

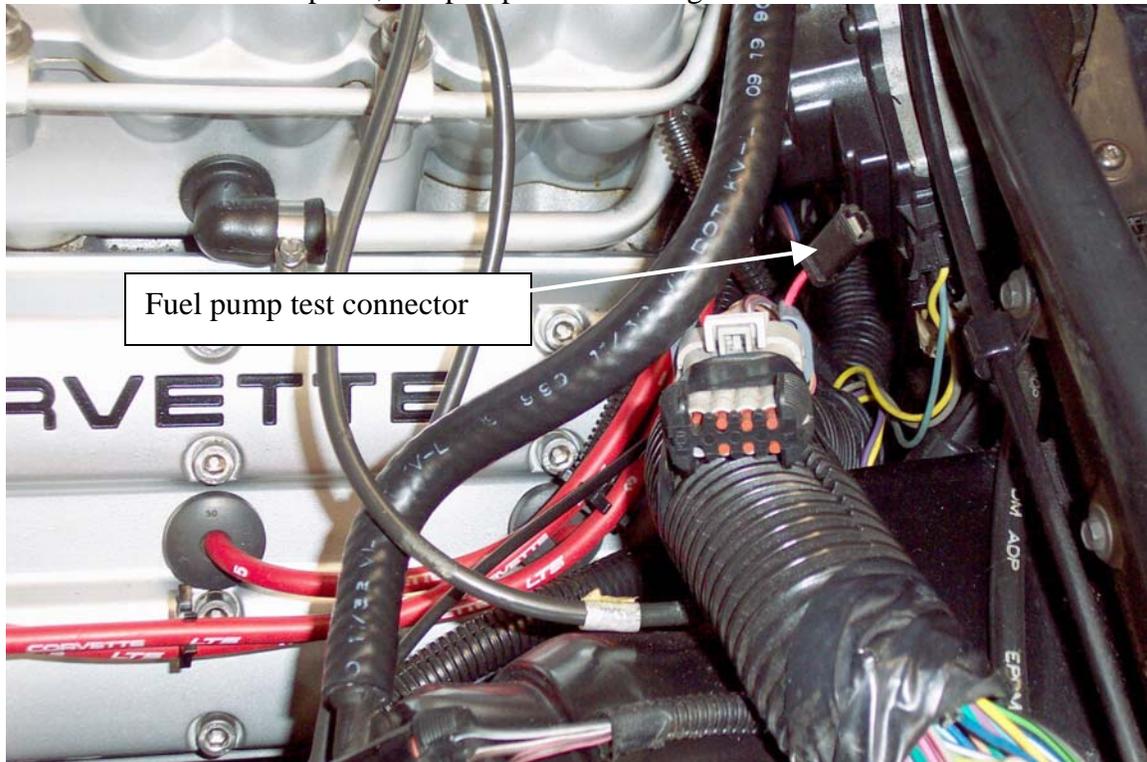
ZR-1 Specific Trouble Shooting Tips

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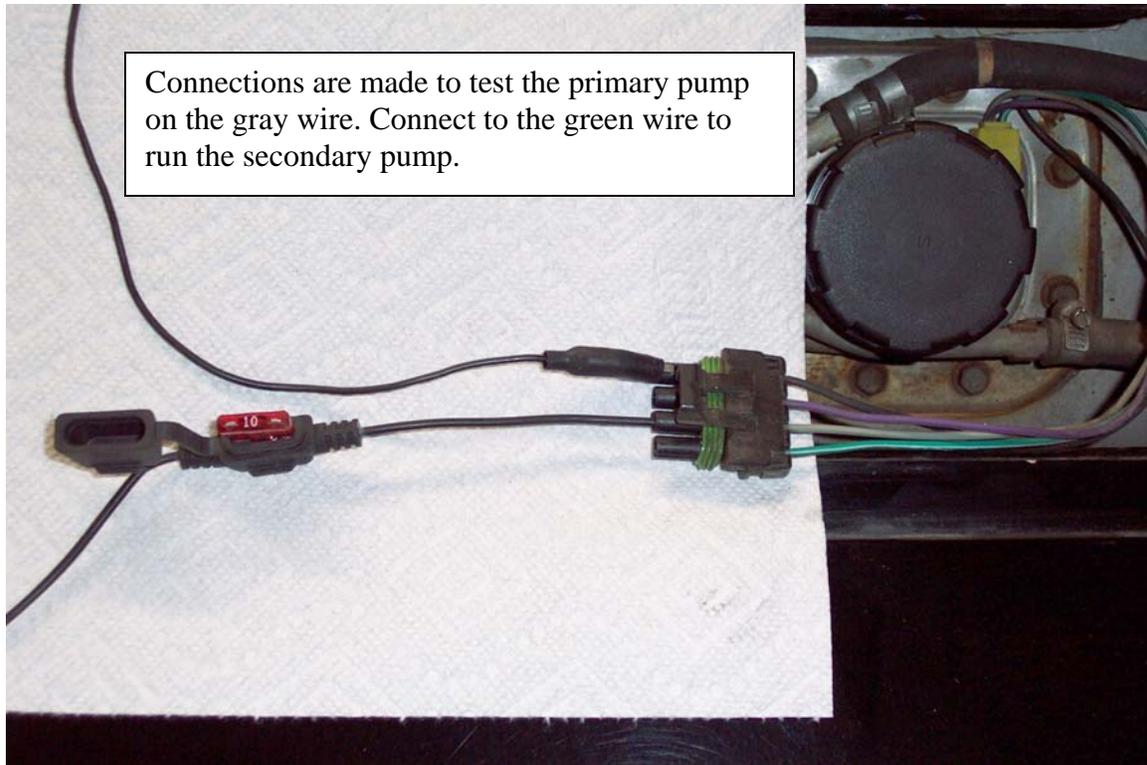
These are service procedures that are specific to the configuration of the LT5 engine. This information is not available from any GM source. These procedure are intended to save time and get positive results.

Are the fuel pumps working?

The ZR-1 has two fuel pumps. If the secondary pump does not operate the engine will run lean for fuel over 5000 rpm and a 'Check Engine' error code 55 will occur if the condition persists for two seconds. On cars built after about 1990 VIN 400 there is a fuel pump test connector near the wiper motor. It has one red wire. When the engine is not running, apply 12 volts to the connector. The pumps normally draw 10 amperes. If the current is about five amperes, one pump is not running.



On the early '90 cars the connector is located next to the right side of the battery. On some cars it is buried on the wiring and not accessible. An alternative way to test the pumps is to remove the rubber fuel filler cover and disconnect the fuel sender electrical connector. Apply 12 volts on a test lead with a 10 ampere fuse to the gray wire to run the primary pump. The black wire is ground. You should hear the pump run and the current draw should be five amperes. Then apply 12 volts to the green wire for the secondary pump. Listen to it run and measure the current draw at five amperes.

