



GM 60 Degree Tuning Guide

For 1994-1995 L Body

Information describing how to add the ability to tune your 1994-1995 L Body by swapping to the OBDI 16149396 PCM with electronic transmission controls for the 4T60-E.

By Isaac Hayes

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 - Robert Saar for wiring diagram

*** Re-import pictures if pixilated.

*** X = Section done to satisfactory amount for now.

Introduction

The 1994-1995 L bodies and other GM cars with the 3100 (except for A-body) got stuck with a PCM that was a cross over gray year. Most refer to this as "OBD1.5". The stock PCM is somewhat more advanced than older PCMs, is flash based, and still technically OBDI. To this day there is no tuning solution for it, and not much technical data from GM. Some people opt to swap to OBDII, but that requires more sensors, wiring harness changes and other items as well as expensive tuner hardware. This guide is going to show you how to swap to an OBDI PCM which is fully tunable and can control the electronically shifted 4T60-E.

The PCM service code that we will be swapping to is 16149396 and is in 91-93 W-body cars with the 3.4L DOHC "Twin Dual Cam" engines. It was used for the 3.1L MPFI motor as well for the 93-94 years only. It has additional SRAM to control the transmission. This PCM can also accept many other "bins" of code for those who have swapped a 5spd or even have a turbo. See the tuning section for more info. However this guide will focus on installing the PCM and getting it up and running for a car still equipped with the factory 4T60-E automatic. It will also touch on how to tune and what is needed.

Keep in mind by going to a "real" OBDI PCM, you will loose SFI. The motor will run with MPFI. The stock SFI computer reverts to MPFI or "batch fire" after so many RPMs anyway. This means you will no longer need the 24x crank sensor behind the harmonic dampener or the cam sensor. You can leave them still attached to the motor though, in case you want to swap back to your original PCM for whatever reason. We will be making an adapter harness so swapping between the two PCMs is as simple as disconnecting them from the body harness. Nothing on the vehicle will need to be modified. Also this may cause problems if your area has emissions testing with going backwards to an older PCM. Although it technically will still be OBD1, and still have the EVAP and EGR working like stock. If you have an engine swap or modified engine, tuning can actually improve your emissions.

Parts Required

- 1). 16149396 PCM from 91-93 W bodies 3.4L DOHC or 93-94 3.1L MPFI. (See Figure 1)
- 2). Four PCM Connectors from the body wiring harness which plugs into the PCM, with 6" or more of length. (See Figure 2)

Note: These connectors can also be had from other weather proof PCMs of the same style case.

- 3). Spare 3100 PCM (or your original one if you don't plan to ever use it again). (See Figure 3.a)

We will take this apart and remove the three electrical connectors only. You could also order these connectors brand new through Mouser Electronics. (See Figure 3.b)

[Mouser Part Numbers: 12186043 - 12186041 - 12129008]

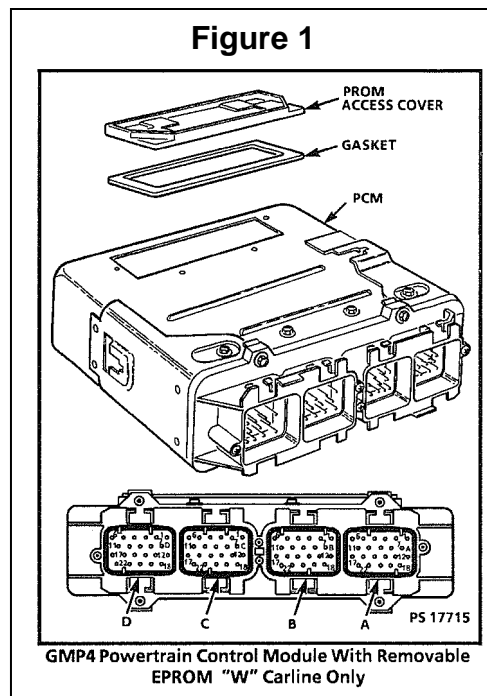


Figure 3.a



Figure 3.b

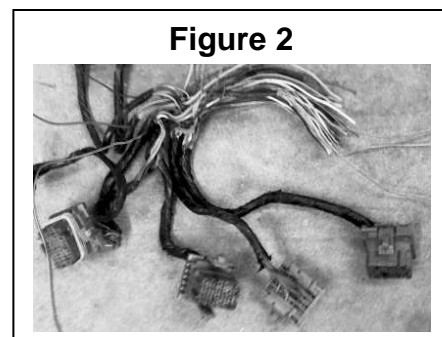


Figure 2

Putting it Together

Now once we have the parts, we will take the 4 connectors from the 16149396 PCM, solder the wires from them to the connectors we removed from the 3100 PCM going to the correct pins for the conversion (see next page for pinouts). This will allow the harness we have made to plug into the 16149396 PCM, and the other end into the body harness of the car.

