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

AT

DESCRIPTION

The No. 2 Automatic Transmission Fluid (ATF) temperature sensor is on the transmission, just before the oil cooler inlet pipeline.

If the ECM detects an abnormally high ATF temperature through this sensor, it illuminates the warning light to indicate the problem to the driver.

HINT:

- The ATF temperature is liable to increase under vehicle conditions such as towing, climbing hills and in traffic.
- If there is a short malfunction in the No. 2 ATF temperature sensor, the ECM receives signals from the sensor, which indicate that the ATF temperature is 150°C (302°F) or more.

The symptoms and recovery conditions, when the sensor is normal or there is a short malfunction in the sensor, are as shown in the table below.

No.2 ATF Temperature Sensor Status	Detection Condition	Symptom	Recovery Condition
Sensor is normal	• ATF temperature more than 150°C (302°F)	• ATF temperature warning light remains on	• ATF temperature less than 135°C (275°F) *2
	• ATF temperature more than 130°C (266°F)	• Shift point too high	• ATF temperature less than 110°C (230°F)
	When the conditions (a) and (b) are satisfied continually (a) ATF temperature more than130°C (266°F) (b) Engine coolant temperature more than 95°C (203°F)	• Lock-up in 3rd gear *1	• ATF temperature less than 110°C (230°F) *2 and engine coolant temperature less than 95°C (203°F)
Sensor is short	• Any conditions	• ATF temperature warning light remains on • Shift point too high	• Symptoms still occur
	• Engine coolant temperature more than 95°C (203°F)	• Lock-up in 3rd gear *1	• Symptom still occurs

HINT:

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

*2: When the ATF temperature is in the normal range, it decreases to less than 135°C (275°F) within 5 minutes of the shift lever being moved to the P or N position, while idling.

DTC No.	DTC Detection Conditions	Trouble Areas
P2740	Conditions (a) and (b) are detected momentarily within 0.5 seconds when neither P2742 nor P2743 is detected (1-trip detection logic) (a) No. 2 ATF temperature sensor resistance (voltage) is less than 25 Ω (0.046 V) (b) No. 2 ATF temperature sensor resistance (voltage) is more than 156 kΩ (4.915 V) HINT: Within 0.5 seconds the malfunction changes from (a) to (b) or (b) to (a)	• Open or short in No.2 ATF temperature sensor circuit • No.2 ATF temperature sensor • ECM

DTC No.	DTC Detection Conditions	Trouble Areas
P2742	No. 2 ATF temperature sensor resistance (voltage) is less than 25 Ω (0.046 V) for 0.5 seconds or more (1-trip detection logic)	• Short in No.2 ATF temperature sensor circuit • No.2 ATF temperature sensor • ECM
P2743	No. 2 ATF temperature sensor resistance (voltage) is more than 156 kΩ (4.915 V) for 0.5 seconds or more 15 minutes or more after starting engine (1-tip detection logic)	• Open in No.2 ATF temperature sensor circuit • No.2 ATF temperature sensor • ECM

MONITOR DESCRIPTION

These DTCs indicate an open or short in the No. 2 Automatic Transmission Fluid (ATF) temperature sensor circuit. The No. 2 ATF temperature sensor converts the ATF temperature to an electrical resistance value. Based on the resistance, the ECM determines the ATF temperature, and detects any open or short malfunctions in the No. 2 ATF temperature sensor circuit. If the resistance (voltage) of the No. 2 ATF temperature sensor 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 No. 2 ATF temperature sensor or its wiring. The ECM turns on the MIL and stores a DTC.

