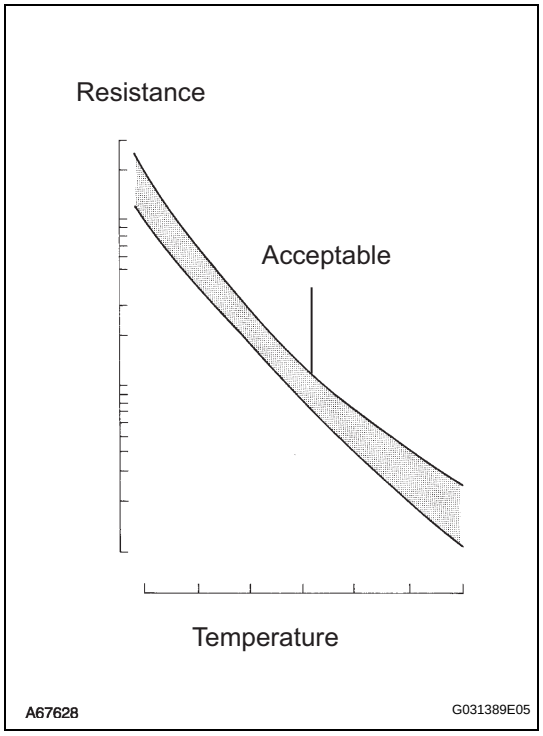
DTC	P2740	Transmission Fluid Temperature Sensor "B" Circuit

DTC	P2742	Transmission Fluid Temperature Sensor "B" Circuit Low Input

DTC	P2743	Transmission Fluid Temperature Sensor "B" Circuit High Input

DESCRIPTION



The ATF (Automatic Transmission Fluid) temperature sensor converts the fluid temperature into a resistance value which is input into the ECM.
The ECM applies a voltage to the temperature sensor through ECM terminal THO1.
The sensor resistance changes with the transmission fluid temperature. As the temperature becomes higher, the sensor resistance decreases.
One terminal of the sensor is grounded so that the sensor resistance and the voltage decrease as the temperature becomes higher.
The ECM calculates the fluid temperature based on the voltage signal.

DTC No.	DTC Detecting 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. 1 ATF temperature sensor voltage is less than 0.142 V. (b) No. 1 ATF temperature sensor voltage is more than 4.915 V. HINT: Within 0.5 seconds the malfunction changes from (a) to (b) or (b) to (a).	• Open or short in No. 1 ATF temperature sensor circuit • Transmission wire (No. 1 ATF temperature sensor) • ECM

DTC No.	DTC Detecting Conditions	Trouble Areas
P2742	No. 1 ATF temperature sensor voltage is less than 0.142 V for 0.5 seconds or more. (1-trip detection logic)	• Short in No. 1 ATF temperature sensor circuit • Transmission wire (No. 1 ATF temperature sensor) • ECM
P2743	No. 1 ATF temperature sensor voltage is more than 4.915 V for 0.5 seconds or more 15 minutes or more after starting engine. (1-trip detection logic)	• Open in No. 1 ATF temperature sensor circuit • Transmission wire (No. 1 ATF temperature sensor) • ECM

MONITOR DESCRIPTION

The Automatic Transmission Fluid (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 AFT temperature circuit. If the output voltage of the ATF temperature is less than 0.142 V*1 or more than 4.915 V*2, the ECM interprets this as a fault in the ATF temperature sensor or its wiring. The ECM turns on the MIL and stores a DTC.

*1: 150°C (302°F) or more is indicated regardless of the actual ATF temperature.

*2: -40°C (-40°F) is indicated regardless of the actual ATF temperature.

HINT:

The ATF temperature can be checked on the intelligent tester display.

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
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)

TFT Sensor voltage	Less than 0.142 V or More than 4.915 V

AT

P2742: Range check (Low voltage)

