

GENERIC · POWERTRAIN

P0117

OBD-II TROUBLE CODE

P0117

Engine Coolant Temperature Circuit Low Input

P0117 means the engine control module (ECM) has detected a voltage signal from the engine coolant temperature (ECT) sensor that is lower than the normal operating range, which the ECM interprets as an extremely high coolant temperature or a short to ground. The ECM sets this code when the sensor circuit voltage stays below a calibrated threshold for a set period, indicating a fault in the sensor, wiring, or connector rather than a confirmed overheating condition.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Powertrain	Generic (all makes)	Medium	Intermediate	Fuel and air metering

Symptoms you may notice

- The check engine light illuminates, often with no other noticeable symptoms.
- The temperature gauge may read abnormally high or peg at the hot mark even when the engine is cold.
- The cooling fan may run constantly because the ECM thinks the engine is overheating.
- Poor fuel economy or rich fuel mixture due to the ECM adding fuel for a cold engine.
- Hard starting or rough idle when the engine is cold, as the ECM misjudges coolant temperature.
- In some vehicles, the air conditioning compressor may be disabled to reduce engine load.

Common causes, most likely first

- 1 A short to ground in the signal wire between the ECT sensor and the ECM.
- 2 A faulty ECT sensor that has failed internally and reads low resistance.
- 3 Corroded, loose, or damaged electrical connector at the ECT sensor.
- 4 Damaged wiring harness causing the signal wire to chafe against ground.
- 5 A failed ECM driver circuit for the ECT sensor (rare but possible).
- 6 Coolant contamination or sensor tip coated with deposits altering resistance.
- 7 Aftermarket or incorrect ECT sensor with wrong resistance curve.



How to diagnose and fix it

- 1 Scan all modules and record freeze-frame data to confirm P0117 is the only coolant-related code.
- 2 Inspect the ECT sensor connector and wiring for corrosion, looseness, or obvious damage.
- 3 Measure the resistance of the ECT sensor with a multimeter and compare to the manufacturer's temperature-resistance chart.
- 4 Backprobe the sensor signal wire at the ECM and check for a short to ground with the sensor disconnected.
- 5 If wiring checks out, substitute a known-good sensor and clear the code to see if it returns.
- 6 Check for technical service bulletins (TSBs) or reprogramming updates that address false P0117 setting.
- 7 Replace the ECT sensor if resistance is out of specification, then clear codes and verify the repair with a test drive.

What a low coolant temp signal really means

- A P0117 is almost always an electrical circuit fault, not a genuine overheating event, so replacing the thermostat or water pump without testing the circuit wastes money.
The ECM may default to a fixed coolant temperature value, causing the cooling fan to run continuously and masking the real issue until the code is cleared.
- A shorted sensor can read low resistance (high temperature) even when the engine is cold, so the temperature gauge may lie to you.
- On some vehicles, a faulty ECT sensor can cause the transmission to shift harshly because the powertrain control module uses coolant temperature for shift scheduling.
Always check for a short to ground in the signal wire before condemning the ECM, as chafed harnesses are a common cause.

Can I keep driving with P0117?

You can usually drive the vehicle short distances to a repair shop, but avoid long trips or heavy loads because the ECM may run the cooling fan constantly and fuel mixture will be rich. If the temperature gauge shows actual overheating or you see steam, stop driving immediately and tow the vehicle.

Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter
- Backprobe pins or piercing probes
- Temperature-resistance chart for the ECT sensor
- Socket set and wrench for sensor replacement
- Wire repair kit with heat-shrink connectors



Reading P0117

- 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.
- 17** The exact fault within that area.

Often seen with

P0115 Engine Coolant Temperature Circuit Malfunction · **P0116** Engine Coolant Temperature Circuit Range/Performance · **P0118** Engine Coolant Temperature Circuit High Input · **P0128** Coolant Thermostat (Coolant Temperature Below Thermostat Reg · **P2182** Engine Coolant Temperature Sensor 2 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/p0117/>

