ECOTEC 4CYL INSTALLATION INSTRUCTIONS

Congratulations on the purchase of your "Affordable Fuel Injection" EcoTec harness. AFI is confident that this purchase will give you the performance and driveability that you deserve from your vehicle. The instructions which follow are intended to give you the most information possible to install your EcoTec system. If you do not understand any part of the instructions, need clarification, or simply need more information, please e-mail us at: Jeremy@affordable-fuel-injection.com. Please read through the instructions completely before beginning your installation. Many questions that you may have are covered within the following pages.

Verify that all of the components are included in your shipment.

1. Wiring Harness
2. Fuse box
3. Gas pedal extension harness
4. Check engine light
5. Optional 02 and sensor package
6. Optional ECU

NOTE: **A PINK 18 ga. WIRE (Labeled IGN 12v) MUST BE HOOKED UP CORRECTLY FOR THE SYSTEM TO OPERATE PROPERLY. PLEASE READ THE INSTRUCTIONS CAREFULLY AND THOROUGHLY.**

ECM the ECM is the central unit of the fuel injection system. This unit provides the signals that trigger the injectors and deliver the proper spark for the ignition. The ECM should be mounted so that it does not move around in the vehicle. It can be mounted with brackets, bolt, etc.

WIRING HARNESS

The wiring harness included with your order has been specifically built for your unique application. This harness only includes the connectors and leads that are required to run your particular engine based on your specific order specifications. Each connector will be marked with a label to the correct sensor that it is to be connected too. The wiring harness is fabricated to allow the proper sensor to be hooked up to the respective connector. The "keying" of the connector will not allow for an improper connection.

BATTERY: There is a silver nut on the bottom of the fuse box which is the 12v positive feed for the system and is to be connected to the battery "+".; a direct connection to the battery is the most desirable***. It is important that these wires are connected to the indicated source or your fuel injection system will not operate properly. It is very important that the ECM and components be supplied with proper voltage all the time. A properly operational alternator supplying 13 volts or higher when running is required.***

KEY ON IGNITION: An 18 ga. "Pink" wire labeled 12v Ignition provides the key-on signal to the ECM. This wire is to be attached to an Ignition 1 source. Ignition 1 is 12 volts while the key is in the on or the crank position. Improper connection of this wire will not allow the engine to start as it will turn off ignition in the crank position.

ENGINE GROUND: Two eye terminals with 1-4 black wires and labeled "engine ground" needs to be properly attached to the engine block. It is very critical that a proper ground is used for this input to the ECM and that it is mounted to the engine itself. Many people attach this to one of the bolts on the engine block or cylinder head. ***It is most critical that this is a connection going to a bare grounding surface and not a painted surface. It is a good idea to run an extra ground wire from the negative (-) on the battery to the ground wire coming from the ECM (from the wire harness Engine ground) Make sure that the ground from the engine to the body of the vehicle is intact. An improper ground will not allow the system to operate properly.***

CHECK ENGINE LIGHT: An orange wire labeled "Check Engine Light" is the ground circuit for the light. This light can be mounted in the dash, use an empty "idiot light" socket in the instrument panel, or mounted in a small bracket under the dash. It should be mounted in an area noticeable in case of any malfunctions. ***The wire from the ECM is the ground for the light.*** When a fault exists, or the engine is not running with the key on, the light is illuminated. The other side of the light requires a 12v ignition feed that you will need to supply from the vehicles fuse box, or other source.

FUEL PUMP CONNECTION: A heavier gauge (usually 12 or 14 ga.) pink wire is supplied originating from the fuse block to power the fuel pump. This wire attaches to the positive side of the fuel pump. Verify positive and negative of the fuel pump and connect accordingly. In many cases a ground wire is required for the ground side of the fuel pump and requires a clean chassis ground. If in doubt, ground directly to the battery or proper path directly to the battery negative.

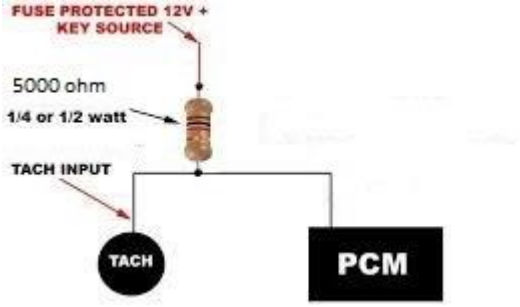
In some cases, it may be difficult to determine positive and negative on the fuel pump. Typically, the larger terminal on the pump is the negative or ground side of the pump. If the pump runs but does not pump fuel after installation, check to ensure that the polarity is correct on the pump.

