



Duramax 6.6L LB7/LLY DSP⁵

User Guide

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Duramax 6.6L LB7/LLY DSP⁵

User Guide

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Prerequisites

Intended Audience

EFILive Customers using the V8 Scan and Tune Tool software.

Computer Knowledge

It is expected that readers have a basic understanding of:

- The Windows operating system;
- Starting and using Windows applications;
- Navigating folders using Windows Explorer.

Tuning Knowledge

It is expected that readers have a basic understanding of:

- Electronic Fuel Injection.
- On Board Diagnostics.



Introduction

What is EFILive?

EFILive is tuning software and hardware - it is not a tune. Together the software and hardware give users the tools to write tunes. EFILive does not provide tune files, tuning advice or support, but do provide software support and hardware support.

DSP² Support Retirement

This document was originally created for DSP⁵ and DSP² custom operating systems. Support for DSP² operating systems was retired in July 2018.

The DSP² custom operating system and associated script files have not been migrated to V8 Scan and Tune software.

What is EFILive DSP⁵?

EFILive's DSP⁵ custom operating systems for Duramax controllers allows customers to be able to switch 'on the fly' between multiple tunes, all stored in the ECM's flash memory

Having multiple tunes instantly accessible means changing tunes to suit different driving conditions no longer requires the ECM to be reflashed each time you choose to run a different tune. (E.g. racing, towing, or power limiting.) Simply build multiple tunes to fill the DSP⁵ slots, flash the ECM once and then select your desired tune through your FlashScan or AutoCal, or via a hardwired switch at any time.

The ECM can be returned to GM factory condition at any time by reflashing a stock GM Operating System and calibration into the ECM using the Full Flash option.

Software Version Overview

This version of the Duramax LB7 & LLY DSP⁵ User Guide migrates all processes to EFILive V8 Scan and Tune software. Functionality is still available in V7.5 software, however software support and bug fixes will cease in 2021.

FlashScan/AutoCal V3 and AutoCal V2 are not compatible with V7 software. V7 functions are only supported by FlashScan V2. The following is a brief view of the activities that are performed with the different software versions:

Feature	V7	V8
Scanning		
OBDII Diagnostics		
Reading		
Flashing		
Tune Editing		
VIN License Management		
Firmware Management		

To upgrade to DSP⁵ exclusively in EFILive V8 Scan and Tune software you must be running the following (or higher) software versions.

1. EFILive V8.3.5 or later.
2. FlashScan V3 / AutoCal V3 Firmware – V3.00.060.
3. FlashScan V2 / AutoCal V2 Firmware - V2.08.170.

The latest software versions are available for download from EFILive's website.



DSP⁵ Upgrade

DSP⁵ Upgrade Checklist

DSP⁵ upgrades are only available on specific factory operating systems. Typically these are based on the latest factory update (at time of development). If you have a truck that has an OS not listed below, you will need to upgrade your base file first.

Supported DSP⁵ operating systems are listed in the table below. These were the latest factory updates as of 2008; released 7 years after this ECM type was introduced.

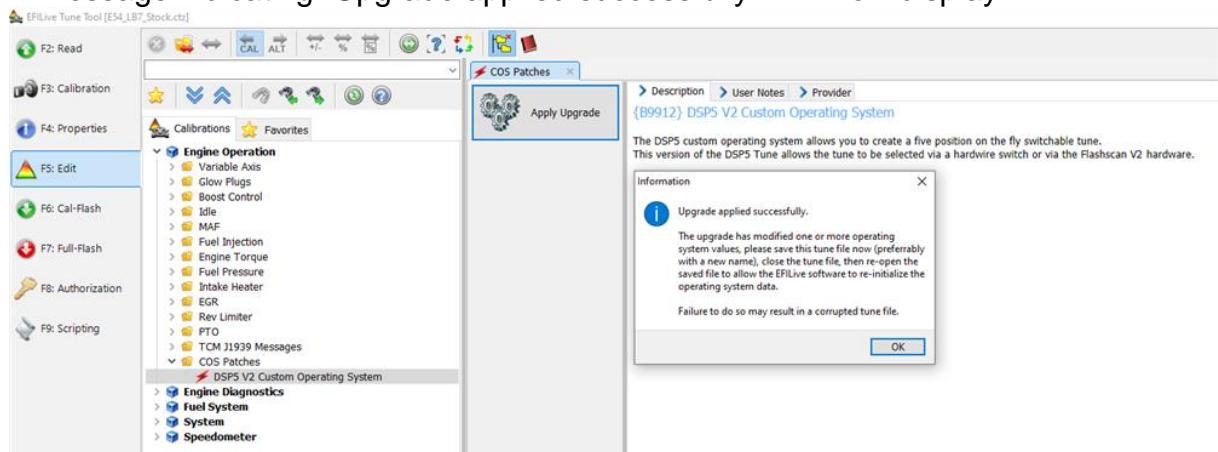
EFILive will not be offering DSP⁵ on older, obscure or obsolete OS's. No further EFILive development is scheduled for the Duramax LB7 or LLY platform.

DSP ⁵ Supported Operating Systems	
E54 (LB7)	E60 (LLY)
15063376	15141668
15097100	15193885
15188873	15231600
15094441	15228758
15166853	
15186006	
15189044	

Upgrade Operating System to DSP⁵

1. Open V8 Scan and Tune software and your stock tune file.
2. Navigate to [F5: Edit].
3. Expand the Engine Operation -> COS Patches Folder and select DSP5 V2 Custom Operating System.
4. Select the [Apply Upgrade] button.
5. Select [Yes] to the "This operation cannot be undone, continue?" dialog box.

6. A message indicating "Upgrade applied successfully." will now display.



7. Save the file with a new name using, **File > Save As**. As an example; 'My Truck Base DSP5 Conversion.ctz'.
8. Close the tune file.
9. In the EFILive V8 Scan and Tune Recent Items entries for the stock tune and your upgraded DSP⁵ tune will be listed. Confirm that the operating system number on the base file is different to the upgraded DSP⁵ converted file.

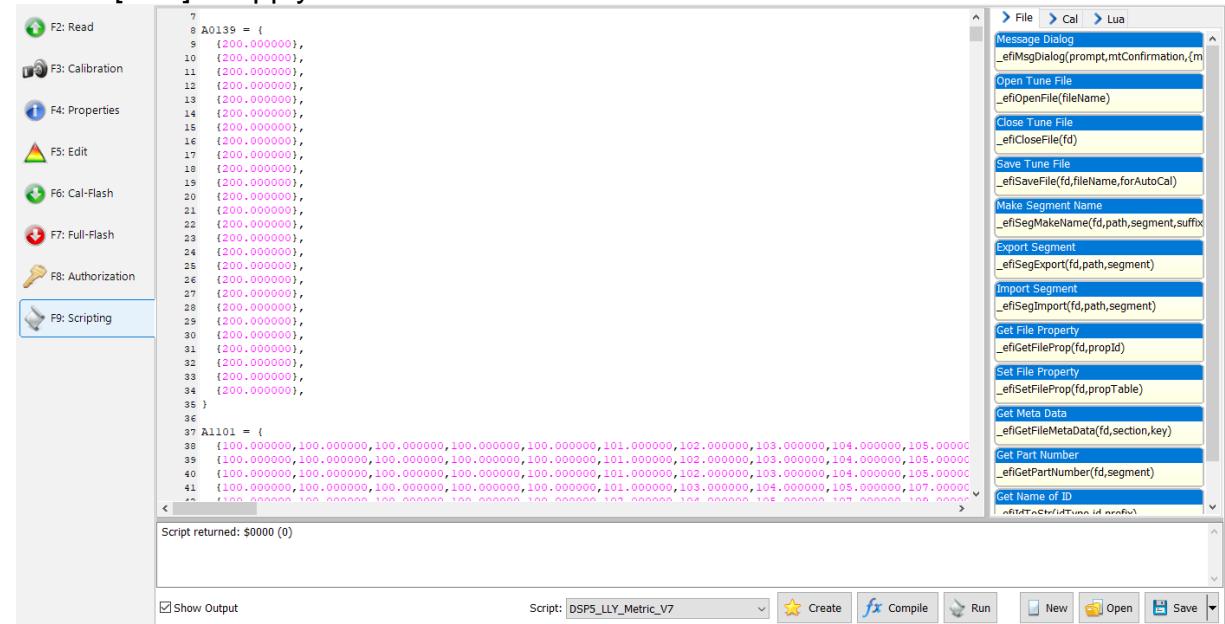
F2: Scan	Display Updates	Check for Updates	Check Firmware																								
F3: Tune																											
F4: OBD																											
Recent Items: <table border="1"> <thead> <tr> <th>Tune Filename</th><th>VIN</th><th>OS</th><th>Controller</th><th>Serial</th><th>Boot Block</th><th>Remote</th><th>Date Last Opened</th></tr> </thead> <tbody> <tr> <td>My Truck Base DSP5 Conversion.ctz</td><td>1GTHC23134F000000</td><td>3904405</td><td>E54</td><td>3169CT086YE1</td><td>00000000</td><td>005000136076</td><td>10/03/2021 12:24:24 PM</td></tr> <tr> <td>E54_LB7_Stock.ctz</td><td>1GTHC23134F000000</td><td>15189044</td><td>E54</td><td>3169CT086YE1</td><td>00000000</td><td>005000136076</td><td>10/03/2021 10:45:20 AM</td></tr> </tbody> </table>				Tune Filename	VIN	OS	Controller	Serial	Boot Block	Remote	Date Last Opened	My Truck Base DSP5 Conversion.ctz	1GTHC23134F000000	3904405	E54	3169CT086YE1	00000000	005000136076	10/03/2021 12:24:24 PM	E54_LB7_Stock.ctz	1GTHC23134F000000	15189044	E54	3169CT086YE1	00000000	005000136076	10/03/2021 10:45:20 AM
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E54_LB7_Stock.ctz	1GTHC23134F000000	15189044	E54	3169CT086YE1	00000000	005000136076	10/03/2021 10:45:20 AM																				

