

P0667, P0668, or P0669

Transmission Control Module (TCM) Temperature Sensor

Diagnostic Instructions

- Perform the Diagnostic System Check – Vehicle on page 6-60 prior to using this diagnostic procedure.
- Review Strategy Based Diagnosis on page 6-57 for an overview of the diagnostic approach.
- Diagnostic Procedure Instructions on page 6-58 provides an overview of each diagnostic category.

DTC Descriptors

DTC P0667: Transmission Control Module (TCM) Temperature Sensor Performance

DTC P0668: Transmission Control Module (TCM) Temperature Sensor Circuit Low Voltage

DTC P0669: Transmission Control Module (TCM) Temperature Sensor Circuit High Voltage

Circuit/System Description

The transmission control module (TCM) temperature sensor is located inside of the control solenoid (w/body and TCM) valve assembly and is not serviced separately. The TCM temperature sensor provides the temperature of the TCM. This temperature reading is used in various shifting and diagnostic routines in the TCM software. This fault is handled inside the TCM and no external circuits are involved.

Conditions for Running the DTC

P0667

- No TFT DTCs P0711, P0712, or P0713.
- No ISS DTCs P0716 or P0717.
- No OSS DTCs P0722 or P0723.

- DTC P0667 has not passed this key ON.
- The TCM temperature is between -54 and $+149^{\circ}\text{C}$ (-65 and $+300^{\circ}\text{F}$).
- The engine speed is greater than 500 RPM for 5 seconds or more.
- The ignition voltage is between 8.6 volts and 19.0 volts.

P0668

- DTC P0668 has not failed this ignition cycle.
- The engine speed is greater than 500 RPM for 5 seconds or more.
- The ignition voltage is between 8.6 volts and 19.0 volts.

P0669

- No ISS DTCs P0716 or P0717.
- No OSS DTCs P0722 or P0723.
- The transmission output shaft speed is 200 RPM or greater for 200 seconds or more.
- The TCC slip speed is 120 RPM or greater for 200 seconds or more.
- DTC P0669 has not failed this ignition cycle.
- The engine speed is greater than 500 RPM for 5 seconds or more.
- The ignition voltage is between 8.6 volts and 19.0 volts.

Conditions for Setting the DTC

P0667 – Fail Case 1

- Vehicle speed is 8 km/h (5 mph) or greater for 300 seconds cumulative.
- Torque converter clutch (TCC) slip speed is greater than 120 RPM for 300 seconds cumulative.
- The TCM temperature is between -55 and $+21^{\circ}\text{C}$ (-67 and $+70^{\circ}\text{F}$).
- The transmission fluid temperature (TFT) is 70°C (158°F) or greater.
- The TCM temperature has changed by less than 2.0°C (3.6°F) in 100 seconds.
- The TFT has increased by 55°C (99°F) since startup.

P0667 – Fail Case 2

- Vehicle speed is 8 km/h (5 mph) or greater for 300 seconds cumulative.
- TCC slip speed is greater than 120 RPM for 300 seconds cumulative.
- The TCM temperature is between 120 – 150°C (248 – 302°F).
- The TCM temperature has changed by less than 2.0°C (3.6°F) in 100 seconds.
- The TFT is 70°C (158°F) or greater.
- The TFT has increased by 55°C (99°F) since startup.

P0667 – Fail Case 3

The TCM temperature changes by 20°C (36°F) or greater 14 times over 7

seconds.

P0668

The TCM temperature is 249°C (480°F) or greater for 4 seconds or more.

P0669

The TCM temperature is -249°C (-416°F) or greater for 10 seconds or more.

Action Taken When the DTC Sets

- DTCs P0667, P0668, and P0669 are Type C DTCs.
- The TCM allows the vehicle to operate in transmission protection mode.

Conditions for Clearing the DTC

DTCs P0667, P0668, and P0669 are Type C DTCs.

Diagnostic Aids

The transmission control module (TCM) temperature sensor is located inside of the control solenoid (w/body and TCM) valve assembly and its output should resemble that of the transmission fluid temperature (TFT) sensor output.

Reference Information

Description and Operation

Electronic Component Description on page 17-279 for control solenoid (w/body and TCM) valve assembly

DTC Type Reference

Powertrain Diagnostic Trouble Code (DTC) Type Definitions on page 6-61

Scan Tool Reference

Control Module References on page 6-1 for scan tool information

Circuit/System Verification

- 1). Engine idling at operating temperature, verify the scan tool TCM Temperature parameter is between -247 and +247°C (-412 and +477°F).

If not within the specified range, replace the control solenoid (w/body and TCM) valve assembly.

- 2). Operate the vehicle at 64 km/h (40 mph) for 10 minutes, verify the scan tool TCM Temperature parameter varies by more than 2°C (5°F) to verify that the sensor is not stuck..
- 3). 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.

Repair Instructions

Important:

- Perform the Service Fast Learn Adapts on page 17-102 following all transmission related repairs.
- Before replacing the TCM, perform the Control Solenoid Valve and Transmission Control Module Assembly Inspection on page 17-98. Perform the Diagnostic Repair Verification on page 6-86 after completing the diagnostic procedure. Control Module References on page 6-1 for control solenoid (w/body and TCM) valve assembly replacement, setup, and programming

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