

P0497: EVAPORATIVE EMISSION SYSTEM LOW PURGE FLOW

OVERVIEW

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

What Does The P0497 Code Mean?

When I see that a code P0497 has been stored, I know that the powertrain control module (PCM) has detected a low flow condition in the evaporative emissions (EVAP) purge system.

Designed to capture fuel vapors (from the fuel tank) before they escape into the atmosphere, the EVAP system utilizes a closed reservoir to store excessive vapors until the engine is prepared to burn them. Fuel vapors are routed to the reservoir (usually called a canister), through a specially designed valve and network of metal tubes and rubber hoses. The pressure that is built when fuel is stored causes the vapors to vent into the tubes and eventually the canister. The canister contains a charcoal element that absorbs fuel vapors for release at the appropriate time.

The purge control solenoid is activated when the PCM deems that the engine is in a state to burn the EVAP fuel vapors efficiently. An EVAP pressure sensor is used to monitor EVAP system efficiency.

The P0497 code is related to the EVAP purge valve. The purge control solenoid/valve is usually located in the engine bay. A constant intake vacuum supply hose (from the engine intake manifold) is attached to one opening of the purge control valve with a second line attached to the only other opening. In most cases, a constant supply of battery voltage is present at one terminal of the purge control valve and the PCM provides a ground pulse when drivability conditions are optimal. This allows the valve to open and intake vacuum to reach the canister. When vacuum reaches the

canister, ambient air is drawn through the charcoal element and it releases the fuel vapors that have been store therein. Engine vacuum draws the fuel vapors into the intake manifold where they are burnt alongside conventional fuel.

In some systems, if there is not sufficient change in manifold air pressure or exhaust oxygen content, when the purge control solenoid/valve is opened, a P0497 will be stored and a service engine soon lamp may be illuminated. Other systems utilize an EVAP pressure sensor to monitor and control purge and vent control solenoid operation. In this type of system, if EVAP pressure fails to drop sufficiently when the purge control valve is opened, a code will be stored and service engine soon lamp illumination may occur.

What Are The Symptoms Of The P0497 Code?

Symptoms of a P0497 code may include:

- Slightly diminished fuel efficiency
- The sound of a vacuum leak from the underhood area
- Poor engine idle quality
- In most cases, no symptoms will be exhibited

What Are The Potential Causes Of The P0497 Code?

Potential causes for this code to set are:

- Defective EVAP pressure sensor
- Faulty EVAP purge solenoid/valve
- Restricted EVAP canister element
- Shorted or open circuit (wiring or connector) for the EVAP purge control solenoid/valve
- Cracked, crimped, or collapsed vacuum lines/hoses

How Can You Fix The P0497 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.

A suitable diagnostic scanner, a digital volt/ohmmeter, a manufacturer's service manual (or equivalent), and a smoke machine will help to diagnose code P0497.

I have a habit of beginning my diagnosis with a visual inspection of all system wiring and connectors, as well as vacuum lines and hoses. Repair or replace damaged wiring and/or connectors as required.

The EVAP system is comprised of a network of long vacuum lines and metal tubing, so this can be a

chore in itself. If you have access to a smoke machine, it can make this process much easier. Keep in mind that most of these vacuum circuits will have no vacuum present unless the purge control solenoid/valve is activated. Repair or replace defective vacuum lines and hoses as needed.

If charcoal is found in the vacuum lines, immediately suspect a defective canister. Compromised charcoal elements cannot usually be replaced individually and will probably demand complete canister replacement. Connect the scanner to the diagnostic connector and retrieve all stored codes and freeze frame data. Write all this down so that you can come back to it later. Clear all codes and test drive the vehicle. Keep in mind that it may take several ignition cycles for this type of code to be reset. If it resets, continue with your diagnosis.

Consult the service manual for particular system specifications and test EVAP purge solenoid/valve operation. Use the scanner to activate the purge control solenoid and physically check vacuum flow with the engine running and the purge control solenoid activated.

If the solenoid fails to open when activated, check system voltage and ground signals as compared to manufacturer's specs. If voltage and ground signals are present, suspect a defective solenoid. Test the purge control solenoid (with the DVOM) using the service manual as a guide. If voltage and ground signals are absent, disconnect system controllers and test system circuits with the DVOM. Repair or replace open or shorted circuits as necessary.

If all system circuits and components comply with manufacturer's specifications, suspect a defective PCM or a PCM programming error.

Additional diagnostic notes:

- Poor running engines may not provide sufficient vacuum for EVAP purge operation
- A loose or missing fuel cap will not cause this code to be stored
- To use the smoke machine effectively, remove vacuum lines from the canister and plug them before applying smoke

Severity Description

This is an emissions related code. While it may slightly reduce fuel efficiency, there is no inherent danger involved.

Reference Sources

[Diagnostic Trouble Code \(DTC\) Charts and Descriptions for P0497](#) - Page 78.