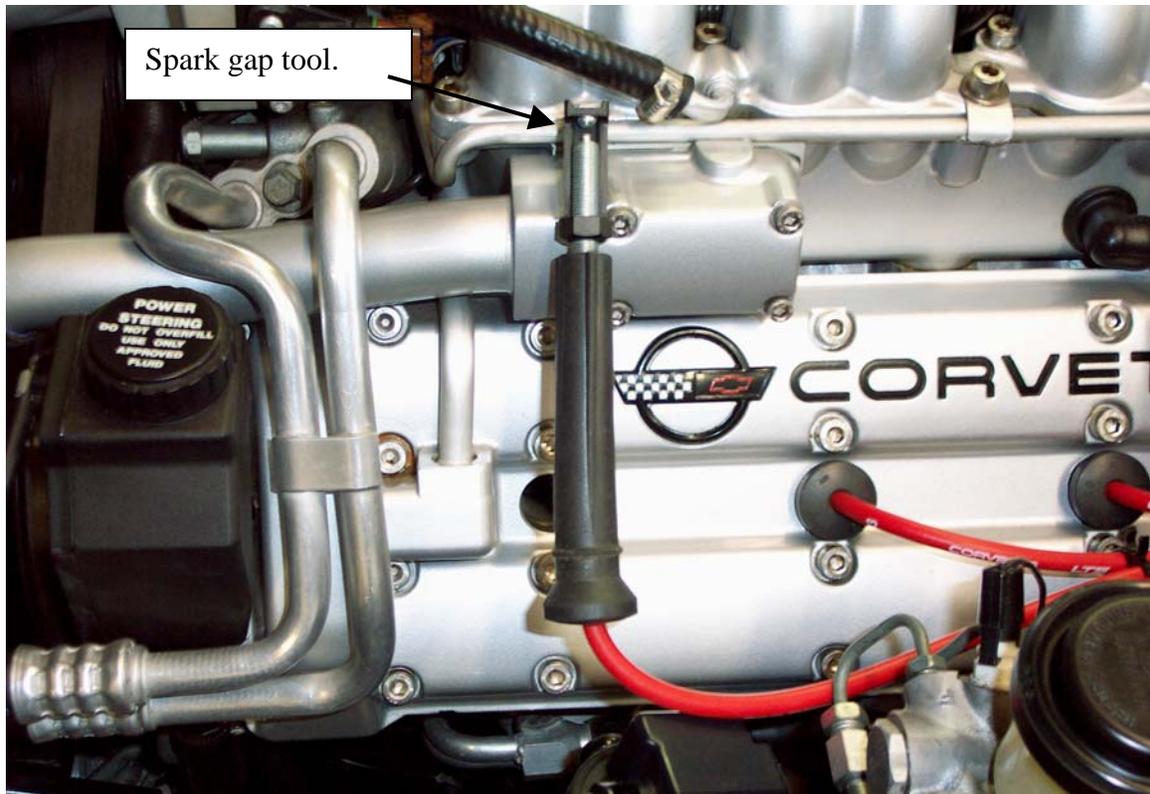


Is the fuel filter clogged?

Measure the fuel pressure at the fuel rail. It should be 43 psi at idle and 51 psi at full throttle over 6000 rpm. The readings are measured \pm 2 psi. An R-12 AC gauge hose fits the service fitting on the fuel rail. This is an easy to find long fuel pressure gauge hose. Tape the gauge to the windshield and have a co-pilot read the pressure while driving on an empty road.

