11P V1.04 Overview
PCMHacking.net

This document covers the extra features of the custom 11P bin designed to run on the Holden '424 PCM. It retains all standard features other than those listed under the removed items.

11P is based on the Holden bin BLCC. This is a variant B $11 bin, the variant C changes have been added.

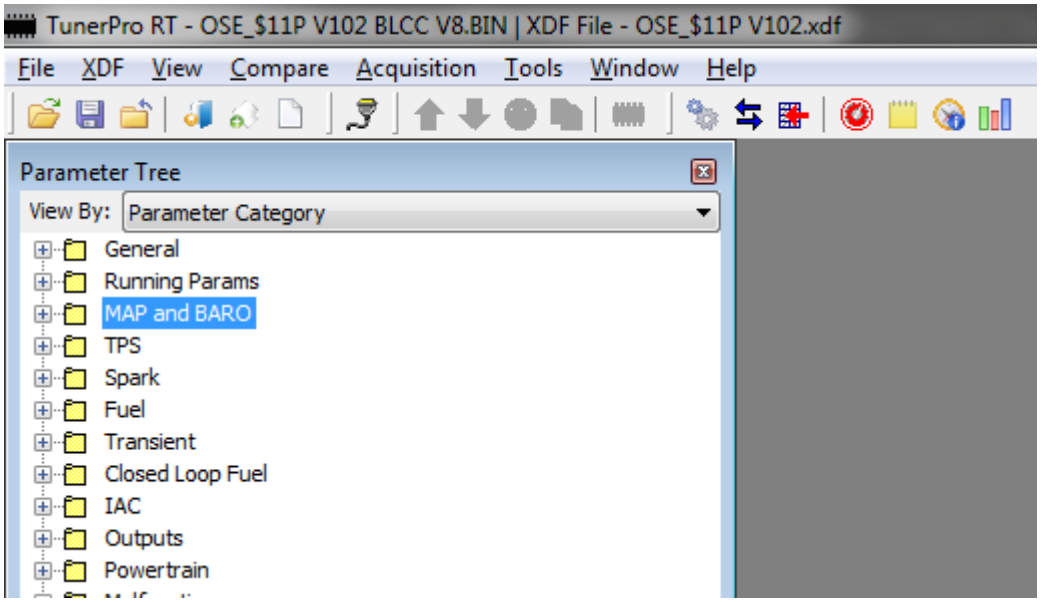
This document does not cover tuning. Please use the 11P/12P tuning guides found on PCMHacking.net

Contents

Software Tools Required

TunerPro: V5 or later
Flashtool: V1.50 or later
OSE Plugin: V1.50 or later

To enable easier editing in TunerPro all items have been assigned categories. It is recommended to change the 'View By' option to Parameter Category as shown below.



Many items also have comments. Hovering the mouse over the item in the parameter tree will popup any comments associated with the item.

Hardware

The 11P bin can be used on any '424 PCM, there is no requirement for an NVRAM to be installed permanently. However all flashtool operations that write to the PCM require an NVRAM to be installed, this includes setting up the ALDL message scheduler and custom ALDL message. Once these have been setup, reading the bin and writing to a memcal or EEPROM board retain the configured settings.

Functions Removed From Factory $11

Removed all the factory development code to free up ROM and RAM space

Factory $11 Bug Fixes

Fixed the bug in ALDL mode 2 that causes the wrong byte to be sent when requesting address 0xFFFF
Fixed the MAP reading incorrectly during fuel cut rev limit
Added the variant 11C fixes, the original disassembly used BLCC 11B variant.

Memory Mapping Changes

A standard $11 bin had checksum code prior to the calibration area memory allocation. This caused the checksum to be incorrectly calculated when using TunerPro. The memory allocation has been changed to allow this to be calculated easily by moving all running code to after the calibration area. The checksum calculation has been adjusted so it skips the calibration area for Real-Time tuning, the checksum does not require adjustment by the end user.

ALDL Changes

New ALDL Modes and Stream Changes

New Modes:

- Mode 11 – 8 Byte Write
- Mode 12 – 128 Byte Write
- Mode 13 – 128 Byte Read
- Mode 14 – Reset PCM
- Mode 16 – Bin Write

Modified Modes:

- Mode 1 Message B can be custom configured using the flashtool
- Mode 1 Message 0 Changes (no change to factory message size)
  - Added Current VE
  - Added Wideband AFR
  - Added Knock Counts
  - Added Injector Duty Cycle
  - Added Baro Compensated MAP
  - Added Charge Temp
  - Added Boost Multiplier
  - Added Boost Load Variable
  - Added Flexible Output Duty Cycle
  - Added Flag NVRAM Read/Write
  - Added Flag for [econ]/[pwr] map switching status
  - Added Flag for spark cut status
  - Changed Fuel PW Term (for duty cycle calc)
  - Removed Prom ID
  - Removed Cranking Time
  - Removed Reference Voltage
  - Removed Filtered MAP
- Mode 1 Message 4 Changes (no change to factory message size)
  - Changed vehicle speed term to trans code item

Adjustable Baud Rate

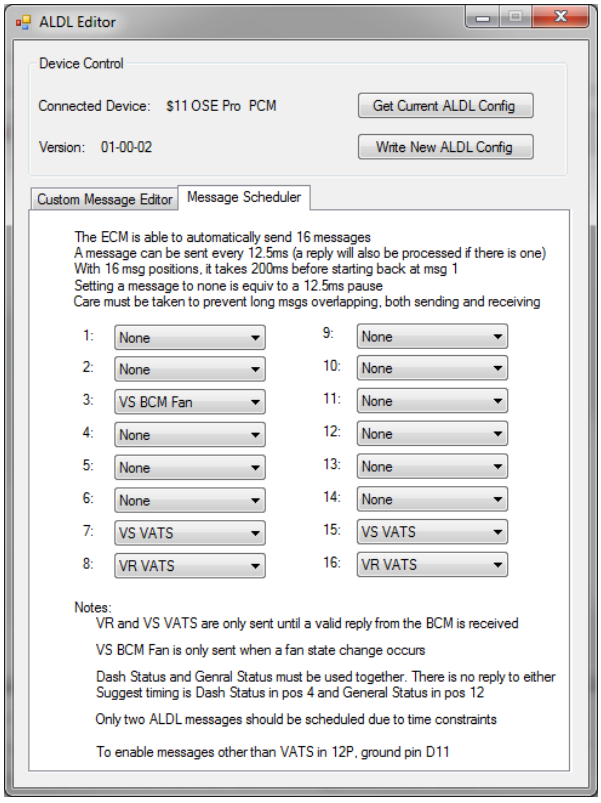
11P ALDL by default operates at 8192 baud. This can be adjusted to other rates using the parameter “ALDL Baud Rate Selection”

