

GENERIC · POWERTRAIN

P2E77

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P2E77

Hybrid/EV Battery Pack Coolant Temperature Sensor D Circuit High

P2E77 indicates the hybrid or electric vehicle battery pack coolant temperature sensor D circuit is reporting a voltage higher than the manufacturer's expected range, which the computer interprets as an open circuit or excessive resistance. The powertrain control module sets this code when the sensor signal stays above the calibrated threshold for a set period, often disabling active battery thermal management as a protective measure.

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 or service vehicle soon message, often with no other noticeable symptoms
- Reduced hybrid or electric driving range or power output as the system limits battery usage to prevent overheating
- A warning message on the dash indicating battery temperature or cooling system fault
- The cooling fan or coolant pump may run continuously or not at all, depending on the fail-safe strategy
- In some cases, the vehicle may refuse to start or enter a reduced power mode after the code is stored

Common causes, most likely first

- 1 Open or high-resistance wiring in the sensor D circuit, such as a broken wire, corroded connector pin, or loose terminal
- 2 Failed battery pack coolant temperature sensor D, where the internal thermistor has drifted or opened
- 3 Poor electrical connection at the sensor or at the powertrain control module harness connector
- 4 Coolant level low or air pockets in the battery cooling loop causing the sensor to read incorrectly and set a circuit code
- 5 Faulty powertrain control module or hybrid control module, though this is rare and should be diagnosed last
- 6 Damage to the sensor wiring harness from road debris, heat, or chafing against nearby components
- 7 Aftermarket or incorrect sensor installed previously, leading to a signal outside the expected range



How to diagnose and fix it

- 1 Scan all modules and record freeze-frame data to confirm the code is current and not history, then check for related codes in the hybrid control module
- 2 Visually inspect the sensor D connector and wiring for corrosion, damage, or loose pins, and check coolant level and condition in the battery cooling reservoir
- 3 Measure the sensor resistance with a multimeter and compare it to the manufacturer's temperature-resistance chart to verify the sensor is within specification
- 4 Backprobe the sensor signal circuit at the powertrain control module to check for an open or high-resistance circuit while wiggling the harness
- 5 Perform a voltage drop test on the sensor ground circuit to rule out a poor ground connection
- 6 If the circuit and sensor check out, substitute a known-good sensor or use a signal generator to simulate the correct signal and see if the code clears
- 7 Clear the code and perform a road test with the scan tool monitoring battery coolant temperature to confirm the repair and ensure the code does not return

What the coolant sensor D code hides

- A low coolant level or trapped air in the battery cooling system can cause the sensor to read a temperature outside the expected range and set a circuit high code, so always check coolant level and bleed the system before condemning the sensor.
- The sensor D circuit may share a ground or reference voltage with other sensors, and a fault in a shared circuit can set multiple codes, so look for companion codes that point to a common wiring issue.
- A poor connection at the powertrain control module harness, often caused by water intrusion or terminal fretting, can mimic a failed sensor and is frequently missed during diagnosis.
- The code can be set by a momentary glitch during a low-voltage event, such as a weak 12-volt battery, so check battery health and charging system operation before replacing parts.
- Replacing the sensor without verifying the circuit can lead to a repeat failure if the root cause is a chafed wire or corroded connector that damages the new sensor over time.

Can I keep driving with P2E77?

You can usually drive the vehicle short distances to a repair shop, but avoid heavy acceleration, long trips, or extreme temperatures because the battery cooling system may be disabled and the battery could overheat. If the vehicle enters reduced power mode or shows a high battery temperature warning, stop driving and have it towed.



Tools that help

- OBD-II scan tool with hybrid/EV capability and live data
- Digital multimeter with temperature probe
- Backprobe pins and wiring diagram for the sensor circuit
- Coolant refractometer or hydrometer
- Socket set and trim removal tools for sensor access

Reading P2E77

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

Often seen with

P0A93 Inverter A Cooling System Performance · **P0AEF** Drive Motor Inverter Temperature Sensor A Circuit Low
 · **P0AF0** Drive Motor Inverter Temperature Sensor A Circuit High · **P2E76** Hybrid/EV Battery Pack Coolant Temperature Sensor D Circuit · **P2E78** Hybrid/EV Battery Pack Coolant Temperature Sensor D Circuit

See it working

Watch the animated explainer [Engine Cooling System Trainer: How Engines Stay Cool](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p2e77/>

