

Service Category Engine/Hybrid System Section Engine Control

Market USA



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TSB No. SS002-07 is Obsolete and any printed versions should be discarded.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.

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* <i>OR</i> 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.

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 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 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.



nterface setup:	Mongoose MFC
	TIS Techstream VIM
Interface information -	Mongoose MFC
Vendor Name	: Drew Technologi
Device Name	: Mongoose MFC
ProtocolsSupported	
CAN	:1
ISO15765	:1
J1850PWM	:1
J1850VPW	:1
ISO9141	:1
ISO14230	:1
SCI A ENGINE	:0
SCI A TRANS	: 0
SCI B ENGINE	:0
SCI B TRANS	: 0
Function Library	: C:\WINDOWS\system32\MONGM432.DLL
ConfigApplication	: C:\WINDOWS\system32\MongConf.exe
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• If using TIS Techstream, select TIS Techstream VIM (this is the default).

Figure 3. Select TIS Techstream VIM (default) to Use TIS Techstream

nterface setup:	TIS Techstream VIM Detail
Interface information -	Mongoose MFC
Vendor Name	: DENSO CORPORATION
Device Name	: TIS Techstream VIM
ProtocolsSupported	
CAN	1
ISO15765	:1
J1850PWM	:1
J1850VPW	:1
IS09141	:1
ISO14230	:1
SCI A ENGINE	:0
SCI A TRANS	: 0
SCI B ENGINE	: 0
SCI B TRANS	: 0
Function Library	: C:\Program Files\Toyota Diagnostics\Techstream\Bin\ComTol32.dll
ConfigApplication	

4. Click OK.

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.

Note: An asterisk(*) indicates a system that is unsupported or not responding. All ECUs Powertrain Chassis Body Electrical Engine and ECT Cruise Control ABS/VSC/TRAC Immobiliser SRS Airbag Body Rear Left Door Rear Right Door *Back Door Combination Meter Occupant Detection rear Immobiliser SRS Airbag Body Immobiliser Ckt Immobiliser
Engine and ECT Cruise Control ABS/VSC/TRAC Immobiliser SRS Airbag Body "Rear Left Door Rear Right Door 'Back Door Combination Meter Occupant Detection mmg
Rear Left Door Rear Right Door Back Door Combination Meter Occupant Detection Inneg Combination Meter Combination Meter Combination Meter Inneg Combination Meter Combination C
ming ck This ECU controls fuel injection, ignition timing, knock control, idling engine speed, self-diagnosis function, and backup function in extraordinary circumstance etc. Additionally, it controls automatic transmission
mng ck This ECU controls fuel injection, ignition timing, knock control, idling engine speed, self-diagnosis function, and backup function in
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This ECU controls fuel injection, ignition timing, knock control, idling engine speed, self-diagnosis function, and backup function in
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This ECU controls fuel injection, ignition timing, knock control, idling engine speed, self-diagnosis function, and backup function in
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This ECU controls fuel injection, ignition timing, knock control, idling engine speed, self-diagnosis function, and backup function in
This ECU controls fuel injection, ignition timing, knock control, idling engine speed, self-diagnosis function, and backup function in extraordinary circumstance etc. Additionally, it controls automatic transmission
This ECU controls fuel injection, ignition timing, knock control, idling engine speed, self-diagnosis function, and backup function in
This ECU controls fuel injection, ignition timing, knock control, idling engine speed, self-diagnosis function, and backup function in
extraordinary circumstance etc. Additionally, it controls automatic transmission

Operation Procedure (Continued)

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

Figure 5.

System Select Store	d Data Cal Update						
	System Select Select desired system Note: An asterisk(*) in	tion Menu n and then press Live Data ndicates a system that is u	to access the ECU.	sponding.			
	All ECOS Power	Carias Castral		Immobilions	ODC Airban	Redu	
Health Check	*Pear Left Deer	Poor Picht Door	ABS/VSC/TRAC	Combination Mater	Occupant Detection	Body	_ <u>^</u>]
Customiza	Real Leit Dool	Rear Right Door	Back Dool	Combination weter	Occupant Detection		
Setting							- 11
ECU		Health	heck (5309-02)				
		This Pre-	Powertrain(2 ECUs) Chassis(2 ECUs) Body(7 ECUs) function may take a ss Next to continue.	few minutes to complete			
	This ECU controls fu extraordinary circum	el injection, ignitic H stance etc.Additic	elp	Next> Can	ction, and back	sup function in	د ۲

- D. Click Next.
- E. Click *Continue* to view *Health Check* results.