NOTE: There is no RT support in TunerPro at any baud rate other than 8192. Logging at 16384 appears to work however other rates are very unreliable and do not appear to work correctly. The flashtool supports only 8192 and 16384 baud for 11P. Changing to a non-supported baud rate on an NVRAM may require a programmer to recover comms to the PCM.

VS Low Speed Fan Control

In VS V6 application the dual speed fan is controlled by both the PCM and BCM. The low speed fan is switched via the BCM, it receives an ALDL message from the PCM commanding the fan on or off. The dual speed fan option flag “[xxxx] set=2 speed fan option” is used to enable the two speeds. The flashtool is then used to configure the ALDL scheduler so a message will be sent to the BCM.

After connecting to the PCM, select OSE 11P/12P ALDL Editor from the Binary Functions menu. Click Get Current ALDL config and once complete open the message scheduler tab. This screen can be used to schedule various messages for the PCM to send, for VS low speed fan control select “VS BCM Fan” in one position. If the PCM requires the low speed fan state to change (ie turn on when off, or off when on) a message is sent to the BCM commanding this.



Note: While logging the PCM the low speed fan message will not be sent to the BCM as all chatter will be silenced.

VT/VX/VY Instrument Cluster Support

A limited form of support for the VT/VX/VY instrument cluster data stream has been added to enable most major dash functions. The cluster requires two data frames to operate, a Dash Status (ID 41) and General Status (ID 11) frame. In VT and later vehicles the BCM is the bus master, it schedules messages that devices listen to and then respond if required. Pre VT models the PCM is the bus master, so for cluster support the 11P PCM will send the two status messages using a message scheduler.

Only the following items have been implemented for the Dash Status Message:

- Fuel Used
- Road Speed
- Engine Temp
- Manifold Temp
- Engine RPM
- Status Flag 1 (CEL, Trans Pattern and shifter position)
- Status Flag 2 (Malf Logged, Current Gear Position, VATS Ok)
- Status Flag 3 (Low Speed Fan Status, A/C Clutch Status)
- Fuel Flow

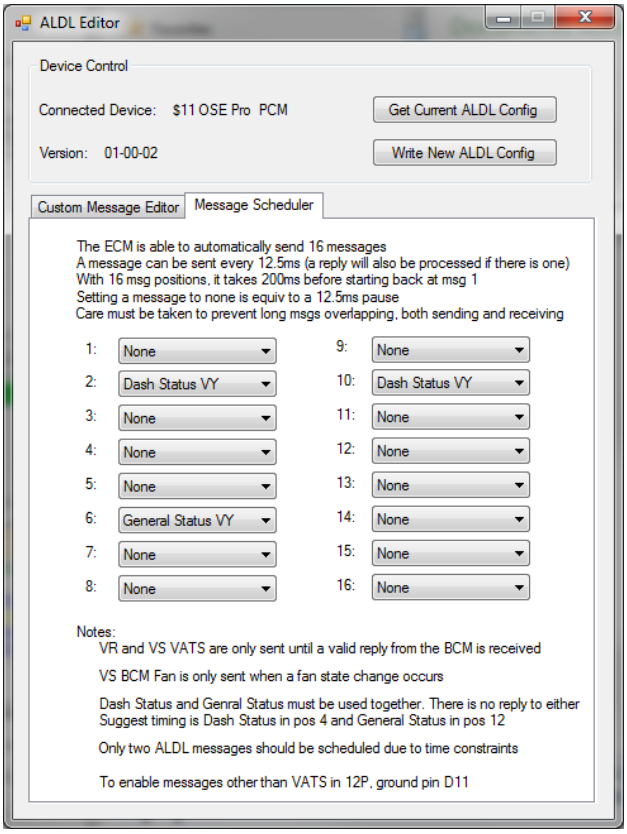
The General Status message is sent with only dummy data to stop the cluster from reporting a fault and to enable the gear shifter position display. It serves no other purpose for cluster operation in 11P.

After connecting to the PCM, select OSE 11P/12P ALDL Editor from the Binary Functions menu. Click Get Current ALDL config and once complete open the message scheduler tab. This screen can be used to schedule various messages for the PCM to send . The VT and VX data frames are the same format so VT would be selected for a VX cluster, a VY uses a slightly different frame and as such the VY frames should be selected.

The recommended setup is as follows..

- Position 2: Dash Status VT/VY
- Position 6: General Status VT/VY
- Position 10: Dash Status VT/VY

This setup will send a dash status update once every 100ms and a general status update once every 200ms.



