P0458: EVAPORATIVE EMISSION SYSTEM PURGE CONTROL VALVE CIRCUIT LOW

OVERVIEW

Severity	:	Medium
DIY Difficulty Level	:	Intermediate
Repair Cost	:	**$150-$300**
Can I Still Drive?	:	**Yes** (Short-term only)

What Does The P0458 Code Mean?

On vehicles equipped with evaporative emission control systems (EVAP), the engine draws in excessive fuel vapors from the gas tank that would otherwise be vented into the atmosphere. The purpose of the system is to reduce vehicle emissions.

The evaporative emission system consists of the fuel tank, a vacuum hose to the charcoal canister for containing the fuel vapors, pressure sensor on the fuel tank, purge valve on the charcoal canister, vacuum hose to the filler neck shut off valve and vacuum hose from the charcoal canister purge valve to the intake manifold. When the engine is off, the vent shutoff valve and canister purge valve are closed.

The fuel can't escape into the atmosphere. When the engine starts, the purge valve on the canister opens to allow the trapped fuel vapor to be drawn by engine vacuum into the intake manifold. At the same time the vent shutoff valve also opens to allow a small amount of air to enter the canister and mix with the fuel vapor for a better mixture. Once vented and the pressure sensor in the tank shows a significant drop, both valves close sealing the system once again.

The fuel vapor is routed through a vacuum line to the engine's intake and the purge valve/solenoid meters the desired amount of fuel vapors, controlled by the vehicles powertrain control module (PCM) or engine control module (ECM). The PCM/ECM monitors the voltage to the purge control valve and has detected a lower voltage than expected.

Related purge control valve circuit codes include:

- P0443 – Evaporative Emission Control System Purge Control Valve Circuit
- P0444 – Evaporative Emission Control System Purge Control Valve Circuit Open
- P0445 – Evaporative Emission Control System Purge Control Valve Circuit Shorted
- P0459 – Evaporative Emission System Purge Control Valve Circuit High

What Are The Symptoms Of The P0458 Code?

Noticeable symptoms of a P0458 EVAP trouble code normally only include illumination of the malfunction indicator lamp (MIL), or "Check Engine Light / Service Engine Soon" light.

Other trouble codes may accompany this code. In some cases there may be a smell of gas and/or a slightly decline in fuel efficiency.

What Are The Potential Causes Of The P0458 Code?

Causes of this DTC may include:

- Faulty fuse or relay
- Faulty purge control valve
- Faulty EVAP purge solenoid control
- Engine wiring harness or connector open or short circuit
- Purge control solenoid open or short circuit condition
- PCM/ECM malfunction

How Can You Fix The P0458 Code?

Step 1

A good first step if you receive a P0458 is to check for Technical Service Bulletins (TSBs) that apply to your year/make/model. If this is a known issue, a TSB can help save you time and money during diagnosis & repair.

Step 2

Visually inspect the engine wiring harness connectors for damage, look for pinched wires, loose or bent pins or bare wiring with no insulation. Typically the purge control valve is energized by the the battery and triggered on and off with a duty cycle through the PCM/ECM.

Using the manufacturers wiring diagrams, identify which type of circuit being used and check for battery voltage presence with the key on/engine off at the power side of the control solenoid connector using a digital volt ohm meter (DVOM) set to the volts scale. If no battery voltage is present, trace the wiring back to determine the cause.

Step 3

Check for a short to ground by disconnecting the harness at the control valve solenoid and the source of voltage. Using the DVOM set to the ohms scale, with the negative lead connected to a known good ground and the positive lead on either end that supplies power to the control valve solenoid. If resistance is very low, suspect a short to ground and repair the wiring harness.

Check for a short to ground on the control side of the harness by disconnecting the harness from the control valve solenoid and the PCM/ECM harness. Identify the correct wire and using the DVOM set to ohms scale, check for resistance with the negative lead connected to a known good ground and the positive lead on either wire harness for the control circuit. If resistance is very low, suspect a short to ground and repair the wiring harness.

Step 4

Check for continuity at the purge control solenoid connector pins after removing the harness plug using the DVOM set to the ohms scale. Verify resistance is within manufacturers specifications. Check for a short to ground using the DVOM with the negative lead attached to a known good ground and the positive lead on each of the terminal pins to the control valve solenoid.

Resistance should be very high or over limit (OL). If there is a very low amount of resistance found, suspect the control valve solenoid is shorted to ground and replace with a known good unit.

Step 5

Since the EVAP is only turned on during certain driving conditions, it will be necessary to monitor the EVAP control operation using an advanced scan tool capable and performing a road test under the driving conditions required to activate the EVAP system. Some advanced scan tools have an internal test to activate the EVAP system manually. Verify the PCM/ECM is commanding the EVAP system on.

If the system is functioning correctly, it will be necessary to back probe the PCM/ECM wiring harness connector using a graphing multimeter or oscilloscope with a duty cycle feature with the positive lead on the purge control valve pin and the negative lead connected to a known good ground. The duty cycle should match what is commanded on by the PCM/ECM during EVAP operation. If there is no duty cycle present, the PCM/ECM may be at fault.

Reference Sources

Diagnostic Trouble Code (DTC) Charts and Descriptions for P0458 - Page 74.