DIDVQ−01

| DTC | P2740 | Transmission Fluid Temperature Sensor ”B” Circuit |
|---|---|---|

| DTC | P2742 | Transmission Fluid Temperature Sensor ”B” Circuit Low Input |
|---|---|---|

| DTC | P2743 | Transmission Fluid Temperature Sensor ”B” Circuit High Input |
|---|---|---|

## CIRCUIT DESCRIPTION

ATF (Automatic Transmission Fluid) temperature sensor No.2 is on the transmission and just in front of the oil cooler inlet pipeline.

If ECM detects the abnormally high temperature of ATF by this sensor, it draws driver’s attention by illuminating the warning lamp.

HINT:

- The temperature of ATF easily rises when towing, climbing hills and in traffic, etc.
- If the ATF temperature sensor No.2 becomes short−circuited, the signal that indicates the ATF temperature is 150°C (302°F) or higher is input in ECM.

**Vehicle conditions when the sensor is normal and when the sensor is short−circuited are indicated in the table below.**

| ATF temperature Sensor No.2 State | Detection Condition | Symptom | Recovery Condition |
|---|---|---|---|
| Sensor is normal | • AT fluid temp. more than 150°C (302°F). | • AT Oil Temp. warning light remains on | • AT fluid temp. less than 135°C (275°F). *2 |
| | • AT fluid temp. more than 130°C (266°F). | • Shift point too high. | • AT fluid temp. less than 110°C (230°F). |
| | When the conditions (a) and (b) are satisfied.<br>(a) AT fluid temp. more than 130°C (266°F).<br>(b) Engine coolant temp. more than 95°C (203°F). | • Lock−up at 3rd gear. *1 | • AT fluid temp. less than 110°C (230°F) *2 and engine coolant temp. less than 95°C (203°F). |
| Sensor is short−circuited | • Any conditions. | • AT Oil Temp. warning light remains on<br>• Shift point too high. | • Symptoms still occur |
| | • Engine coolant temp. more than 95°C (203°F). | • Lock−up at 3rd gear. *1 | • Symptoms still occur |

HINT:

*1: When AT fluid temperature is normal, transmission locks up at 5th gear with the shift lever in D position and at 4th gear with the shift lever in 4 position.

*2: When AT fluid temperature is in normal range, it decreases to less than 135°C (275°F) within 5 minutes with the shift lever in P or N position in an idling state.

| DTC No. | DTC Detecting Condition | Trouble Area |
|---|---|---|
| P2740 | (a) and (b) are detected momentarily within 0.5 sec. when neither P2742 nor P2743 is detected (1−trip detection logic)<br>(a) ATF temperature sensor No.2 resistance is less than 25 Ω (0.046 V)<br>(b) ATF temperature sensor No.2 resistance is more than 156 kΩ (4.915 V)<br>HINT:<br>Within 0.5 sec. the malfunction switches from (a) to (b) or from (b) to (a) | • Open or short in ATF temperature sensor No.2 circuit<br>• Transmission wire (ATF temperature sensor No.2)<br>• ECM |
| P2742 | ATF temperature sensor No.2 resistance is less than 25 Ω (0.046 V) for 0.5 sec. or more (1−trip detection logic) | • Short in ATF temperature sensor No.2 circuit<br>• Transmission wire (ATF temperature sensor No.2)<br>• ECM |
| P2743 | ATF temperature No.2 sensor resistance is more than 156 kΩ (4.915 V) when 15 minutes or more after the engine start DTC is detected for 0.5 sec. or more (1−trip detection logic) | • Open in ATF temperature sensor No.2 circuit<br>• Transmission wire (ATF temperature sensor No.2)<br>• ECM |

## MONITOR DESCRIPTION

The Automatic Transmission Fluid (ATF) temperature sensor converts ATF temperature to an electrical resistance value. Based on the resistance, the ECM determines the ATF temperature, and the ECM detects an open or short in the AFT temperature circuit. If the resistance value of the ATF temperature is less than 25 Ω (0.046 V) or more than 156 kΩ (4.915 V), the ECM interprets this as a fault in the ATF sensor or wiring. The ECM will turn on the MIL and store the DTC.

