



## GM LS1/LSX/Vortec fuel Injection Harness installation instructions

*Thank you for your purchase from Larry's Electric. To help aid in a successful installation, I have included these instructions. Please take the time to familiarize your self with all the components and instructions before installing. If these instructions are not followed very carefully it may result in severe damage or harm to your self and the vehicle. In addition to these instructions you must have at least a general idea of how fuel injection works and be familiar with all of its components.*

### Things that you need to start.

- GM LS series engine and transmission, with all the correct sensors.
- GM PCM for the correct year engine/transmission you are working with.
- Your PCM reprogrammed or "Flashed" with at least the correct tire size, gear ratio, emissions removed and vats removed. Other changes are up to you.
- 2 Heated O2 sensors (oxygen sensor) mounted in the exhaust with in 18 inches of the exhaust port. Vortec use (Delco 213-1702), LS1 use (Delco AFS98)
- Electric fuel pump capable of delivering 60 PSI under all driving conditions and a fuel filter designed for that amount of pressure preferably with a built in regulator since the LS1 only has one fuel line..
- 3/8 or larger fuel supply line from the tank (Fuel injection line 90psi min only), and a 5/16 or larger return line to the tank. The return line must end at least 1/2 in from the bottom of the fuel tank to prevent vapor and static electricity build up.
- Injectors for your size engine. If you don't have them already
- Retain the coil harness that attaches to all 8 coils.

In addition to standard mechanics tools you need a 12 volt test light or meter and a digital non-loading meter.

### INSTALLATION:

**!!!IMPORTANT!!!**

**Do not force any connector into place. Take your time.**

To begin, decide on a mounting place for your pcm. It is normally mounted in the engine bay but can be mounted inside, but this requires cutting a large hole in the fire wall.

If you decide to install the pcm inside the vehicle start by working from inside the vehicle, start feeding the harness through the fire wall into the engine compartment.

Route both banks of the injector wires along the correct side of the intake manifold. Injector banks are as follows right side will start with Green/black and a pink on #2

cylinder and the left bank will start with a black and a pink on injector #1. The rest of the injectors fall out in the proper order just plug in to the corresponding injector.

Connect the coil harness to your existing coil wiring. If you have the injectors on the correct sides then the coil wiring will be correct also

Connect the coolant temp sensor plug toward the front of the engine cylinder head on the driver side or left side of engine. (yellow and black wires, black connector).

Connect the black wire to a clean solid bolt on the rear of the head (Ground). **DO NOT GROUND TO VALVE COVER**, it is insulated by o-rings

Connect the throttle position sensor (black, blue, and grey wires) to the throttle position sensor on the side of the throttle body. Connect the idle air motor (green/white, green/black, blue/white, blue/black wires) to the bottom of the throttle body near throttle position sensor. (**If using Drive By wire disregard**)

Drive by wire harnesses have two possible combinations of connections for the throttle body, vortec style harness will have one large connector on the right side that connects to the throttle body others will have two connections one for the TPS (six wires) and one for the throttle blade (two wires). Some drive by wire setups will require the use of a TAC module and a connecting harness to the pedal. (not included)

Install the Oxygen sensors and connect the o2 sensor wires to the correct side (purple, tan, black/white, pink wires (**Right side**) and purple/white, tan/white, black/white, pink wires (**Left Side**))

Connect the MAP sensor located on the rear of the intake (grey connector, green, black and grey wires).

Connect Knock sensor wires. Connector located at rear of intake. Light blue and Dark blue wires.

Connect the camshaft sensor wire to the sensor located in the rear of the intake. (brown/white, pink/black, and red wires)

Connect the Crank sensor wires to the connector located behind the starter (blue/white, yellow/black, green wires)

Connect the large orange wire to the starter **battery hot** terminal. Not the "S" terminal.

Connect the Intake air temp sensor wires, tan, and black with grey connector. (**Disregard if using 5 Wire MASS AIR SENSOR**)

Connect the mass air sensor to the 3 pin connector with pink, black/white, and yellow wires. If using 5 Wire mass air the connector will be a large 5 pin connector with pink, black/white, black, tan, and yellow. (The 5 wire mass air includes the IAT sensor in it.)

Connect the transmission wires to there correct location and the speed sensor located in the tail housing of the tranny. (4L80E requires input speed sensor located near the front of the transmission, connect the black connector with the red/black and Blue/white wires to it)

Mount PCM, fuse block fuel pump relay, and power relay in a cool dry place.

Connect the large gang-plugs to the ECM, making sure you do not force them into place and that they are correctly positioned.

Connect the 14 gauge pink wire to an ignition switched on **(hot in start and run)**.

Connect 14 gauge grey wire (fuel pump inscribed on it) to the fuel pump at the + terminal of the pump.

Connect “Check Engine Light” (light brown wire) to negative terminal of light fixture and a 12 volt Key on power source to the positive side of light. Use **Low Wattage** (1/4 or less) bulb.

Connect the loose light blue/white or light blue wire, at the ECM end of the harness, to a normally closed brake switch (in other words a switch that has key on 12 volts on it all the time except when the brake pedal is pressed.)

Connect the green/white wire to your speedometer (optional check with your speedo manufacturer.) Loose white wire is a tach output for aftermarket tach setups

Mount the ALDL connector out of sight, but easily accessible location for scanner connection later. (16 way black connector with an orange, 2 black/white, and purple wires)

Bleed the fuel lines by cycling the ignition on, wait for the pump to run and shut off, then turn the key off, and repeat several times.

**\*\*\*NOTE\*\*\***

If your injectors have set along time the gas in them will gum them up and they will not work. To make sure that they are in working order before plugging in the injectors take two pieces of scrap wire and put 12 volts to one side of the injector terminal and ground to the other. The injector should make a click sound. If not remove them and have them cleaned or replace them.

Start and run engine.

If you have any questions/problems or require technical assistance, please call Larry's Electric @ 618-282-2852 Monday – Friday 8 – 4 pm CST.

*If for any reason that you are not satisfied with this product within 10 days of purchase please call us and we will refund or exchange it, as long as the product is not altered in any way shape or form and is returned in its original box with all pieces. Shipping is a non refundable service, we are not responsible for shipping cost or transit times.*

*This product is not intended for sale or use on any emissions controlled vehicle which will ever be operated on a public thoroughfare.*

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