10. Reopen the tune file that was converted.
11. Navigate to [F9: Scripting] and select [Open].
12. Users MUST run script files to populate maps. EFILive DOES NOT automatically populate DSP tables with factory maps during the upgrade for LB7 or LLY. Select the script for your tune file based on the operating system number using the table below.

	GM OS	DSP5 OS	Script File Name
LB7 DSP ⁵ Script Files	15063376	01337605	DSP5_LB7_Early_Metric.txt
	15097100	01710005	
	15188873	01887305	
	15094441	02444105	
	15166853	02685305	
	15186006	02600605	
	15189044	03904405	
LLY DSP ⁵ Script Files	15141668	04166805	DSP5_LLY_Metric.txt
	15193885	05388505	
	15231600	05160005	
	15228758	05875805	

13. Navigate to the \Documents\EFILive\V8\Scripts directory and open the script that matches your selection.

14. Select [Run] to apply base values to the DSP⁵ tune tables.



15. [Save] the changes made to your tune file.

16. Edit the values on your individual tunes, and [Save] the changes to your tune file.

17. Flash the DSP⁵ tune into your ECM. Refer to pass-thru flashing, FlashScan V3/AutoCal V3 flashing or FlashScan V2 flashing for further instructions.

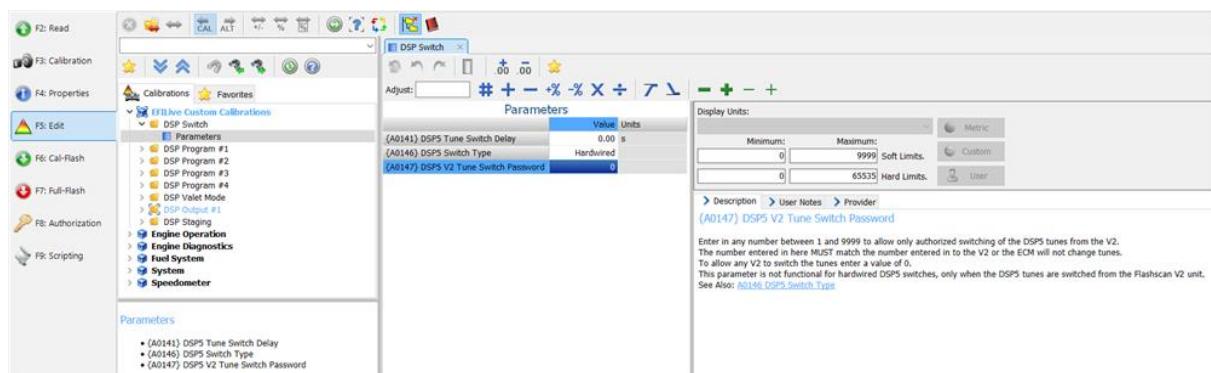
Tune Switch Password

Users may restrict tune selection by adding a password to move between tune selections to prevent unauthorized switching between tunes 1 to 5.

Before switching between tune selections, users would need to enter in the password (1 to 9999). If the password is correct, the tune will switch, if it is incorrect the tune will not switch.

It should be noted that not all switching devices may support this function, however EFILive's own FlashScan and AutoCal hardware does.

To enable the tune switch password, users need to input their chosen password in the calibration. As the calibration description states, if the password = 0 then there is no password prompt given to the user when switching tunes.



Supported Switching Methods

EFILive's DSP⁵ custom operating system can be switched using EFILive FlashScan/AutoCal V3, FlashScan/AutoCal V2, or hardwired switch. Users may make their own switch or purchase a pre-made switch.

Tune switch method is managed via A0146 - DSP5 Switch Type parameter.

1. Select [Hardwire] to switch via a hardwired switch.
2. Select [Serial Data] to switch via FlashScan or AutoCal.

Important DSP⁵ Parameters and Tables

A0141 – DSP⁵ Tune Switch Delay

Used to control the ‘delay’ before switching from the tune’s current position to selected position. The timer can be set to delay the switching up to approximately 7 seconds.

As an example, if the delay was set to 2 seconds and the switch was set to DSP Program #2, the switch would need to be moved off Position #2 to any other position for 2 seconds before the ECM will switch to the new position as set by the switch. This could be used to automatically switch to a different tune when racing. You could set it up with a delay of 5 seconds, so soon after you leave the line you turn the DSP switch to another tune (maybe better suited to the top end of the track) and 5 seconds later the ECM will switch to this tune.

A0136 to A0139 – DSP⁵ Staging Control

DSP⁵ staging control can be used to limit fuel delivery amounts which in turn allows you to control (or limit) power under certain conditions. The fuel limiting table is activated by vehicle speed, throttle position and boost levels.

When table A0139 is active it will limit the fuel delivery amounts referenced to RPM, this allows you to slowly and smoothly ramp out fuel as the engine RPM approaches a value you might want to limit the engine to.

This function is useful for drag race staging by allowing you to launch at consistent RPM or boost levels without trying to control the throttle manually.

The fuel limiting table will be bypassed once any of the parameters specified by A0136, A0137 & A0138 are exceeded. Some examples below –

- **A0136** (Vehicle Speed Limit) = 2MPH
- **A0137** (Throttle Limit) = 60%
- **A0138** (Boost Limit) = 18psi

With the above values, if the vehicle speed goes above 2MPH OR the Throttle goes above 60% AND the boost levels stay below 18psi then there will be no limiting.

If any one of the 3 parameters goes outside the limits specified then the limiting table will be ignored. In the real world this set up (with the A0139 table set with some low mm3 numbers) would allow you to limit boost to 18psi until the throttle went above 60% or the vehicle speed went above 2MPH, both of which will occur once the light turns green!

A0140 – DSP⁵ Valet Mode

DSP⁵ valet mode forces the ECM into a form of ‘limp mode’ which could be used as a valet mode / reduced engine power mode. This parameter must be set to enable to allow this to function.

Once it is enabled in the tune file, the ECM will monitor the state of an external input to determine if valet mode is to be initiated. It is highly recommended that the valet switch is not easily accessible so it cannot be accidentally engaged.

A0142, A0143, A0144, A0145 – DSP⁵ switching voltages

These parameters set up the switching points for each DSP program to become enabled.

