T-SB-0012-13



Techstream ECU Flash Reprogramming Procedure

Service Category Engine/Hybrid System

			Toyota Supports
Section	Engine Control	Market USA	ASE Certification

Applicability

YEAR(S)	MODEL(S)	ADDITIONAL INFORMATION	
2001 - 2014	4Runner, Avalon,		1
	Avalon HV, Camry,		
	Camry HV, Celica,		
	Corolla, Echo, FJ		
	Cruiser, Highlander,		
	Highlander HV, Land		
	Cruiser, MR2 Spyder,		
	Matrix, Prius, Prius		
	C, Prius PHV, Prius		
	V, RAV4, RAV4 EV,		
	Sequoia, Sienna,		
	Solara, Tacoma,		
	Tundra, Venza, Yaris		

SUPERSESSION NOTICE

The information contained in this bulletin supersedes SB No. T-SB-0064-10.

- · Applicablity has been updated to include 2014 model year Toyota vehicles.
- The entire bulletin has been updated to include information for Techstream 2.0.

Service Bulletin No. T-SB-0064-10 is Obsolete and any printed versions should be discarded. Be sure to review the entire content of this 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.

ΦΤΟΥΟΤΑ

Techstream ECU Flash Reprogramming Procedure

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
Techstream 2.0*		TS2UNIT	
TIS Techstream	ADE	TSPKG1	1
Techstream Lite		TSLITEDLR01	

NOTE

- · Only ONE of the Techstream units listed above is required.
- Software version 7.31.003 or later is required.
- Additional Techstream units may be ordered by calling Approved Dealer Equipment (ADE) at 1-800-368-6787.
- The Diagnostic Tester is NOT recommended for flash reprogramming. Please use Techstream or an approved J2534 interface to perform flash reprogramming updates. Visit <u>techinfo.toyota.com</u> for more information regarding J2534 reprogramming.

SPECIAL SERVICE TOOLS (SST)	PART NUMBER	QTY
GR8 Battery Diagnostic Station*	00002-MCGR8	1

NOTE

Additional SSTs may be ordered by calling 1-800-933-8335.

* Essential SST.

Techstream Preparation

Selecting 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 drop down menu.

Figure 1.



Techstream Preparation (Continued)

- 3. Select the correct Interface Setup from the drop down list.
 - · If using Techstream 2.0, select "MongoosePro MFC".
 - If using Techstream Lite, select "Mongoose MFC" or "MongoosePro MFC" (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.

- If using TIS Techstream, select "TIS Techstream VIM".
- 4. Click "OK".

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.

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 2.

				and the second second			
	System Select	ion Menu					
11/1 18452 7.113	Select desired system Note: An asterisk(*) in	and then press Live D	ata to access the ECU is unsupported or not re	isconding			
1	Aureus 1 Dame	unia I Channis I B	at Electrical				
	All ECUs Power	Course Control	ABSAISCITRAC	Immobilizar	SDS Airban	Both	
Health Check	*Rear Left Door	Rear Right Door	*Back Door	Combination Meter	Occupant Detection	Cosy	-
Customize							_
Setting							
ECU							_
Reprogramming	1						_
CAN	1					1	-
Bus Check							_
							_
							_
							-
	1						_
	The Fair control of		The second second second				
Constant States	inis EGO controis tue	et injection, ignition tim stance etc Additionally	it controls automatic tr	g engine speed, see-alag ansmission	nosis function, and back	rup runction in	
	extraordinary circums	stance etc.Additionally	ing, knock control, ioin, it controls automatic tr	g engine speed, sei-diag ransmission	nosis iunction, and back	op uniction w	
164264.32	1 States						
	and the second second						
12 2 3 1 1 3 4 S							
And the second of the second of the	1						
the second							

Operation Procedure (Continued)

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

Figure 3.

	System Select Select desired system Note: An asterisk(*) in All ECUs Power	ion Menu n and then press Live D dicates a system that train Chassis Bo	ata to access the ECU is unsupported or not ret dy Electrical	sponding		
Health Check	Engine and ECT	Cruise Control	ABS/VSC/TRAC	Immobiliser	SRS Airbag	Body 🛎
	"Rear Left Door	Rear Right Door	*Back Door	Combination Meter	Occupant Detection	
Customize .						
Contraction of the second seco		Heal	th Check (\$305-02)	and the second second	11/2/2	
			Powertrain(2 ECUs) Chassis(2 ECUs) Body(7 ECUs) his function may take a ress Next to continue.	few minutes to complete		
	This ECU controls to extraordinary circum	el injection, ignitic stance etc Additic —	Help	Next> Can	celClion, and back	kup tunction in 🔄

D. Click "Next".

E. Click "Continue" to view Health Check results. Figure 4.

Health Ch	eck (5309-05)
Health	Check Complete I
-Health	Check does not display live data
-Chang	es in vehicle condition will not update automatically
-To upd	ate Health Check, click the "Refresh Health Check" button
	Continue

Techstream ECU Flash Reprogramming Procedure

Operation Procedure (Continued)

F. Available calibration updates are indicated by a <u>Yes</u> link in the *"Cal. Update?"* column. Click the Yes link 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.