## MONITOR STRATEGY

| | | |
|---|---|---|
| Related DTCs | P2740 | ATF temperature sensor/Range check (Fluttering) |
| | P2742 | ATF temperature sensor/Range check (Low voltage) |
| | P2743 | ATF temperature sensor/Range check (High voltage) |
| Required sensors/Components | ATF temperature sensor (TFT sensor) | |
| Frequency of operation | Continuous | |
| Duration | 0.5 sec. | |
| MIL operation | Immediate | |
| Sequence of operation | None | |

## TYPICAL ENABLING CONDITIONS

| Item | Specification | |
|---|---|---|
| | Minimum | Maximum |
| The monitor will run whenever these DTCs are not present. | See page DI−963 | |
| **Range check (Fluttering, Low voltage)** | | |
| The typical enabling condition is not available. | − | |
| **Range check (High voltage)** | | |
| Time after engine start | 15 min. or more | − |

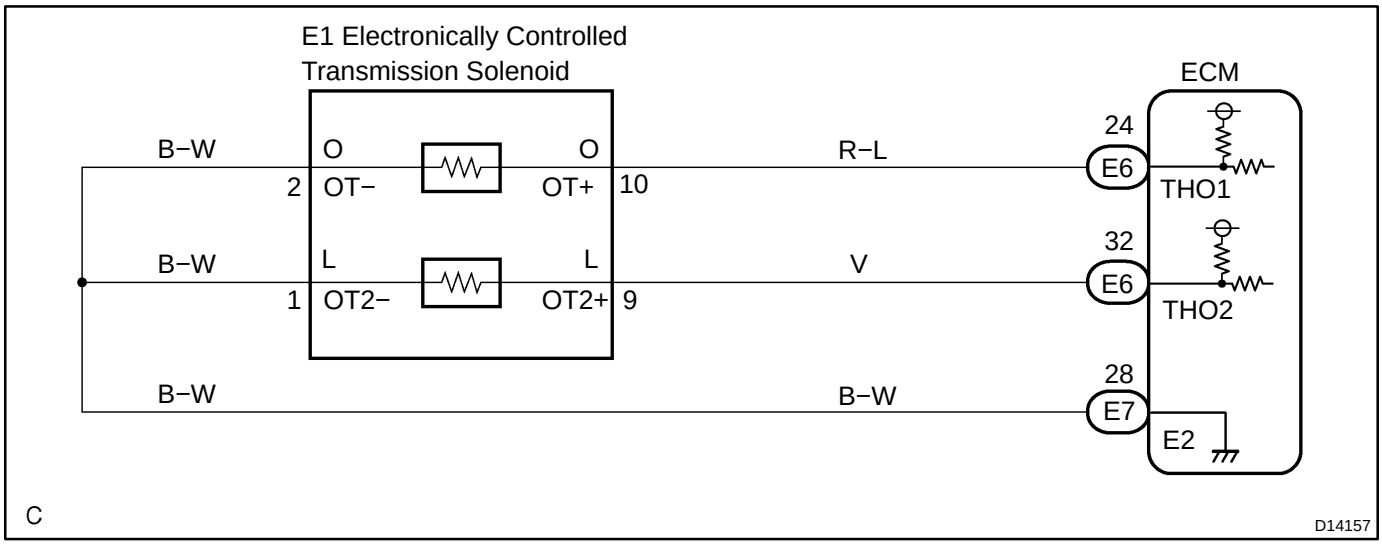
## TYPICAL MALFUNCTION THRESHOLDS

| Detection criteria | Threshold |
|---|---|
| **Range check (Fluttering)** | |
| TFT (transmission fluid temperature) sensor voltage | Less than 0.046 V<br>or<br>More than 4.915 V |
| **Range check (Low voltage)** | |
| TFT (transmission fluid temperature) sensor voltage | Less than 0.046 V |
| **Range check (High voltage)** | |
| TFT (transmission fluid temperature) sensor voltage | More than 4.915 V |

## COMPONENT OPERATING RANGE

| Parameter | Standard value |
|---|---|
| TFT (transmission fluid temperature) sensor | Atmospheric temperature to approx. 130°C (266°F) |

## WIRING DIAGRAM



## INSPECTION PROCEDURE

HINT:

According to the DATA LIST displayed by the OBD II scan tool or hand−held tester, you can read the value of the switch, sensor, actuator and so on without parts removal. Reading the DATA LIST as the first step of troubleshooting is one method to shorten labor time.

