

Measuring Fuel Injector Resistance with the Plenum in Place

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Revision 2

The LT5 is one of the most handsomely packaged engines that GM has ever produced. Esthetics often reign supreme over serviceability. In many situations using the right approach can enhance serviceability. Electrical resistance testing of the fuel injectors is one of them. While the connectors for the fuel injectors are under the plenum, alternate connection points are available. They can be accessed at the ECM and at the secondary relay module connectors.

In my experience, resistance testing of the fuel injectors has been an important diagnostic tool. I have found that most of the time, shorted fuel injectors are the cause of misfire with '90 - '92 LT5's. The early fuel injectors are susceptible to fuel contamination in the solenoid coils. I have also observed that low mileage engines are more likely to exhibit the problem. Stagnant fuel seems to increase the likelihood of the problem. When the '90 - '92 injectors were designed it was not known that ethanol would be utilized as an additive in fuel. Today ethanol is a popular fuel additive. Ethanol causes the solenoid coil shorting problem. Rochester Products improved the '93 - '95 fuel injectors for ethanol compatibility. I have never encountered a shorted fuel injector on a '93 and up engine.

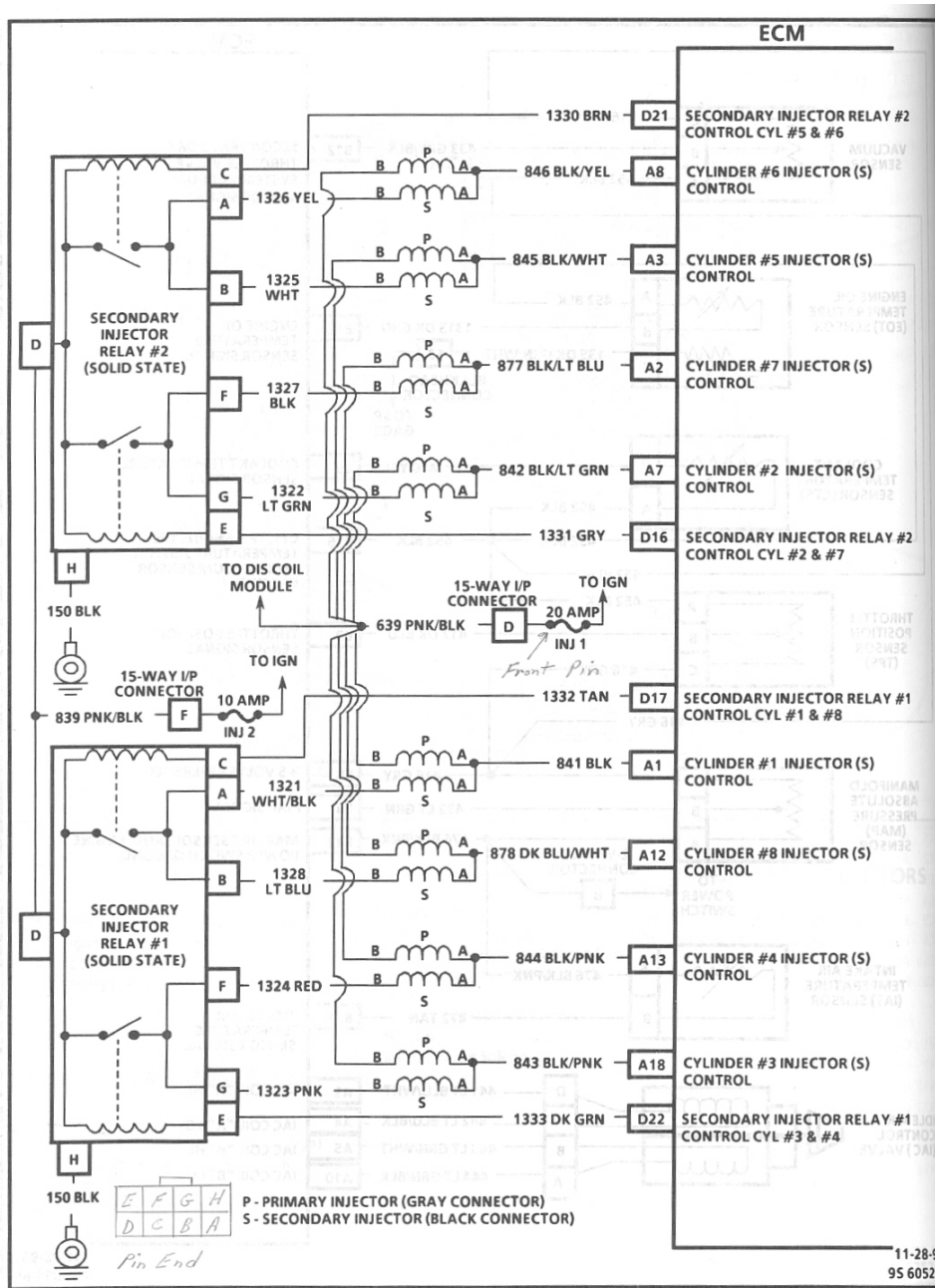
The primary fuel injectors can be accessed between the "A" connector of the ECM and the Inj 1 fuse. Before measuring the resistance, remove the power to the ECM. This can be done without removing the battery cable. On '90 to '92 Corvettes there is a 12 gage red wire that comes off of the positive battery cable and goes to a 16 gage orange wire with a fusible link. On this wire, there is a single wire connector. On some cars the connector is buried under other wires and hoses. Locating the connector pays off because of the convenience of not having to remove the battery cable. In '93, Maxi Fuses were introduced. The ECM's power can be disconnected by removing the lower most fuse in the fuse block located behind the battery.

