

# EcoTec LE5/L61 variant DBW Installation Instructions

*Thank-you for choosing Swap Specialties for your EcoTec project needs. Expect everything to be the highest of quality, craftsmanship, and detail. Every product is 100% tested and customized to fit your project needs. Please follow these simple guidelines to ensure proper installation and function of your product(s).*

## Getting to know your Powertrain Control Module (PCM, ECM, ECU, ect...)

If you received a PCM from Swap-it comes tuned and setup for the powertrain platform you are running. Some minor performance and drivability enhancements have been upgraded in the computer to give your engine the best performance and drivability. Some changes may need to be made and/or programmed if you have made engine enhancements such as:



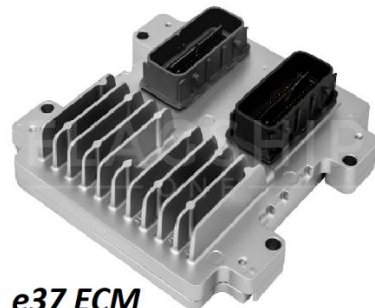
- Larger Fuel Injectors
- Aftermarket Camshafts
- Electronic Transmission Enhancements
- Turbo or Supercharger Installation
- Significant Internal Motor Modifications
- Gear Ratio and Tire Size of your project

*We can provide the changes you need with our simple and fast Mail-In program. We do recommend that any major motor modifications be tuned on a dynamometer by a professional to achieve maximum potential and operation.*

**THE GEN2 L61/LE5 VARIANT ECOTEC ENGINES CAN RUN OFF THE e67 ECM or THE e37 ECM. THE HARNESS HAS TO MATCH YOUR ECM. DO NOT PLUG A 2 PLUG e37 HARNESS INTO AN e67 ECM and VISE/VERSA.**



**e67 ECM**



**e37 ECM**

## Installation

If your PCM is a factory OEM style, it is completely weatherproof. Many popular mounting locations are on fenders, under dash, under battery trays, and on a firewall- The options are virtually endless. However, DO NOT MOUNT IN CLOSE PROXIMITY TO HEAT such as close to exhaust or heat exchanger.

**If you are running an aftermarket ECU and are unsure if your PCM is weatherproof it is best to mount it in a interior or weatherproof location. !!!**

Sometimes mounting brackets are available for your PCM but some fabrication may be needed to fit in custom areas. As will all electrical components, do not weld on, screw to, or drill any PCM. Vital interior components of the computers are sensitive to electricity and must not be tampered with.

## It's Harness Time!

Your standalone harness comes setup to run from the Right REAR of the engine above the bellhousing- unless otherwise ordered. The harness will come with a "Natural" form to fit on the motor and ensure ease of installation. Please keep adequate clearances from turbo, exhaust, and/or high temp areas to prevent any damage to the harness. Also assure any tight wires may need to be rerouted to ensure integrity.

Connectors and wires will all be labeled accordingly. Furthermore, each wire and connector is formed to specific lengths to reach components. If for any reason something looks like it wont reach, please take the time to ensure you have the correct item you are trying to connect.

Note\*- The EcoTec engines do have some variations to them in reference to sensor locations. Your harness comes setup according to the year and model you ordered it for. If something is not in the correct location please let us know- we have extensions and pigtailed available to make things connect if your engine and harness are not fitting correctly.

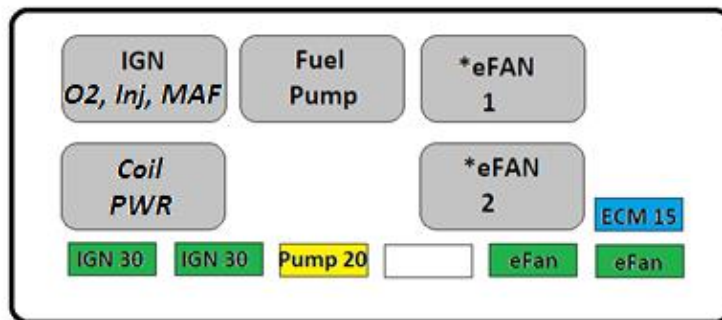
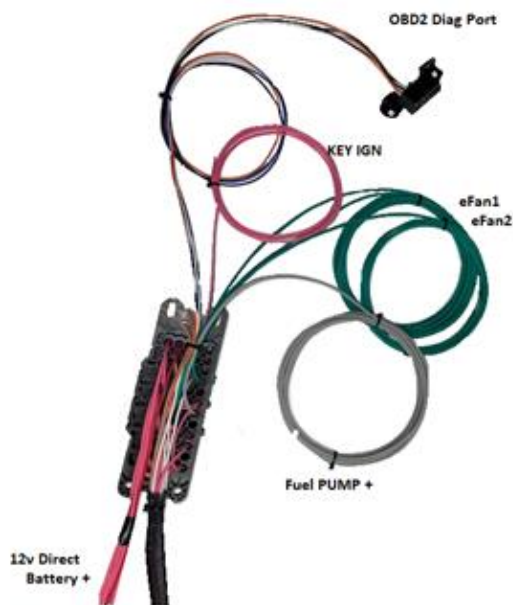
## Relay & Fuse Box