It works by the voltage from the switch for each tune needing to fall between each adjacent parameter for a valid reading. So as an example only, if you set the parameters like so –

Table #	DSP Program #	Volts	Description
Non-DSP Program (stock)		>4.01V	For the non DSP Program (stock) to become enabled the switch voltage must be above 4.01V.
A0142	DSP Program #1	4.00V	To enable #1, the switch voltage must be between 4.00V and 3.01V
A0143	DSP Program #2	3.00V	To enable #2, the switch voltage must be between 3.00V and 2.51V.
A0144	DSP Program #3	2.50V	To enable #3, the switch voltage must be between 2.50V and 1.81V.
A0145	DSP Program #4	1.80V	To enable #4 the switch voltage must be between 0.00V and 1.80V

Monitoring DSP status in the Scantool

You can monitor the DSP switch data using the following PID's –

GM.DSP5_VOLTS_DMA – This will show the measured voltage at the ECM pin.

GM.DSP5_TUNE_DMA – This PID will show the current tune number the ECM is using.



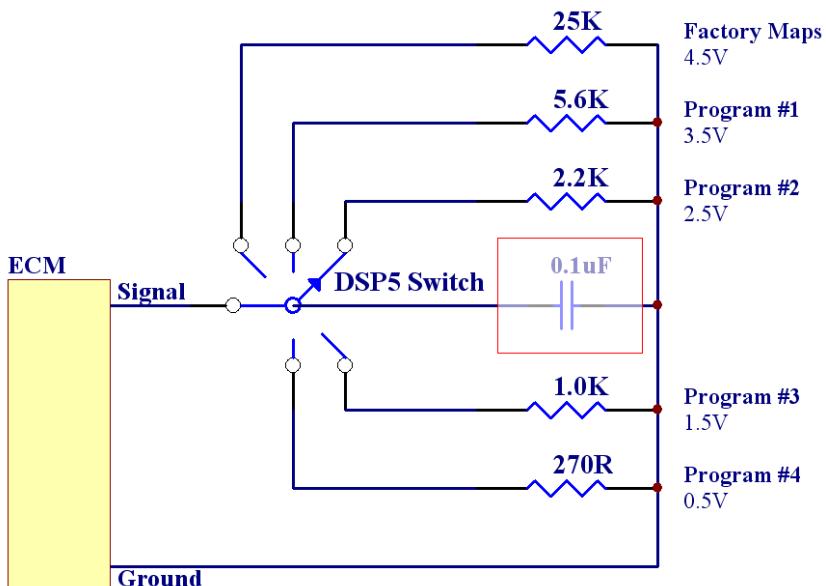
Installing a Hardwired switch

Wiring the DSP⁵ Switch

The DSP⁵ switch works by selecting different voltages for the ECM to measure, from these voltages the ECM can determine which program you wish to run.

Below is the suggested resistance to be used for any DSP⁵ switch you may wish to design. Also shown is the approx. voltage the ECM will measure for each resistance. The switching voltages are configurable within EFILive, however, the values below give a good even separation of switch points.

The 0.1uF capacitor shown in red is optional, it is used to reduce switch bounce.



The connections to the ECM from the switch are made to the following pins –

LB7

Signal = Blue connector, pin 69

Ground = Blue connector, pin 49

LLY

Signal = Grey connector, pin 32

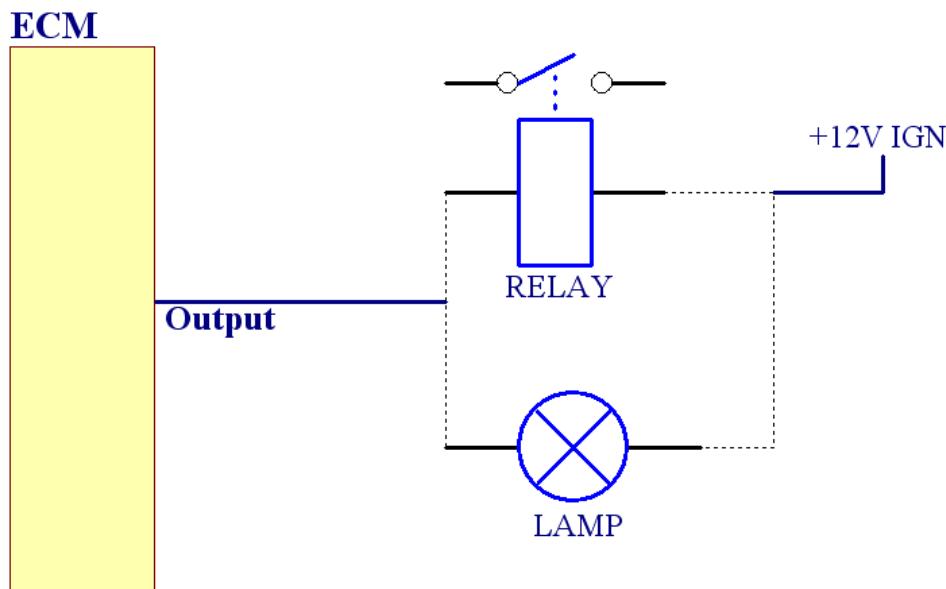
Ground = Grey connector, pin 50

Wiring the DSP Output

WARNING: Do not wire this output directly to heavy duty solenoids such as N2O controls. Solenoids must be switched via a relay, permanent damage to the ECM will occur if this is not done.

Do not use high wattage lamps, you should only use small indicator type lamps.

Choose the ECM type and wire the output as follows.

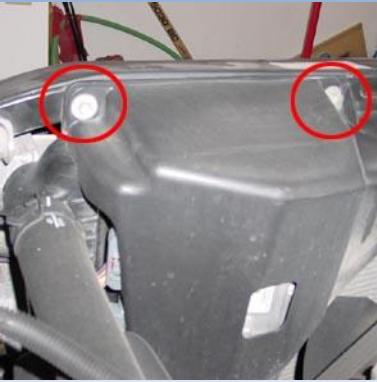


The connections to the ECM output are made to the following pins:

LB7 - Output = Blue connector, pin 39

LLY - Output = Blue connector, pin 27

LB7 ECM Connector wiring installation

#1 – Remove TCM cover	#2 – Lift out TCM	#3 – Disconnect TCM
		
#4 – Remove ECM cover	#5 – Unbolt blue plug	#6 – Remove blue cover
		
#7 – Pins now exposed	#8 – Insert new pin/wire	#9 – Re-assemble
		

LLY ECM Blue Connector wiring installation.

Note: Use the same process on the ECM's Black or Grey Connectors.

#1 - Lift Grey lever	#2 - Detatch plug	#3 - Lift grey cover
#4 - Grey cover lifted	#5 - Now removed	#6 - Remove pin lock
#7 - Remove pin filler	#8 - Keep pin lock safe	#9 – Insert new pin & wire
#10 – Push in pin to latch	#11 – Reassemble 6 & 4	#12 - Finished

The LLY ECM also has the connector pin numbers stamped on its case for confirmation, though these can be difficult to see when the ECM is fitted to the vehicle.

All installation photos courtesy of Tony Nostedt

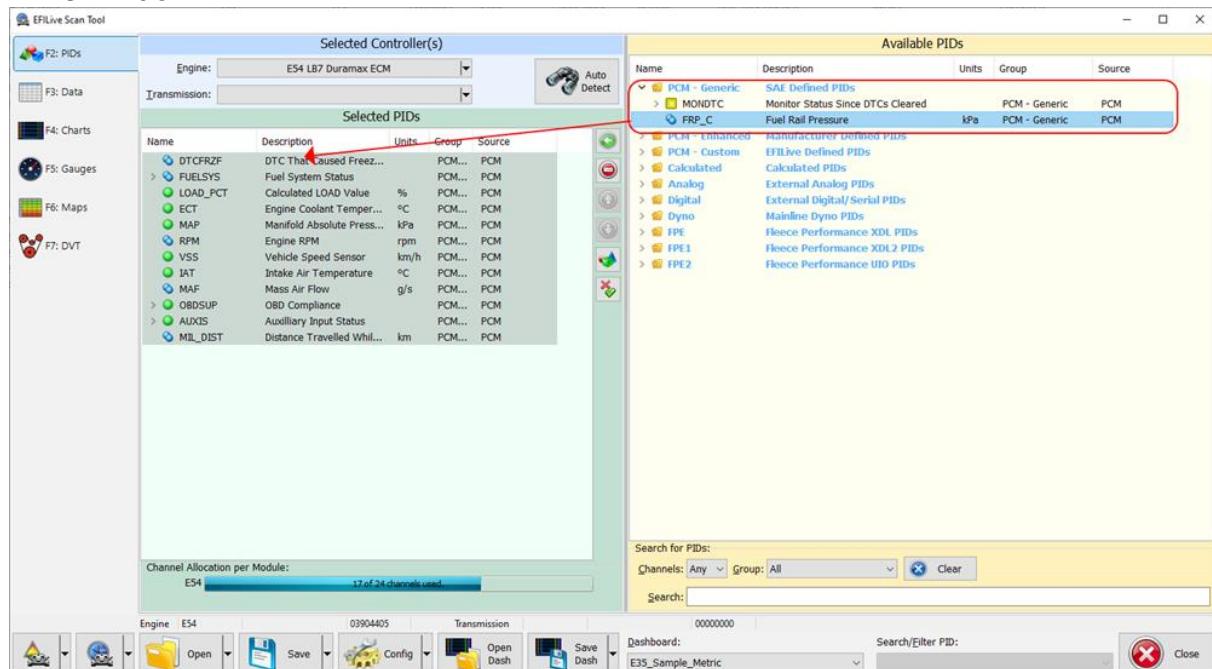


V8 Scan and Tune Scan

Pass-Thru Data Logging

To log data using FlashScan or AutoCal and V8 Scan and Tune software;

