



P039C

Cylinder 1 Pressure Variation Low

P039C indicates that the engine control module has detected an abnormally low pressure variation in cylinder 1 during the combustion cycle, based on signals from the cylinder pressure sensor. This means the computer sees less pressure rise during compression and combustion than it expects for that cylinder, which can point to mechanical or sensor-related issues.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Powertrain	Generic (all makes)	Medium	Professional	Ignition system and misfire

Symptoms you may notice

- Illuminated check engine light, often with no other noticeable symptoms
- Rough idle or misfire-like shaking, especially when the engine is cold
- Reduced engine power or sluggish acceleration
- Poor fuel economy compared to normal
- Excessive vibration or knocking sounds from the engine
- In some cases, the engine may enter limp mode to protect itself

Common causes, most likely first

- 1 Faulty cylinder pressure sensor or its wiring/connector
- 2 Carbon buildup on the sensor tip or in the cylinder, affecting pressure readings
- 3 Worn piston rings or cylinder wall damage causing low compression
- 4 Leaking or sticking fuel injector for cylinder 1, altering combustion pressure
- 5 Incorrect valve clearance or valve sealing problems
- 6 Engine mechanical issues such as a damaged camshaft lobe or lifter
- 7 Contaminated engine oil affecting sensor performance (rare)

How to diagnose and fix it

- 1 Use a scan tool to verify P039C and check for related codes; record freeze-frame data
- 2 Inspect the cylinder pressure sensor and its wiring for damage, corrosion, or loose connections
- 3 Perform a compression test on cylinder 1 and compare with other cylinders to rule out mechanical faults
- 4 Check fuel injector operation and perform a injector balance test if applicable
- 5 Remove and inspect the cylinder pressure sensor for carbon buildup; clean or replace if necessary
- 6 If mechanical issues are found, perform further diagnostics such as a leak-down test or borescope inspection
- 7 After repairs, clear codes and verify the fix with a test drive and live data monitoring



Cylinder pressure sensor often misdiagnosed

- A dirty or carbon-fouled cylinder pressure sensor is a common cause that many technicians overlook, leading to unnecessary mechanical repairs.
- The code can be set by a faulty fuel injector that leaks or delivers unevenly, altering combustion pressure without triggering a misfire code.
- Low pressure variation may also result from a worn timing chain or belt that slightly retards cam timing on one bank, affecting cylinder 1.
- Always check for technical service bulletins (TSBs) for the specific vehicle, as some manufacturers have known issues with sensor calibration or software.
- Do not assume the sensor is bad solely based on the code; perform a compression test first to rule out internal engine damage.

Can I keep driving with P039C?

It is generally safe to drive with P039C if the engine runs smoothly and no other warning lights are on, but avoid heavy acceleration or towing until diagnosed. If you notice rough running, knocking, or reduced power, have the vehicle inspected promptly to prevent potential engine damage.

Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter for electrical testing
- Compression tester
- Fuel injector tester or balance tester
- Borescope camera for cylinder inspection
- Basic hand tools (wrenches, sockets, screwdrivers)

Reading P039C

P Powertrain: engine, transmission and emissions.

0 Generic (SAE) code: it means the same thing on every OBD-II vehicle.

3 Ignition system and misfire.

9C The exact fault within that area.

Often seen with

P0171 System Too Lean (Bank 1) · **P0300** Random/Multiple Cylinder Misfire Detected · **P0301** Cylinder 1 Misfire Detected · **P039D** Cylinder 1 Pressure Variation High · **P039E** Cylinder 1 Combustion Performance



See it working

Watch the animated explainer [How Hydraulic Brakes Work: Pedal to Caliper](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p039c/>