Fi	in	111	ro	5
	ı u	u		· • •

	Health Check Results Health Check does not display live data -Changes in vehicle condition will not update a -To update Health Check, click the "Refeat H	utomatically ealth Check" button					
2006_Sienna_38 File Notes	System	Current	Pending	History	Monitor	Calibration	Cal.
E Health Checi	Frane and FCT	0	6	0	Inc	30875100	Yes
Data 1.11	and a state of the state of the state of the	The Plant of the	In section in	S 1 37 15		50803000	Yes
	Cruise Control	0					
	ABS/VSC/TRAC	0	i i				
	SRS Arbag	0		0			
	Combination Meter	3.0		- m.)			
1	Rear Right Door	0	1.045			14	
	Immobiliser	0		0			
1	Body	0	-	0		Ψ.	
	Occupant Detection	0	-	0			
Expand>>				1301.		K	

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

Operation Procedure (Continued)

H. 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.

He He	ome / TIS			TOYOTA Help My Account Log
O Library	(•) Disgnostic	o Tech Assistance	O Vehicle Inquiry	
Scan	Tool and press	Calibrations	Immobilizer Reset	
Calibration S	earch Form	and the local dealer and	and and share the state	Reference Documents
C Division/M	lodel/Year Divisi Moi Ye	Calibration ID C vi on: TOYOTA del: Sienna arri 2004 Clear Search	os	A completion of the new disgnostic applications updates released for 2004 model year scentool support. Tayota Process Bulletin SS002-01 A complete guide to the ECU Flash Reprogramming process Tayota Error 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 S	earch Result	and a strength of the strength	a la trada a series de la compañía d	Diagnostic Support Applications
Current ECU CAL ID	New ECU CAL ID	Document Title (Release Date)	Year / Model / VDS	115 Diagnostic Applications Installer Select the link above to scan your workstation and verify that recommended diagnostic support applications are currently installed. If updates are required, follow the step-by step
30801100 30801200 30801200 30802000 30802100 30802100 30802200 30802000 50801000 50801000 50801000 50801000 50801000	30806000 30807000 50805000 50806000	TC007-03: D4 Sienna: ECM Calibration: Shift Feeling Enhancement (Revised) (2003-11-06)	2004 / Sienna / BA22C 2004 / Sienna / BA23C 2004 / Sienna / ZA23C 2004 / Sienna / ZA23C	Instructions provided. If you need to install CUW (Calibration Update Wizard), it is now bundled with Techstream software instead of the TIS Diagnostic Applications Installer. Use the Techstream 2.00.003 Full Software Installer (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 <u>GR8</u> <u>Instruction Manual</u> located on TIS, *Diagnostics – Tools & Equipment – Battery Diagnostics.*

Figure 7.



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 - please review the selected Service Bulletin carefully.

Figure 8.

Calibration dentification Chart	MODEL YEAR	MODEL	ECM (CPU)	PREVIOUS CALIBRATION ID	NEW CALIBRATION ID	VDS
		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. Figure 9.

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.

3	Name: T-	-0015-06.cuw		
4.95	Type: a	JW, 1.84 MB		
	From: t3	media.toyota.	zom	
	-	Onen	1 Saure	Cancel
				Canca
✓ Always	s ask before or	pening this type	of file	

TOYOTA

Techstream ECU Flash Reprogramming Procedure

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> 16.0 volts 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 Service Bulletin 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.

Figure 10.

Calibration Upda	te Wizard - Screen 5701-01		sin s
data constant	Va	hiclo ECIL	NOTION OF TAXABLE PARTY.
	~ ···		
Lana 2	Calibration	i Update Wiz	ard
	Welcome to	the Calibration Update Witard.	
This application	on is designed for professional aut	omotive technicians who service Toyota,	Lexus, and Scion vehicles.
NOTI	E If you are using a serial mouse, or disconvect the s	either plug the diagnostic tester into a d erial mouse and rebool your machine.	ifferent COM port
			ALC: T
English	2	Setup	Next Cancel
Copyright (C12000	2005 TOYOTA MOTOR CORPORA	TION All Rights Reserved.	