1. Open the EFILive V8 Scan and Tune.
2. Connect your FlashScan/AutoCal device to your PC and vehicle.
3. Turn the vehicle ignition to the *On* position.
4. Select an existing Dashboard configuration either by using the [Open Dash] button or using the Dashboard drop down, or configure after making controller and PID selections.
5. Navigate to the [F2: Scan] -> [F2: PIDs] menu option.
6. In the Engine field use the drop down list to select the LB7 or LLY controller type or use Auto Detect.
7. Drag PIDs or PID folders from the Available PIDs window into the Selected PIDs window.



8. Navigate to the [F3: Data], [F4: Charts], [F5: Gauges] or [F6: Maps] tab and configure your dashboard to arrange data displays where a dashboard has not already been selected.
9. Users should [Save Dash] to save their custom configurations to reduce future configuration requirements.
10. Start the vehicle.
11. Select either Record or Monitor from the [F3: Data], [F4: Charts], [F5: Gauges] or [F6: Maps] screens.
12. Stop the vehicle and turn the ignition off prior to selecting Stop to stop the data logging session.
13. Save the log.

14. To replay the data log, navigate to the [F3: Data], [F4: Charts], [F5: Gauges] or [F6: Maps] tab and select the appropriate Playback buttons.

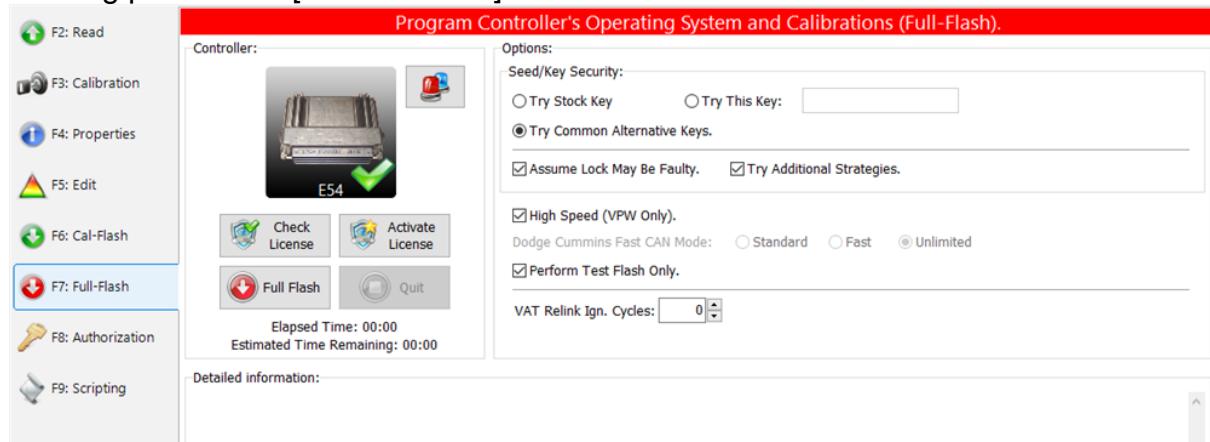


Pass-Thru Licence and Flash a Controller

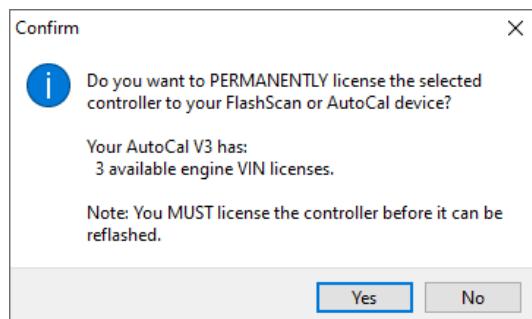
Follow these steps to license and flash the selected controller.

1. Open the EFILive Scan and Tune application.
2. Connect your FlashScan/AutoCal to your PC and your vehicle.
3. Turn the vehicle ignition to the *On* position, (not the Accessory position). Vehicle must not be cranked/running when flashing.
4. Select the [F3: Tune] option in the left-hand pane.
5. Click on the Open button and select the calibration file for the controller you wish to flash or license.
6. If tune file security has been applied to the tune file, review and accept the Security Warning.
7. Click on the [F7: Full Flash] options in the left-hand pane. A full flash is required to program a DSP⁵ into the ECM where a single tune is already programmed and to revert from a DSP⁵ to single tune. For all other tune file

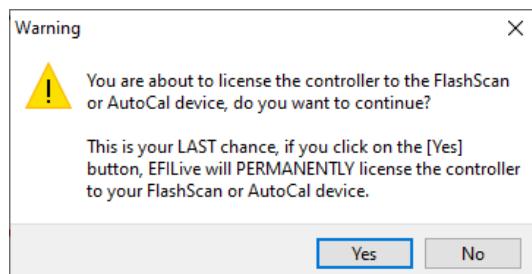
flashing please use [F6: Cal-Flash]



8. Click on the Check License button. This will indicate if the controller is already licensed or needs to be licensed.
9. Where the controller is NOT licensed, select Activate License to license the controller.
10. Select Yes to license the controller or No to close this window without licensing the controller.



11. Select Yes to license the controller or No to close this window without licensing the controller.



12. Select the Full Flash button to commence the flash.
13. While the ECM is flashing an Elapsed time indicator, an Estimated Time Remaining indicator, and a Progress bar will display tracking the Flash progress.
14. When the flash process is complete a countdown timer will be shown. When prompted perform the following actions:
 - a. Turn the vehicle ignition Off.
 - b. Click on the Start button to begin the countdown timer.
 - c. DO NOT turn the vehicle ignition on until the countdown timer expires. This time is critical to allow the ECM to perform internal functions after a read operation.



Configure FlashScan/AutoCal for BBX

There are a range of configuration files that must be installed on FlashScan and AutoCal devices before the device can be used in standalone mode (BBX).

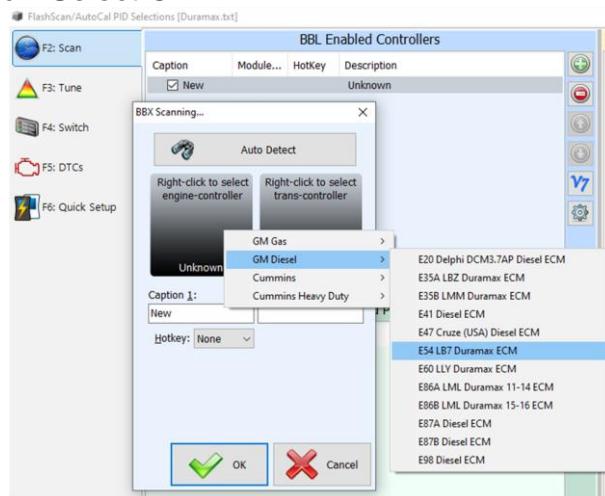
Follow these instructions to configure your FlashScan or AutoCal for BBX.

1. Connect your FlashScan or AutoCal to your PC.
2. Open the EFILive V8 Scan and Tune application.
3. Select the [F5: BBX] option in the left-hand pane.