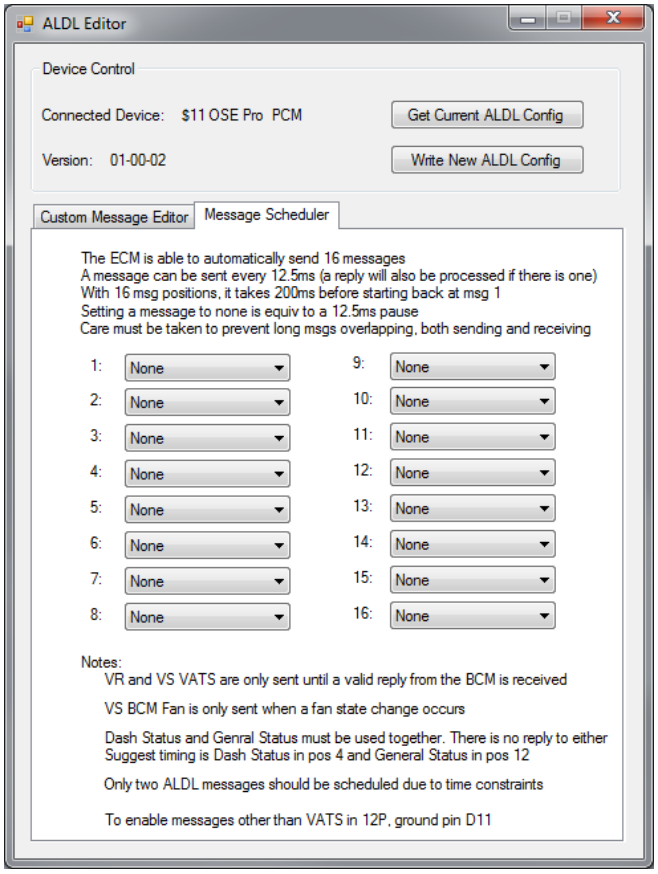
Note: While logging the PCM the messages will not be sent to the cluster as all chatter will be silenced.

VT/VX/VY BCM Support

In VT and later vehicles the bus master (ie the device initiating communications) is the BCM. The function has been added to 11P to allow the PCM to become a slave device and respond to status requests from a VT-VY BCM. The main change is to now listen to every message appearing in the data bus, but only process messages that are for the PCM, and to allow a message to be received on one ID but respond using another (ie The BCM sends a ID 40 message asking the PCM to send the instrument cluster data, which is a message ID 41).

By default VT/VX mode is used, select "[xxxx] ALDL - BCM Vehicle Type For Slave Mode. Clr=VT/VX Set=VY" to allow operation as a VY PCM. It is also important to turn off all messages in the flashtool scheduler setup. Due to the BCM being the bus master the PCM must no longer schedule messages, it must only reply to the BCM messages.

After connecting to the PCM, select OSE 11P/12P ALDL Editor from the Binary Functions menu. Click Get Current ALDL config and once complete open the message scheduler tab. Set all positions to None.

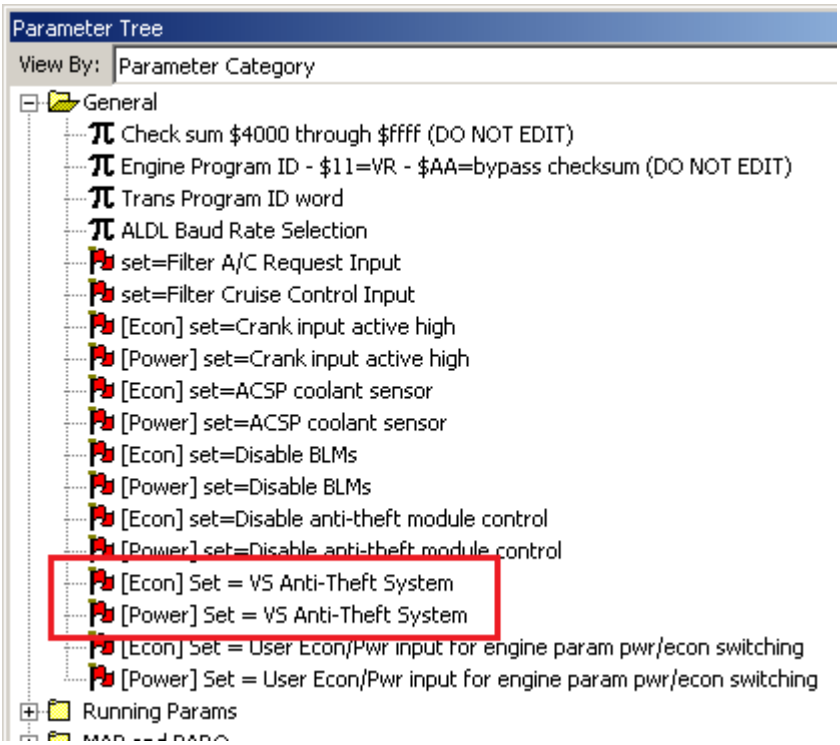


NOTE: 11P does not support VT-VY VATS, VATS must therefore be disabled in the calibration. While logging the PCM the messages will not be sent to the cluster as all chatter will be silenced.

Anti-Theft System

Due to the original bin being based on BLCC VR $11, the anti-theft system only operated in VR vehicles. The VS anti-theft system has been added with a flag to select between vehicle models.

To operate as a VS PCM set the flag "[xxxx] Set = VS Anti-Theft System". With the flag clear the PCM operates using VR VATS.



General Code Changes

NVRAM Check

A check has been added to determine the status of the NVRAM (if installed). A flag has been added to the Mode 1 Message 0 stream to indicate if the NVRAM can be written to.

Flexible Output

There is one PWM output available to be used as a flexible output. This is also the fuel usage output that is sent to the trip computer. The flag option "[xxxx] Flex - Use The Fuel Usage Output As Flexible Output " has been added to allow choosing the function of the output, it can be either fuel usage or a flex output, not both. However it is possible to have the power and econ map switching options set differently.

To setup the flexible output the flashtool is used to edit the calibration/bin file and XDF.

The Advanced Tuning Guide by Holden202T has a step by step procedure on setting up the flexible output. It is the same method and operation as 12P. A second XDF for 11P is provided to used for flex table editing.