Operation Procedure (Continued)

D. Select the correct reprogramming device.

- If using Techstream 2.0, select "Generic J2534 Interface".
- If using Techstream Lite, select "Generic J2534 Interface".
- If using Techstream, select "Techstream VIM".

Then click "Next".

Figure 11.

Please select the desired repro	gramming device.	and Shiften and	
C Diagnostic Tester	C [Generic J2534 Interface]	C Techstream VIM	
Tenser 1		techstream))	
	J2534		
			Sec. 1
		4	1

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".

1

Figure 12. Using Techstream 2.0 or Techstream Lite

Connect the device as describe	d by the component manufacturer.		
Please confirm: 1. J2534 device is connected i 2. J2534 device is connected i 3. Key ON, Engine OFF 4. Select J2534 device Tool. Caution! Any unsupported device the ECU. Please see TIS confirm that your device	to PC. to the DLC3(J1962) connector. Drew Technologies Inc. Mongoose MFC may negatively affect reprogramming p (Technical Information System website and firmware is supported before proce	erformance and potentially dar at http://techinfo.toyota.com) to reeding with reprogramming.	nage
	J2534		

Select Correct Device Tool ("Mongoose MFC" or "MongoosePro MFC")

Operation Procedure (Continued)

Figure 13. Using TIS Techstream

Compression openee mental - secent sectors	
Connect to Vehicle	C-21-97
Connect the device as described by the component manufacturer.	
Please confirm:	
1. Techstream VIM is connected to PC.	1. 1. 2. 2.
2. Techstream VIM is connected to the DLC3 (J1962) connector.	1
	J

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 14 shows an example of the update procedure for a two-processor ECU.

Figure 14.

O DE ENVIOLENTE				
ENG & ECT				
Current Calibration	1 :	New Calibration In	formation:	
Current Cal ID	30801000	New Cal ID	30806000	
Current Cal ID	50801000	New Cal ID	50805000	
Current Cal ID	1200	New Cal ID	47	
	Report Contraction	Issue Date	Aug. 02, 2006	
		Model Name	Sienna	
		Model Year	04	
		Engine Type	3MZ-FE	
		Vehicle Type	2WD	
Selected Ca Press NEXT	alibration file is authorized to to continue. applicable TSB for calibration	o update this vehicle.	•	

Operation Procedure (Continued)

G. Turn ignition OFF. Then click "Next".

Figure 15.



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		a 3	3
Verify the vehicle is c	onnected to a ba	ttery charger	before continuing — If battery
voltage falls below 11	.4 volts, ECU da		cur.

Then click "Start".

Figure 16.

Confirm t	he fellowing conditions				and the second
1. Turn ig 2. Engine 3. All elev 4. Battery	ACC ON Start	CAUTION! When reprogramming: 1. Do not disconnect the D 2. Do not turn OFF the IG so 3. Do not apply any electrica	LC3 cable from vehic itch. I load to the vehicle.	le.	
Click "Sta	rt" to begin reprogram	 Do not allow battery voltag ming. 	e to drop below 11.4V.		
- K	and the effector		-		

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 17.

-lash Calibration Upda	ate in Process	
Estimated Time: 00.02.37		
Remaining Time: 00:02:07		
CAL 1:		
CAL 2:		
Do not launch or use any oth	er application while reprogramming is in progress.	

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 18.

	Flash Calibration Update Successful
	CAL 1 has been loaded successfully.
р — N	OFF OFF OFF
	Click "Next" to continue

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

Figure 19.



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 20.

Flash Calibration Update in Process
Estimated Time: 00:02:37
Remaining Time: 00:02:07
CAL 1: CAL
CAL 2:
Do not faunch 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 21.



ΦΤΟΥΟΤΑ

Techstream ECU Flash Reprogramming Procedure

Operation Procedure (Continued)

- N. Turn ignition to the ON position. Then click "Next".
 - Figure 22.

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

O. Confirm all calibrations were updated as specified in the Service Bulletin. Then click "Finish". Figure 23.

Before Update:				
Current Cal ID-1	30801000	After Update:	20806000	1000
Current Cal ID-2	50801000	Current Cal ID-2	50805000	
Current Cal ID-3		Current Cal ID-3		
NOTE: Some DTCs may I Clear all DTCs aft	ave been set during the er restoring the vehicle.	reprogramming process.		

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.

Figure 24.



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

