

BMW · POWERTRAIN

P1396

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P1396 · BMW

Crankshaft Position Sensor Segment Timing Plausibility

P1396 on BMW vehicles indicates that the engine control module (ECM) has detected an implausible signal from the crankshaft position sensor during the segment timing self-check. The ECM compares the crankshaft signal against the camshaft signal and expects a specific relationship; when the pattern falls outside the allowed tolerance, this code is stored.

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 noticeable symptoms
- Intermittent engine stumble or misfire at idle or under light load
- Difficulty starting, especially when the engine is cold or after sitting
- Rough running or hesitation during acceleration
- Stalling at low speeds or when coming to a stop
- Reduced engine performance and poor fuel economy

Common causes, most likely first

- 1 Faulty crankshaft position sensor (most common)
- 2 Damaged or corroded sensor wiring or connector
- 3 Metal debris or damage on the crankshaft reluctor wheel
- 4 Worn or stretched timing chain affecting camshaft-to-crankshaft correlation
- 5 Faulty camshaft position sensor (less common)
- 6 ECM software issue or internal fault (rare)

How to diagnose and fix it

- 1 Perform a visual inspection of the crankshaft sensor and its wiring for damage or corrosion
- 2 Check for technical service bulletins (TSBs) related to the code and ECM software updates
- 3 Use a scan tool to monitor live crankshaft and camshaft position signals for consistency
- 4 Test the crankshaft position sensor with a multimeter or oscilloscope for proper signal output
- 5 Inspect the reluctor wheel for debris or damage and clean or replace as needed
- 6 Verify timing chain condition and alignment if other causes are ruled out
- 7 Replace the crankshaft position sensor if tests indicate failure, then clear the code and verify repair



Crankshaft Sensor Segment Timing Pitfalls

- A stretched timing chain can cause P1396 without any sensor fault, as the camshaft-to-crankshaft relationship drifts beyond tolerance.
- Debris on the crankshaft reluctor wheel is a commonly overlooked cause that can mimic a failed sensor.
- The code may set intermittently due to heat-related sensor failure, so testing when the engine is warm is crucial.
- Replacing the sensor without checking the reluctor wheel or timing chain often leads to a quick return of the code.
- Some BMW models require ECM software updates to correct false P1396 triggers, so always check for bulletins first.

Can I keep driving with P1396?

If the engine runs normally, you can drive cautiously to a repair shop, but avoid heavy acceleration or long trips. If the engine stalls, misfires severely, or loses power, stop driving and have the vehicle towed to prevent safety risks.

Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter
- Oscilloscope (for signal analysis)
- Basic hand tools (socket set, wrenches)
- Feeler gauge or timing chain inspection tools

Reading P1396

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

Often seen with

P1397 Engine Speed Wheel Adaptation At Limit · **P1397** Variable Valve Timing Solenoid B Circuit Low Input · **P1397** Wheel Speed Sensor 2 G-Sensor Circuit Low Voltage · **P1397** System Voltage Out Of Self Test Range · **P1397** Wheel Speed Sensor 2, G-Sensor Circuit Low Voltage · **P1397** Camshaft Position Sensor B Circuit Bank 1 · **P0016** Crankshaft/Camshaft Position Correlation (Bank 1 Sensor A) · **P0335** Crankshaft Position Sensor A Circuit Malfunction · **P0336** Crankshaft Position Sensor A Circuit Range/Performance · **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-p1396/>