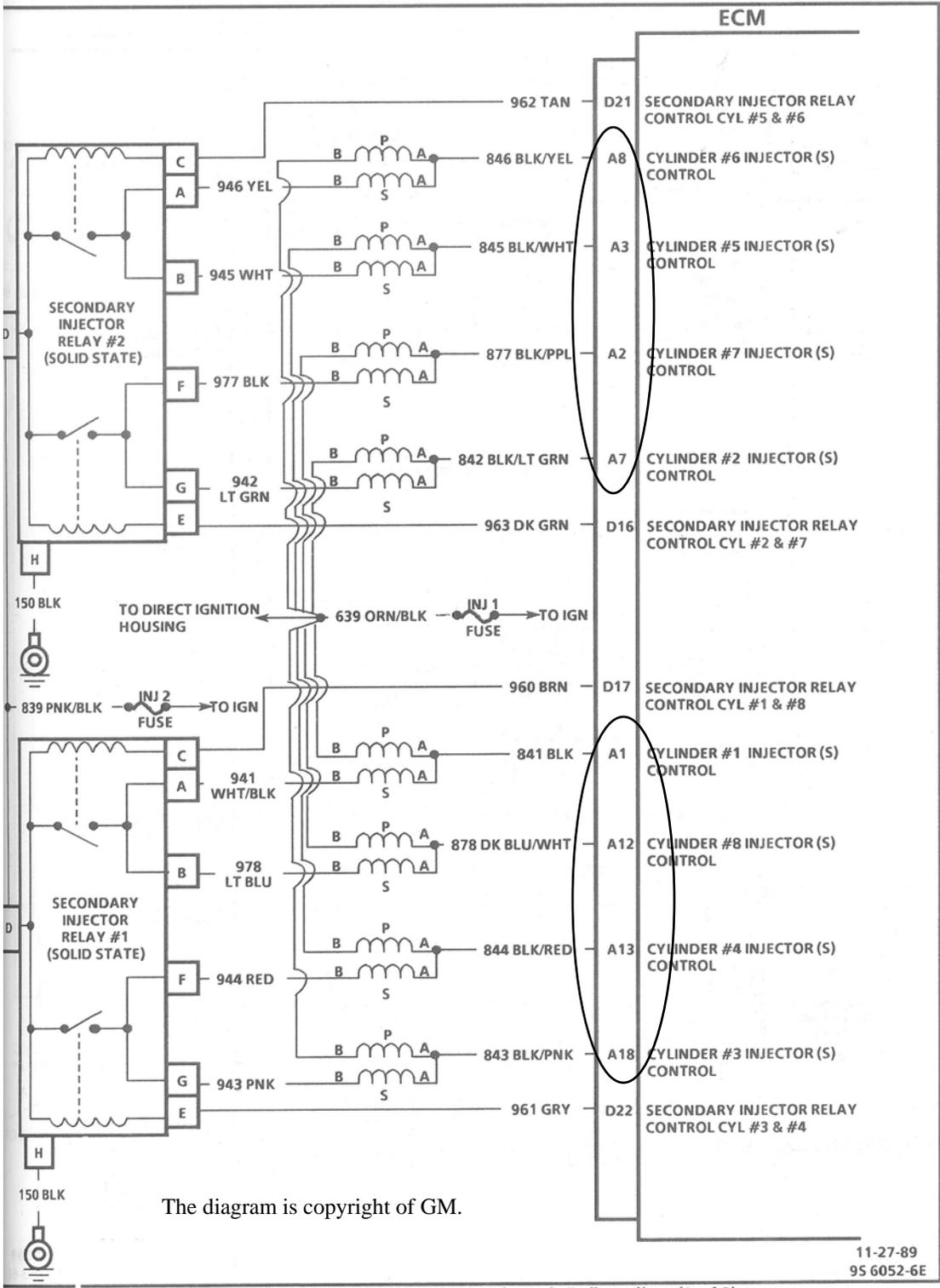
Is a misfire ignition or fuel related?

Use a scope or a spark tool to observe the ignition spark at each cylinder. Never remove a spark plug wire from a spark plug when the engine is running. Doing so will cause the spark voltage to jump through the wire insulation and possibly arc to a low voltage circuit under the plenum. This could cause electrical damage to the low voltage circuit. Attach the spark tool and start the engine. The spark should be at least 1/4" long, bright blue and have a snap like a little whip. Shut the engine down and move the tool to the next cylinder.



Test the fuel injectors by pressurizing the fuel rail and spraying them. Remove the 'A' connector (gray connector) from the ECM. Turn the ignition on. Then ground the individual primary fuel injectors via connector pins 1,2,3,7,8,12,13, and 18. Be very gentle when touching the pins. If a test lead is jammed into the pin the spring will yield and the pin will fit loose on the ECM. Caution, a loose fitting connector pin can send you to intermittent electrical problem hell. In a quiet shop, listen for a click as the fuel injector opens and hear the fuel spray. If a fuel pressure gauge is attached to the fuel rail you can observe that the pressure drop is the same for each injector flow.