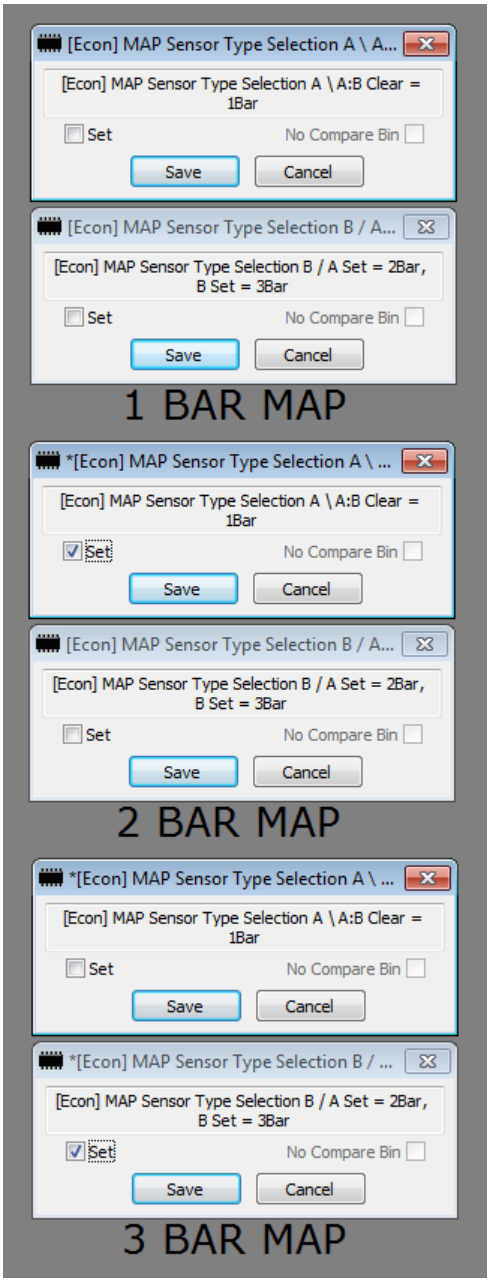
Engine Code Changes

A number of new features have been added, anything not listed as being changed has been left operating as per the factory $11 bin.

2/3 Bar Support

Support for 2 and 3 bar sensors has been added along with the ability to control fuel and spark above 100kPa. 1 Bar operation remains as per factory.

There is only one bin to cover all MAP sensor types with selection using two flags. The MAP sensor selection flags are set as follows for 1, 2 or 3 bar MAP sensors…



Tables Added

The following tables have been added for 100-200/300kPa boost regions when used with a 2 or 3 bar sensor:

VE (extended to 8000RPM)
Spark Advance (extended to 8000RPM)
Target AFR (extended to 8000RPM)
Cold engine AFR
Charge Temp Advance
Coolant Temp Advance
Percent coolant contribution for calculating charge temp

Boost Multiplier

A boost multiplier term has been added to the fuel calculation. The table "Boost - Boost Multiplier Vs MAP (100-200kPa or 100-300kPa)" controls the multiplier value, it should not be adjusted unless you have a thorough understanding of the function. The default values provide a linear fuel increase with boost pressure, for every 100kPa of boost the fuel delivery doubles.

Barometric Pressure Compensation

A number of changes have been made to the barometric pressure compensation logic to allow 2/3 bar operation. The PCM uses the MAP sensor to measure the barometric pressure, this is done while the engine is off and under certain conditions during engine run (high load, low RPM). When using a 2/3 bar sensor and boost the barometric pressure will be calculated incorrectly using the factory update logic due to sensing boost pressure as high barometric pressure.

An option has been added to only update the baro while the engine is off. Clear the flag "[xxxx] set=Update Baro During Run" if using a 2/3 bar MAP sensor. This will update the baro at key on and retain the value until the engine is stopped. It will however mean that any change in altitude is not compensated for while the engine is running.

The altitude adjusted load variable has been modified to allow both vacuum and boost table lookups.

For boost table lookups a boost load variable has been added. This uses the altitude adjusted load variable to allow barometric compensated fueling.

Larger Table Lookups

New table lookup code has been added to extend the tuning range. Some tables have been made larger or merged from two tables to one for the extended range.

VE Table – Mapping to 8000RPM instead of 6400RPM from two tables
Spark Advance – Mapping to 8000RPM instead of 4800RPM
Target AFR – Mapping to 8000RPM instead of 6400RPM

Due to the larger spark lookup the extension slope scalar has been removed.

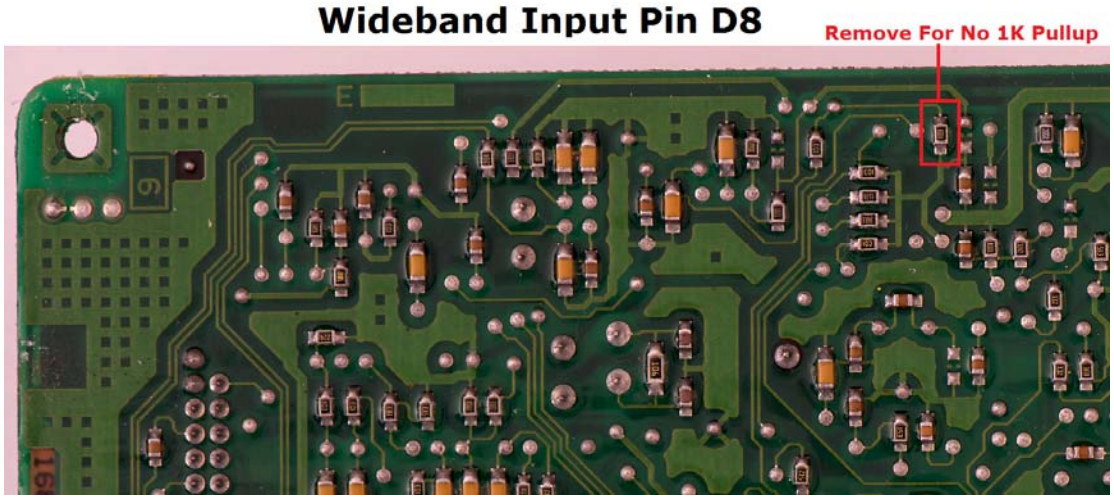
Wideband AFR

A spare analog input on pin D8 has been used to allow wideband logging. The two scalars “WideBand - WideBand 0V AFR” and “WideBand - WideBand 5V AFR” are used to allow the 0-5V analog signal from a wideband controller to be converted to the AFR equivalent for display and recording. These must match the wideband controller analog output. Only 0-5V linear outputs are supported.

Default values for various brands...
Innovate: 0-5V = 7.35-22.9 AFR
14point7: 0-5V = 10-20 AFR
Autronic: 0-5V = 10-30 AFR
AEM: 0-5V = 10-20 AFR

Some wideband controllers allow the 0-5V output to be modified. If this is done you must also set the 11P wideband scalars to match.