You will need to know how to solder, and use heat shrink to cover the connections. I would also use some electrical tape as well, and possibly wire loom to organize the new harness. You will want to seal the 3100 PCM connectors since the pins on the back will be exposed where you soldered the wires. Liquid electrical tape or potting compound will work. Do not use silicone as it contains acid and will corrode the connections. Epoxy could be used if one wished.

Depending on where you mount the PCM will determine how long the harness you will make. You could fabricate brackets to mount it in the stock location. Another option is to make the harness very long and have the PCM mount on the hump behind the heater controls on the floor with some Velcro or metal L-brackets for grip. You may need to solder on extra wire to extend the length between the two connectors.

Removing the 3100 female connectors from the donor PCM

If you do not buy new connectors for the interfacing to the body harness, you will need to take them out of a 94-95 3100 PCM or PCM from a 3.4L RWD F-body. First open the PCM case. If the torx screws are rusted tight, take a hacksaw and cut the thin part of the case through where the screws mount and it will quickly come apart. Then take the torx screws and bolts out of the PCB's and remove them from the case. Now you can remove the injector driver MOSFETs and other items in your way to get at the connectors. The easiest way to remove the connectors is to take a Dremel with a thin cut-off wheel and slowly cut through both rows of pins flush to the board. You could also de-solder it from the board if you can do that kind of work without over heating the connectors. To clean the dust off, take a nylon brush (toothbrush) and soap and water to get the metal dust out of the clear sticky rubber potting compound that is on the inside of the connectors. You don't want this holding the metal dust and possibly making connections between pins. That would cause trouble shooting nightmares. Then shake the water off or blow the water out with air and set aside.

Wiring it together

Solder the wires from the body harness pigtail 16149396 PCM connectors to the female 3100 PCM connectors. Use shrink wrap to cover the connections. (see Figure) Use the table on the next page to match up the wires to the correct pins. See Figure 1 for the 16149396 connector letters (in picture, prom cover is facing up). For the 3100 PCM connectors, **A**=White/Gray, **B**=Black, **C**=Blue. Looking inside the connectors you will see where the numbering starts and ends. (9396 numbers, check those to see if they show up, else show close up)

Pin-out table notes

If going to a manual swap later, see the manual/auto pins which serve dual purpose. Be sure to either enable the correct flags in the .bin to turn off auto support and enable manual support, or better yet start with a 5spd bin.

1st gear and 4th gear switch inputs are not connected because the newer 4T60-E does not have these outputs. This probably is not needed for function of the PCM/trans as it appears to only be a secondary monitoring of the trans. It could be hooked up with the gear select position switch and two PNP transistors to "decode the logic circuit". **More info later if this is needed.** But the info is here in case we need it or want to use it for some reason.

Power Steering signal is not hooked up or needed. This was for the older pumps to raise the idle when there is extra load from the pump.

See the Adding Features section for adding in the rest of the un-used connections.

