

GENERIC · POWERTRAIN

P2C3A

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P2C3A

Cylinder Head Temperature Sensor B Circuit Low

P2C3A indicates that the engine control module has detected an abnormally low voltage signal from the cylinder head temperature sensor B circuit, which is a second temperature sensor often used to monitor head temperature independently of coolant temperature. The circuit is considered low when the signal voltage falls below the expected range for the current operating conditions, typically indicating a short to ground, an open return path, or a sensor that has failed in a low-resistance state.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Powertrain	Generic (all makes)	Medium	Intermediate	Hybrid propulsion

Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms
- Rough running or misfire when the engine is cold if the module substitutes an incorrect default temperature
- Poor fuel economy or elevated idle speed as the module enriches the mixture based on a false cold reading
- Overheating warning or fan running constantly if the module interprets the low signal as an extremely high temperature
- Intermittent driveability complaints that appear only in damp or wet conditions when wiring is compromised
- A stored freeze-frame showing the sensor voltage pinned near zero volts

Common causes, most likely first

- 1 A short to ground in the signal wire between the cylinder head temperature sensor B and the engine control module
- 2 A failed cylinder head temperature sensor B that has internally shorted and reads low resistance
- 3 Corroded, loose, or damaged connector pins at the sensor or at the module harness
- 4 An open or high-resistance ground return circuit for the sensor, causing the signal to be pulled low
- 5 Harness chafing against the cylinder head or exhaust components that has worn through insulation and contacted ground
- 6 Moisture intrusion into the sensor connector or wiring splice, creating a partial short
- 7 A rare internal fault in the engine control module driver circuit for that sensor input



How to diagnose and fix it

- 1 Connect a scan tool and record the freeze-frame data and live cylinder head temperature B voltage to confirm the low signal condition
- 2 Visually inspect the sensor connector and harness for corrosion, chafing, moisture, or loose pins, and repair any obvious damage
- 3 Disconnect the sensor and measure resistance across its terminals, comparing to the manufacturer's temperature-resistance chart to rule out a failed sensor
- 4 With the sensor disconnected, measure voltage on the signal wire at the connector to check for a short to ground with the key on
- 5 Check the ground return circuit for excessive resistance using a voltage drop test while the circuit is loaded
- 6 If wiring and sensor test good, perform a wiggle test on the harness while monitoring live data to expose an intermittent short
- 7 Replace the cylinder head temperature sensor B only after electrical tests confirm it is the source, then clear the code and verify the repair with a road test

What a low signal really tells you

- A low signal code is set by voltage, not by actual temperature, so a perfectly good sensor can trigger it when the ground return path has resistance from corrosion or a loose engine ground strap.
- Technicians often replace the sensor first and find the code returns because the real fault was a chafed signal wire shorting to the cylinder head, which only shows up when the engine moves under torque.
- Cylinder head temperature sensor B is frequently a second, separate sensor from the primary coolant temperature sensor, so a normal coolant temperature reading on the scan tool does not rule out this circuit.
- Some modules set this code when the sensor circuit is open rather than shorted because the pull-up resistor drives the signal low when the return path is lost, so do not assume low voltage always means a short to ground.
- A weak or failing battery or charging system can cause reference voltage instability that mimics a low sensor signal, so check system voltage before condemning the sensor or module.

Can I keep driving with P2C3A?

You can usually drive the vehicle to a repair shop, but avoid heavy loads, long trips, and sustained high-speed driving because the module may be using a default temperature that affects fuel mixture and cooling fan operation. If the engine temperature gauge behaves erratically or the cooling fan runs constantly, keep the trip short and have it checked promptly.



Tools that help

- OBD-II scan tool with live data and freeze-frame capability
- Digital multimeter with resistance and voltage drop functions
- Back probe pins or breakout leads for connector testing
- Wiring diagram for the specific vehicle to identify sensor B circuit pins
- Hand tools for connector and sensor removal

Reading P2C3A

- P** Powertrain: engine, transmission and emissions.
-
- 2** Generic (SAE) code: it means the same thing on every OBD-II vehicle.
-
- C** Hybrid propulsion.
-
- 3A** The exact fault within that area.

Often seen with

P0117 Engine Coolant Temperature Circuit Low Input · **P0118** Engine Coolant Temperature Circuit High Input · **P0128** Coolant Thermostat (Coolant Temperature Below Thermostat Reg · **P2C39** Cylinder Head Temperature Sensor B Range/Performance · **P2C3B** Cylinder Head Temperature Sensor B Circuit High

See it working

Watch the animated explainer [How a Coolant Temperature Sensor Works](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p2c3a/>

