

Extender™

Rev F01

For '87 and '87 Buick Turbo V6 and '89 Turbo Trans-Am

For use with the MAF Translator

Introduction

The Extender ECM chips are designed to take advantage of the MAF Translator's ability to measure true airflow at high horsepower levels. This ability to measure all the air entering the engine gives the ECM control to properly adjust injector pulsewidth to maintain correct Air/Fuel ratios for best horsepower under all conditions. Additionally, the Extender chips feature advanced software to permit the user to adjust many parameters that were previously only adjustable by the chip programmer. You do not need to use the adjustable features, but for those people that like to tweak and tune, they are a great feature.

The adjustable parameters are:

- Knock Light: flashes Check Engine light when excessive detonation is detected
- DFCO delay: prevents annoying RPM dips while coasting caused by high stall torque converters
- Fan Temperature: Select "Street" or "Race" modes
- Cruise TCC: Select the vehicle speed for TCC engagement at part throttle
- WOT LoGear Spark: Adjust how much extra spark advance is commanded in first and second gear
- BLM correction: Adjust for out of spec injectors or fuel pressure. Adjusts all BLM's up or down.
- System Options: Control the operation of open and closed loop at cruise and idle, and enable Launch Assist and Lean Highway Cruise mode.
- WOT TCC: Control the MPH at which the Torque Converter Clutch engages at full throttle.
- Spoolup Fuel: Adjust how much fuel is delivered during the spoolup phase of full throttle.
- LoGear Fuel: Adjust the Air/Fuel ratio for Full throttle operation in first and second gear.

In addition to the new adjustable features, the Extender Extreme chips have the following standard features:

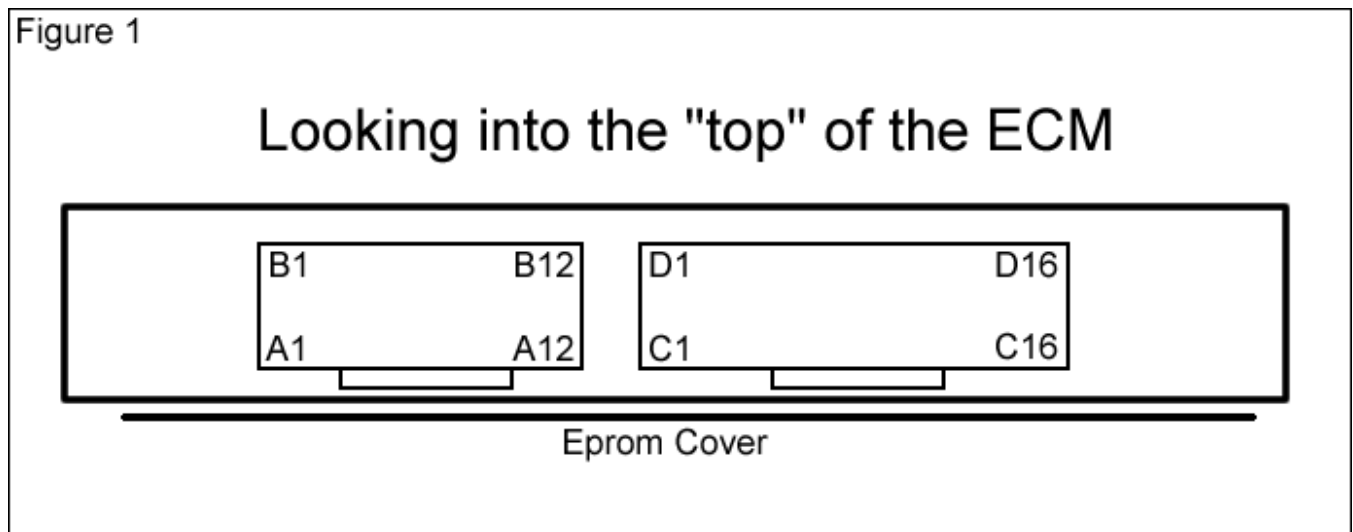
- False knock ignore: Prevents false knock from affecting performance
- BLM lock at WOT: For more consistent full throttle fuel control
- MAF Anti-dropout : To prevent surging and detonation from high airflow readings.
- Anti-stalling software: Prevents stalling common with lightweight torque converters.

