

GENERIC · POWERTRAIN

P2D52

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P2D52

Hybrid/EV Battery Pack Coolant Temperature Sensor C Circuit

P2D52 indicates that the hybrid or electric vehicle battery pack coolant temperature sensor circuit C is reporting a voltage or signal outside the expected range, so the battery control module cannot reliably monitor coolant temperature. The computer sets this code when the sensor signal is too high, too low, or intermittent for a calibrated period, which may trigger reduced power or charging limits to protect the battery.

SYSTEM

Powertrain

CODE TYPE

Generic (all makes)

SEVERITY

Medium

FIX DIFFICULTY

Intermediate

AREA

Hybrid propulsion

Symptoms you may notice

- Illumination of the hybrid system warning light or service vehicle soon message
- Reduced electric driving range or forced engine running in plug-in hybrids
- Limited power output or reduced charging rate, especially in hot or cold weather
- Active grille shutters or coolant pump may run continuously or not at all
- Often no symptoms besides the warning light, particularly in mild ambient temperatures

Common causes, most likely first

- 1 Faulty coolant temperature sensor C, such as an open or shorted thermistor element
- 2 Damaged or corroded wiring harness between the sensor and the battery control module
- 3 Loose, backed-out, or water-intruded connector pins at the sensor or module
- 4 Coolant level low or air pockets causing the sensor to read incorrectly
- 5 Failed battery control module or hybrid control module internal driver circuit
- 6 Aftermarket or incorrect sensor installed during prior repairs



How to diagnose and fix it

- 1 Verify coolant level and condition, then pressure-test the battery coolant loop for leaks or air pockets
- 2 Inspect the sensor connector and harness for corrosion, chafing, or loose pins, and perform a wiggle test while watching live data
- 3 Measure sensor resistance at known temperatures and compare with the manufacturer's resistance chart
- 4 Check reference voltage and ground at the sensor connector with a multimeter to rule out wiring faults
- 5 If wiring and sensor test good, substitute a known-good sensor and clear the code to see if it returns
- 6 Perform a battery control module software update if a calibration bulletin applies to the vehicle
- 7 Replace the sensor or repair the harness as needed, then clear codes and verify the coolant temperature reading matches ambient after a cold soak

Coolant sensor C faults that fool technicians

- A low coolant level or trapped air in the battery pack coolant loop often sets this code because the sensor reads air temperature instead of liquid temperature, so always bleed the system before condemning the sensor.
- The sensor C circuit may share a common ground or reference voltage with other temperature sensors, so a fault in a different sensor can pull the C circuit out of range and set this code without any problem in sensor C itself.
- On many hybrids the battery coolant temperature sensor is part of a combined sensor block or harness that also includes the inlet and outlet sensors, and replacing only the C sensor may not be possible or may require replacing the entire assembly.
- Intermittent codes that appear only after a cold start or during high-load driving often point to a harness chafe near a bracket or a connector that expands with heat, not a failed sensor.
- A battery control module that has logged this code may keep the coolant pump running after shutdown or disable active grille shutters, which can drain the 12-volt battery and create a no-start condition that misleads diagnosis.

Can I keep driving with P2D52?

You can usually drive the vehicle short distances to a repair shop, but avoid heavy acceleration, sustained high speeds, and fast charging because the battery may overheat without proper coolant temperature monitoring. If the hybrid system warning light flashes or power is severely limited, stop driving and have the vehicle towed.

Tools that help

- OBD-II scan tool with live data and hybrid battery parameter capability
- Digital multimeter with temperature probe
- Manufacturer service information for resistance charts and bleed procedures
- Socket set and trim removal tools for sensor access
- Coolant refractometer or hydrometer



Reading P2D52

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

Often seen with

P0A93 Inverter A Cooling System Performance · **P0C73** Hybrid Battery Pack Cooling Pump Performance · **P2D50** Hybrid/EV Battery Pack L Over Temperature · **P2D51** Air Assisted Injector Control Circuit · **P2D53** Hybrid/EV Battery Pack Coolant Temperature Sensor C 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/p2d52/>

