

FORD · POWERTRAIN

P1116

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P1116 · Ford

Engine Coolant Temperature Sensor is Out of Self-Test Range

P1116 on Ford vehicles means the powertrain control module (PCM) ran its self-test of the engine coolant temperature (ECT) sensor circuit and found the signal outside the range the PCM expects during that test. The PCM is not reporting a simple open or short circuit; it is flagging that the coolant temperature reading did not behave as expected during the key-on or start-up self-test window.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Powertrain	Ford specific	Low	Intermediate	Fuel and air metering

Symptoms you may notice

- Illuminated check engine light, often with no other noticeable symptoms
- Rough idle or poor driveability when the engine is cold
- Incorrect temperature gauge reading or a gauge that stays low
- Higher-than-normal fuel consumption because the PCM thinks the engine is cold
- Hard starting or a rich-running condition in cold weather
- Cooling fan running constantly or not engaging when it should

Common causes, most likely first

- 1 Faulty engine coolant temperature sensor that is out of specification or slow to respond
- 2 Corroded, loose, or damaged wiring and connector pins at the ECT sensor
- 3 Open or shorted signal or ground circuit between the ECT sensor and the PCM
- 4 Low coolant level or air pockets in the cooling system causing the sensor to read incorrectly
- 5 Thermostat stuck open, preventing the engine from reaching the temperature the self-test expects
- 6 PCM software calibration issue or a faulty PCM (rare, but possible after other causes are ruled out)



How to diagnose and fix it

- 1 Check coolant level and condition, then pressure-test the cooling system for leaks or air pockets
- 2 Inspect the ECT sensor connector and wiring for corrosion, chafing, or loose pins
- 3 Measure the ECT sensor resistance with a multimeter and compare it to Ford's temperature-resistance chart
- 4 Back-probe the sensor signal circuit at the PCM and compare the voltage to the expected value for the actual coolant temperature
- 5 Verify thermostat operation by watching coolant temperature rise to normal operating range during a road test
- 6 Replace the ECT sensor if resistance is out of range or it responds too slowly to temperature changes
- 7 Clear the code and perform a drive cycle to confirm the self-test passes and the code does not return

Why the self-test range matters on Fords

- This code is set during a specific PCM self-test window, so a sensor that reads correctly once the engine is warm can still trigger P1116 if it is slow or skewed during key-on or early warm-up.
- A stuck-open thermostat is a common cause that gets missed because the sensor itself tests fine at room temperature; the engine simply never reaches the temperature the self-test expects.
- Air pockets from a recent cooling system service can make the ECT sensor read low even when the sensor and wiring are perfect, so bleed the system before condemning parts.
- Ford ECT sensors use a negative temperature coefficient (NTC) element, meaning resistance drops as temperature rises; a sensor that is only slightly out of spec can pass a basic ohm check but still fail the self-test.

Do not replace the PCM until you have verified the sensor, wiring, coolant level, and thermostat, because a false P1116 from a cooling system issue will return on a new PCM.

Can I keep driving with P1116?

You can usually keep driving with P1116 because it is a self-test range fault rather than a severe circuit failure, but avoid long trips or heavy load until it is diagnosed. If the temperature gauge behaves erratically or the engine runs poorly when cold, have it checked promptly to prevent rich-running conditions and poor fuel economy.

Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter
- Ford ECT sensor temperature-resistance chart or service information
- Cooling system pressure tester
- Back-probe kit or pin probes
- Basic hand tools for sensor and connector access



Reading P1116

- P** Powertrain: engine, transmission and emissions.
- 1** Manufacturer-specific code (Ford): its meaning depends on the make.
- 1** Fuel and air metering.
- 16** The exact fault within that area.

Often seen with

P0115 Engine Coolant Temperature Circuit Malfunction · **P0116** Engine Coolant Temperature Circuit Range/Performance · **P0117** Engine Coolant Temperature Circuit Low Input · **P0118** Engine Coolant Temperature Circuit High Input · **P0128** Coolant Thermostat (Coolant Temperature Below Thermostat Reg

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/ford-p1116/>