TFT Sensor voltage	Less than 0.142 V

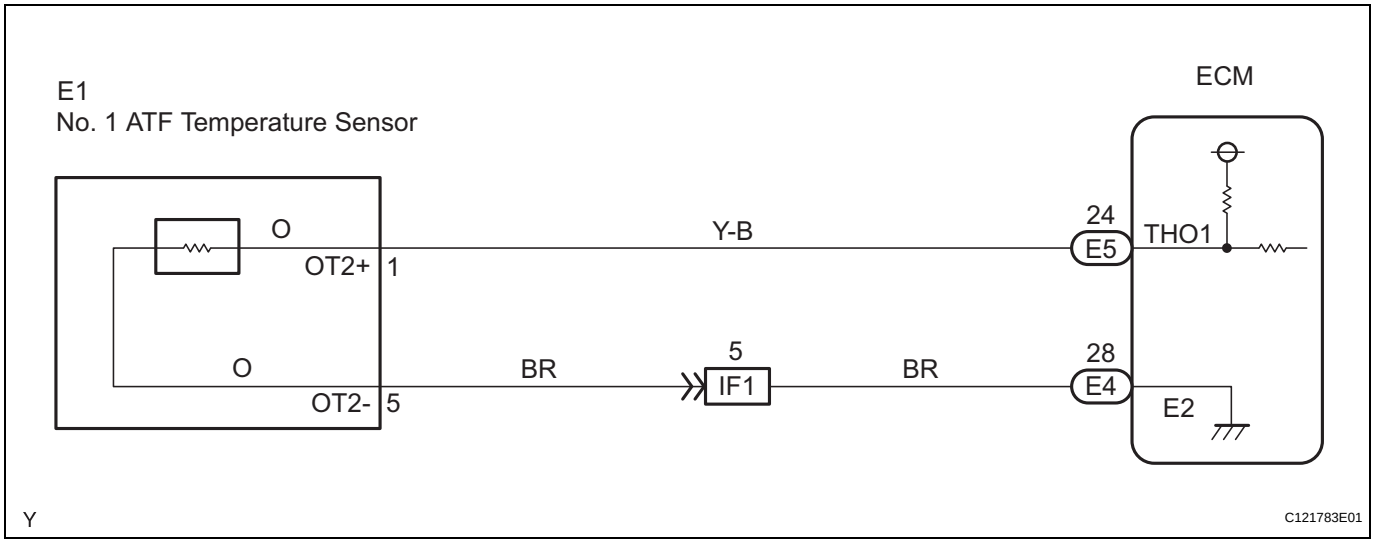
P2743: Range check (High voltage)

TFT Sensor voltage	More than 4.915 V

COMPONENT OPERATING RANGE

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

WIRING DIAGRAM



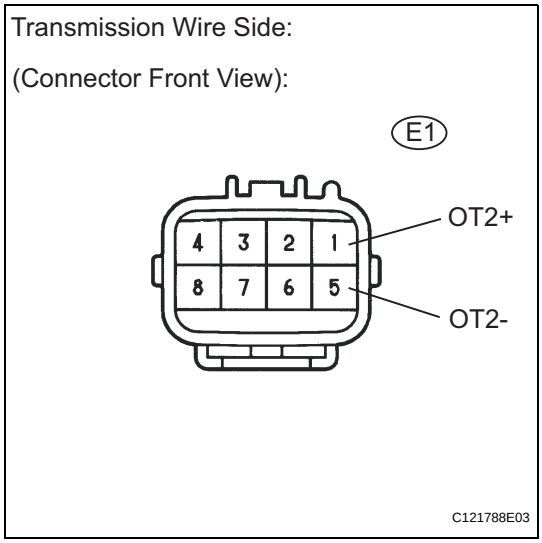
HINT:
According to the DATA LIST displayed on the intelligent tester, you can read the values of components, such as the switches, sensors and actuators, without removing any parts. Reading the DATA LIST as the first step of troubleshooting is one method of shortening labor time.
NOTICE:
In the table 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.
(a) Warm up the engine.
(b) Turn the ignition switch off.
(c) Connect the intelligent tester together with the CAN VIM (controller area network vehicle interface module) to the DLC3.
(d) Turn the ignition switch to the ON position.
(e) Push the "ON" button of the tester.
(f) Select the items "DIAGNOSIS/ ENHANCED OBD II/ DATA LIST/ A/T".
(g) According to the display on the tester, read the "DATA LIST".

Item	Measurement Item/ Range (display)	Normal Condition
A/T OIL TEMP1	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 when cold soak

HINT:
When DTC P2742 is output and the intelligent tester reading is 150°C (302°F) or more, there is a short circuit.
When DTC P2743 is output and the intelligent tester reading is -40°C (-40°F), there is an open circuit.
Measure the resistance between terminal THO1 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 (ATF TEMPERATURE SENSOR)



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

Tester Connection	Specified Condition
1 (OT2+) - 5 (OT2-)	79 Ω to 156 kΩ
1 (OT2+) - Body ground	10 kΩ or higher
5 (OT2-) - Body ground	10 kΩ or higher

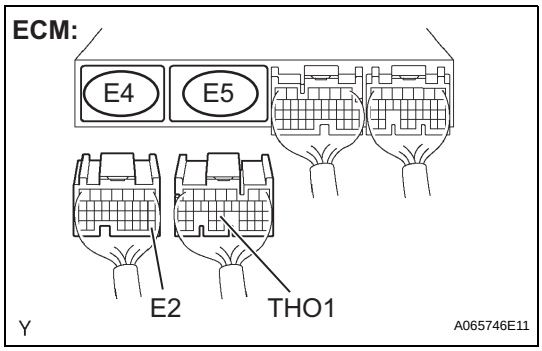
HINT:
If the resistance is outside the specified range at either of the ATF temperatures shown in the table below, the driveability of the vehicle may decrease.

ATF Temperature:	Resistance:
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
E5-24 (THO1) - E4-28 (E2)	79 Ω to 156 kΩ
E5-24 (THO1) - Body ground	10 kΩ or higher
E4-28 (E2) - Body ground	10 kΩ or higher

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

OK

REPLACE ECM