

BMW · POWERTRAIN

P1589

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P1589 · BMW

Control Module Self Test Knock Control Test Pulse Bank 1

P1589 on BMW vehicles indicates that the engine control module (DME) has detected a fault during its internal self-test of the knock control system, specifically the test pulse for Bank 1. The DME generates a known test signal and monitors the return from the knock sensor circuit; when the expected pulse is not verified, it stores this code and may default to a conservative ignition timing map.

SYSTEM

Powertrain

CODE TYPE

BMW specific

SEVERITY

Medium

FIX DIFFICULTY

Intermediate

AREA

Vehicle speed, idle control and auxiliary inputs

Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms
- Reduced engine performance and sluggish acceleration due to retarded ignition timing
- Decreased fuel economy as the DME enriches the mixture and retards timing for safety
- Occasional engine knock or pinging under load if the fault is intermittent
- Rough idle or hesitation in some cases, especially when the knock sensor signal is erratic

Common causes, most likely first

- 1 Faulty knock sensor on Bank 1 (open circuit, short, or degraded piezoelectric element)
- 2 Damaged or corroded wiring and connectors between the knock sensor and the DME
- 3 Poor ground connection at the knock sensor mounting bolt or engine block
- 4 Internal DME fault affecting the knock control self-test circuit
- 5 Mechanical engine noise (e.g., loose timing chain, valve train tick) mimicking a knock signal and disrupting the test pulse
- 6 Aftermarket or incorrect knock sensor installed, causing signal mismatch



How to diagnose and fix it

- 1 Connect a BMW-capable scan tool and read all fault memory, then clear codes and road-test to see if P1589 returns
- 2 Visually inspect the Bank 1 knock sensor, its connector, and the wiring harness for chafing, corrosion, or loose pins
- 3 Measure the knock sensor resistance and compare to BMW specifications; also check for continuity to ground and shorts to voltage
- 4 Check and clean the knock sensor mounting bolt and engine block ground points to ensure a solid ground
- 5 Perform a wiggle test on the harness while monitoring knock sensor live data to catch intermittent wiring faults
- 6 If the sensor and wiring test good, substitute a known-good knock sensor and retest; if the code persists, diagnose the DME
- 7 As a last resort, send the DME for testing or replacement, ensuring proper coding and adaptation afterwards

Knock sensor test pulse traps on BMW

- A loose knock sensor bolt is a frequent culprit: the sensor must be torqued to spec because the piezoelectric element uses the mounting bolt as its ground reference, and a poor ground corrupts the test pulse.
- Mechanical noises such as a failing timing chain tensioner or a loose heat shield can be interpreted by the DME as knock, causing it to fail the self-test even when the sensor and wiring are perfect.
- P1589 can be stored intermittently by a weak battery or voltage spikes during cranking, so always check charging system health before condemning the knock sensor.
- After replacing a knock sensor, the DME may need to relearn its knock control adaptation; clearing codes and performing a drive cycle is essential to confirm the repair.
- Do not confuse P1589 with P0325 (knock sensor circuit malfunction); P1589 is specifically a self-test failure of the test pulse, which often points to the DME's internal signal generation rather than a simple sensor fault.

Can I keep driving with P1589?

You can usually continue driving with P1589, but avoid heavy throttle and towing until the fault is repaired, because the DME may retard ignition timing and reduce power to protect the engine. Prolonged driving with a failed knock control system risks engine damage if knock occurs undetected.

Tools that help

- BMW-specific scan tool (e.g., ISTA, INPA, or a capable OBD-II scanner with live data)
- Digital multimeter for resistance and continuity checks
- Torque wrench for correct knock sensor installation
- Socket set and extensions for accessing the knock sensor
- Oscilloscope (optional) for viewing the knock sensor signal waveform



Reading P1589

- P** Powertrain: engine, transmission and emissions.
- 1** Manufacturer-specific code (BMW): its meaning depends on the make.
- 5** Vehicle speed, idle control and auxiliary inputs.
- 89** The exact fault within that area.

Often seen with

P1588 Engine Mount Solenoid Valves Open Circuit · **P1588** Cruise Control Clutch Control Circuit High · **P1588** Throttle Control Unit Detected Loss of Return Spring · **P1588** Cruise Control Clutch Control Circuit High · **P0325** Knock Sensor 1 Circuit Malfunction (Bank 1) · **P0327** Knock Sensor 1 Circuit Low Input (Bank 1) · **P0328** Knock Sensor 1 Circuit High Input (Bank 1) · **P0330** Knock Sensor 2 Circuit

See it working

Watch the animated explainer [Fuel Trims Explained: Short-Term and Long-Term](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/bmw-p1589/>

