

P1684-P1686 Transmission Control Module (TCM) Power Up 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 P1684: Transmission Control Module (TCM) Power Up Temperature Sensor Performance

DTC P1685: Transmission Control Module (TCM) Power Up Temperature Sensor Circuit Low Voltage

DTC P1686: Transmission Control Module (TCM) Power Up Temperature Sensor Circuit High Voltage

Circuit/System Description

The transmission control module (TCM) power up temperature sensor is located inside of the control solenoid (w/body and TCM) valve assembly and is not serviced separately. The TCM power up temperature sensor provides the temperature of the TCM when the TCM power is on. 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

P1684 – Fail Case 1 and 2

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

- DTC P1684 has not passed this key ON.
- The engine speed is 500 RPM or greater for 5 seconds.
- The ignition voltage is between 8.6 volts and 19.0 volts.
- The TCM power up temperature is between -39 and $+149^{\circ}\text{C}$ (-38 and $+300^{\circ}\text{F}$).

P1684 – Fail Case 3

- The engine speed is 500 RPM or greater for 5 seconds.
- The ignition voltage is between 8.6 volts and 19.0 volts.

P1685

- 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 torque converter clutch (TCC) slip speed is 120 RPM or greater for 200 seconds or more.
- DTC P1686 has not failed this ignition cycle.
- The engine speed is 500 RPM or greater for 5 seconds.
- The ignition voltage is between 8.6 volts and 19.0 volts.

P1686

- The engine speed is 500 RPM or greater for 5 seconds.
- The ignition voltage is between 8.6 volts and 19.0 volts.
- DTC P1686 has not failed this ignition cycle.

Conditions for Setting the DTC

P1684 – Fail Case 1

- 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 power up temperature is between -40 and $+21^{\circ}\text{C}$ (-40 and $+70^{\circ}\text{F}$).
- The TCM power up temperature has changed by less than 2°C (3.6°F) in 100 seconds.
- The transmission fluid temperature (TFT) is 70°C (158°F) or greater.
- The TFT has increased by 55°C (99°F) since startup.

P1684 – 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 sensor is between 120 – 150°C (248 – 302°F).
- The TCM power up temperature has changed by less than 2°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.

P1684 – Fail Case 3

The TCM power up temperature changes by 20°C (36°F) or greater 14 times in a 7 second sample.

P1685

The TCM power up temperature is -59°C (-74°F) or less for 10 seconds or greater.

P1686

The TCM power up temperature is 165°C (329°F) or more for 10 seconds or greater.

Action Taken When the DTC Sets

DTCs P1684, P1685, and P1686 are Type C DTCs.

Conditions for Clearing the DTC

DTCs P1684, P1685, and P1686 are Type C DTCs.

Reference Information

Connector End View Reference

Component Connector End Views on page 11-211

Description and Operation

- Transmission General Description on page 17-278
- 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). Ignition ON, clear the DTCs with a scan tool.
- 2). Operate the vehicle within the Conditions for Running and Setting the DTC. The DTCs should not set.

if a DTC sets, replace the control solenoid (w/body and TCM) valve assembly.

- 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