FAN CONTROL(option): A heavy gauge red wire originating from the fuse block powers the electric fans from the ECM. These are temperature controlled so it will not come on until the desired temperature is reached. Fan relays are required in the fuse block for the fan(s) to work. The operating temperature of the fan can be custom calibrated from AFI. The really is rated for 40 amps. For fans that pull more then this. We can upgrade the setup with a dual relay setup.

TACH OUTPUT: A grey wire labeled tach is supplied and can be used with a tachometer. In some cases, it is necessary to install a 5K ohm resistor to operate the tach using stock gauge clusters. A 5K resistor is included with your harness in case it is required. See diagram below in order to use this process if needed. This only applies to harness made prior to 1/2021.

TACH DIAGRAM

May require addtional parts if using stock gauge clusters.



DIAGNOSTICS: An OBD2 connector is another extension of the harness mounted to vehicle. This connector is a two-row 16 pin connector with mounting tabs on it. This is usually mounted under the dash, and available for diagnostics and scan tool hook up. Using a GM or any OBDII scan tool, you can monitor the operational sensors and retrieve trouble codes. The scan tool may need to be programmed for the vehicle make that your EcoTec engine was transplanted from. An OBDII scan tool is required when seeking any tech support for your installation or troubleshooting.

OBD2: the obd2 diagnostics port can be used to run gauges through a obd2 dongle adapter to a app on your tablet or phone.

FUEL PUMP An external fuel pump may be used with your system.

This pump delivers a constant high pressure to the fuel rail where it needs to be regulated to 58psi. This pump should be mounted to the frame or body of your vehicle in an area that will be protected from the elements as best as possible. The fuel pump should be mounted below the fuel tank fuel level for the pump to work properly. If necessary, put a cover over it to keep the environment away from the pump. Many installers use the Integrated filter/regulator which GM produced for filtering and regulation. If you are not using this, a standard EFI fuel filter which is 10 microns or less of filtration is required after the pump. Some manuals suggest the installation of a general 100 micron filter **PRIOR** to the fuel pump. Premature failure of the pump and injectors can be the result of improper fuel filter installation.

Frame mounted fuel pumps are to be kept out of the heat of the engine compartment and/or any direct heat. Heat over a period of time will cause the fuel pump to not pump fuel to the engine.

Fuel pumps which cannot be mounted lower or even with the tank in some cases will over work and as such, overheat the fuel pump and stop working until cooled down. Prolonged operation like this will deteriorate the pump and cause premature failure of the pump. In many of these cases it is best to use a separate "boost" pump or fuel module to maintain a positive pressure on the inlet of the pump and allow it to not overheat.

COMMON PARTS for the 2.4

If an AFI sensor package was not purchased, these part numbers may help you with your project. Not all parts are include in sensor package. Most replacement parts can be found under a 2007 chevy cobalt, at your favorite parts warehouse.

Coolant temp sensor# 19236568
Oxygen sensor# 12578576
Crank position sensor# 12789959
Cam position sensor# 12674704 or 12584079
Knock sensor# 12567711
Air temp sensor# 12160244 (if purchased as speed density)
Mas air flow # 15865791 (tune must match sensor)
Belt # k050340 (for a/c deleted setups)
Gas pedal # 22706224 (weather resistant) other pedals may work aswell
Map sensor# 12615136

Troubleshooting your Fuel Injection System

Most of the problems encountered while installing your fuel injection system or after a time of operation are very simple. If your check engine light is on you more than likely have a hard fault meaning something is grounded out, unplugged or has gone bad.

If you have installed a Fuel Injection system in your vehicle and are having some initial issues here is a quick checklist to work from to get you started.

1. Check to make sure your check engine light is not on, or that it is on with the key on but the engine is not running.
2. Make sure that the red battery wire is connected to a battery source (It is highly recommended that this wire is connected directly to the battery) and the pink wire is connected to an ignition 1 source. If your ignition wire is not connected to an ignition 1 source your ECM will not be powered while cranking the engine.

Pink Ignition wire MUST be connected to 12 volt switched ignition that receives power during crank and key on.

3. Check that the ground wire is securely fastened to the block and that the interface between the block and the terminal are clean.

4. Crank no start. Refer to tuning tips section and # 2 above.
5. Check your fuel pressure to insure that you are getting the proper pressure to the system.