Data Logging

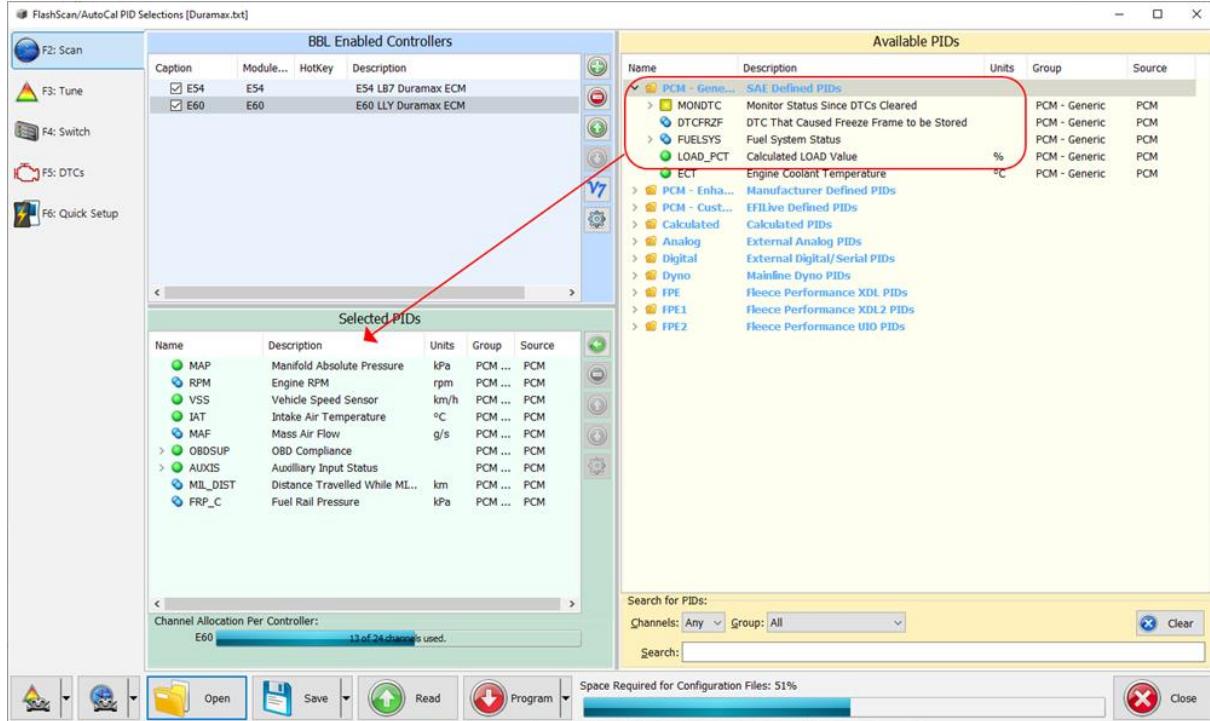
To configure data logging:

1. Select the [F2: Scan] option in the left-hand pane.
2. Remove any unnecessary controller configurations to ensure capacity restrictions are not exceeded.
3. Add your chosen controller(s) to your list;
 - a. Press the green '+' icon.
 - b. Right click on the Engine Controller box.
 - c. Navigate to Select E54 or E60.
 - d. Select OK.



4. Click on the LB7 or LLY controller in the “BBL Enabled Controllers” window.

5. Navigate and drag the PIDs or PID folders from the Available PIDs window into the Selected PIDs window.



Configure Tuning

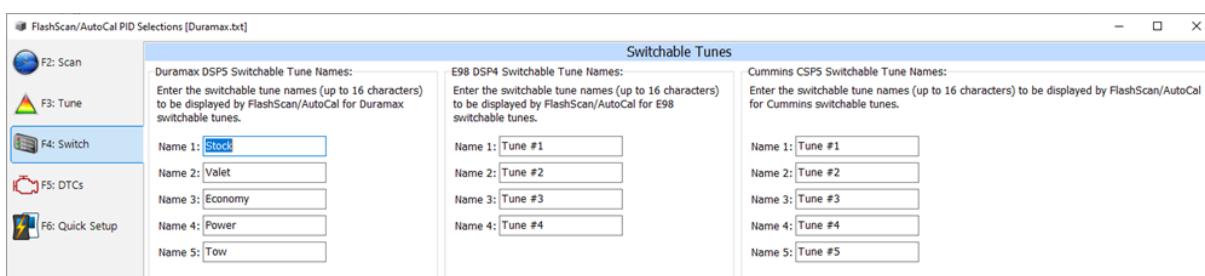
To configure flashing of LB7 or LLY controllers on your FlashScan/AutoCal device;

1. Select the [F3: Tune] option in the left-hand pane.
2. Remove any unnecessary controller configurations to ensure capacity restrictions are not exceeded.
3. Add your chosen controller(s) to your list;
 - a. Press the green '+' icon.
 - b. Right click on the Engine Controller box.
 - c. Navigate to Select E54 or E60.
 - d. Select OK.

Tune File Switching

To configure the switching of DSP⁵ tune positions on your FlashScan/AutoCal device;

1. Select the [F4: Switch] option in the left-hand pane.
2. Enter switchable tune names as appropriate.



Configure DTCs

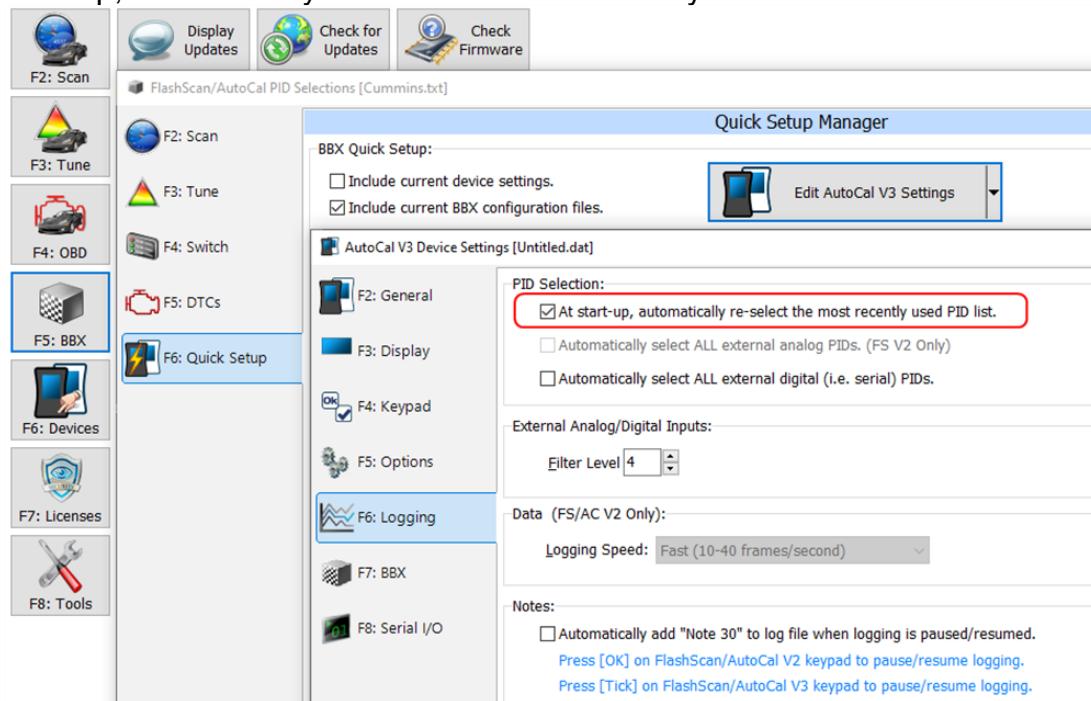
To configure the display of trouble codes and descriptions onto FlashScan;

