

GENERIC · POWERTRAIN

P007C

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P007C

Charge Air Cooler Temperature Sensor Circuit Low Bank 1

P007C means the engine computer has detected a voltage signal from the charge air cooler temperature sensor on bank 1 that is lower than the expected range for the current operating conditions. The sensor is a thermistor whose resistance drops as intake air temperature rises, so a low signal voltage tells the computer the air leaving the cooler is hotter than it should be or that the circuit is shorted to ground.

SYSTEM

Powertrain

CODE TYPE

Generic (all makes)

SEVERITY

Medium

FIX DIFFICULTY

Intermediate

AREA

Fuel and air metering and auxiliary emission controls

Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms.
- Reduced engine power or limp mode if the computer substitutes a default charge air temperature and limits fueling.
- Poor fuel economy or black smoke from the tailpipe if the engine over-fuels based on a falsely hot intake air reading.
- Rough running, hesitation, or misfires under boost if the incorrect temperature reading skews the air-fuel mixture.
- In rare cases, a no-start or hard-start condition when the sensor signal is shorted and the computer cannot calculate the correct injection quantity.

Common causes, most likely first

- 1 A short to ground in the signal wire between the charge air cooler temperature sensor and the engine control module.
- 2 A failed charge air cooler temperature sensor that has internally shorted and reads a fixed low resistance.
- 3 Corroded, pushed-back, or water-intruded terminals at the sensor connector or the engine control module connector.
- 4 A chafed or pinched wire harness rubbing against a metal bracket, engine component, or the charge air cooler itself.
- 5 A faulty engine control module, though this is rare and should only be suspected after all circuit and sensor tests pass.
- 6 Aftermarket or incorrect sensor installed previously that does not match the vehicle's calibration.



How to diagnose and fix it

- 1 Connect a scan tool and record the freeze-frame data for P007C, then clear the code and verify whether it returns immediately or only after a drive cycle.
- 2 Visually inspect the charge air cooler temperature sensor, its connector, and the wiring harness for damage, corrosion, or loose pins.
- 3 Disconnect the sensor and measure resistance across its terminals with a multimeter, comparing the reading to the expected value for the current ambient temperature.
- 4 With the sensor disconnected and the key on, measure voltage on the signal wire at the sensor connector to check for a short to ground; a reading near zero volts indicates a wiring fault.
- 5 If the signal wire is shorted, trace the harness from the sensor to the engine control module, checking for rub-throughs and testing continuity to ground with the computer disconnected.
- 6 Repair or replace the faulty sensor or damaged section of harness, clear the codes, and perform a road test with the scan tool monitoring charge air cooler temperature to confirm the fix.
- 7 If all external circuits and the sensor test good, perform a resistance and voltage check at the engine control module pins to rule out an internal module fault before replacement.

What a low charge air temperature signal really means

- A low signal voltage does not always mean the sensor is bad; a short to ground anywhere along the signal wire will produce the same code, so testing the wire before replacing the sensor saves time and money.
- On many vehicles, the charge air cooler temperature sensor is integrated into the charge air cooler or the intake air temperature sensor, so a failed sensor may require replacing the entire cooler assembly rather than a stand-alone part.
- Water intrusion into the sensor connector from condensation or pressure washing is a common cause of this code that is easily missed during a visual inspection.
- The engine computer may use the charge air cooler temperature signal to calculate the density of the incoming air and adjust fueling; a false low reading can cause over-fueling and soot accumulation without setting a misfire code.
- A P007C code can be set intermittently by a loose battery terminal or a poor ground connection that causes voltage spikes in the sensor circuit, so checking grounds is a worthwhile step before condemning the sensor.

Can I keep driving with P007C?

You can usually drive the vehicle with P007C, but avoid heavy acceleration and towing until the fault is repaired because the engine may be running with an incorrect air-fuel mixture. If the vehicle enters limp mode or runs poorly, have it diagnosed promptly to prevent damage to the turbocharger or diesel particulate filter.



Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter
- Wire piercing probes or back-probe kit
- Electrical contact cleaner
- Factory service information or wiring diagram for the vehicle

Reading P007C

- P** Powertrain: engine, transmission and emissions.
-
- 0** Generic (SAE) code: it means the same thing on every OBD-II vehicle.
-
- 0** Fuel and air metering and auxiliary emission controls.
-
- 7C** The exact fault within that area.

Often seen with

P007B Charge Air Cooler Temperature Sensor Circuit Range/Performan · **P007D** Charge Air Cooler Temperature Sensor Circuit High Bank 1 · **P0112** Intake Air Temperature Circuit Low Input · **P0113** Intake Air Temperature Circuit High Input · **P0238** Turbocharger Boost Sensor A Circuit High

See it working

Watch the animated explainer [Turbocharger Trainer: Boost, Wastegate and Intercooler](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p007c/>