Note: The wideband input has a 1K ohm pull-up resistor to 5V. Some wideband controller analog outputs cannot sink current to drive this load which results in an AFR offset or error.



Note: Some wideband controllers generate a significant amount of electrical noise due to using switching voltage regulators. This can feed back down their power source and cause electrical interference with other devices in the vehicle. Using undersized cable or connecting to a low current source in the loom makes the problem worse. Ensure adequate sized cable is used for both the +12V and ground connections. The power source should preferably be an ignition switched relay with its source direct from the battery using a fuse. A ferrite bead around the +12V cable can help reduce interference further.

Connecting a wideband controller directly to the PCMs power source can introduce enough noise that ALDL communication errors result. If you are using a wideband and having trouble with comms, try disconnecting the wideband power and re-test. If the communication errors disappear or are reduced you will need to connect the wideband power source to an alternate location in the loom.

Charge Temp Advance

A charge temp advance/retard table has been added. Charge temp is the estimated air temperature entering the cylinder. A high temperature requires lower spark advance to prevent detonation while a cooler charge can potentially allow for higher spark advance. This table has been added to allow spark advance changes based on charge temp and engine load, for both vacuum and boost areas. The default table settings are 0 and as such make no spark adjustments.

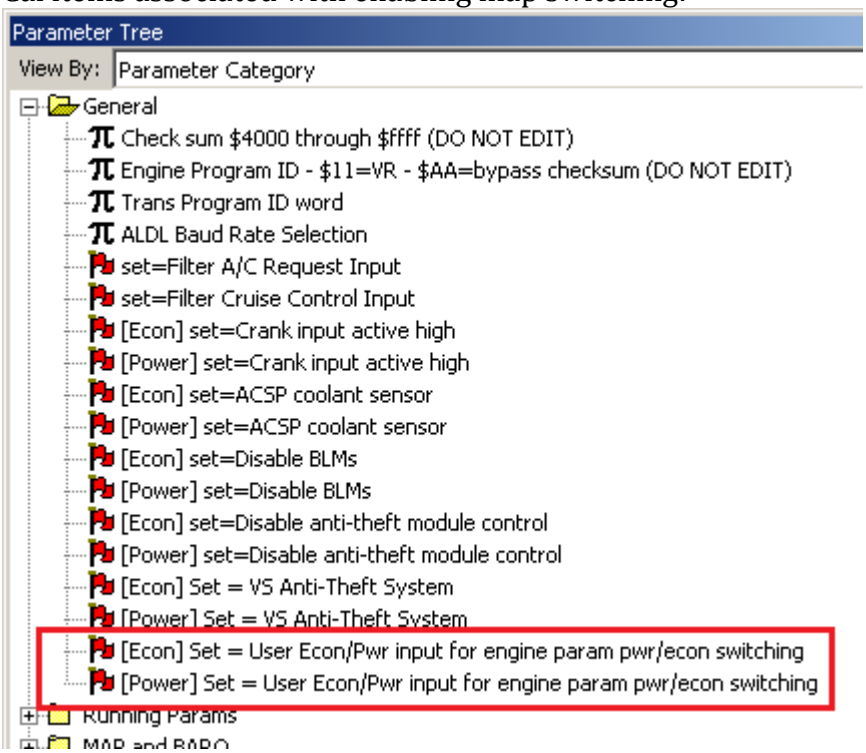
Closed Throttle Volumetric Efficiency (VE)

On engines with low and varying vacuum at idle it can be problematic using the MAP sensor signal for fueling. A closed throttle VE vs RPM table has been added. To enable the use of this table set "[xxxx] set = Closed Throttle VE Option". The VE value from the table "Volumetric Efficiency (VE) – Closed Throttle VE vs RPM" is used instead of the value in the main VE table whenever the throttle is closed.

Engine Map Switching

An engine map switching option has been added, controlled by the pwr/econ trans pattern switch. Any engine parameter with [Econ] or [Power] in the title is capable of being switched.

Cal items associated with enabling map switching:

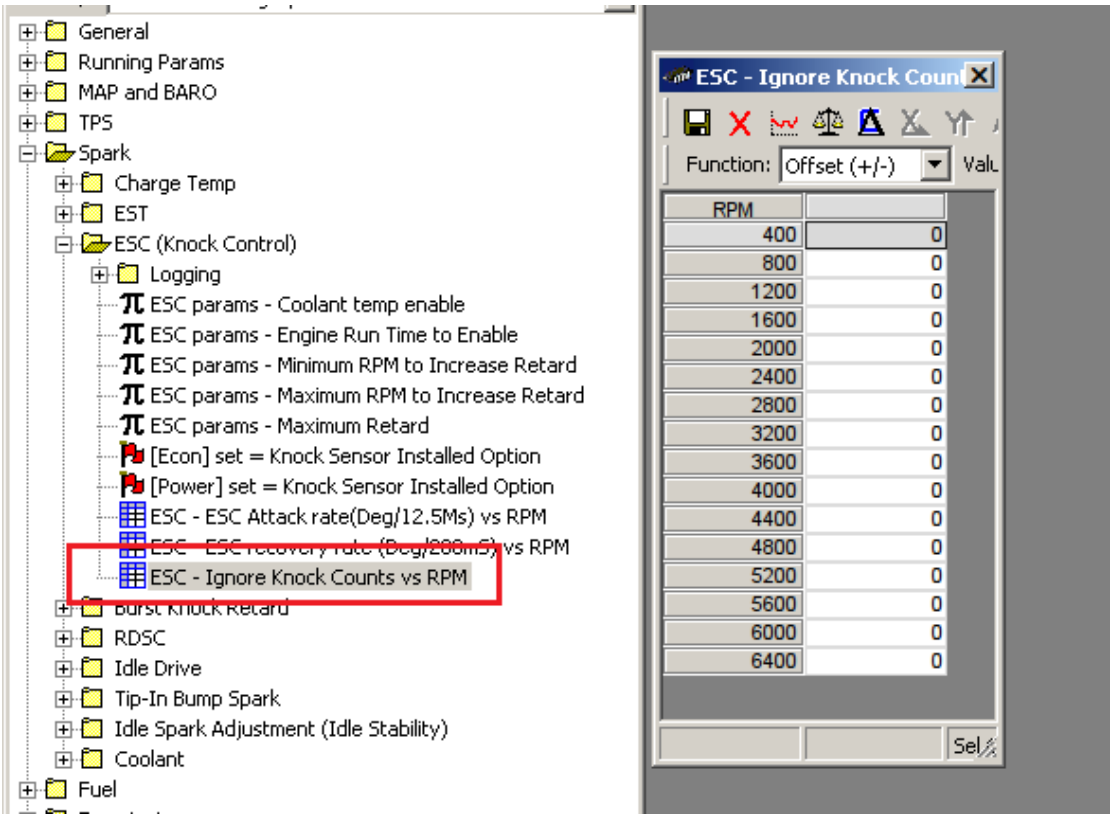


To enable this function set **BOTH** "[Econ] Set = User Econ/Pwr input for engine param pwr/econ switching" and "[Power] Set = User Econ/Pwr input for engine param pwr/econ switching".

Knock Control

Knock control has been improved by adding an ignore count table. This table can be setup to ignore a fixed number of counts before using knock retard. This can help filter out background engine noise from knock.

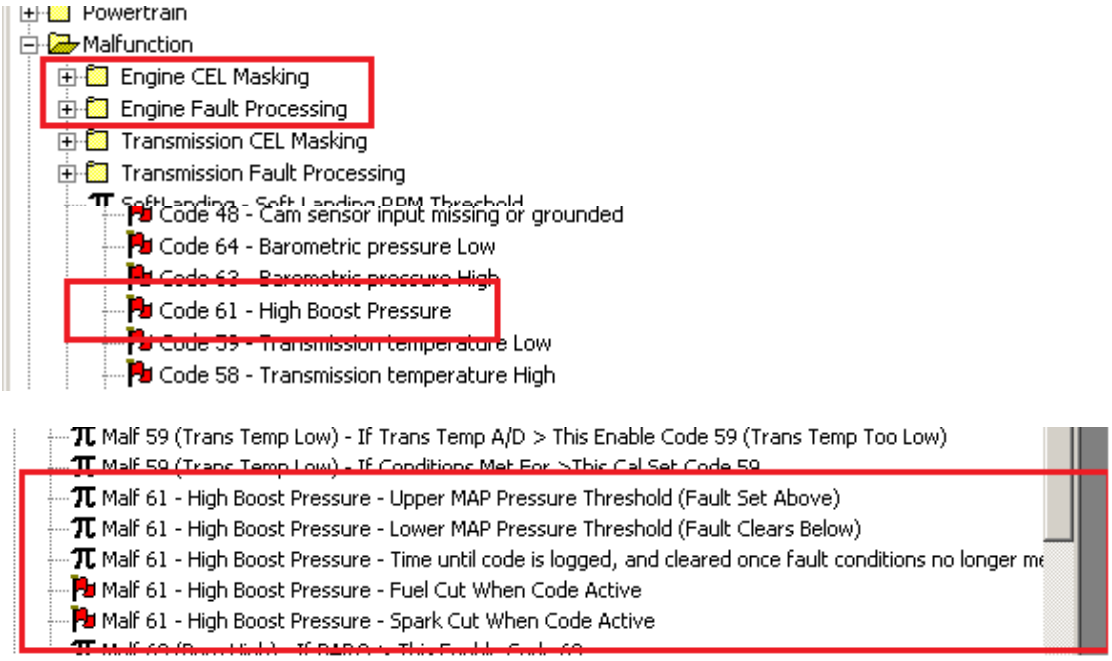
The mode 1 message 0 table for logging now includes a new knock count item. It shows the least significant byte (LSB) of the raw knock counter. This will increment when ever some knock (or false knock) is detected, even if the knock occurs between logging data. In standard $11 code it was possible to see no knock counts but have knock retard if the knock event was so short it started and stopped between logging frames.



Over Boost Protection – Code 61

Malfunction 61 has been added to report, and optionally act on, high boost pressure. It is enabled just like any other malfunction using the flag “Code 61 - High Boost Pressure” under Engine Fault Processing. To also enable a check engine light when the fault is active the flag “Code 61 - High Boost Pressure” under Engine CEL Masking can be set.

Cal items associated with code 61:



A fault will be set if MAP pressure exceeds the upper threshold for the time threshold. The fault will be cleared when the MAP pressure is below the lower threshold for the time specified. The fault will be stored in the malfunction history.

While the fault is active an optional fuel or spark cut can be employed by selecting the appropriate option flags.

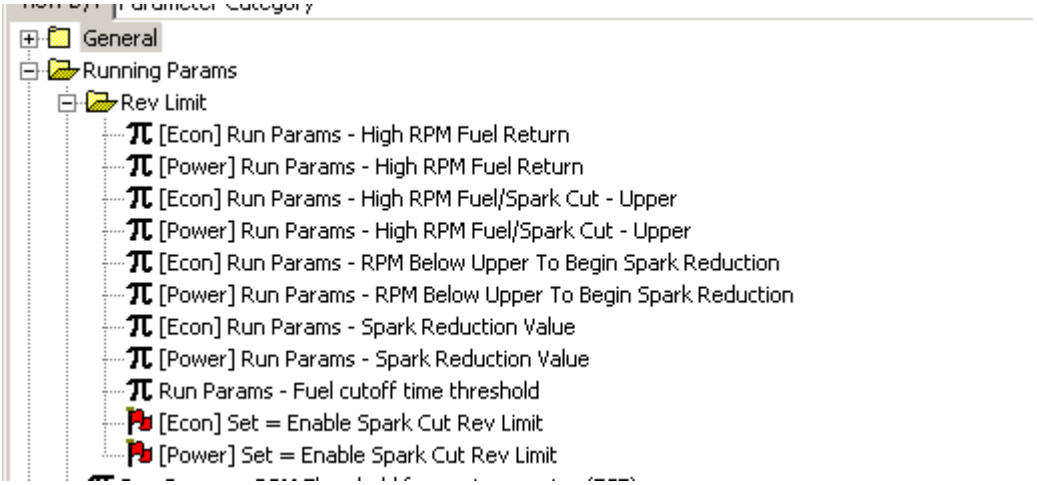
Rev-Limit

The factory fuel cut remains unchanged using the default settings. A spark retard function and spark cut has been added.

