

GENERIC · POWERTRAIN

P2C13

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P2C13

B Camshaft Profile Actuator Position Sensor A Range/Performance Bank 1

P2C13 indicates that the powertrain control module (PCM) has detected a range or performance error in the 'A' camshaft profile actuator position sensor on bank 1. The sensor reports the actual position of the camshaft profile actuator, and the PCM compares this signal against expected values; when the signal falls outside the acceptable range or does not respond as commanded, the code is stored.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Powertrain	Generic (all makes)	Medium	Intermediate	Hybrid propulsion

Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms
- Rough idle or unstable engine operation, especially when cold
- Reduced engine power or limp mode under certain conditions
- Poor fuel economy or increased emissions
- Hesitation or stumble during acceleration
- Unusual engine noises or valve train rattle in severe cases

Common causes, most likely first

- 1 Faulty camshaft profile actuator position sensor
- 2 Wiring or connector issues (open, short, or corrosion) in the sensor circuit
- 3 Contaminated or degraded engine oil affecting actuator response
- 4 Sticking or mechanically binding camshaft profile actuator
- 5 PCM software calibration issue or internal fault
- 6 Oil passage blockage or low oil pressure to the actuator



How to diagnose and fix it

- 1 Perform a visual inspection of the sensor, wiring, and connectors for damage or corrosion
- 2 Check engine oil level and condition; change oil and filter if contaminated or degraded
- 3 Use a scan tool to monitor the camshaft profile actuator position sensor data and compare to commanded position
- 4 Test the sensor circuit with a multimeter for continuity, shorts, and reference voltage
- 5 Remove and inspect the camshaft profile actuator for mechanical binding or sludge buildup
- 6 Replace the camshaft profile actuator position sensor if testing indicates failure
- 7 Reprogram or update the PCM if a known calibration issue exists

Diagnosing P2C13 Beyond the Sensor

- A low oil level or degraded oil is a common cause of this code because the camshaft profile actuator relies on clean, pressurized oil to function correctly.
- The code can be set by a mechanical issue with the actuator itself, not just the sensor, so replacing the sensor without checking actuator movement often leads to a repeat failure.
- Intermittent wiring faults can mimic a failing sensor; always wiggle-test the harness while monitoring live data to catch loose connections.
- Some vehicles require a relearn or calibration procedure after sensor replacement, and skipping this step can cause the code to return immediately.
- The PCM may set this code if the sensor signal is plausible but does not match the commanded profile change within a specified time, indicating a performance issue rather than a total failure.

Can I keep driving with P2C13?

Driving with P2C13 is generally safe for short distances, but avoid aggressive acceleration or heavy loads because the engine may enter limp mode or run poorly. Have the fault diagnosed promptly to prevent potential damage to the camshaft actuator or other valve train components.

Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter
- Basic hand tools (socket set, screwdrivers)
- Oil pressure gauge
- Vehicle service information for circuit testing



Reading P2C13

- P** Powertrain: engine, transmission and emissions.
- 2** Generic (SAE) code: it means the same thing on every OBD-II vehicle.
- C** Hybrid propulsion.
- 13** The exact fault within that area.

Often seen with

P0010 'A' Camshaft Position Actuator Circuit (Bank 1) · **P0011** 'A' Camshaft Position - Timing Over-Advanced or System Perfo · **P0016** Crankshaft/Camshaft Position Correlation (Bank 1 Sensor A) · **P2C14** B Camshaft Profile Actuator Position Sensor A Circuit Low Ba · **P2C15** B Camshaft Profile Actuator Position Sensor A Circuit High B

See it working

Watch the animated explainer [Four-Stroke Engine Cutaway: Intake to Exhaust](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p2c13/>