Figure 6.

Health	Check (5309-05)
Healt	th Check Complete !
-Hea	Ith Check does not display live data
-Cha	nges in vehicle condition will not update automatically
-To u	pdate Health Check, click the "Refresh Health Check" button
	Continue

Operation Procedure (Continued)

F. Available calibration updates are indicated by a <u>Yes</u> link in the *Cal. 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 7.

System Select Store	Deta								
	Health Check Results -Health Check does not display live data -Changes in vehicle condition will not update -To update Health Check, click the 'Refresh'	automatically Health Check" button							
2006_Sienna_38 File Notes	System	Current	Pending	History	Monitor Status	Calibration	Cal. • Update?		
Data 1.11	Engine and ECT	0	0	0	Inc	30816100	Yes		
Cond I Th						50803000	Yes		
	Cruise Control	0			•				
	ABS/VSC/TRAC	0							
	SRS Airbag	0		0	-		•		
	Combination Meter			•	-	-			
	Rear Right Door	0		•			•		
	Immobiliser	0		0			•		
	Body	0		0					
	Occupant Detection	0		0	-		· ·		
Evenedation							=		
Cxpano>>									

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

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.

	Calibration Se	earch Form			Reference Documents
1	Choose the crit	teria you would	l like to search by:		TIS Diagnostic Applications Updates:
	Oivision/Me	odel/Year	C Calibration ID C VD	S	A complete guide to the new diagnostic applications updates released for 2004 model year scantool support.
		Divis Mo Ye	ion: TOYOTA • del: Sienna • ear: 2004 • Clear Search		Toyota Process Bulletin SS002-01 A complete guide to the ECU Flash Reprogramming process Toyota Erro Bulletin SS004-01 During the ECU Flash Reprogramming process with the vehicle you may receive an error message. Check out this bulletin for details.
•	Calibration Se	earch Result			Diagnostic Support Applications TIS Diagnostic Applications Installer
	Current ECU CAL ID	New ECU CAL ID	Document Title (Release Date)	Year / Model / VDS	Select the link above to scan your workstation and verify that recommended diagnostic support applications are currently installed. If undees are required follow the step-by step.
	30801000 30801100 30801200 30801300 30802000 30802200 30802200 30802200 30802200 30805000 50801000 50801000 50801000	30806000 30807000 50805000 50806000	TC007-03: 04 Sienna: ECM Calibration: Shift Feeling Enhancement (Revised) (2003-11-06)	2004 / Sienna / BA22C 2004 / Sienna / BA22C 2004 / Sienna / ZA22C 2004 / Sienna / ZA23C	Instructions provided. If you need to install CUW (Calibration Update Wizard), it is now bundled with Techstream onfwarer instead of the TIS Diagnostic Applications Installer. Use the Techstream 2.00.008 Full Software Installer if you do not already have Techstream software installed on your PC. Note: After clicking the link above, be sure to choose "Run" or "Open" this program to launch the Installer.

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.





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.

Calibration dentification	MODEL YEAR	MODEL	ECM (CPU)	PREVIOUS CALIBRATION ID	NEW CALIBRATION ID	VDS
Chart		2WD	Main	30801000 30801100 30801200 30801300 30804000	30806000	ZA22C ZA23C
	2004		Sub	50801000 50801100 50803000	50805000	
	& 2005	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.



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 11.4 volts</u> during reprogramming. Confirm battery voltage is higher than 11.4 volts, but be sure voltage <u>DOES NOT RISE ABOVE</u> <u>16.0 volts</u> 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. <u>00002-V8150-KIT</u> "Digital Battery Analyzer," and follow TSB No. <u>PG001-06</u>, "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 <u>GR8 Instruction Manual</u> located on TIS, *Diagnostics – Tools & Equipment – Battery Diagnostics.*
- C. Click *Next* to start the calibration update process.



Operation Procedure (Continued)

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

Figure 13.

Calibration Update Wizard - Screen Sz Please select the desired reprogramm	701-04 ning device.	
C Diagnostic Tester	C Generic J2534 Interface	C Techstream VIM
		Next Cancel

When using Techstream Lite, select *Generic J2534 Interface*. Then click *Next*. Figure 14.