MONITOR STRATEGY

Related DTCs	P2740 : No. 2 ATF temperature sensor/Range check (Fluttering) P2742 : No. 2 ATF temperature sensor/Range check (Low voltage) P2743 : No. 2 ATF temperature sensor/Range check (High voltage)
Required sensors/Components	No. 2 ATF temperature sensor
Frequency of operation	Continuous
Duration	0.5 seconds
MIL operation	Immediate
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

P2740: Range check (Fluttering)

The monitor will run whenever the following DTCs are not present.	None
The typical enabling condition is not available.	-

P2742: Range check (Low voltage)

The monitor will run whenever the following DTCs are not present.	None
The typical enabling condition is not available.	-

P2743: Range check (High voltage)

The monitor will run whenever the following DTCs are not present.	None
Time after engine start	15 minutes or more

TYPICAL MALFUNCTION THRESHOLDS

P2740: Range check (Fluttering)

No. 2 ATF temperature sensor voltage	Less than 0.046 V or More than 4.915 V

P2742: Range check (Low voltage)

No. 2 ATF temperature sensor voltage	Less than 0.046 V

P2743: Range check (High voltage)

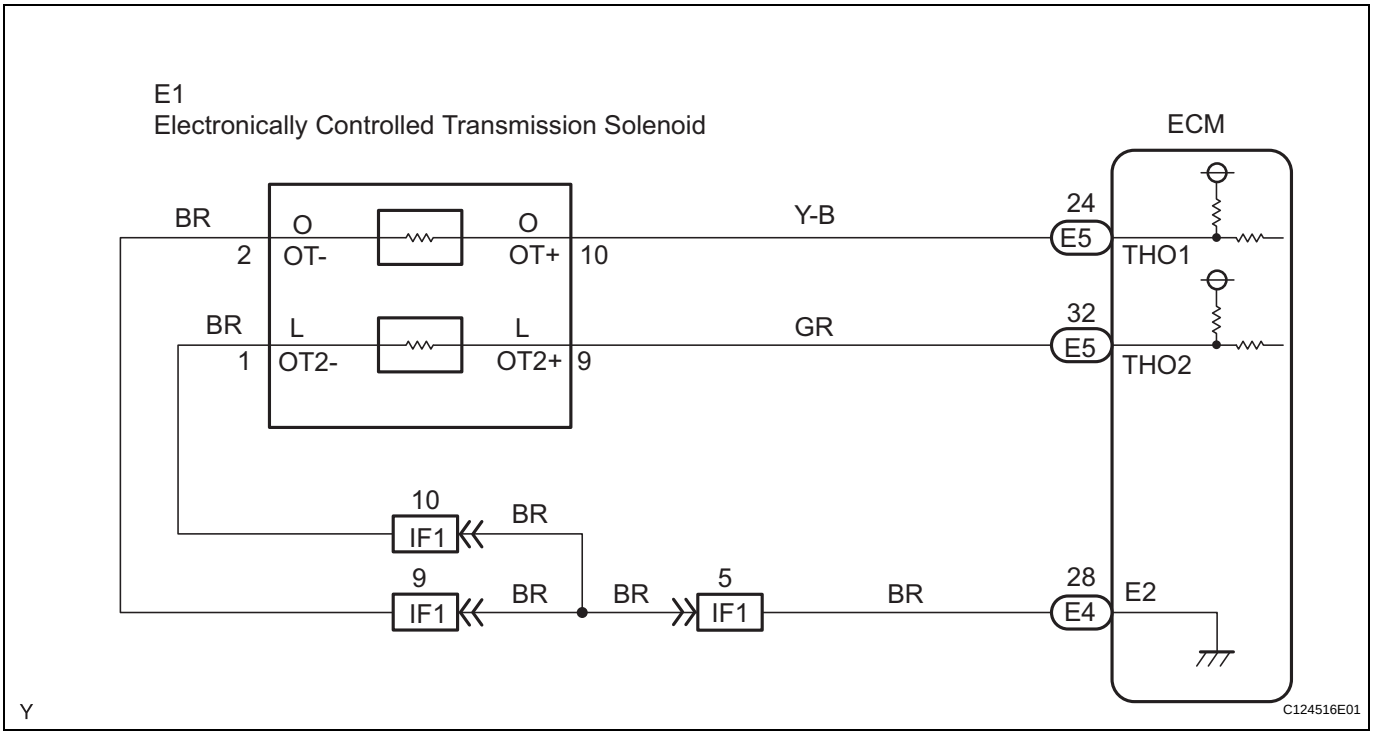
No. 2 ATF temperature sensor voltage	More than 4.915 V

COMPONENT OPERATING RANGE

ATF temperature sensor	Atmospheric temperature up to approximately 130°C (266°F)

WIRING DIAGRAM

AT



HINT:
According to the DATA LIST displayed on the intelligent tester, you can read the values of components, such as the switches, sensors, actuators, without removing any parts. Reading the DATA LIST as a first step of troubleshooting is one method of shortening labor time.

