

P0094: FUEL SYSTEM LEAK DETECTED - SMALL LEAK

OVERVIEW

Severity	:	Medium
DIY Difficulty Level	:	Intermediate
Repair Cost	:	\$150 - 600
Can I Still Drive?	:	Yes (Short-term only)

What Does The P0094 Code Mean?

When I come across a stored code P0094, it generally means that the powertrain control module (PCM) has detected a substantial decrease in fuel pressure. Fuel pressure specifications vary from one manufacturer to another and the PCM is programmed to monitor fuel pressure according to these specifications. This code is primarily used in diesel powered vehicles.

Diesel fuel systems are monitored (by the PCM) using one or more fuel pressure sensors. Low pressure fuel is pumped from the storage tank to the high pressure injector pump via a supply (or transfer) pump that is usually either attached to the frame rail or inside the fuel tank. Once the fuel exits the injector pump, it can reach levels as high as 2,500 psi. Use caution when testing fuel pressure.

These extreme fuel pressure conditions can be very hazardous. Although diesel fuel is not as combustible as gasoline, it is highly flammable especially under high pressure. Additionally, diesel fuel under these levels of pressure can penetrate the skin and enter the bloodstream. This can be harmful or even fatal under certain circumstances.

Fuel pressure sensors are placed at strategic locations in the fuel delivery system. Typically, there will be at least one fuel pressure sensor for each segment of the fuel system; a sensor for the low pressure supply end and another for the high pressure delivery end.

The fuel pressure sensors are normally of a three-wire design. Some manufacturers use battery

voltage and others use a lesser degree of voltage (usually five-volts) as a reference for the PCM. Reference voltage and a ground signal are supplied to the sensor.

The sensor provides the PCM with a voltage input signal. As fuel system pressure increases, the resistance level of the fuel pressure sensor decreases, allowing the voltage signal that is input to the PCM to increase accordingly. When fuel pressure decreases, resistance levels in the fuel pressure sensor increase, causing the voltage input signal to the PCM to decrease. If the fuel pressure sensor/s is operating normally, this cycle takes effect with each ignition cycle.

If the PCM detects fuel system pressure that does not coincide with programmed specifications, during a set period of time and under certain circumstances, a code P0094 will be stored and a malfunction indicator lamp may be illuminated.

What Are The Symptoms Of The P0094 Code?

Symptoms of a P0094 code may include:

- The distinct smell of diesel fuel
- Diminished fuel efficiency
- Decreased engine performance
- Other fuel system codes may be stored

What Are The Potential Causes Of The P0094 Code?

Possible causes for this engine code include:

- Clogged fuel filter
- Defective fuel pressure sensor
- Faulty fuel pressure regulator
- Fuel system leaks that may include: fuel tank, lines, injection pump, supply pump, fuel injectors

How Can You Fix The P0094 Code?

A good starting point is always to check for technical service bulletins (TSB) for your particular vehicle. Your issue may be a known issue with a known fix put out by the manufacturer and can save you time and money during diagnosis.

I would gain access to a suitable diagnostic scanner, a diesel fuel pressure gauge, a digital volt/ohmmeter (DVOM), and a vehicle service manual or a subscription to All Data (DIY), when attempting to diagnose a code of this type.

I typically begin my diagnosis with a visual inspection of fuel lines and components. If any leaks are discovered, repair them and recheck the system. Inspect system wiring and connectors at this time.

Connect the scanner to the vehicle diagnostic connector and retrieve all stored codes and freeze frame data. Write this information down in case this proves to be an intermittent code, which will prove much more difficult to diagnose. If other fuel system related codes are present, you may want to diagnose them first before attempting to diagnose the P0094. Clear the codes and test drive the vehicle.

If the P0094 is immediately reset, locate the data stream of the scanner and observe fuel pressure readings. By narrowing the data stream to include only pertinent data, you will get a quicker response. Compare the actual reflected fuel pressure readings with manufacturer's specifications.

If fuel pressure is not within specs, use the fuel pressure gauge to test system pressure in the appropriate quadrant. If actual fuel pressure readings are not within manufacturer's recommended specifications, suspect a mechanical failure. Continue by disconnecting the fuel pressure sensor connector and testing the resistance of the sensor itself. If the sensor resistance does not comply with manufacturer's specifications, replace it and retest the system.

If the sensor checks out, disconnect all related controllers and begin testing system circuits for resistance and continuity. Repair or replace shorted or open circuits as required.

If all system sensors and circuitry seems normal, suspect a defective PCM or PCM programming error.

Additional diagnostic tips:

- Use caution when testing high pressure fuel systems. These types of systems should only be serviced by qualified personnel
- Despite this code being described as a "small leak" low fuel pressure is often the culprit

Severity Description

Given the potential for a vehicle fire, as well as the distinct possibility of diminished fuel efficiency that can be associated with a stored P0094 code, it should be addressed with a great degree of urgency.

Reference Sources

[Diagnostic Trouble Code \(DTC\) Guide for P0094](#) - Ominitek Advanced Technologies, pages 31-32.