91-93 16149396 Pinout	DESCRIPTION	CIRCUIT #	W-BODY	L-BODY	N-BODY
A1	IAC A HIGH	441	B27	B27	B27
A2	IAC B LOW	444	B25	B25	B25
A3	FAN 2	473	B1	B2	B2
A4	EGR 1	697	B11	B11	B11
A7	IAC LOW	442	B26	B26	B26
A8	IAC B HIGH	443	B24	B24	B24
A9	FAN 1	335	B2	B2	B2
A10	CANNISTER PURGE	428	B4	B4	B4
A11	ESC SIGNAL	496	C20	C20	C20
A12	A/C RELAY	459	B6	B6	B6
A13	SHIFT SOLENOID B	582	A12	A12	A12
A16	O2 SIGNAL	412	B22	B22	B22
A18 AUTO	SHIFT SOLENOID A	581	A11	A11	A11
A18 MAN	AIR PUMP	429	-----	-----	-----
A19	EGR 2	698	B12	B12	B12
A20	FUEL PUMP SIGNAL	120	A6	A6	A6
A22	SENSOR GROUND	413	B23	B23	B23
B1	SES LIGHT	419	B7	B7	B7
B3	DIAG/TEST	451	-----	-----	-----
B5	SERIAL DATA	461	B19	B19	B19
B7 AUTO	TCC	422	A15	A15	A15
B7 MAN	SHIFT LIGHT	422	-----	-----	-----
B8	SPEED OUT	389	B28	B28	B28
B10	IGN FEED	439	C3	C3/C4	C3/C4
C2	VSS LOW	401	B29	B29	B29
C3	DIS BYPASS	424	C28	C28	C28
C4	IAT	472	C29	C29	C29
C5	SENSOR GROUND	802	A1	A1	A1
C6	GROUND	450	C1	C1	C1
C7	5VOLT REF (MAP)	474	B31	B31	B31
C8	VSS HIGH	400	B30	B30	B30
C9	EST CONTROL	423	C27	C27	C27
C10	SENSOR GROUND	808	A17	A17	A17
C12	5VOLT REF (TPS)	416	B31	B31	B31
C13	EGR 3	699	B13	B13	B13
C15	TPS	417	A30	A30	A30
C16	COOLANT TEMP	410	A31	A31	A31
C17	A/C REQUEST	66	A2	A2	A2
C20	4TH GEAR SIGNAL	446	-----	-----	-----
C21	A/C PRESSURE	732	A5	A5	A5
C22	MAP	432	A29	A29	A29
D3	INJECTORS 1/3/5	467	C12/C14/C16	C12/C14/C16	C12/C14/C16
D4	GROUND	450	C1	C1	C1
D6	2ND GEAR START	1493	A21	-----	-----
D7	FUEL PUMP RELAY	465	A8	A8	A8
D9	INJECTORS 2/4/6	467	C13/C15/C32	C13/C15/C32	C13/C15/C32
D10	GROUND	551	C17	C17	C17
D11	P/N SWITCH	434	B18	B18	------(B18?)
D12	GROUND	551	B16	B16	B16
D13	DIS HIGH	430	C30	C30	C30
D16	P/S SIGNAL	495	-----	-----	-----
D17	BATTERY FEED	430	B14/B15	B14/B15	B14/B15
D19	DIS LOW	453	C31	C31	C31
D22 AUTO	1ST GEAR SIGNAL	1457	-----	-----	-----
D22 MAN	CLUTCH SWITCH	90	-----	-----	-----

Tuning - Introduction

This section will cover setup, equipment, and what needs to be changed to get you running out of the box, using the \$DF (3.4L DOHC) code and how to tune to get the VE fuel tables and spark tables tuned to your setup. The DOHC VE Fuel tables are closer to the 3100 compared to the 3.1mpfi. If you do not need the electronic trans controls (such as future 5spd swap), the 16149396 PCM will accept other .bin's that the 1227730 and 1227727 PCMs can run such as the Turbo Grand Prix \$8F code for boost, or \$A1 5spd 3.1mpfi code. There will be suggested values which may or may not apply to your particular setup. If you have a different transmission, different engine or injectors, you will need to adjust these values using the formulas supplied. If you are using a bin other than \$DF, you will need to refer to it's documentation to see what the stock values are, and what needs to be changed on them. This guide will not cover that information as that is readily available on the internet. However many of the formulas and instructions on how to tune in this guide can be applied to other setups and bins.

Setup & Required Equipment

Equipment needed to tune OBDI is available through www.moates.net. The PCM has what is called a MEMCAL. It removes from the access panel on the PCM much like a stick of RAM from a PC (See Figure 1). On the MEMCAL contains the filter for the knock sensor, and the PROM chip which contains the code and calibration. We will be replacing this with an adapter which will go where the MEMCAL was, with the MEMCAL attaching to the adapter so that the knock sensor filter still works. The adapter does not use the stock chip, but has a place to put a new chip which is erasable and reprogrammable. If one so desired, the stock chip could be un-soldered from the MEMCAL and in it's place a new EEPROM chip soldered on which means the adapter would not be needed. Then you would need the "HDR1 MEMCAL Header" from www.moates.net which allows you to stick the stock MEMCAL unit into the burner and read/write it. This would be something to do once you have a "final" tune down and would only need to update the chip on the rare occasion or new modification. Below is a list of what you typically would need:

- "G1 Memory Adapter"
- "C2 SST 27SF512 Chip" (two are a good idea, so you can rotate out as you update the tune)
- "S2 Aries 28-pin ZIF Socket" (Optional, but makes it super easy to remove the EEPROM chip)
- (The GP1 package contains all of the above)
- "BURN2 Chip Programmer" EEPROM read/writer
- ALDL Cable (to scan data logs. USB or Serial versions exist)
- A laptop (preferably one with a serial port and auto power adapter) (Running Windows XP for V5 of TunerPro)

There are other items you could use, such as the stand alone Ostrich emulator which plugs into the adapter where the EEPROM chip would, and allows you to make changes to the tune on the fly in real time. There is also a chip extender with a ribbon cable which allows you to move the chip socket outside of the PCM to a location that is easy to reach when swapping chips. Depending on how you mount the 16149396 PCM will determine what you will want to go with. If it is in the stock location, removing the glove box should be good enough to get to the chips, but you could extend the chip socket into the actual glove box to get the chips without reaching too far. Once the tune is final, installing the chip without the extender is recommended.

The software we will be using is TunerPro RT. It is available from www.tunerpro.net. Cost is very low. With it you can write your own definitions etc for just about anything if you have the information. Version 4 works with Windows 95 and up. Version 5 works with XP and up. V5 has more features such as better data logging dash customization. As of time of righting this, V5 is still in beta.

Getting Started with TunerPro RT

Overview

This program can be used to tune just about any OBD1 system out there, if you have the right files, or have the info of how the .bin works and how the ALDL stream is read you can create the needed files. Take a while to read about it, it is very powerful. I will provide some files that I used to get you started on my website or in a .ZIP file.

There are several files that are used with TunerPro RT that you will need. The .BIN is the PCM program, .ADS (v4) or .ADX (v5) is the file to decode the data stream to log with, and .XDF is the file that allows you to read and make changes to the .BIN itself. There are tables, constants, and flags to change in the .BIN to enable or disable items, define values, and define ranges for just about anything. We won't be modifying everything, as most things are set from the factory and don't need changing, but it's nice to know that if we needed to, we can. You can really get in

depth and remove all torque management, catalytic converter protection, emissions, and so on if one really desired or needed to for a strict all out race only application. Or you can keep everything working like stock. This guide will only focus on changing things to get the car tuned and running. Take some time to get familiar with TunerPro and all the adjustments in the .BIN after reading this guide. TunerPro RT version 5 beta is out as of time of this writing, and it seems to display the item list of things to change a little nicer. And it has more powerful features.

Once you have loaded the .BIN, .XDF and .ADX/.ADS files you are ready to make some changes to the stock 3.4 DOHC .BIN. Go ahead and make the changes using the suggested values listed later in this guide. Please be aware that those are not the only things you need. Remember this guide is to show you how to tune. You will have to make adjustments, particularly to the VE and spark tables on your own. After you have made the changes and uploaded the program file to your Ostrich emulator, or burned it to an EEPROM chip, you are ready to install it in the car and fire it up and make a datalog.

Data Logging

This is where we will use the ALDL cable to record data from the cars diagnostic port while driving, to see what changes we need to make. The ALDL cable and TunerPro RT will allow us to read current and history trouble codes, clear them, and also read sensor data and data that the PCM is using and calculating with. Connect the ALDL cable to the appropriate pins in the ALDL, and into the laptop.

*** Explain V5 connect/log procedure ***... Show how to take histogram of BLM and INT, then paste into spreadsheet, along with VE table, to have it calc new VE table.. etc... blah blah blahb..

Suggested Values & Formulas

Below are the values needed to change in the stock \$DF to adapt it to the stock L Body hardware so that you can get it going out of the box for a stock setup. If you have a different transmission, or other modifications the supplied values may not be accurate. In that case, use the formulas supplied underneath each item to calculate what the value needs to be for your application.

VSS - (Constants/Scalars)

Road Speed Sensor Constant = 23192

This calculates your MPH for both the PCM and speedometer.

W body value: 24015.64 (26.62" tall w body tire 225/60r16) -stock value

L body value: 23191.87 (24.85" tall L body tire 225/50r16)

VSS Reluctor pulses for W body trans = 30

VSS Reluctor pulses for L body trans = 29

VSS Reluctor - 30mph actual, L body VSS pulses will be less.