1. Select the [F5: DTC's] option in the left-hand pane.
2. Select appropriate DTC options.

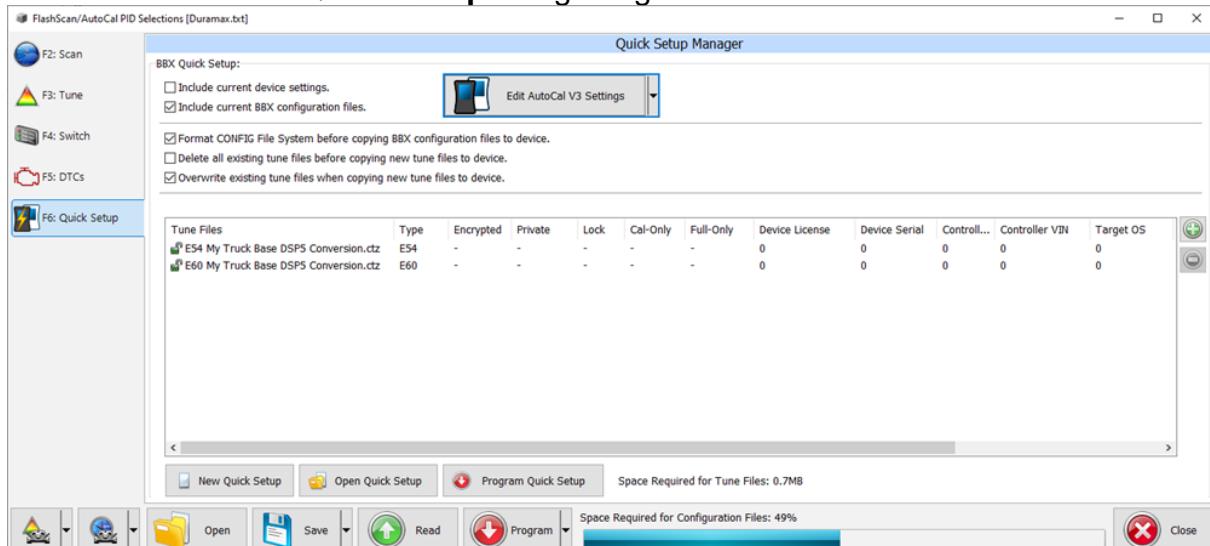
Quick Setup

To configure BBX settings, device settings, and configure tune files for BBX;

1. Select the [F6: Quick Setup] option in the left-hand pane.
2. Select appropriate BBX configuration options.
3. Edit device settings as necessary. To prevent manually selecting your controller PID group each time FlashScan/AutoCal is powered, the most recent PID group selection can be automatically selected by:
 - a. Selecting the correct hardware on the [F6: Quick Setup] -> [Edit AutoCal V3 Settings] button.
 - b. In the Device Settings window, navigate to [F6: Logging] and tick the “At start-up, automatically re-select the most recently used PID list.”



4. Add tune files to the **Quick Setup** using the green '+' icon.



5. Write this configuration to FlashScan or AutoCal using the [Program Quick Setup] function. The [Program Quick Setup] programs all selected Scan, Tune, Switch, and DTC options, as well as selected device settings, BBX Quick Setup selections and tune files. Once the device is programmed, FlashScan or AutoCal is configured for BBX functions.

Each option can be programmed individually using the [Program] button on each tab, or collectively using the [Program Quick Setup] option.



FlashScan Menu Navigation

FlashScan/AutoCal V3

FlashScan/AutoCal V3 supports two menu structures; the EFILive standard menu and the user defined menu. Where a used defined menu is not installed, the EFILive standard menu will be displayed.

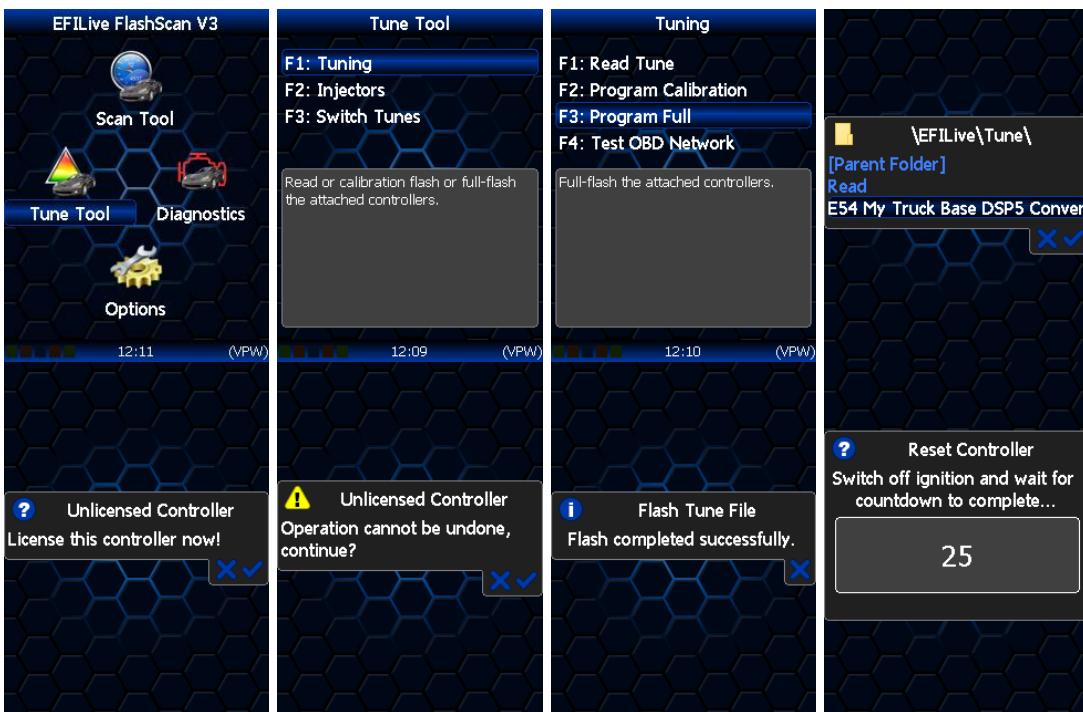
Data Logging

1. Configure FlashScan/AutoCal V3 for BBX features if not already setup.
2. Connect your FlashScan/AutoCal V3 device to your vehicle.
3. Turn the vehicle ignition to the *On* position.
4. Navigate to the Scan Tool -> F1 Select PIDs menu option.
5. Select correct controller type from BBX configured controllers.
6. Navigate to the F1 Scan Tool -> F2 Data Logging menu option.
7. Select F1: Record Data to commence the logging session.
8. The LCD will display recording status, elapsed time, frame count and the selected PIDs.
9. A range of options are available while the Log is recording:
 1. Select to pause/resume the log.
 2. Select the up and down arrows to navigate through selected PIDs.
 3. Select X, to stop data logging and save the logged data.
10. Start the vehicle and drive to record actual performance. Do not attempt to operate a FlashScan/AutoCal device while your vehicle is in motion.
11. Select X on FlashScan/AutoCal V3 to stop data logging and save the log file.

License and Flash a Controller

1. Configure FlashScan/AutoCal V3 for BBX features if not already setup.
2. Copy selected tune file(s) from your PC to FlashScan/AutoCal V3 if not already copied via Quick Setup during step 1.
3. Connect your FlashScan/AutoCal V3 device to your vehicle.
4. Turn the vehicle ignition to the *On* position, (not the Accessory position). Vehicle must not be cranked/running when flashing).
5. Navigate to the Tune Tool menu and select F1: Tuning -> F3 Program Full menu option.
6. Navigate to the folder your tune file is located in and select to commence the flash.
7. If the controller has not been licensed by this device previously, you will be presented with an “Unlicensed Controller” message. Select to proceed with licensing the controller, or X to exit without licensing the controller.
8. Select to confirm licensing the controller and commence the flash, or X to exit without licensing the controller.
9. When the flash process is complete, select X to close the flash completed message.
10. The Reset Controller notification will be shown, and the controller reset process will begin.

1. Turn the vehicle ignition Off.
2. Click on the Start button to begin the countdown timer.
3. DO NOT turn the vehicle ignition on until the countdown timer expires. This time is critical to allow the ECM to perform internal functions after a read operation.



Switch Tunes using FlashScan/AutoCal V3

1. Connect your FlashScan/AutoCal V3 device to your vehicle.
2. Turn the vehicle ignition to the *On* position.
3. Navigate to the **Tune Tool** menu and select **F3 Switch Tunes -> F1 Switch DSP5** menu option.
4. Use the arrows to navigate between tunes.
5. Press **✓** to make a tune selection.
6. You do not need to reselect the tune once the engine is shut down; the ECM 'remembers' which tune you previously selected.

