

BMW · POWERTRAIN

P1397

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P1397 · BMW

Camshaft Position Sensor B Circuit Bank 1

P1397 on a BMW means the engine control module (DME) has detected an implausible or missing signal from the Bank 1 camshaft position sensor B circuit, which on most BMW engines is the exhaust camshaft sensor. The DME compares this signal against the crankshaft position sensor and the intake camshaft sensor, and when the expected correlation is absent or erratic it flags the circuit as faulty. This is a circuit-level fault, so the problem may be in the sensor, its wiring, or the DME's interpretation of the signal rather than a mechanical timing failure.

SYSTEM

Powertrain

CODE TYPE

BMW specific

SEVERITY

Medium

FIX DIFFICULTY

Intermediate

AREA

Ignition system and misfire

Symptoms you may notice

- Illumination of the check engine light, often with no other symptoms besides the warning light
- Rough idle or intermittent stumbling, especially when the engine is cold or at low rpm
- Reduced engine power or a limp-home mode as the DME defaults to a fixed camshaft timing strategy
- Hard starting or extended cranking because the DME cannot identify the camshaft position quickly
- Poor fuel economy and increased emissions due to incorrect variable valve timing control
- Occasional stalling when coming to a stop or during low-speed manoeuvres

Common causes, most likely first

- 1 Failed Bank 1 exhaust camshaft position sensor (the sensor itself is the most common cause on high-mileage BMW engines)
- 2 Damaged, chafed, or oil-contaminated wiring harness or connector at the sensor, particularly where it routes near the exhaust manifold
- 3 Corroded or loose pins in the sensor connector causing an intermittent circuit
- 4 Faulty VANOS solenoid or stuck VANOS unit preventing the camshaft from reaching the commanded position, which the DME interprets as a sensor correlation fault
- 5 Timing chain stretch or skipped teeth on the exhaust camshaft sprocket, especially on N20 and N55 engines with known chain guide wear
- 6 Metal debris or sludge on the sensor tip disrupting the magnetic signal
- 7 Internal DME driver circuit fault, rare but possible after water intrusion or voltage spikes



How to diagnose and fix it

- 1 Read all stored and pending fault codes with a BMW-capable scan tool and record freeze-frame data before clearing anything
- 2 Visually inspect the Bank 1 exhaust camshaft sensor connector and harness for oil intrusion, chafing, and corrosion, and repair any damaged wiring
- 3 Swap the Bank 1 exhaust camshaft sensor with a known-good unit or perform a resistance and waveform check with an oscilloscope to confirm signal integrity
- 4 Check live VANOS commanded versus actual camshaft position data to see whether the camshaft is mechanically unable to follow the target
- 5 Inspect the timing chain, guides, and camshaft sprocket alignment if the sensor and wiring test good but the correlation error persists
- 6 Test the VANOS solenoid for proper operation and clean or replace it if it is sticking
- 7 Clear adaptations and fault memory, then road-test through the full rpm range to confirm the code does not return

Before you replace the camshaft sensor

- A P1397 on a BMW is frequently set by a stretched timing chain on N20 and N55 engines rather than by the sensor itself, so always verify camshaft-to-crankshaft correlation before fitting parts.
- Oil leaking from the valve cover gasket into the sensor connector is a common hidden cause that a simple sensor swap will not fix.
- The DME may set this code intermittently when the engine oil level is low or the oil is heavily sludged, because VANOS response suffers and the camshaft lags behind its target.
- After replacing the sensor or repairing the circuit, BMW adaptations must be cleared and a relearn drive cycle performed, or the code can reappear immediately.
- A failing Bank 1 exhaust camshaft sensor can produce no drivability symptoms at all, so do not assume the engine is mechanically damaged based on the warning light alone.

Can I keep driving with P1397?

You can usually drive the car to a workshop, but avoid hard acceleration and sustained high-rpm driving because the DME is running a default camshaft timing strategy that can affect emissions and fuel economy. If the engine is misfiring, stalling, or in limp mode, stop driving and arrange a diagnostic scan before further use.

Tools that help

- BMW-capable OBD-II scan tool with live data and VANOS actuation capability
- Digital multimeter for circuit continuity and voltage checks
- Oscilloscope for camshaft and crankshaft sensor waveform comparison
- Basic socket and torx set for sensor and connector access
- Contact cleaner and dielectric grease for connector repair



Reading P1397

- P** Powertrain: engine, transmission and emissions.
- 1** Manufacturer-specific code (BMW): its meaning depends on the make.
- 3** Ignition system and misfire.
- 97** The exact fault within that area.

Often seen with

P1396 Engine Speed Sensor Missing Tooth · **P1396** Variable Valve Timing Solenoid B Circuit · **P1396** Wheel Speed Sensor 2 G-Sensor Circuit Performance · **P1396** Glow Plug Monitor Fault Bank 2 · **P1396** Wheel Speed Sensor 2, G-Sensor Circuit Performance · **P1396** Crankshaft Position Sensor Segment Timing Plausibility · **P0011** 'A' Camshaft Position - Timing Over-Advanced or System Perfo · **P0012** 'A' Camshaft Position - Timing Over-Retarded (Bank 1) · **P0016** Crankshaft/Camshaft Position Correlation (Bank 1 Sensor A) · **P0340** Camshaft Position Sensor A Circuit Malfunction (Bank 1)

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/bmw-p1397/>

