

DTC P0597-P0599 (ENGINE COOLI...

DTC P0597-P0599 (ENGINE COOLING)

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DTC P0597-P0599**Diagnostic Instructions**

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provide an overview of each diagnostic category.

DTC Descriptors**DTC P0597 00:** Engine Coolant [Thermostat Heater](#) Control Circuit**DTC P0598 00:** Engine Coolant [Thermostat Heater](#) Control Circuit Low Voltage**DTC P0599 00:** Engine Coolant [Thermostat Heater](#) Control Circuit High Voltage**Diagnostic Fault Information**

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Control High	P0597 00, P0598 00	P0597 00, P0598 00	—	—
Control Low	P0598 00	P0598 00	P0597 00, P0599 00	—

Circuit/System Description

The engine control module (ECM) controls the pulse width modulated (PWM) thermostat. The engine coolant [thermostat heater](#) controls coolant flow and regulates the engine operating temperature. The ECM supplies 12 V to the thermostat. The ECM controls the engine coolant [thermostat heater](#) by grounding the control circuit with a solid state device called a driver. The driver is equipped with a feedback circuit that is pulled up to a voltage. The ECM can determine if the control circuit is open, shorted to ground, or shorted to a voltage by monitoring the feedback voltage.

Conditions for Running the DTC

- The ignition is ON, or the engine is running.
- The ignition voltage is greater than 9 V.
- DTC P0597 00, P0598 00, and P0599 00 run continuously once the above conditions are met.

Conditions for Setting the DTC

The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match for greater than 15 s.

Action Taken When the DTC Sets

DTC P0597 00, P0598 00, P0599 00 are Type B DTCs.

Conditions for Clearing the DTC

DTC P0597 00, P0598 00, P0599 00 are Type B DTCs.

Diagnostic Aids

The engine coolant [thermostat heater](#) has a mechanical fail safe in case of an electrical condition with the engine coolant [thermostat heater](#). The mechanical thermostat will open at approximately 104°C (220°F). The mechanical thermostat will cycle from approximately 104°C (220°F) to approximately 98°C (208°F). The heater is part of the thermostat. The engine coolant [thermostat heater](#) and the thermostat housing are serviced as an assembly.

Reference Information**Schematic Reference**

[Engine Controls Schematics](#)**Connector End View Reference**[Component Connector End Views](#)**Electrical Information Reference**

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

DTC Type Reference[Powertrain Diagnostic Trouble Code \(DTC\) Type Definitions](#)**Scan Tool Reference**

[Control Module References](#) for scan tool information

Circuit/System Verification

Operate the vehicle within the conditions for running the DTC to verify the DTC does not reset. You may also operate the vehicle within the conditions that you observed from the freeze frame/failure records data.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the E41 Engine Coolant [Thermostat Heater](#).
2. Ignition ON, verify that a test lamp illuminates between the ignition circuit terminal 2 and ground.
⇒X If the test lamp does not illuminate, test the ignition circuit for a short to ground or an open/high resistance. If the circuit tests normal and the ignition circuit fuse is open, test all the components connected to the ignition circuit and replace as necessary.
3. Command the E41 Engine Coolant [Thermostat Heater](#) to 10% with a scan tool. Test for 2.5–3.5 V between the control circuit terminal 1 and ground.
4. If less than the specified range, test the control circuit for a short to ground or an open/high resistance. If the circuit/connections test normal, replace the K20 Engine Control Module.
5. If greater than the specified range, test the control circuit for a short to voltage. If the circuit tests normal, replace the K20 Engine Control Module.
6. Command the E41 Engine Coolant [Thermostat Heater](#) to 100% with a scan tool. The DMM should transition from 2.5–3.5 V when commanded to 10% to less than 0.1 V when commanded to 100%.
⇒X If the circuit voltage does not correspond to the specified values, replace the K20 Engine Control Module.
7. If all circuits test normal, test or replace the E41 Engine Coolant [Thermostat Heater](#).

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the diagnostic procedure.

- [Engine Coolant Thermostat Replacement \(1.6L LDE, LXV, 1.8L LUW, 2H0 and LFH\)](#)
- [Control Module References](#) for ECM replacement, setup, and programming

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