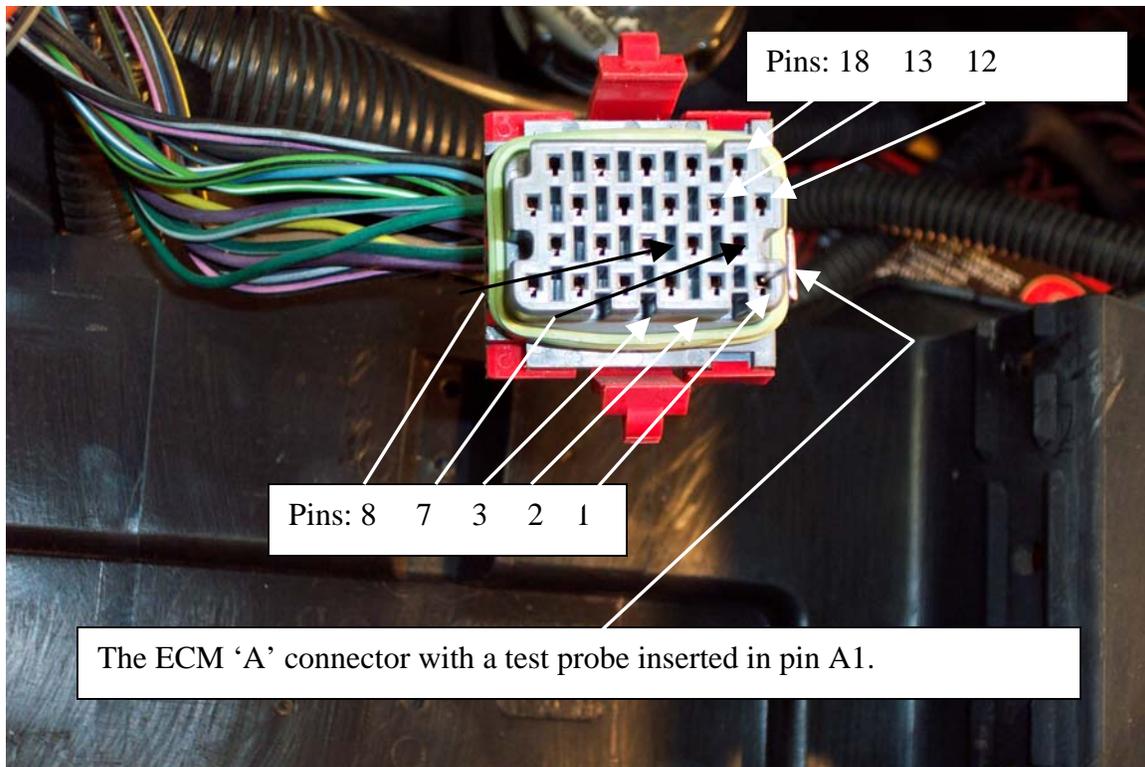
DRIVEABILITY AND EMISSIONS 5.7L (VIN J) 6E3-A-5



The diagram is copyright of GM.

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Figure A-4 - ECM Wiring Diagram 5.7L (VIN J) "Y" Carline (2 of 8)



The ECM 'A' connector with a test probe inserted in pin A1.

The idle speed is over 700 rpm with an OE calibration chip. Where is the vacuum leak?

First, make sure that the tachometer is not reading high. Read the digital engine speed from the ECM on the HVAC LCD display. Press and hold the fan speed up and down arrows together until -00 is displayed. Then press the 'up arrow' fan button until -06 is displayed. Press the center 'fan' button. The digital engine speed /25 will display. Multiply the number by 25 to get the engine speed.