FlashScan V2

Data Logging

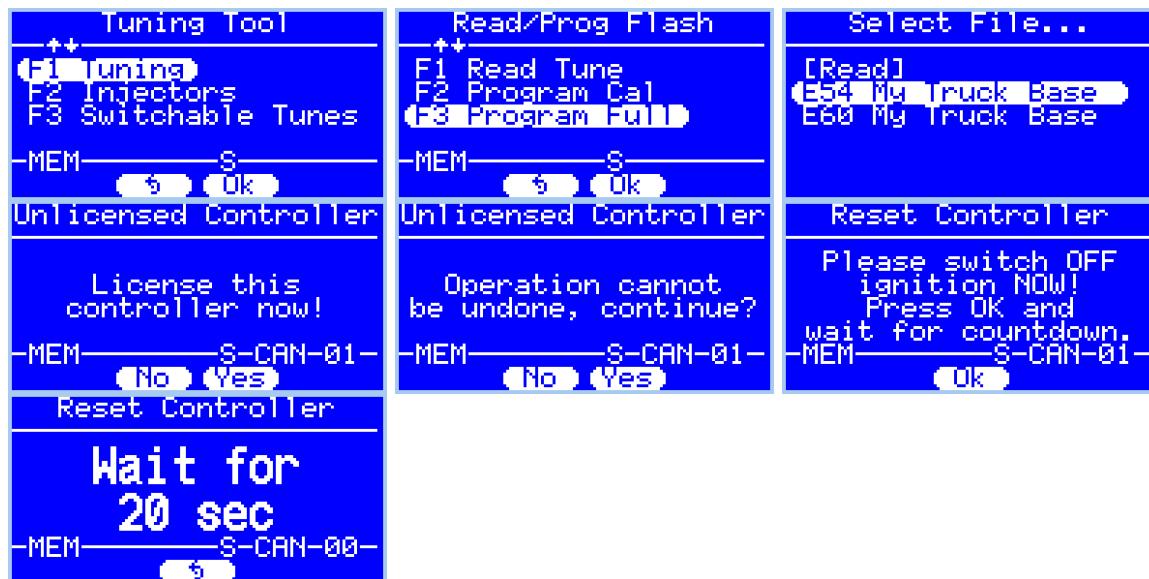
1. Configure FlashScan V2 for BBX features if not already setup.
2. Connect your FlashScan V2 device to your vehicle.
3. Turn the vehicle ignition to the *On* position.
4. Navigate to the F1 Scan Tool - F1 Select PIDs menu option.
5. Select correct controller type from BBX configured controllers.
6. Navigate to the F1 Scan Tool - F2 Data Logging menu option.
7. Select F1: Record Data to commence the logging session.
8. The LCD will display the elapsed time, frame count and the selected PIDs.
9. A range of options are available while the Log is recording:
 1. Select OK to pause/resume the log.
 2. Select F1..F4 or Ctrl+F1..Ctrl+F4 to add "user notes" 1 thru 8 to the log.
 3. Select Enter to toggle between Metric and US Customary units.
 4. Select the up and down arrows to navigate through selected PIDs.

5. Select Cancel, to stop data logging and save the logged data.
10. Start the vehicle and drive to record actual performance. Do not attempt to operate a FlashScan/AutoCal device while your vehicle is in motion.
11. Select Cancel on FlashScan V2 to stop data logging and save the log file.

NOTE: When data logging is activated you cannot return to the menu until logging is stopped.

License and Flash a Controller

1. Configure FlashScan V2 for BBX features if not already setup.
2. Copy selected tune file(s) from your PC to FlashScan V2 if not already copied via Quick Setup in step 1.
3. Connect your FlashScan V2 device to your vehicle.
4. Turn the vehicle ignition to the *On* position, (not the Accessory position). Vehicle must not be cranked/running when flashing).
5. Navigate to the F2 Tune Tool -> F1 Tuning and select F3 Program Full menu option.
6. Using the arrow keys, navigate to the correct tune file and select OK.
7. If the controller has not been licensed by this device previously, you will be presented with the License this controller now? message. Select Yes to license the controller or No to exit without licensing the controller.
8. Select Yes to confirm licensing the controller and commence the flash, or No to exit without licensing the controller.
9. When the flash process is complete the Reset Controller notification will be shown. When prompted perform the following actions:
 - a. Turn the vehicle ignition Off.
 - b. Click on the Start button to begin the countdown timer.
 - c. DO NOT turn the vehicle ignition on until the countdown timer expires. This time is critical to allow the ECM to perform internal functions after a read operation.



Switch Tunes using FlashScan V2

1. Connect your FlashScan V2 device to your vehicle.
2. Turn the vehicle ignition to the *On* position.
3. Navigate to the F2 Tune Tool -> F3 Switchable Tunes menu option
4. Select PIDs
5. Use the arrows to navigate between tunes.

6. Press OK to make a tune selection.
7. You do not need to reselect the tune once the engine is shut down; the ECM 'remembers' which tune you previously selected.





Support

Trouble Shooting

Should users encounter problems with the EFILive software, FlashScan or AutoCal hardware they should:

1. Confirm software, firmware and boot block versions are up to date.
2. Check that checksums are valid.
3. Check the base file matches the calibration for your vehicle.
4. Check to see if the NVRAM in the ECM is functional.
5. DSP⁵ tune files cannot be read from the ECM.
6. Confirm DSP⁵ file was upgraded to new operating system number, as sequenced above.
7. Check the operational settings in the DSP Output #1 section of the *.ctz file to ensure the output behaves correctly. {A0115}-{A0124}.
8. Check Voltage settings by monitoring the voltage PID and tune number using the EFILive Scan Tool.
9. Check wiring installation; specifically check that the pins are properly fitted to the ECM.
10. Remove/isolate all after-market devices including mobile phone adapters, after-market equipment (audio systems, security, remote start etc.) and any devices wired into the OBD port that may interfere with vehicle communications.
11. DO NOT operate any vehicle feature that may communicate on the data bus.
This includes opening or closing of hood, doors, windows, as well as changing settings on radio, HVAC, connecting/removing charging devices etc.

Error Codes

If an error occurs while using AutoCal, users can look up the error code description in the EFILive V8 Scan and Tune software.

The [F8: Tools] -> [F8: Error Codes] menu item provides an error code lookup function, and the “EFILive Error Codes.pdf” document accessed by selecting the Windows Start Icon and navigating to Program Files->EFILive->V8->Documents->EFILive Error Codes.pdf is also available. Both options provide error code descriptions, causes and actions.

Should the issue not be resolved after reviewing the Error code list, end users should contact their Tuner for support.

Checksums

Checksums perform a vital role in ensuring the integrity of the data in the tune file. There are two main reasons that checksums display as invalid:

1. The data in the file is corrupt and MUST NOT be flashed into a controller.
2. The data in the file has been modified with a software package that did not update the checksums – such as a hex editor.

Do not correct the checksums unless you know the tune file was modified outside of the EFILive software and that the modifications are correct and accurate.

If you correct the checksums of a file with corrupt data you are merely masking corruption. If you flash a corrupt file into a controller, you risk damaging the controller and/or causing the vehicle to operate incorrectly.

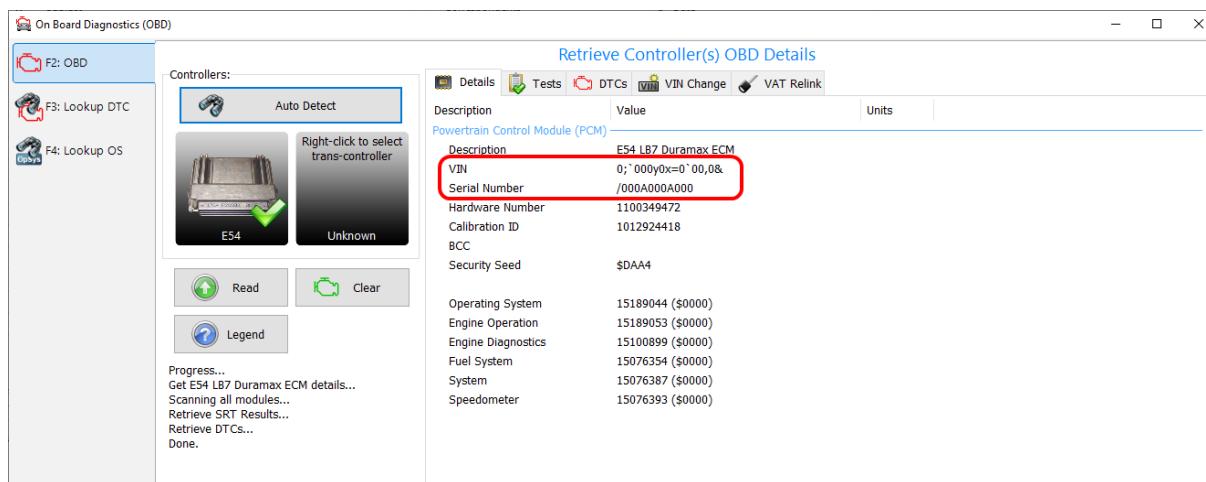
NVRAM Status

If the NVRAM area of the ECM is corrupted the vehicle may still run, however it may not be possible to read or flash the controller. Typically, if the VIN, Serial number, Hardware number and/or calibration ID do not contain valid data, the controller will need to be repaired to restore full functionality.