The relay and fuse box is completely weatherproof and can be mounted anywhere on the vehicle. A diagram on the inside cover shows relay and fuse location. This can be a main point of troubleshooting if problems ever arise.

ALL RELAYS COME WITH WIRE OUTPUTS. All output wires are labeled and appropriate lengths.

### **The wires provided are not long enough?**

*If you need to extend any wires please make sure the wire size is the same size or larger. DO NOT use "crimp connects" as these are not weatherproof and may malfunction as time passes. Please use a rosin-core solder if possible to connect any extending wires and use a heat shrink sleeve to shield and cover the joint.*



## Where do my wires go to?

### Battery *Do I need this? YES!*

There is a bundle of wires coming out of the back of the fusebox. A wire DIRECTLY FROM THE BATTERY needs to be run to this and terminated with a barrel crimp or solder. A minimum of 10 GA WIRE or larger should be used. This fuse box protects the entire setup so no need to fuse this connection.

DO NOT setup a disconnect to this wire. The PCM learns your driving habits, power and efficiency data, and fuel habits and it needs battery power to store it. If you kill power to the battery the computer has to learn this data from the start and repetitive on/off may ultimately harm its processor.

### 12v Key IGN *Do I need this? YES!*

This wire needs to see 12v with ignition on AND WHILE CRANKING. Also known as IGN 1, this wire tells the computer when you turn the key on and also shuts the system down.

Please attach this wire to the key switch only. The engine will not shut down until this wire loses power. If you cannot connect it directly to the key switch please refer to a wire that is not powering another vehicle component- A draw could keep this circuit hot or make it loose power while cranking.

### Fuel Pump *Do I need this? YES!*

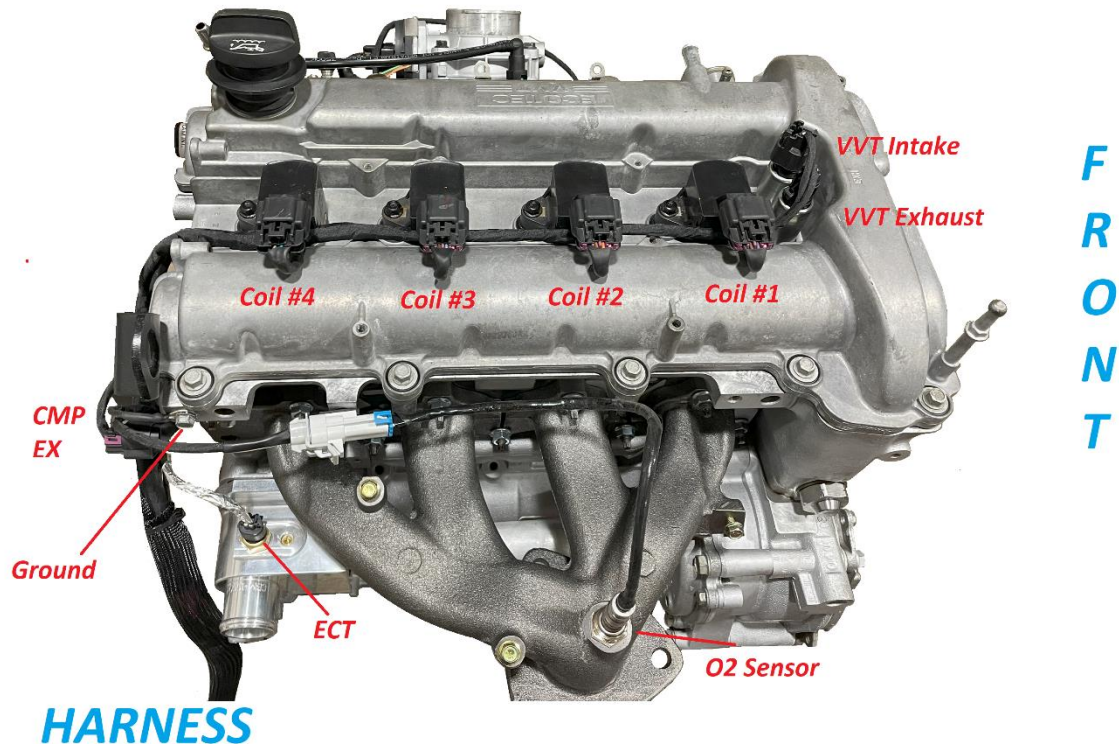
This wire is the output from your fuel pump relay. This needs to go directly to the fuel pump "+" terminal on the pump. A 12v supply with max of 15 amps will be supplied. For dual pump setups please assure a jumper wire from pumps or addition to this wire is soldered securely and shielded from weather.

