

GENERIC · POWERTRAIN

P2EC1

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P2EC1

Turbocharger Compressor Outlet Temperature Sensor Circuit High

P2EC1 indicates that the powertrain control module (PCM) has detected an abnormally high voltage signal from the turbocharger compressor outlet temperature sensor circuit. This sensor measures the temperature of the compressed air leaving the turbocharger, and a high voltage typically corresponds to a reading above the sensor's normal range or an open circuit in the wiring.

SYSTEM

Powertrain

CODE TYPE

Generic (all makes)

SEVERITY

Medium

FIX DIFFICULTY

Intermediate

AREA

Hybrid propulsion

Symptoms you may notice

- Illumination of the check engine light (malfunction indicator lamp) with no other noticeable symptoms
- Reduced engine power or limp mode due to the PCM limiting boost to protect the turbocharger
- Poor fuel economy or altered turbocharger operation because the PCM cannot accurately control boost
- In rare cases, a noticeable loss of power or hesitation during acceleration if the PCM defaults to a fixed boost strategy
- Often no symptoms besides the warning light, especially if the fault is intermittent

Common causes, most likely first

- 1 Open circuit or high resistance in the signal wire between the sensor and the PCM
- 2 Faulty turbocharger compressor outlet temperature sensor (internal open circuit or incorrect resistance)
- 3 Corroded, loose, or damaged electrical connector at the sensor or PCM
- 4 Short to voltage on the signal circuit (less common, but possible if wiring is chafed against a power wire)
- 5 PCM internal fault causing incorrect voltage interpretation (rare)



How to diagnose and fix it

- 1 Connect a scan tool and record the freeze-frame data for P2EC1, noting the sensor voltage reading and engine conditions when the fault set.
- 2 Visually inspect the sensor, its connector, and the wiring harness for damage, corrosion, or loose pins; repair as needed.
- 3 Disconnect the sensor and measure resistance across its terminals; compare to the manufacturer's specification (often around 1–10 kΩ at room temperature, varying with temperature).
- 4 With the sensor disconnected and the ignition on, measure voltage on the signal wire at the sensor connector; it should be near 5 V (reference voltage). If not, check continuity from the PCM to the sensor and repair the open circuit.
- 5 Check for short to voltage on the signal wire by measuring voltage with the sensor disconnected and the PCM connected; any voltage above 5 V indicates a short, which must be traced and repaired.
- 6 If wiring and sensor resistance are within specification, substitute a known-good sensor and clear the code to see if it returns; replace the sensor if the fault disappears.
- 7 If all else fails, perform a continuity check from the sensor connector to the PCM and inspect the PCM connector for corrosion or damage; replace the PCM only as a last resort after confirming all other possibilities.

Don't Replace the Sensor Before Checking These

- A common mistake is to replace the compressor outlet temperature sensor without first checking the wiring harness for an open circuit, which is actually the most frequent cause of this code.
The sensor's resistance changes with temperature, so a resistance check at room temperature may not reveal an intermittent fault; a wiggle test of the harness while monitoring live data can expose a broken wire.
- This code can be set by a poor connection at the PCM connector, especially if the vehicle has been exposed to moisture or road salt, so always inspect both ends of the circuit.
- A faulty sensor may still read plausible temperatures when the engine is cold, so the code may only set after the turbocharger has been under load and the sensor reaches a certain temperature.
- Do not overlook the possibility of a short to voltage on the signal wire; a chafed wire near the exhaust or turbocharger can cause a high-voltage signal that mimics a failed sensor.

Can I keep driving with P2EC1?

You can generally continue driving with this code, but avoid heavy acceleration and sustained high-load conditions because the PCM may limit boost to protect the turbocharger. Have the fault diagnosed soon to prevent potential turbocharger damage or reduced engine performance.



Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter
- Wiring diagram for the specific vehicle
- Basic hand tools (sockets, wrenches, screwdrivers)
- Contact cleaner and electrical tape for minor repairs

Reading P2EC1

- P** Powertrain: engine, transmission and emissions.
- 2** Generic (SAE) code: it means the same thing on every OBD-II vehicle.
- E** Hybrid propulsion.
- C1** The exact fault within that area.

Often seen with

P0234 Engine Overboost Condition · **P0235** Turbocharger Boost Sensor A Circuit Malfunction · **P0299** Turbo/Supercharger Underboost · **P2EC0** Turbocharger Compressor Outlet Temperature Sensor Circuit Lo · **P2EC2** Turbocharger Compressor Outlet Temperature Sensor Circuit Ra

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/p2ec1/>