Installation

The Extender Extreme installs just like a regular chip in the ECM. Be sure the key is off, and unplug the orange power wire near the vehicle's battery. Remove the ECM from its mounting location (passenger kick panel on a Buick). Remove the cover from the side of the unit. Remove the previous chip and install the Extender.

If you will be making changes to the chip's adjustable features, then you can install the optional ECM wire (this wire is not required, as you can optionally remove the small Calpak chip for the same effect). You can contact your chip supplier about this wire if you want to install it.

If you have the optional wire, this will be installed into an unused location in one of the ECM harness connectors. Remove the locking "comb" from the top side of the large connector and insert the small terminal of the supplied wire into cavity D11 as shown in figure 1. Run this wire above the plastic footwell trim to the front end of the console. Using a tap connector, attach to the gray wire that runs down from behind the radio and disappears under the console. For column shift cars use the gray ashtray light wire. This connection allows the parking lights switch to select the 'top row' of parameters. Reconnect the Orange power wire (at the battery) and installation is complete.



At this time ensure that the installation of the MAF Translator hardware is complete and the configuration settings in the translator are set correctly.

For the Translator, set the 4 little dip switches inside the box to ON, ON, OFF, OFF.

For the LT1 3" MAF sensor, use a MAF Base of 3.

For the LS1 3.5" MAF sensor, use a MAF Base of 0.

The chip is designed to be run with 45psi fuel pressure (checked with vacuum line off).

Parameter Adjustment Overview

The adjustable parameters are stored in 8 locations in the ECM memory and can be seen as the bottom 2 rows of BLM cells for those people using Powerlogger or Directscan. On other scantools, you can see them using the INT and BLM positions.

The adjustable parameters are changed by using various controls inside the car. These are: Throttle (gas pedal), Air Conditioner, Shift, and Parking Lights. If you do not have the optional ECM wire installed to enable the parking light adjustment, you can optionally remove the Calpak chip for the same effect.

The parameters are numbered 8 - 15. When the ignition is on and the engine is not running, the parameter number selected for adjustment is shown on the integrator of a scantool, the value stored to that parameter are shown on the BLM (block learn) of a scantool.

| | | | | |
|---------------------------|--------------------------------------|--|-----------------------------------|------------------------|
| 8 Shiftlight 0 | 9 DFCO/FAN Cruise TCC 0 | 10 WOT LoGear Spark Advance 8 | 11 BLM Correction 8 | Lights On (Calpak out) |
| ----- | | | | |
| 12 Options 0 | 13 WOT TCC 0 | 14 WOT Spoolup Fuel 8 | 15 WOT LoGear Fuel 8 | Lights Off (Calpak in) |
| A/C = Off Shift = Park | A/C = On Shift = Park | A/C = Off Shift = Drive | A/C = On Shift = Drive | |

Adjustment Procedure:

1. Determine which parameter you wish to adjust and the new value to be stored.
2. Using the A/C, Shift, and the parking lights, select the correct parameter. This is confirmed by checking the INT display for the correct parameter number.
3. The BLM (bL) display on the scantool will show the current stored value of the selected parameter.
4. Press the gas pedal past half way and the BLM display will start showing the new value to be saved. The further the pedal is pressed, the higher the number will go (up to 15).
5. When the BLM shows the desired value to be saved, hold the gas pedal at that position and turn the ignition key OFF. This will save the new value to the selected parameter. Turn the key on and verify the correct value was saved.

Feature Descriptions

Loop Control: The Extender Chips can be configured to run open loop at idle. This can be used to help smooth a rough idle caused by vacuum leaks, exhaust leaks, large camshafts, bad O2 sensors or other cause. When open loop idle is enabled, the Block Learn value that was previously learned is frozen and the Air/Fuel mixture is richened slightly. The O2 reading will usually run 780 – 830 millivolts; this indicates an air-fuel ratio of between 13.0 and 14.0 which is perfectly fine. It may have an adverse affect on catalytic converters, so use this feature in off-road configurations only.