Please select the desired repro	Nizard - Screen S701-04	<u></u>	
C Diagnostic Tester	Generic J2534 Interface	C Techstream VIM	
		Next Cancel	

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

C	onnect to Vehicle
	Connect the device as described by the component manufacturer.
	Please confirm: 1. Techstream VIM is connected to PC. 2. Techstream VIM is connected to the DLC3 (J1962) connector. 3. Key ON, Engine OFF

Figure 16. Using Techstream Lite

Connect to Vehicle			
Connect the device as describe	ed by the component manufacturer.		
Please confirm: 1. J2534 device is connected t	to PC.		
2. J2534 device is connected t 3. Key ON, Engine OFF	to the DLC3(J1962) connector.		
4. Select J2534 device Tool. Caution! Any unsupported device the ECU. Please see TIS confirm that your device	Drew Technologies Inc. Mongoose Mi may negatively affect reprogrammi (Technical Information System wel and firmware is supported before p	FC ing performance and potenti bsite at http://techinfo.toyota proceeding with reprogramm	ally damage .com) to iing.
	J2534		0

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.

Calibration Selec	tion Confirmation			
ENG & ECT				
Current Calibration:		New Calibration In	formation:	
Current Cal ID	30801000	New Cal ID	30806000	
Current Cal ID	50801000	New Cal ID	50805000	
Current Cal ID		New Cal ID		
		Issue Date	Aug. 02, 2006	
		Model Name	Sienna	
		Model Year	04	
		Engine Type	3MZ-FE	
		Vehicle Type	2WD	
Selected Calibra Press NEXT to NOTE: Refer the appl	ation file is authorized to upda continue. icable TSB for calibration file i	te this vehicle. information. Select N	lew Cal	Cancel

Operation Procedure (Continued)

G. Turn ignition OFF. Then click Next.

Figure 18.



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.

Prepare for reprogramming		
Confirm the following conditions.		
1. Turn ignition ON. 2. Engine Hood Open 3. All electrical accessories are OFF 4. Battery voltage above 11.4V ACC ON Start OFF OFF	CAUTION! When reprogramming: 1. Do not disconnect the DLC3 cable from vehicle. 2. Do not turn OFF the IG switch. 3. Do not apply any electrical load to the vehicle. 4. Do not allow battery voltage to drop below 11.4V.	
Click "Start" to begin reprogram	ning.	
Chek Start to beginneprogram	ining.	

NOTE

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

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.

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.

Flash Calibration Update Su	iccesstul	
CAL 1 has been loaded successfu	lly.	
OFF OFF Start	 Please cycle ignition OFF for a minimum of 10 seconds. Confirm ignition is returned to the ON position. 	
Click "Next" to continue.	~	

K. Turn ignition to the ON position. Then click Start.

Figure 22.

Prepare for reprogramming		
Confirm the following conditions. 1. Turn ignition ON. 2. Engine Hood Open 3. All electrical accessories are OFF 4. Battery voltage above 11.4V ON OFF OFF OFF OFF OFF	F CAUTION! When reprogramming: 1. Do not disconnect the DLC3 cable from vehicle. 2. Do not turn OFF the IG switch. 3. Do not apply any electrical load to the vehicle. 4. Do not allow battery voltage to drop below 11.4V.	
Click "Start" to begin reprogram	nming.	

NOTE

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

Operation Procedure (Continued)

L. Do NOT disturb the vehicle during flash reprogramming.

Figure 23.

SCAL1 20% / Calibration Update Wizard - Screen 5701-16
Estimated Time: 00:02:37
Remaining Time: 00:02:07
CAL 1: CAL
CAL 2:
Do not launch or use any other application while reprogramming is in progress. Do not disconnect from vehicle.

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

Figure 24.



Operation Procedure (Continued)

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

Figure 25.

Prepare for verifying vehicle	
Please confirm IG ON to download calibration information.	
OFF OFF	
Click "Next" to continue.	

O. Confirm all calibrations were updated as specified in the service bulletin. Then click *Finish*. Figure 26.

Calibration Update Wizard	- Screen 5701-26			
Reprogramming success Please turn IG off.	iul !			
Please confirm that calib	ation ID has been updated a	s outlined in the specific Se	rvice Bulletin.	
Before Update:	Before Update:		After Update:	
Current Cal ID-1	30801000	Current Cal ID-1	30806000	
Current Cal ID-2	50801000	Current Cal ID-2	50805000	
Current Cal ID-3		Current Cal ID-3		
NOTE: Some DTCs may ha Clear all DTCs after	ve been set during the repro restoring the vehicle.	ogramming process.		
			Print	Finish

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.





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

