

GENERIC · POWERTRAIN

P0116

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P0116

Engine Coolant Temperature Circuit Range/Performance

P0116 means the engine computer (PCM) has detected that the engine coolant temperature (ECT) sensor signal is outside the expected range or is not rising at a plausible rate after a cold start. The PCM compares the coolant temperature reading with other inputs like intake air temperature and engine run time, and flags the code when the sensor's behavior does not match the model's expected warm-up curve.

SYSTEM

Powertrain

CODE TYPE

Generic (all makes)

SEVERITY

Low

FIX DIFFICULTY

Intermediate

AREA

Fuel and air metering

Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms
- Inaccurate or erratic temperature gauge readings on the dashboard
- Poor fuel economy or rough running during warm-up if the PCM substitutes a default temperature value
- Cooling fan running continuously or not engaging at the correct temperature
- Hard starting or stalling when the engine is cold in some cases
- A noticeable drop in heater performance if the sensor misreports coolant temperature

Common causes, most likely first

- 1 Faulty engine coolant temperature (ECT) sensor that is drifting or slow to respond
- 2 Corroded, loose, or damaged wiring and connector pins at the ECT sensor
- 3 A stuck-open or incorrect thermostat causing the engine to warm up too slowly
- 4 Low coolant level or trapped air in the cooling system affecting sensor readings
- 5 PCM software calibration issue or faulty PCM in rare cases
- 6 Contamination or sludge on the sensor tip from old or mixed coolant



How to diagnose and fix it

- 1 Verify coolant level and inspect for leaks or air pockets in the cooling system
- 2 Use a scan tool to compare the ECT sensor reading cold and after warm-up against actual coolant temperature with an infrared thermometer
- 3 Inspect the ECT sensor connector and wiring for corrosion, chafing, or loose pins and repair as needed
- 4 Test the ECT sensor resistance with a multimeter and compare to the manufacturer's temperature-resistance chart
- 5 Check thermostat operation by monitoring coolant temperature rise during warm-up; replace if it opens too early or sticks open
- 6 Replace the ECT sensor if resistance is out of specification or response is sluggish
- 7 Clear the code and perform a drive cycle to confirm the repair and ensure the monitor completes

Why a thermostat can trigger P0116

- A thermostat that sticks open is one of the most commonly overlooked causes of P0116 because the engine never reaches normal operating temperature within the expected time, making the ECT signal appear implausible to the PCM.
- The code does not always mean the sensor itself has failed; wiring harness chafing near the thermostat housing or intake manifold can intermittently short or open the signal circuit.
- After replacing a sensor or thermostat, always clear the code and complete a full warm-up drive cycle, as some vehicles will not re-run the rationality test until specific conditions are met.
- On many vehicles, a failed ECT sensor causes the PCM to default to a fixed temperature value, which can mask driveability symptoms and lead to misdiagnosis of fuel or ignition problems.
- Air pockets trapped in the cooling system after a coolant service can cause erratic ECT readings and set P0116 even when all components are functioning correctly.

Can I keep driving with P0116?

It is generally safe to continue driving with P0116, but avoid ignoring it because inaccurate coolant temperature data can affect fuel economy, emissions, and cooling fan operation. Have the fault diagnosed soon, especially if you notice overheating, poor heater performance, or rough running.

Tools that help

- OBD-II scan tool with live data capability
- Infrared thermometer
- Digital multimeter
- Socket set and wrench set
- Coolant refractometer or hydrometer



Reading P0116

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

Often seen with

P0115 Engine Coolant Temperature Circuit Malfunction · **P0117** Engine Coolant Temperature Circuit Low Input · **P0118** Engine Coolant Temperature Circuit High Input · **P0128** Coolant Thermostat (Coolant Temperature Below Thermostat Reg · **P2181** Cooling System Performance

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/p0116/>