An error code received during reading and/or flashing may indicate a NVRAM issue.

To identify if the NVRAM is functional or corrupt:

1. Open the EFILive V8 Scan and Tune software.
2. Connect your FlashScan/AutoCal device to your PC and vehicle.
3. Turn the vehicle ignition to the *On* position.
4. Navigate to the [F4: OBD] -> [F2: OBD] menu option and select the [Details] tab.
5. Select your controller(s) by using the [Auto Detect] button, or;
 - a. Hover over the Engine Controller box, and right click on the "Right-click to select engine-controller" box and manually select the ECM.
 - b. Navigate and select the correct controller.
6. Click the [Read] button to populate controller data.
7. Where the VIN, Serial number, Hardware number and/or calibration ID either contain all zeros or non-numeric characters, the controller will need to be repaired to restore full functionality.



Controller repair requires the flash memory chip to be replaced in the ECM. A number of companies can perform this service including SoCal Diesel and Wait4Me Performance.

LB7 and LLY Flashing Tips and Tricks

LB7 and LLY controllers use a communications platform that is not very robust and was replaced in 2006. In many cases, these controllers fail with factory tools and will be unrecoverable.

Tips for successful reading/flashing of LB7 and LLY controllers include:

1. Use a bench harness for reading/flashing (Recommended).
2. Remove/isolate all after-market devices including mobile phone adapters, after-market equipment (audio systems, security, remote start etc) and any devices wired into the OBD port.
3. DO NOT operate any vehicle feature that may communicate on the data bus. This includes opening or closing of hood, doors, windows, as well as changing settings on radio, HVAC, connecting/removing charging devices etc.
4. Check Available Licenses. The first time FlashScan/AutoCal flashes a controller, licensing requirements are validated and must be met to facilitate a successful flash. Refer to the License Status knowledgebase article for further information.
5. Check the EFILive Error Code list. The code displayed on FlashScan/AutoCal and in the EFILive software is an important diagnostic tool. Look up the error code number and obtain a detailed description of the cause and suggested solutions to your issue.

If you still have problems flashing:

1. Isolate fuses. Common communication problems are reported with the ABS, BCM, Radio, Info and Lift Pump fuses.
2. If flashing in high speed; revert to low speed flashing.
3. Use pass-thru reading/flashing rather than standalone reading/flashing.

LB7 & LLY Controller Recovery

To attempt to recover a failed flash for LB7 or LLY;

Full Flash

1. DO NOT REMOVE POWER FROM THE CONTROLLER. As long as the controller remains powered up, EFILive's proprietary boot loader running in the controller will continue to wait for a successful full flash procedure. Retry the full flash procedure until it is successful.
2. POWER REMOVED FROM CONTROLLER. If power has been removed from the controller, it may be recoverable if the flash was at least 15%-20% complete and the communications portion of the operating system was reprogrammed to allow the controller to continue to operate in dead poll mode. Retry the full flash procedure.

If flashing fails with a "no communications" error then the controller has probably been rendered inoperable and unrecoverable. The only way to recover the controller is to disassemble it and physically remove, reprogram and replace the flash chip on the main circuit board.

Calibration-Flash

A calibration-flash failure is not critical and will generally not result in an unrecoverable controller. To recover from a failed calibration-flash, turn the ignition off, wait 30 seconds, turn the ignition back on, wait a further 10 seconds, then retry the calibration-flash.

If the calibration-flash continues to fail:

1. Remove battery power from the controller, by either removing the controller's fuse or by disconnecting the battery from the vehicle.
2. Wait 30 seconds.
3. Reconnect power.
4. Retry the calibration-flash.

Test for Rogue Modules

For Customers with FlashScan/AutoCal V3 a range of test modes to check the network for rogue modules that may cause read or flash operations to abort are available.

Navigate to the Tune Tool -> F1: Tuning -> F4: Test OBD Network menu. The following VPW test options are available:

1. Test VPW 1x Speed
2. Test VPW 4x Speed

Trace Files

V8 Scan and Tune *.htx files

When V8 Scan and Tune software reads or flashes a controller the details of the read/flash process may be saved in trace files for diagnostic purposes.

In addition, users can manually save trace files where options do not perform the desired outcome.

To manually generate a trace file, generate the error in V8 software, then open the EFILive Control Panel and navigate to [F8: Trace] and select [Save Trace]. Users can set the trace file and save location during this process.

Automatically generated trace files are created on your PC or laptop in the folder: \Documents\EFILive\V8\Trace and are named using the following naming convention:

YYYYMMDD_HHNNSS_T_CCC.htx, where:

- YYYYMMDD: is the year, month and day that the trace was recorded.
- HHNNSS: is the hour, minute and second that the trace was recorded.
- T: is the mode and is one of **R**=Read **F**=Full-Flash **W**=Cal-Flash.
- CCC: Is the controller type
- htx: is the file extension.

FlashScan/AutoCal V3 *.xalm files

Trace files are automatically saved where an error message is presented using the device in BBX mode. Users can manually save trace files where options do not perform the desired outcome, including for pass-thru functions.

To manually generate a trace file on FlashScan/AutoCal V3 navigate to Scan Tool -> F3: Scan Options -> F1: Save Trace.

FlashScan/AutoCal V3 maintains an internal buffer of the most recent messages sent to and received from the vehicle. That buffer is stored in RAM memory and is wiped clean each time the device is powered off or rebooted. Therefore you MUST save the trace file before powering off or rebooting the device.

Trace files are located in the EFILive -> Trace folder on FlashScan/AutoCal V3.

Trace files are named using the following naming convention:

yyyymmdd_hhnnss_<desc>.xalm, where:

- yyyymmdd: is the year, month and day that the trace was recorded.
- hhnnss: is the hour, minute and second that the trace was recorded.
- <desc>: is the description where;
 - “User” means user generated trace files

- “xxx._x_\$xxxx” identifies the 3 character controller ID, the communication process upload/download, and the 4 digit error code.
- .xalm: is the file extension.

FlashScan V2 Trace Files

Trace files are automatically saved where an error message is presented using the device in BBX mode. Users can manually save trace files where options do not perform the desired outcome.

To manually generate a trace file on FlashScan V2 navigate to F1 Scan Tool -> F3 Scan Options -> F1 Save Trace File.

FlashScan V2 maintains an internal buffer of the most recent messages sent to and received from the vehicle. That buffer is stored in RAM memory and is wiped clean each time the device is powered off or rebooted. Therefore you MUST save the trace file before powering off or rebooting the device.

Trace files are located in the Scan folder on FlashScan V2. It will be named USR_xxxx.efx, where xxxx is the unique file counter number.

Knowledgebase

The [EFILive Knowledgebase](#) provides a detailed resource on how to configure and use your EFILive software and hardware.

EFILive Authorized Dealer

If after reviewing this guide further assistance is required please contact the EFILive Authorised Dealer from whom you purchased your product. They are your first point of contact for EFILive support related inquiries.

How to Tune?

EFILive is tuning software and hardware - it is not a tune. Together the software and hardware give users the tools to write tunes. EFILive does not provide tune files, tuning advice or support, but do provide software support and hardware support.

If your question is in relation to the actual tuning of your vehicle (e.g. how to gain performance, economy etc.) then please ask these questions on the EFILive Forum (<http://forum.efilive.com/>).

EFILive Service Desk

Should you require additional assistance after using this support guide, please start a ticket on the [EFILive Service Desk](#). Please include the following information:

1. Dealer Name.
2. Device type.
3. Serial Number and Auth Code.
4. Your computer operating system.
5. Software and firmware versions.
6. Trace files.
7. Detailed information about your issue.