(a) Warm up the engine.
(b) Turn the ignition switch off.
(c) Connect the OBD II scan tool or hand−held tester to the DLC3.
(d) Turn the ignition switch to the ON position.
(e) Push the ”ON” button of the OBD II scan tool or the hand−held tester.
(f) When you use the hand−held tester:
Select the item ”DIAGNOSIS / ENHANCED OBD II / DATA LIST”.
(g) According to the display on the tester, read the ”DATA LIST”.

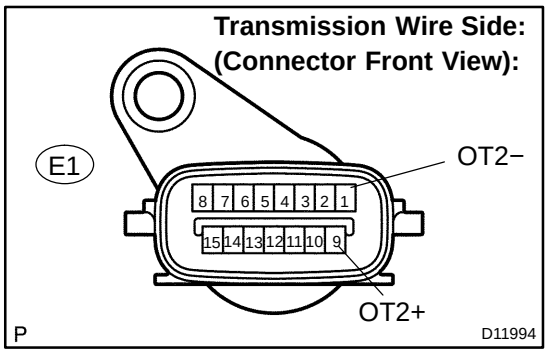
| Item | Measurement Item/ Range (display) | Normal Condition |
|---|---|---|
| AT FLUID TEMP 2 | ATF Temp. Sensor Value/ min.: −40°C (−40°F) max.: 215°C (419°F) | • After Stall Test; Approx. 80°C (176°F) • Equal to ambient temperature when cold soak |

HINT:

When DTC P2742 is output and hand−held tester output is 150°C (302°F) or more, there is a short circuit.
When DTC P2743 is output and hand−held tester output is −40°C (−40°F), there is an open circuit.
Measure the resistance between terminal THO2 (OT2) and body ground.

| Temperature Displayed | Malfunction |
|---|---|
| −40˚C (−40˚F) | Open circuit |
| 150˚C (302˚F) or more | Short circuit |

| 1 | Inspect transmission wire (ATF temperature sensor No.2) |
|---|---|




**PREPARATION:**

Disconnect the transmission wire connector from the transmission.

**CHECK:**

Measure the resistance according to the value(s) in the table below.

**OK:**

| Tester Connection | Specified Condition |
|---|---|
| 1 (OT2−) − 9 (OT2+) | 25 Ω to 156 kΩ |
| 1 (OT2−) − Body ground | 10 kΩ or higher |
| 9 (OT2+) − Body ground | 10 kΩ or higher |

HINT:

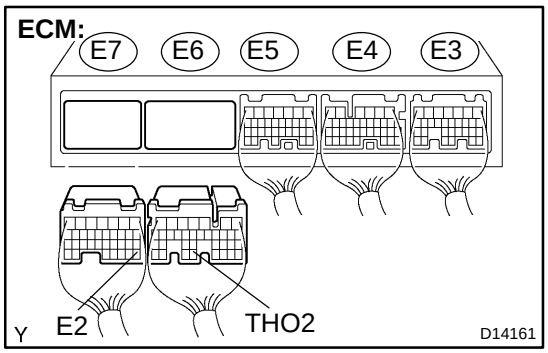
If the resistance is out of the specified range with either the ATF temperature shown in the table below, the driveability of the vehicle may decrease.

| ATF Temperature | Specified Condition |
|---|---|
| 20°C (68°F) | 3 to 4 kΩ |
| 110°C (230°F) | 0.22 to 0.28 kΩ |

**NG** → **Repair or replace the transmission wire (ATF temperature sensor No.2) (See page AT−9).**

**OK**

| 2 | Check harness and connector (Transmission wire − ECM) |
|---|---|




**PREPARATION:**

(a) Connect the transmission wire connector.

(b) Disconnect the connector of the ECM.

**CHECK:**

Measure the resistance according to the value(s) in the table below.

**OK:**

| Tester Connection | Specified Condition |
|---|---|
| E6 − 32 (THO2) − E7 − 28 (E2) | 25 Ω to 156 kΩ |

**CHECK:**

Measure the resistance according to the value(s) in the table below.

**OK:**

| Tester Connection | Specified Condition |
|---|---|
| E6 − 32 (THO2) − Body ground | 10 kΩ or higher |
| E7 − 28 (E2) − Body ground | ↑ |

**NG** → **Repair or replace the harness or connector (See page IN−30).**

**OK**

**Replace the ECM (See page SF−66).**