### Electric Fans (optional) *Do I need this? No!*

These 2 wires are the output from the eFan relays. They provide 12v to power your cooling fans and are controlled by the ECM. If your only running 1 fan use Fan1.

If your running an aftermarket ECU (holley, MoTec, AEM, ect.....) there will be more outputs that you can designate/assign functions to-we also may have already designated some already in the wiring to accommodate your platform.

## On to the good stuff....



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### Ground Eyelet

This eyelet needs to be fastened to the back of the cylinder head or the stud on any hard steel/aluminum point on the engine. To assure it is a good ground, use a volt meter to check between it and the 12v post on the battery.

### Oxygen Sensor

OEM PCM's will use 1 Oxygen sensor. The sensor needs to be installed in the factory location if you are running the OEM manifold or in the hottest point of the collected gases if you are running a header or aftermarket manifold.

### Camshaft Position Sensor- EXHAUST

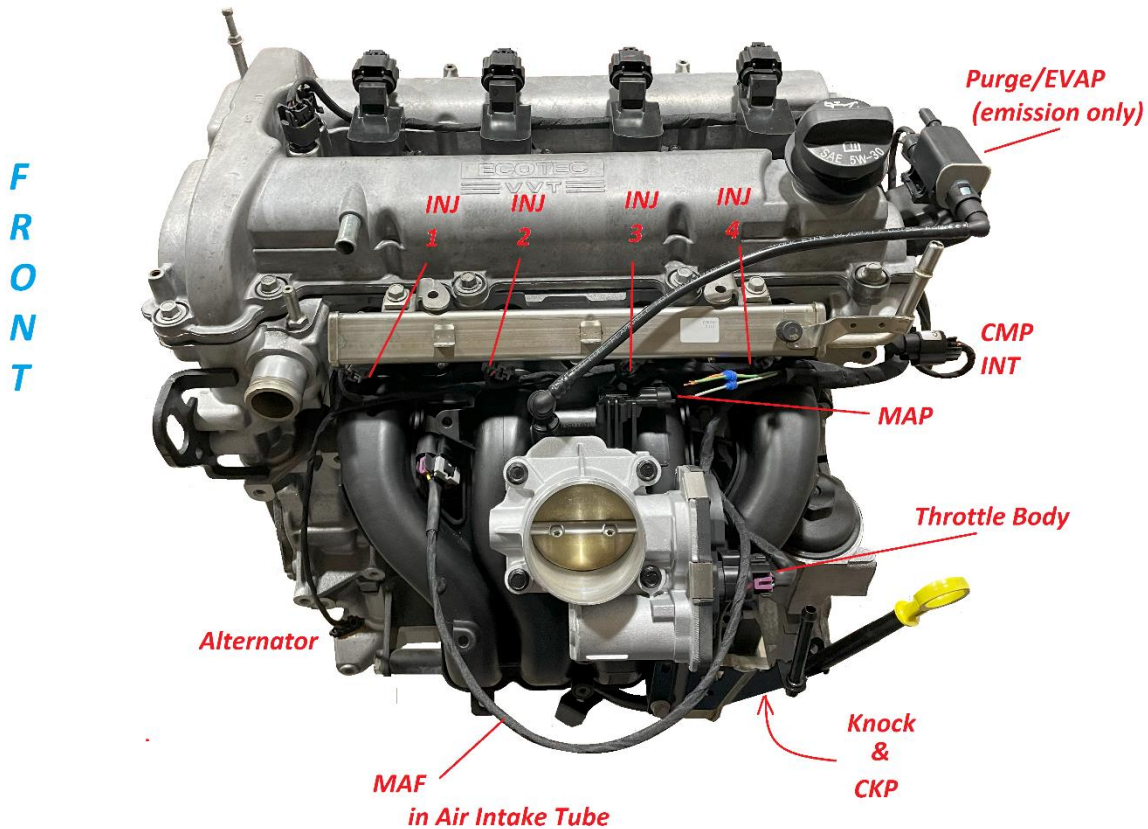
VVT engines will use 2 Camshaft Position sensors. One on the Exhaust side of the engine and the other on the intake side of the engine. Engines without VVT will only require 1 Cam sensor on the exhaust side of the engine. The sensor(s) are located at the back of the head.