NOTICE:

In the table below, the values listed under "Normal Condition" are for reference only. Do not depend solely on these reference values when judging whether a part is faulty or not.

1. Warm up the engine.
2. Turn the ignition switch off.
3. Connect the intelligent tester together with the CAN VIM (controller area network vehicle interface module) to the DLC3.
4. Turn the ignition switch to the ON position.
5. Push the "ON" button of the tester.
6. Select the items "DIAGNOSIS/ ENHANCED OBD II/ DATA LIST"/ A/T.
7. According to the display on the tester, read the "DATA LIST".

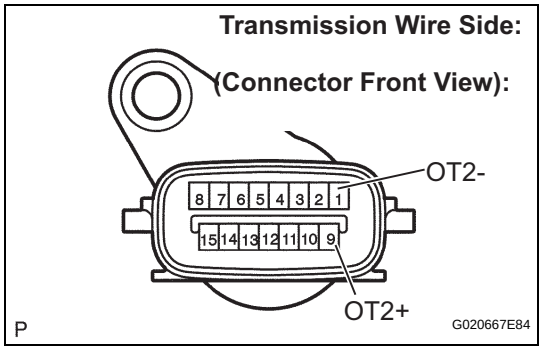
Item	Measurement Item/ Range (display)	Normal Condition
AT OIL TEMP2	No. 2 ATF Temperature Sensor Value/ min.: -40°C (-40°F) max.: 215°C (419°F)	• After Stall Test: Approximately 80°C (176°F) • Equal to ambient temperature during cold soak

HINT:
When DTC P2742 is output and intelligent tester reading is 150°C (302°F) or more, there is a short circuit.
When DTC P2743 is output and intelligent tester reading is -40°C (-40°F), there is an open circuit.

Measure the resistance between terminal THO2 (OT2) and the body ground.

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

1 INSPECT TRANSMISSION WIRE (NO.2 ATF TEMPERATURE SENSOR)



(a) Disconnect the transmission wire connector from the transmission.
(b) Measure the resistance.
Standard resistance

Tester Connection	Specified Condition
1 (OT2-) - 9 (OT2+)	79 Ω to 156 kΩ

(c) Measure the resistance.
Standard resistance (Check for short)

Tester Connection	Specified Condition
1 (OT2-) - Body ground	10 kΩ or higher
9 (OT2+) - Body ground	10 kΩ or higher

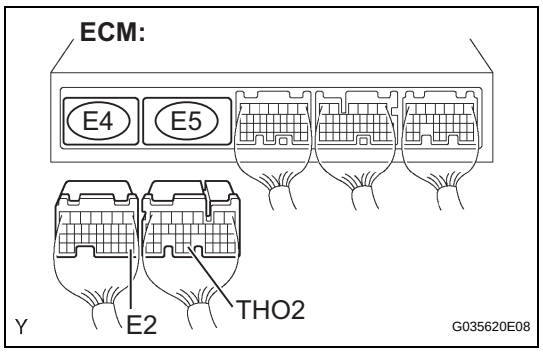
HINT:
If the resistance is out of the specified range with either the ATF temperature shown in the table below, the driveability of the vehicle may decrease.

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 TRANSMISSION WIRE**

OK

2 CHECK HARNESS AND CONNECTOR (TRANSMISSION WIRE - ECM)



(a) Connect the transmission wire connector to the transmission.
(b) Disconnect the ECM connectors.
(c) Measure the resistance.
Standard resistance

Tester Connection	Specified Condition
E5-32 (THO2) - E4-28 (E2)	79 Ω to 156 kΩ

(d) Measure the resistance.
Standard resistance (Check for short)

Tester Connection	Specified Condition
E5-32 (THO2) - Body ground	10 kΩ or higher
E4-28 (E2) - Body ground	10 kΩ or higher

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

AT

REPLACE ECM