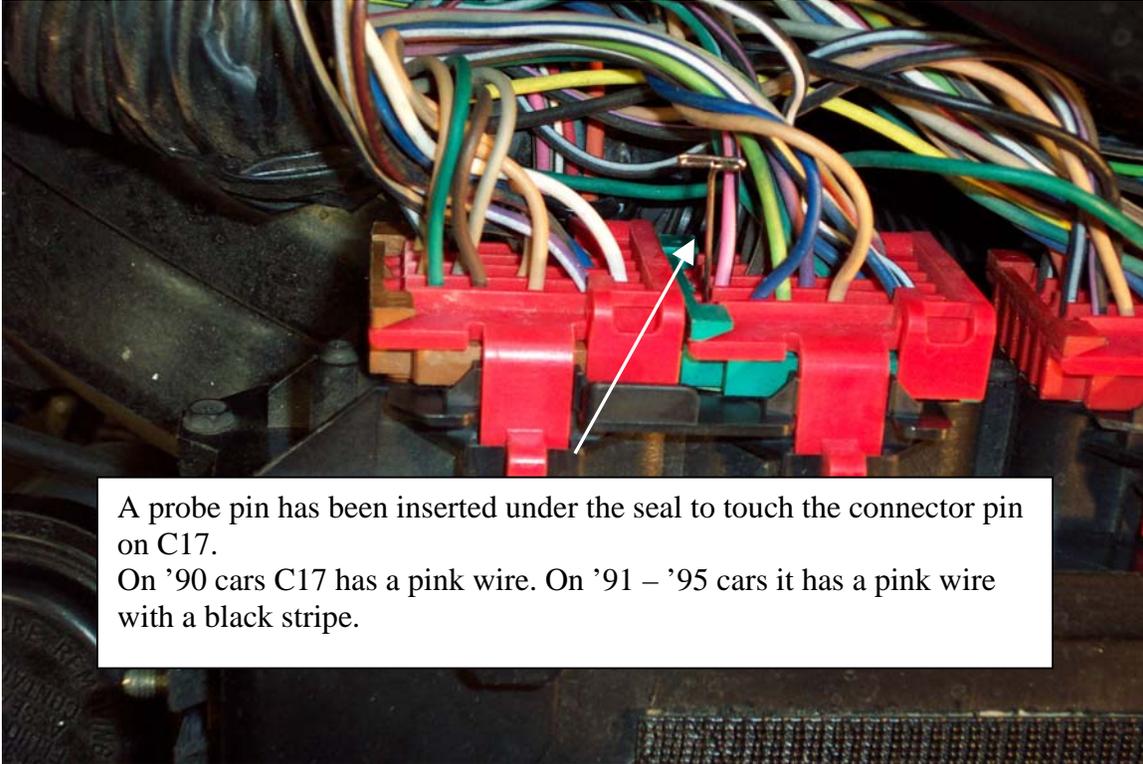
The most common leak on a '90 is the dual vacuum connector that is located under the throttle arm. To repair it, remove the water manifold and the PVC vacuum line. Remove the fitting and replace it with two pieces of 5/16" fuel line.

The second leak on a '90 and the most common leak on a '91 – '95 is the PVC valve grommet. Remove the grommet and sleeve the PCV valve nipples to make them larger in diameter. Then the grommet will once again fit tightly. Or acquire a new grommet from www.jerrysgaskets.com.

Are the secondary intake port throttle valves operating?

Turn the ignition on, don't start the engine, and listen for the secondary vacuum pump. It will make a clicking sound when it runs. The pump is located under the right headlight. If it is not heard, investigate. Removing the vacuum line from the pump should cause it to run continuously. If the pump cycles on and off the vacuum connections up to the secondary port solenoid are tight. As long as the pump will turn off for one second, the secondary port throttles will operate normally. If the pump shuts off for longer than five seconds it indicates that the vacuum system connections are tighter than average.

Ground pin C17 (green connector) on the ECM. This will open the secondary port vacuum valve. The secondary port actuators should pull in and the pump should cycle off for one second or more. Observe the operation of the secondary actuators by shining a light down between the center plenum runners on the right and left sides. Observe that the actuator arm is moving into the full open stop. If the actuators hit the stops and the pump shuts off, the entire secondary port vacuum system is working correctly.



A probe pin has been inserted under the seal to touch the connector pin on C17.
On '90 cars C17 has a pink wire. On '91 – '95 cars it has a pink wire with a black stripe.