P0090: FUEL PRESSURE REGULATOR 1 CONTROL CIRCUIT OPEN

OVERVIEW

Severity	:	High
DIY Difficulty Level	:	Intermediate
Repair Cost	:	**$100-$400**
Can I Still Drive?	:	**Yes** (Short-term only)

What Does The P0090 Code Mean?

A stored code P0090 means that the powertrain control module (PCM) has detected an open control circuit in the electronic fuel pressure regulator (designated 1).

This designation is used in systems that incorporate multiple electronic fuel pressure regulators. This type of designation may refer to the engine bank but not exclusively. Also, the word open could be substituted for disconnected or broken.

The electronic fuel pressure regulator is typically controlled by the PCM. A battery voltage signal and a ground signal are used to control a servo motor which positions a valve so that the desired level of fuel pressure can be achieved for any given set of circumstance.

As voltage is applied to the electronic fuel pressure regulator servo motor, the valve is opened in small increments and fuel pressure is increased. When voltage is decreased, the servo retracts and a strong spring forces the valve to close; fuel pressure is decreased.

The fuel pressure sensor (usually located in the fuel injector rail) allows the PCM to monitor fuel pressure and adjust fuel pressure regulator voltage accordingly.

The fuel pressure regulator and fuel pressure sensor may be separate components but are most often integrated into a single housing which has one electrical connector.

If actual fuel pressure fails to comply with desired fuel pressure, as calculated by the PCM, a P0090 may be stored and a malfunction indicator lamp (MIL) illuminated.

Related fuel pressure regulator engine codes:

- P0089 Fuel Pressure Regulator 1 Performance
- P0091 Fuel Pressure Regulator 1 Control Circuit Low
- P0092 Fuel Pressure Regulator 1 Control Circuit High

What Are The Symptoms Of The P0090 Code?

Symptoms of a P0090 code may include:

- Delayed startup
- Black smoke from the exhaust system
- Diminished fuel efficiency
- Engine drivability codes may also accompany a P0090

What Are The Potential Causes Of The P0090 Code?

Potential causes for this code to set are:

- Shorted or open wiring and/or connectors in the fuel pressure regulator control circuit
- Defective fuel pressure regulator
- Faulty fuel rail pressure sensor
- Bad PCM or a PCM programming error

How Can You Fix The P0090 Code?

A diagnostic scanner, a digital volt/ohmmeter (DVOM), a suitable fuel pressure gauge, and a reliable vehicle information source (such as All Data DIY) will be necessary for diagnosing a code P0090.

NOTE: Use extreme caution when connecting manual fuel pressure gauge. High pressure fuel that comes into contact with hot surfaces or open spark could ignite and cause a harmful vehicle fire.

Step 1

I normally start with a visual inspection of system wiring and connectors; focusing my attention on harnesses and connectors on top of the engine. The warmth associated with this area makes it popular with pests in cold climates. These pests can damage (gnaw) system wiring and connectors.

Step 2

Connecting the scanner to the vehicle diagnostic port and retrieving the stored codes and freeze

frame data would be my next task. I write this information down because it may be helpful as the diagnostic process continues. Now, I would clear the codes and test-drive the vehicle if possible.

If the code is immediately reset, check for voltage and ground at the fuel pressure regulator. If no voltage is discovered, test power supply relays and fuses following the wiring diagram derived from the vehicle information source. If there is no ground, follow the wiring diagram to find the appropriate location of the fuel pressure regulator control system ground/s and make sure that all are secure.

If there is voltage and ground at the fuel pressure control regulator, obtain fuel pressure specifications from your vehicle information source and test fuel system pressure using the fuel pressure gauge.

Step 3

Carefully follow manufacturer's recommendations for connecting the fuel pressure gauge. Observe fuel system data using the scanner while visually monitoring manual fuel pressure with the fuel gauge. If fuel pressure reflected on the scanner data display does not coincide with actual fuel pressure, suspect a faulty fuel pressure sensor.

Fluctuations in actual fuel pressure should occur with variations in fuel pressure regulator control voltage. If this is not the case, suspect that the fuel pressure regulator is defective, there is an open or shorted circuit in one of the fuel pressure regulator control circuits, or that the PCM is bad.

Step 4

Follow manufacturer's recommendations for testing the electronic fuel pressure regulator and the individual fuel pressure regulator control circuits with the DVOM. Disconnect controllers from the circuit before testing with the DVOM to prevent damage to control modules.

Additional diagnostic notes:

- Fuel rail and related components may be under high pressure. Use caution when removing the fuel pressure sensor or fuel pressure regulator
- Turn the ignition switch off to connect/disconnect the fuel pressure gauge

Other fuel pressure trouble codes include:

- P0087 Fuel Rail/System Pressure – Too Low
- P0088 Fuel Rail/System Pressure – Too High
- P0191 Fuel Rail Pressure Sensor A Circuit Range/Performance
- P0192 Fuel Rail Pressure Sensor A Circuit Low Input
- P0193 Fuel Rail Pressure Sensor A Circuit High Input

- P0194 Fuel Rail Pressure Sensor A Circuit Intermittent

Severity Description

Excessive fuel pressure can lead to a variety of drivability issues, as well as causing internal engine and catalytic converter damage. For this reason a code P0090 should be classified as severe.

Reference Sources

Technical Service Bulletin P0090 - GM