### Ignition Coils 1-4

The Ecotec uses a coil on plug setup with 1 at the front and 4 at the back. You must plug in the coils to the corresponding number.

### VVT Solenoids

VVT engines will have 2 solenoids at the front of the engine topside. One is labeled VVT EX for exhaust side of the engine and the other is VVT INT for the intake side of the engine. The connectors on the harness have specific keyway clips so they will not interchange or plug into the incorrect solenoid.



**Camshaft Position Sensor INT (VVT engine only)**

The CMP INT is located on the back of the head intake side. If you're not running a VVT engine you will not have this sensor.

**Crank Sensor (CKP) and Knock Sensor**

The crank position sensor (CKP) is the sensor that the PCM uses with the Cam position sensor to fire injectors and adjust timing control. The sensor is a 3 pin plug located under the intake towards the back and bottom side of the block.

**Knock/Detonation Sensor(s)**

The Knock sensor is located slightly above the Crank Position Sensor and usually has a small harness connected to it.

**Fuel Injectors**

On to these babies..... Your harness will be setup with factory injector connectors unless otherwise ordered. These 2 pin connectors should be set up to reach 1 and only 1 injector, they fire in sequential order and cannot be swapped around. 1 in the front of the engine and 4 in the back.

**I'm not running stock injectors?**

*Please let us know, do not cut into the harness yourself as it will void all warranties. The PCM will also have to be tuned to run a different size injector. If you have a stock motor we recommend you do not change the size (they are rated by lbs./flow). Consult a tuner or us for recommendations and advise on injector sizing higher HP motors.*

## **MAP Sensor**

The Manifold Absolute Pressure Sensor (MAP) relays the negative or positive manifold pressure to the computer. The computer then uses it to judge engine loading and adjust fuel and spark control. The sensor is a 3 pin connector located on the intake manifold between injector 2 and 3.

<b>My MAP is different than the harness Plug</b>
<i>GM changed the MAP sensor styles throughout the years. More than likely you have a different year engine. You can switch to a newer/older MAP to match the harness or get a pigtail to change it. However a tune change will usually also be needed.</i>
<b>Im running a Supercharger or Turbo</b>
The MAP location will need to be moved to the SC location with an adapter, unless we already set your harness up for the Supercharger when you ordered. For a turbo make sure your MAP is a 3 bar and usually we ask that you run a TMAP with intake air temp inside the MAP. (4 pins)

## **Throttle Body**

Depending on the year of the engine the Throttle Body may be 6 or 8 pin. 8 pin were earlier and 6 pin were later. An adapter can be used if yours is of the wrong year or you ordered wrong. The accelerator pedal will plug into your pedal to operate the TB.

## **Mass Airflow Sensor MAF**

The MAF sensor should be setup in a straight portion of the air intake tube away from any bends or the throttle body itself. You want a solid sample of air and any bends will distort this reading. **PLEASE ASSURE YOUR MAF IS INSTALLED IN THE CORRECT ORIENTATION ACCORDING TO THE ARROW ON THE SENSOR.**

## **Alternator/Generator**

Factory computers will control the mopar alternator. Aftermarket ECUs usually do not have this option and it suggested that you run a 1 wire alternator or run a key power with a resistor to the correct voltage to control. If you need help with this please let us know.

**!!You will need to run a heavy battery cable from alternator charging stud to the battery or starter!!**

<b>Setting Up Your Engine Oil Pressure Gauge</b>
DO NOT TIE A GUAGE WIRE INTO THIS PLUG OR HANRESS!!! It will create an incorrect reading to the ECM and running troubles will surely be the result. If you want to run a engine oil pressure gauge you can "T" into the port on the engine and add a pressure sensor for your gauge. Again, there are also CANBUS or digital dashes that can read info directly from the ECU OBD2 port.

## EXTRAS

### Accelerator Pedal

The accelerator pedal should be mounted in a location that is comfortable and clear of any obstruction. The EcoTec computers need to have the correct pedal in order to operate correctly. When you order we ask for the type of pedal you have (or car its from) so we can match that up correctly for you. Fabrication may be needed to accomplish a safe, clean, and comfortable pedal mount.