Fuel Pressure is critical for proper operation. Fuel tank must be free from debris and fuel pressure needs to be constant and consistent.

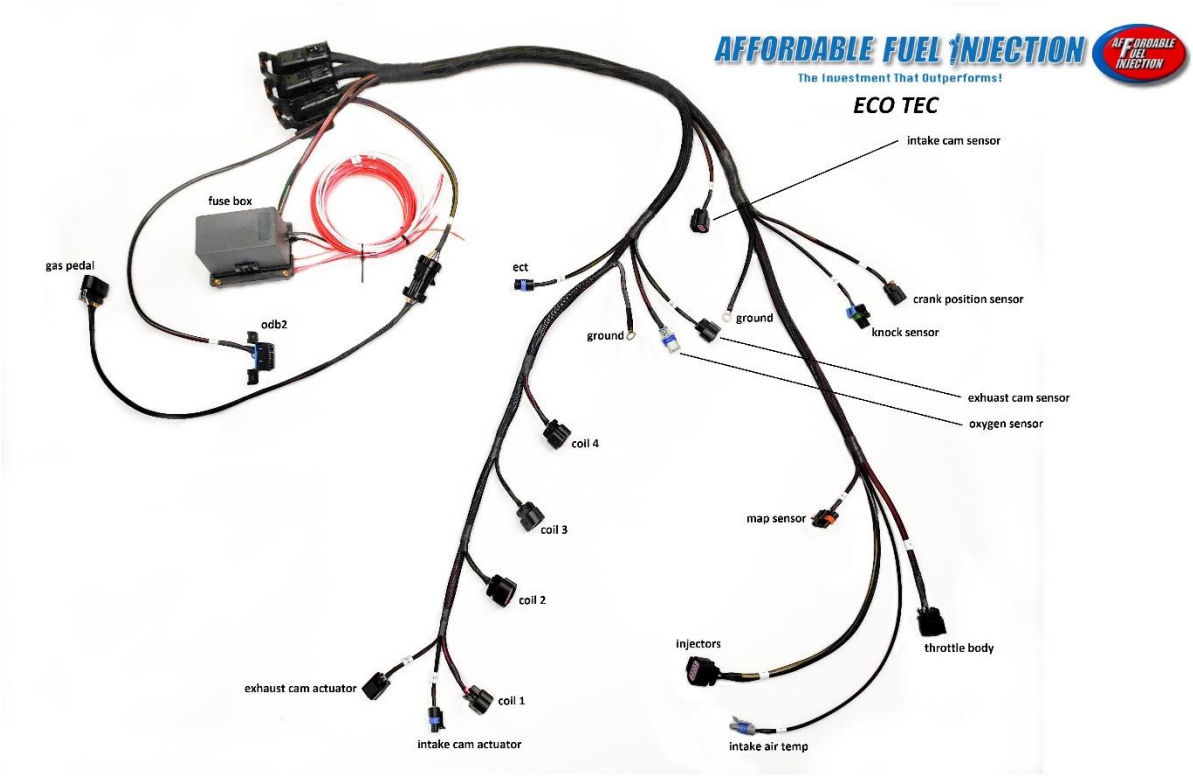
99% of all issues are usually taken care of with one or more of these 5 steps of diagnosis.

TUNING TIPS for those who purchased a harness without an ecu

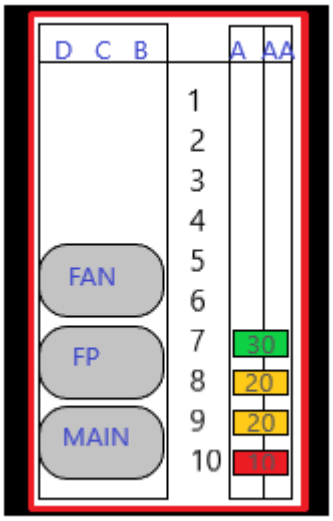
After installing our harness onto your project. Power up the ecu and hook up your Favorite tuning tool. Excludes gms tech 2 scanners.

After deleting vats and preforming a complete write, you should be all set to start your project.

Harness may differ from one pictured.



Fuse box diagram for 2.2 dbc,2.2 and 2.4 ecotecs



FRONT

The fuses from top to bottom are as fallowed
30 amp is for the fans
20 amp is for the fuel pump
20 amp is for the main ecu ignition power
10 amp is for the keep alive memory