.  Select OK to continue.

> NOTE
>
> Sub steps P and Q are ONLY required for GTS+ software version 2024.03 and newer.

**Figure 23.**



Please login to continue.

OK

# GTS+ ECU Flash Reprogramming With Security Signature

**Operation Procedure (continued)**

Q. Enter your password and select LOG IN to continue

**Figure 24.**
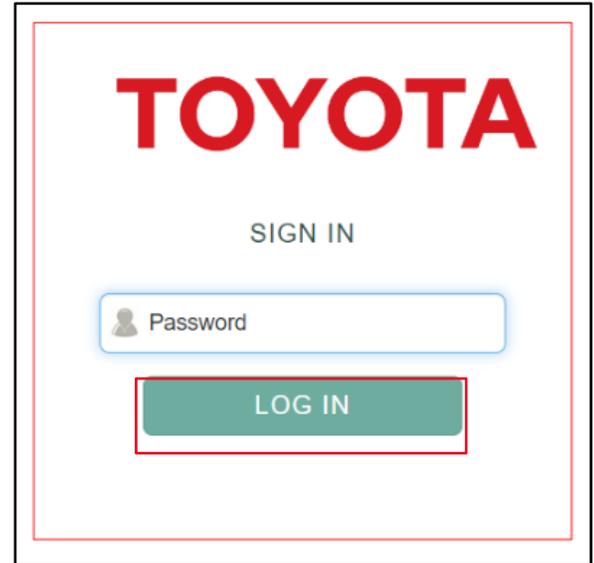


R. Do NOT disturb the vehicle during flash reprogramming.

> **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 25.**
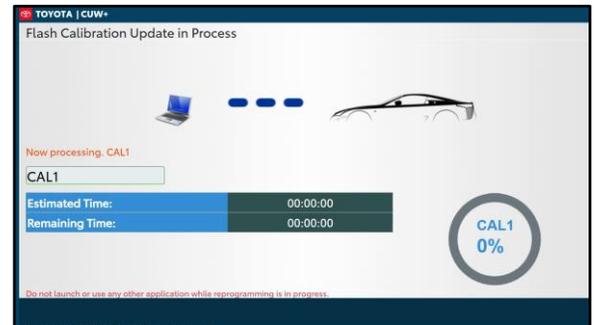


S. Does the vehicle require only ONE calibration update?
- **YES —** Go to sub step T.
- **NO —** If the vehicle requires a SECOND calibration update, continue as follows:
  - For serial communication vehicles, continue to sub step T.
  - For CAN communication vehicles, go to sub step V.

# GTS+ ECU Flash Reprogramming With Security Signature

**Operation Procedure (continued)**

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

**Figure 26.**
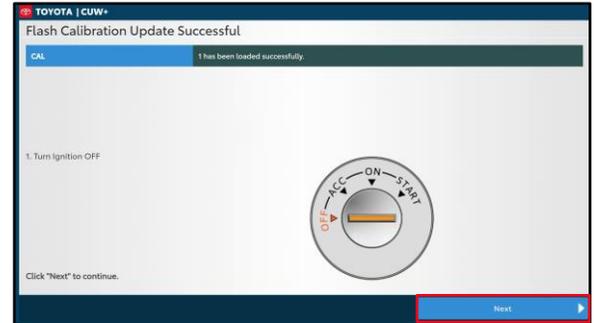


U. Turn the ignition to the ON position, then click Start.

> **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 27.**
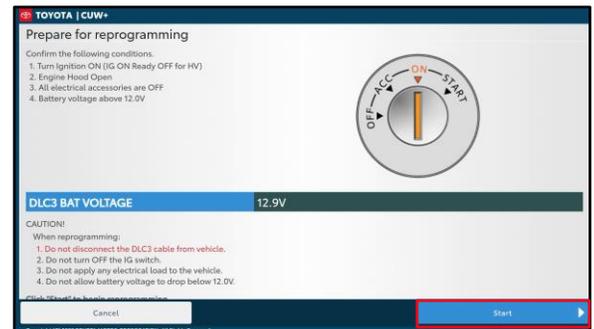


V. Do NOT disturb the vehicle during flash reprogramming

.

**Figure 28.**
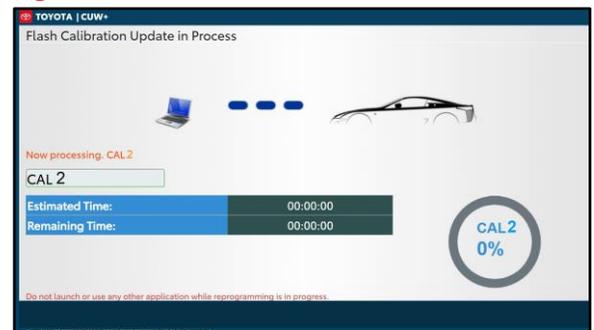
# GTS+ ECU Flash Reprogramming With Security Signature

**Operation Procedure (continued)**

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

**Figure 29.**
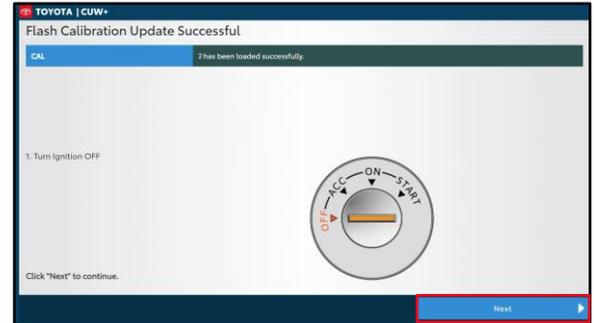


X. Turn the ignition to the ON position, then click Next.

**Figure 30.**



Y. Confirm calibrations were updated and click Finish.

**Figure 31.**



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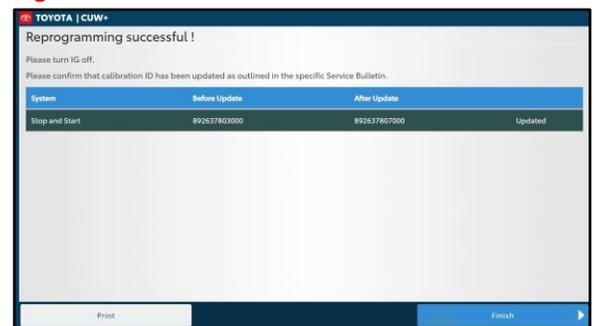
**NOTE**

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 GTS+. 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.

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