#### How do I Setup the Starter

For safety reasons we leave that up to you. You can run the original vehicle start wire to the EcoTec starter or run a new wire direct from key switch, push button, or output module. No specific ECU control is needed. We do recommend running a neutral safety switch so that it will not start in gear.

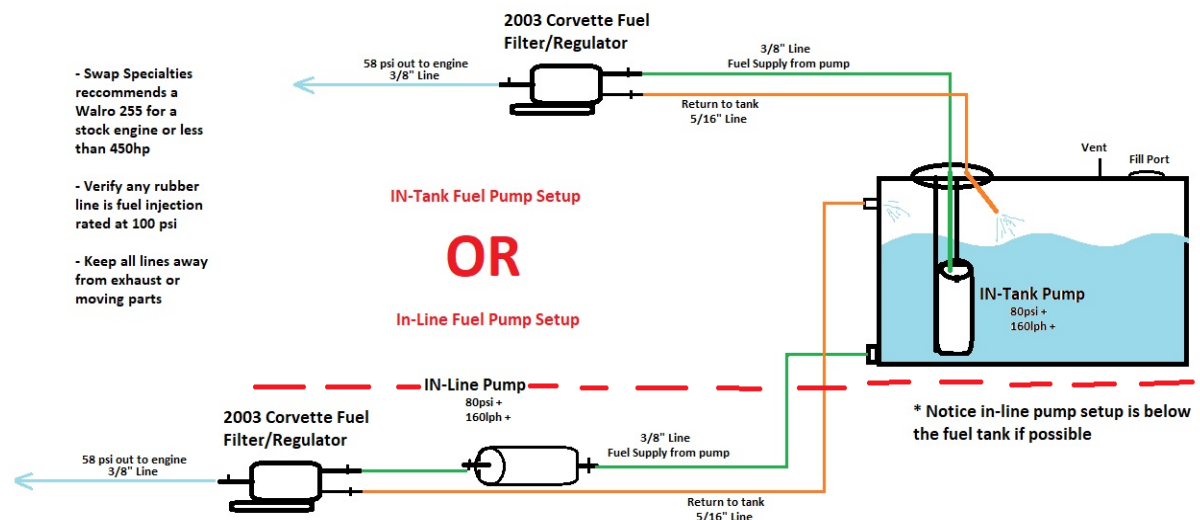
#### Setting Up Gauges

DO NOT TIE A GAUGE WIRE INTO THE WIRING HANRESS!!! It will create an incorrect reading to the ECM and running troubles will surely be the result. If you want to run gauge wiring and sensors you will need to run directly to a different sensor than the computer is reading from. There are also CANBUS or digital dashes that can read info directly from the ECU OBD2 port.

#### How do I Setup My Fuel System

The EcoTec needs a minimum of a 5/16" Fuel Feed Line and a regulator setup for 60 psi.

#### Fuel System Setup



- Swap Specialties recommends a Walbro 255 for a stock engine or less than 450hp

- Verify any rubber line is fuel injection rated at 100 psi

- Keep all lines away from exhaust or moving parts

## **Grounds Grounds Grounds Grounds GROUNDS!**

PLEASE make sure you have good ground from engine block to frame, Block to battery, and frame to cab. You can spend a lot of time and money chasing a grounding issue. To verify use a volt meter or ohm meter and go directly from the battery positive and negative to make sure your grounds are clean, correct, and sufficient.

## **Transmission**

If you are running an electric transmission your harness will come with the correct plugs to operate it- THESE HAVE A SEPARATE TCM TO RUN THE TRANSMISSION. The computer is tuned with the gear ratio and tire size you gave us on the order. Simply plug in the appropriate connections and its time to turn the tires.

If you are running a standalone/Non electronic/Manual transmission, no need to read any further, your all set!

## **Aftermarket ECU Extra Outputs and Inputs**

Depending on the ECU platform your harness will have an extra plug for outputs and inputs that are available on the ECM platform. You will get a specific sheet with your harness if this is the case showing what the pinout and options are.

### **Questions, Comments, Gripes, Moans, or Frustrations.....**

*Please email us, we would love to help out with any questions you have. You can also call us at anytime, we are here to help and make your EcoTec swap the best investment of your project.*

[Info@SwapSpecialties.com](mailto:Info@SwapSpecialties.com)

*(989-720-7927) call or text*

*Phones 9am-4:30pm EST*

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*Email 24/7*