Tire size - 30mph actual, L body VSS pulses will be more.

Raising the RSC compensates for less pulses from less teeth on the VSS reductor.
Lowering the RSC compensates for more pulses due to smaller tire.

Calculations:

Tire diameter = $((2 * \text{width} * \text{Ratio}) / 2540) + \text{Rim-diameter}$

Example, L body 225/50r16. $((2 * 225 * 50) / 2540) + 16 = 24.85"$

Road Speed Constant Adjustment = $(\frac{30}{29}) * (\frac{24.85}{26.62}) * 24015.64$
VSS Tires Original RSC

IP Divisor = 128

This is 128 stock. This only changes if your gauges need a different pulse. Values that are valid = 0 32 64 96 128 160 192 224

Shift Points for WOT

Using Moonwell's Gear Ratio Calc, or the TopSpeed program you can plot out your shift points. The FDR for 3.4 DOHC 3.43, 3.1mpfi is 3.33. Beretta is 2.94-2.97 depending on year (not that big of a difference). If you take into account the DOHC shifts at 5952, has a higher FDR, but taller tires, plot it against the Beretta with 5500 shift point, smaller tires and lower FDR, they work out close to .2-.5 difference in MPH shift points. So we can leave those alone (if working from a 3.4DOHC .bin). Change the RPM point to where you want (5500). The PCM shifts when both conditions are met. So by placing MPH low, it will shift at the RPM value. Note the stock 3-4 will shift at the MPH point since RPM is met first, which the MPH works out to 4176 RPM. We won't touch the tables for normal shifting, unless you want to tweak the performance tables /etc.

F31 Trans - (Constants)

These are your max speed to allow down-shift threshold points.

KICKDOWN 2-1 DOWNSHIFT SPEED, NORMAL MODE = 35 MPH

KICKDOWN 3-2 DOWNSHIFT SPEED, NORMAL MODE = 74 MPH

KICKDOWN 4-3 DOWNSHIFT SPEED, NORMAL MODE = 94 MPH

These are your up-shift points.

KICKDOWN 1-2 SHIFT ENABLE SPEED, NORMAL = 40 MPH

KICKDOWN 1-2 SHIFT ENGINE RPM SHIFT POINT, NORMAL = 5500 RPM

KICKDOWN 2-3 SHIFT ENABLE SPEED, NORMAL = 77 MPH

KICKDOWN 2-3 SHIFT ENGINE RPM SHIFT POINT, NORMAL = 5500 RPM

KICKDOWN 3-4 SHIFT ENABLE SPEED, NORMAL = 104 MPH

KICKDOWN 3-4 SHIFT ENGINE RPM SHIFT POINT, NORMAL = 2000 RPM

CLOSED LOOP - (Constants/Scalars)

Since the \$DF code is based off a single wire O2, and we have a 4-wire heated O2, we can reduce the time before the PCM enters closed loop and monitors the O2 signal.

- COLD C/L TIMER VALUE = 72 (down from 240)
- WARM C/L TIMER VALUE = 32 (down from 104)
- HOT C/L TIMER VALUE = 16 (leave alone)

INJECTOR SIZE ADJUSTING - For 3100 19lb/hr Injectors.

23#	16.7#	19#	Don't look under the constants/injector rates. That is just for DIC equipped cars to calculate MPG. So unless you swapped a HUD into your car, this is not worth messing with.
3.4L	3.1L	3100	
142	187	164	Fuel - (TABLES/FUNCTIONS) BASE PULSE CONSTANT VS DESIRED EGR
142	187	164	
142	187	164	Adjust this table for your size injectors. Stock 3100/3400 94-99 are 19lb/hr @ 43.5psi FPR. 2000+ 3100/3400 are 22.5 @ 55psi FPR.
142	187	164	Ok It's easier to start with the 3.1mpfi bin's values for this exercise, since we don't have to factor in the 3.4L's extra displacement. But we need to adjust for our 19lb/hr injectors instead of the 16.7 of the 3.1mpfi. 16.7/19= 0.87894736842105263157894736842105
142	187	164	
142	187	164	
142	187	164	
146	187	164	If we paste that # into TunerPro's table editor, select Multiply, absolute, and select all cells and Execute, we get our adjusted value. We can then copy this table and paste it into our DOHC code. To the left is the 3100 table to use.
149	192	169	
153	197	173	Now if you have a 3400 swapped, just adjust the DOHC 3.4's table to your size injectors directly. Stock DOHC injectors are 23 lb/hr (23/19). If you have 2000+ injectors and FPR, then the stock DOHC values are close, but you should still adjust them. If you want to calculate for a different size motor, then in addition to calculating the injector change, take your new displacement divided by the old displacement and multiply that against the injector constant. You will need to use a precise measure of volume such as CC's. 3100=3136cc 3400=3350cc 3500=3498cc.
156	202	178	
160	207	182	
163	212	186	
167	217	191	
170	222	195	
174	224	197	