To use the spark cut option select the “Enable Spark Cut Rev Limit” flag . The fuel cut is then not used. If RPM exceeds the scalar “[xxxx] Run Params - High RPM Fuel/Spark Cut Upper” the spark is cut by reducing dwell to a level that does not allow the coil to build enough energy to fire. The spark cut option does not use the fuel return item, as soon as RPM falls below the high RPM scalar spark is resumed.

The spark retard option works with both spark cut and fuel cut rev limit modes. It allows for a softer rev limit by reducing spark advance to create less engine torque. The “RPM below upper to begin spark reduction” scalar creates an RPM window below the hard upper RPM cut where the spark is reduced by the “Spark reduction value”.

Cal items associated with rev-limit:



Vehicle Speed Sensor

The factory code has the driveline ratio hard-coded for the engine code. This meant for any change to tyre diameter or diff ratio the PCM would read the wrong speed. There is now a user configurable term “VSS – Driveline Ratio Constant (Engine Code).

Note: There are two driveline ratio terms. This is due to the original code using two software modules, one for the engine and one for the transmission. The transmission was all in MPH while the engine used KPH. The 11P XDF uses KPH for both engine and transmission with modified calculations to convert anything that was previously MPH. However the underlying data stored in the calibration differs, its only the XDF calculation that makes the ratios appear to be the same, hence the requirement to still have two ratio items.

Example to setup the vehicle speed:
Set “VSS - # pulses per revolution (Used for both engine and trans code)” to match the pulses per rev [Factory 4L60E is 40 PPR]
Set “VSS - Driveline Ratio Constant (Engine Code)” using the calculation “Ratio = (Tyre Rev's per Km x Diff Gear Ratio)/ 0.0357”
Set “VSS - Driveline Ratio Constant (Trans Code)” using the calculated engine code constant.

Temperature Sensor Calibration

The coolant temperature and manifold air temperature calibration tables have been moved to the engine calibration area. The coolant temperature calibration tables can be changed when converting an Ecotec V6 to 11P while retaining the factory coolant sensor.

Dwell Control

All Delco PCMs in Commodores used the same multislope dwell calculation for static engine conditions. The parameters for dwell control were hardcoded in the bin, these have been moved to the engine calibration area. The dynamic dwell control remains unchanged.

By changing the following two scalars the dwell settings becomes approximately the same as the factory configuration for the listed coils.

LS1 Coil Settings:

Dwell - First Slope Upper Ref Period Threshold (High RPM) = 5.00ms
Dwell - Second Slope Dwell Adder (Mid RPM) = 18.00ms

LS2 Coil Settings:

Dwell - First Slope Upper Ref Period Threshold (High RPM) = 3.50ms
Dwell - Second Slope Dwell Adder (Mid RPM) = 16.50ms

Transmission Code Changes

Unless otherwise mentioned below, all transmission operations are unchanged.

PSM Decoding

The shift lever position decoding table has been moved from a hard coded table to the transmission calibration area. See the notes in the XDF for information on how the pressure switch manifold (PSM) bits are decoded.

Shift Solenoid Control

The shift solenoid state table has been moved to the transmission calibration area. See the notes in the XDF on how the solenoid states are configured.

Transmission Temperature Sensor Calibration

The transmission temperature sensor calibration table has been moved to the transmission calibration area.

Wiring Pinouts

Standard VR Wiring Functions

Pin	Type	Function	V6	V8
A1	PWM	Fuel Pump Relay Control (12V Switched)	Used	Used
A2	Dig Output	2-3 Shift Solenoid	Used	Used
A3	Dig Output	1-2 Shift Solenoid	Used	Used
A4	PWM	TCC PWM Solenoid	Used**	Used**
A5	Dig Output	A/C Relay Control	Used	Used
A6	Dig Output	Low Speed Fan Control		
A7	Dig Output	Check Engine Light	Used	Used
A8	Dig Output	High Speed Fan Control	Used	Used
A9	Dig Output	TCC Enable	Used	Used
A10	PWM	Fuel Usage	Used	Used
A11	PWM	3-2 Solenoid Control	Used	Used
A12	Dig Input	Cranking Input	Used	

B1	Dig Output	Econ/Power Shift Pattern Select	Used	Used
B2	Dig Input	Shifter Position Range 'C'	Used	Used
B3	Dig Input	Shifter Position Range 'B'	Used	Used
B4	Dig Input	Shifter Position Range 'A'	Used	Used
B5	Counter	Reluctor Speed Sensor Input HIGH	Used	Used
B6	Counter	Reluctor Speed Sensor Input LOW	Used	Used
B7	PWMA	Pressure Control Solenoid LOW	Used	Used
B8	PWMA	Pressure Control Solenoid HIGH	Used	Used
B9	IRQ In	Cam Sensor Input	Used	
B10	IRQ In	18x Crank Input	Used	
B11	Dig Input	Cruise Control Input	Used*	Used*
B12	Dig Input	A/C Request	Used	Used
C1	Power	Switch Ignition Input	Used	Used
C2	Earth	System Earth	Used	Used
C3	Earth	System Earth	Used	Used
C4	Power Out	MAP Reference Voltage	Used	Used
C5	Analog	TPS Signal	Used	Used
C6	Dig Output	IAC 'A' High	Used	Used
C7	Dig Output	IAC 'A' Low	Used	Used
C8	Dig Output	IAC 'B' Low	Used	Used
C9	Dig Output	IAC 'B' High	Used	Used
C10	Analog	MAP Sensor Signal	Used	Used
C11	Dig Output	ALDL Data	Used	Used
C12	Dig Output	Speed Sensor To Instruments	Used	Used
C13	Earth	O2 Sensor Earth	Used	Used
C14	Analog	O2 Sensor Signal	Used	Used
C15	Dig Output	Fuel Injector Channel A	Used	Used
C16	Dig Output	Fuel Injector Channel B	Used	Used
D1	Power	Battery Voltage	Used	Used
D2	Earth	IAT and MAP Earth	Used	Used
D3	Earth	Coolant, Trans Temp and TPS Earth	Used	Used
D4	Power Out	TPS Reference Voltage	Used	Used
D5	Counter	Knock Sensor	Used	
D6	Analog	Diagnostic Test Enable	Used	Used
D7	Analog	Injector Voltage Monitor	Used	Used
D8	Analog			
D9	Analog	MAT Sensor	Used	Used
D10	Analog			
D11	Dig Output	Electronic Spark Control (EST)	Used	Used
D12	Dig Output	Bypass Control	Used	Used
D13	IRQ In	Crank/Dizzy Reference Signal Low	Used	Used
D14	IRQ In	Crank/Dizzy Reference Signal High	Used	Used
D15	Analog	Trans Fluid Temp Sensor	Used	Used
D16	Analog	Coolant Temp Sensor	Used	Used