The primary fuel injectors have a common connection at the Inj 1 fuse. Resistance measurements can be made between the fuse connector and the individual connections on ECM connector A. The Inj 1 fuse is located in the panel next to the right door. Remove the fuse. The common connection pin is on the side of the fuse connector that is closest to the front of the car, the forward pin. ECM connector A is the connector that is furthest from the centerline of the car; it is gray or yellow in color. The ECM connectors are embossed with the pin location numbers.

The secondary fuel injector resistance is measured between the ECM A connector and the secondary relay connectors. Remove the secondary relay connectors for easy access to the pins.

The resistance of the fuel injectors is 12.1 ohms +/- .1 ohm at 70 degrees F. Resistance measurements of less than 12 ohms, indicate that the solenoid coil has been compromised. There seems to be little effect on the engine as the resistance goes down to about 10 ohms. Below 10 ohms, the idle smoothness begins to be affected. Hydrocarbon emissions will go up, affecting emissions test results. Power output at wide open throttle will be affected as the resistance goes below about 6 ohms.

Solenoid coils are more likely to exhibit shorts when they are hot. It is best to perform resistance checks on a hot engine, the hotter the better. When the engine is shutdown after about 30 minutes of operation, the fuel injector resistance should be about 13.5 ohms. Since the resistance varies with temperature, and the engine's heat soak temperature not easy to control, look for consistent resistance measurements +/- .1 ohm across the group.



Notes about the diagram:

- This diagram is from the '91 service manual. It is not practical to show each of the six model year diagrams in this article. There are variations in the diagram from year to year, however, the connector pin numbers for the connections to the fuel injectors and secondary relays are the same for all LT5's.
- The penciled in connector pin diagram is for a secondary relay. It shows the pin end.
- Secondary relay locations. On '90 - '92 engines, relay module #1 is on the left wheelhouse. Relay module #2 is behind the battery. On '93 - '95 engines, both relays are on the right wheelhouse. Relay #1 is in the location closest to the centerline of the car.
- '93 - '95 engines use a 10 ampere fuse for the Inj 1 circuit.