Other Adjustments:

Disable EGR: EGR - (Constants) IF COOLANT <= THIS, DISABLE EGR
Set this to 304 F (move slider all the way)

Disable Evap Solenoid: CCP - (Constants) DISABLE CCP IF COOLANT < THIS
Set this to 304 F (move slider all the way)

Disable Malfunction Code: CODE FLAGS - (Flags)
CODE 32 = EGR

Rev Limiters: Rev Limiter - (Constants)
RPM LIMIT BEFORE SHUTTING OFF FUEL (in park/neutral) = Set to whatever RPM.
RPM LIMIT BEFORE TURNING FUEL BACK ON = Set to a few points lower than above value.
SHUTOFF ALL FUEL IF RPM >= THIS. = This is your red-line Rev Limiter such as 6050 RPM.
SHUTOFF ALL FUEL IF MPH > THIS. = This is your top speed governor. 120 for DOHC bin.

Speed Limiter - (Constants)
ALLOW FUEL DELIVERY IF MPH < THIS ONCE FUEL HAS BEEN SHUT OFF = 117 for DOHC bin.

Tuning VE Fueling:

Straight gas: 14.64 PE 12.5. E10 14.1 PE 11.8 – useful if you change gas while tuning or using WB O2.
Use the DOHC VE tables to start with, it's closer than the 3.1mpfi tables to the 3x00.

Disable the CCP & EGR before tuning. (See Optional Adjustments) Then if you want EGR, re-enable and tune after you have everything else dialed in. Reduce added EGR spark if knocks, or add some more if there is none. When the EGR kicks on, if the BLMs change, then adjust the upper EGR BPC tables until it's dialed in.

Datalog, Using FuelTrim etc [\(NEW spreadsheet that "autotunes" VE and Idle\) 10 samples history average](#)
Base VE, Idle VE, Main VE

Start with Idle VE. Then Main VE. Adjust PE VE last a .1 increments at a time.

Crank PW might need adjusting. When cold pull fuel until you get the extra out. 20% adjustments is ok.

AE, if it bucks, lower fuel. If it hesitates, add some.

Tuning Spark Advance

The 3.1mpfi spark table is closer to what the 3x00 needs compared to the DOHC. But it still is too aggressive. For spark you can raise it until you detect knock, then back it off some. However keep in mind if you don't get knock, and keep adding spark, there is a point where you won't gain power, and can actually lose some. If the piston is fighting the burning flame front as it's coming up, you are losing power. So don't go crazy, unless you can tune on a dynamometer and see exactly what you are gaining or losing. After changing spark, you may have to go back and slightly adjust your VE tables, as spark affects how efficiently a mixture burns of course.

Notes:

Idle Re-Learn Procedure

OBD1 needs an idle re-learn once the power has been lost from the PCM. If we change the minimum IAC position in the tune, this would not need to be done each time, as it would be closer to what it needs without having to learn it. Below is where you would adjust this, such as after logging after the PCM has learned the idle. Also below is the re-learn procedure.

IAC PKA ADJUSTMENTS - (Constants)

INIT FOR ISMNMPKA WHEN KEEP ALIVE RAM FAIL = 15 stock (try 21)

Reset ECM by pulling ECM fuse (under hood) for a few seconds.

With A/C turned off, start car and immediately put it in Drive with your foot on the brake. If the car does not start initially, keep trying WITHOUT putting your foot on the accelerator.

Let the car idle in gear for at least 5 and no more than 7 minutes.

Shut off the car for 10 seconds.

Start engine, place in drive and let idle for 5 minutes.