* If cruise control fitted

** VR Series 2 and later 4L60E transmissions

11P Wiring Changes

Pin	Type	Function
D8	Analog	Wideband Input
A10	PWM	Flex Output

Transmission Notes

VR 1994 - 4HDD/V6 - 4HBD/V8 first electonically controlled auto.
VR II 1995 - 5HDD/V6 - 5HBD/V8 extra solenoid fitted to provide softer "LOCK UP" torque converter clutch apply.
VS 1996 - 6HDD/V6 - 6HBD/V8 the design of the previously added solenoid was changed and is not backwards compatible with the previous model.
VS II 1997-7HDD/V6 - 7HBD/V8 basically the same as the 1996 unit except the thread size of the cooler pipe unions was enlarged.

11P Version History

The following list summarises the changes made to 11P for each release.

V1.0.0 -

- 11P Program Identifiers Added
- Added ALDL...
  - Mode 11 - 8 Byte Write
  - Mode 12 - 128 Byte Write
  - Mode 13 - 128 Byte Read
  - Mode 14 - Reset PCM
  - Mode 15 - Spare
  - Mode 16 - Bin Write 32 Bytes Init
- Fixed GM ALDL bug - Mode 2 incorrectly sends final byte of ROM
- Program ROM now 0x8000-0xFFFF instead of being split
- Checksum only the program code (0x8000-FFFF)
- Removed All The Factory Calibration Development Code
- Added NVRAM Read/Write Check
- Added ID 41 message for VY cluster support
  - CEL
  - Shifter Position
  - Coolant Temp
  - Manifold Temp
  - Pwr/Econ
  - Fuel Used
  - Fuel Flow
- Moved Into Cal Area
  - BLM Breaks
  - CTS, MAT lookup tables
  - Factory Test Lookup

- ALDL Padding Byte
- Shift Solenoid Table
- Shifter Decode

Added FlashWriter Code for Bin Write Updates
ALDL Message 0 changes

- Removed PROM ID
- Removed Reference Voltage
- Added Current VE
- Added WideBand AFR
- Added Knock Counts
- Added Injector Duty Cycle
- Added Boost Multiplier
- Added Charge Temp
- Added Boost Load Variable (BoostLV)
- Changed knock counter to use Raw Counts

100 - 300% BPW Routine Created For Boost Multiplier
1, 2 or 3 Bar MAP Sensor Option
Baro Changes

- Altitude adjusted MAP Load Variable with Boost Term
- Option To Not Update Baro During Engine Run
- Added baro corrected Load Variable for boost

Boost Multiplier Term (100-200kPa or 100-300kPa with auto selection)
Fixed GM Bug: During RevLimit MAP A/D is not read correctly
VS or VR Anti-theft Option
Configurable Message 11 (24 bytes max)
Wideband AFR
Added GMs VR 11C bin changes
Added PCMhacking.net identifiers
Added 16bit 3D lookup
Added Larger Lookup Tables...

- VE Atmo and Boost
- Spark Atmo and Boost [Map A and Map B]

Added Target AFR Atmo and Boost [Map A and Map B]
Added Cold Engine Target AFR Boost
Removed F1 Extension slope due to spark mapping now going to 8k RPM
Added Charge Temp Advance Atmo and Boost
Added Coolant Advance Boost
Added Closed Throttle VE
Added Map A/Map B Option Flags
Added Map A/Map B RevLimit
Added Boost % Coolant Contribution For Charge Temp Table
Added Ignore Knock Count Option
Added Rev Limit Functions

- Basic On/Off RPM Threshold Spark Cut Using Reduced Dwell
- Added Spark Retard Option

Added Malf61 for high boost pressure.

- Added over boost fuel cut option
- Added over boost spark cut option

Added option for using pwr/econ as map a/b switch

Added Adjustable ALDL Baud Rate
Added Dwell calc items to cal
Force Open Loop Option Flag
BLM Disable Option Flag
Added limited VT cluster support
VS V6 Low Speed Fan Control via BCM [Use the ALDL editor in FlashTool]

V1.0.1 -

Bug Fix: Byte written to addess 0x67FA at key off
Allocated 128bytes less to the flashwriter code
Moved ALDL code to allow more free space

V1.0.2 -

Bug Fix: VT/VX/VY cluster now gets the correct fuel used data. Was not summed continually
Bug Fix: 2/3 Bar sensor option not handling 18x and cam input correctly
VT/VX/VY BCM Handler
    Responds to ID $40 message request with $41 replies
    Now reads all ALDL messages, but will only process if for the PCM
Added flexible output option using fuel usage output
Removed Cranking Time From ALDL, Replaced With Flex A Duty Cycle

V1.0.3 -

Bug Fix: Injector Duty cycle was reading half when in single fire mode.
ALDL: Changed transmission logging message to use transmission vehicle speed item instead of engine code vehicle speed.
Moved engine speed code driveline ratio term to the cal area.

V1.0.4 -

ALDL: Removed MAP LV, replaced with baro compensated MAP LV