Highway Lean Cruise: When enabled, the Lean Cruise option will alter the Air/Fuel ratio during steady highway driving to approximately 16.5:1 to improve fuel economy. To operate properly in this mode, the car needs to be tuned and running properly. Bad spark plugs, plug wires, or other maintenance issues can cause poor drivability during lean cruise. Lean cruise activates approximately 10 seconds after the Torque Converter lockup is enabled in 4th gear. During Lean Cruise, the O2

reading will drop to 20 – 60 millivolts, indicating an Air/Fuel ratio of about 16.5:1. Every 8 minutes Lean Cruise will turn off for 10 seconds to double check the block learns are correct.

Launch Assist: When enabled, Launch Assist will improve turbo spoolup while brake-torquing for improved launch when racing. This mode is not intended for street use and does put a lot of heat into the turbo exhaust, headers, and exhaust valves. It does do a good job helping launch a turbo that is too large for the torque converter stall speed. When activated, Launch Assist reduces engine torque and increases exhaust temperature. Launch assist will activate when the throttle is between 50 and 85% and vehicle speed is below 5 mph. When Launch Assist is working, the Check Engine light will flash.

Open Loop at all times = 8 Open Loop at Idle = 4,
Lean cruise enabled = 2 Launch Assist enabled = 1.
Add up the feature numbers and program Parameter 12

WOT TCC: The torque converter clutch can be programmed to lock at Wide Open Throttle (WOT). This usually improves performance and track times, however, be certain that your transmission and converter can handle the extra load. The lockup speed can be programmed from 50 Mph to 105 Mph in 4 mph increments. **Lockup will occur at ((Param13 * 4) + 45) Mph. Setting Parameter 13 to zero disables WOT TCC.**

Spool fuel: The WOT Air/Fuel ratio during spoolup can be varied using Parameter 14. For the first 1.5 seconds at full throttle, but below 10 psi boost pressure, the Air/Fuel ratio is modified by Parameter 14. Default value is 8. Each increment higher will richen the Air/Fuel mixture by 2%, each increment lower will enlean the mixture by 2%.

LoGear Fuel: The WOT Air/Fuel ratio in first and second gears can be varied using Parameter 15 Default value is 8. Each increment higher will richen the Air/Fuel mixture by 2%, each increment lower will enlean the mixture by 2%.

ShiftLight: The Check Engine Light (CEL) can be programmed to light up above a set RPM. This can be used as a reminder when to shift while racing. Program Parameter 8 as follows: **(Param8 * 100) + 4800 = setpoint. Programming Parameter 8 to zero (default) disables the shiftlight feature.**

DFCO Delay: Vehicles equipped with lightweight or high-stall torque converters have insufficient engine braking at low RPMs for DFCO (Decel Fuel Cut Off) to work properly at low speeds. The result is RPM ‘dips’ while coasting. By enabling DFCO Delay, the fuel cutoff is only enabled at higher speeds, or when running in Drive instead of Overdrive, improving drivability

Fan Race Mode: In normal mode, the engine cooling fan is programmed to turn on at 175 degrees, and off at 170 degrees. When Fan Race Mode is enabled, the cooling fan turns on at 165 degrees, and off at 150. This essentially leaves the fan turned on all the time after initial warm-up.

Cruise TCC: Cruise TCC threshold can be programmed to lock at 45, 50, 55, or 60 mph. Depending on torque converter selection or vehicle configuration, higher lockup speeds can be more pleasant to drive.

DFCO Delay enabled = 8 Fan Race Mode enabled = 4
Cruise TCC: 45mph=0, 50mph=1, 55mph=2, 60mph=3 (choose)
Add the numbers and program into Parameter 9

Low Gear WOT Spark: Spark advance in first and second gears at WOT can be programmed to be higher than in 3rd and 4th. Default setting for Parameter 10 is 8 which is 2 degrees additional advance. This parameter is adjustable from zero additional degrees advance, to 4 degrees additional.

System BLM correction: Parameter 11 can be adjusted to correct for base lean or rich conditions caused by out-of-spec injectors, incorrect fuel pressure, or other anomaly that affects the Block Learns. For example, if a new set of injectors are installed and they happen to run 10% lean, all the chip BLMs will high by about 12 counts. Parameter 11 will correct 4 BLM counts for each increment. To lower the system BLM counts by 12, raise parameter 11 by 3. Raising the value of parameter 11 richens the system, causing the BLM’s to relearn to a lower value.