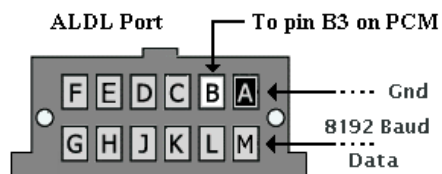
Shut off engine.

Idle is learned.

Adding Features from the 16149396 PCM

Read Diagnostic Codes (via Flashing SES light)

Run pin B3 from the PCM to position "B" on the ALDL. This will enable you to insert a paper clip or other jumper between pins B & A on the ALDL, turn the key to "ON" and the SES light will flash in a sequence you can look up to read trouble codes without any additional hardware. This is handy for when you don't have your scan tool or laptop with you. You could also just run pin B3 to a switch that is hooked to a ground point, and flip the switch if you did not want to run the wire across to the ALDL to accomplish the same thing.



Performance / Snow shift

Run pin D6 to a switch that grounds the wire. This will activate a second set of shift tables. The tables are labeled Snow/Performance. You can set the transmission to start out in 2nd for icy conditions, or you can set it to hold the gears longer before up shifting for a performance mode. Putting an LED with the switch would be ideal, so you know it's on. Measure the voltage coming out of D6 to determine what resistor to use with the LED and wire in series with the switch.

***** Get OBD1.5 small data log items so we can figure out stock spark, and IAC values. *****

Getting L gear position to work

It's possible that the L body's (L) 1-2 combined shift position will not work right. It may only go into 2nd gear not first even at low speeds. If so this info may fix that. (from Robert's testing, the L body "L" position works like the W body 2nd gear position, so this is likely not an issue)

PCM D22 when grounded tells the PCM the trans is in 1st.
PCM C20 when grounded tells the PCM the trans is in 4th.

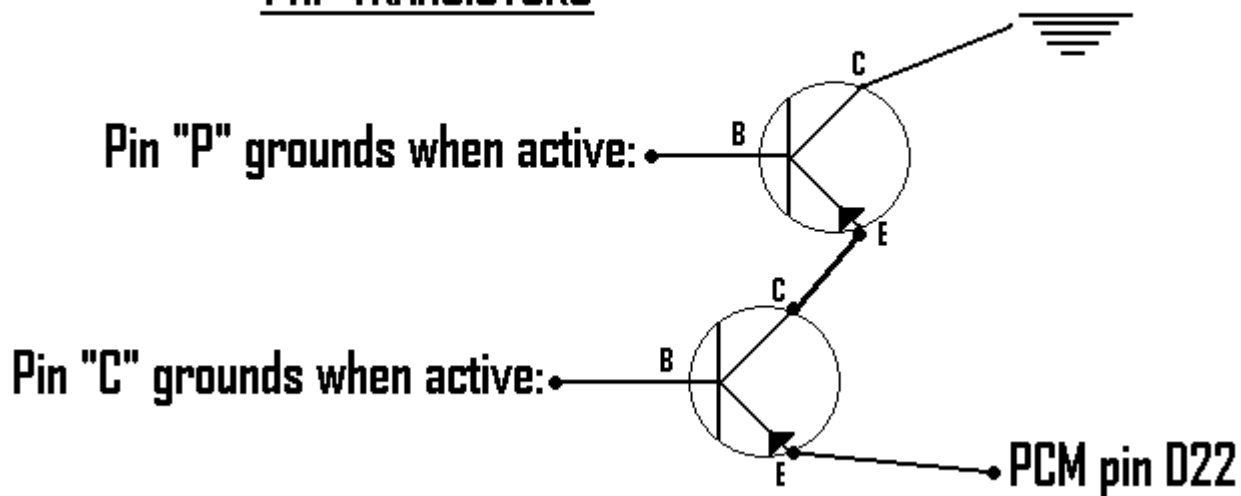
On the L body trans output P & C active = Low gear
On the L body trans output B & C active = 4th gear.

P = pin D
B = pin B
C = pin C

Trans pins ground when "active" ??? What pins on the 3100 ECM are trans pins P C and B???

So, we could rig 2 transistors/etc that when BOTH are grounded, would then ground pin D22 on the PCM to tell it it's in 1st and set the trans to hold first.. That is if the behavior doesn't work like stock out of the box.... This may not be needed. But info is here for now until tested.

PNP TRANSISTORS



The pins on the PCM D22 and C20 are redundant information to the PCM to monitor the trans only from the service notes I can tell. I know Robert's car runs just fine without these hooked up.