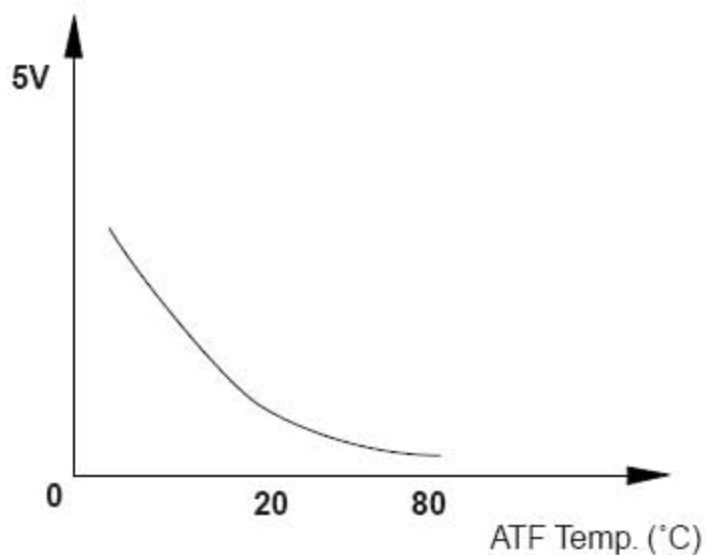
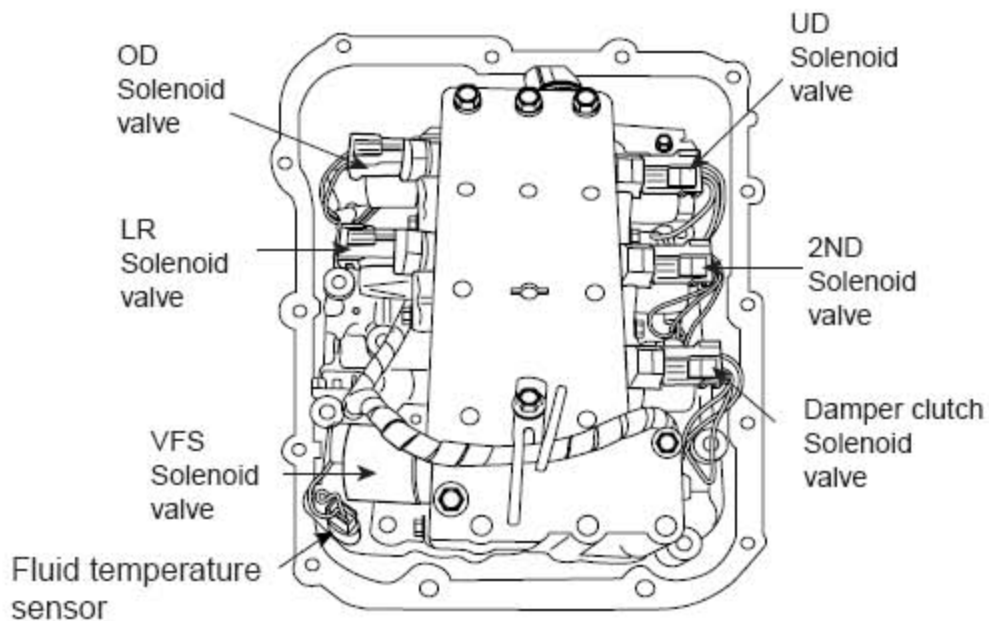


## P0713 FLUID(OIL) TEMPERATURE SENSOR CIRCUIT - HIGH

### COMPONENT LOCATION



## GENERAL DESCRIPTION

The automatic TRANSAXLE fluid(ATF) temperature sensor is installed in the Valve Body. This sensor uses a thermistor whose resistance changes according to the temperature changes. The TCM supplies a 5V reference voltage to the sensor, and the output voltage of the sensor changes when the ATF temperature varies. The automatic TRANSAXLE fluid(ATF) temperature provides very important data for the TCM's control of the Torque Converter Clutch, and is also used for many other purposes.

## DTC DESCRIPTION

This DTC code is set when the ATF temperature output voltage is higher than a value generated by thermistor resistance, in a normal operating range, for an extended period of time. The TCM regards the ATF temperature as fixed at a value of 80 C(176 F).

## DTC DETECTING CONDITION

Item	Detecting Condition	Possible cause
<b>DTC Strategy</b>	<ul style="list-style-type: none"> <li>• Check for Voltage range</li> </ul>	<ul style="list-style-type: none"> <li>• Sensor signal circuit is short to ground</li> <li>• Faulty sensor</li> <li>• Faulty PCM</li> </ul>
<b>Enable Conditions</b>	<ul style="list-style-type: none"> <li>• Intake air temperature <math>\geq -23.5</math> C(-10.3 F)</li> <li>• Engine state = RUN</li> </ul>	
<b>Threshold Value</b>	<ul style="list-style-type: none"> <li>• Voltage <math>\geq 4.9</math>V</li> </ul>	
<b>Diagnostic Time</b>	<ul style="list-style-type: none"> <li>• more than 1sec</li> </ul>	
<b>Fail Safe</b>	<ul style="list-style-type: none"> <li>• Learning control and Intelligent shift are inhibited</li> <li>• Fluid temperature is regarded as 80 C(176 F)</li> </ul>	

## SPECIFICATION

TEMP.[ C( F)]	Resistance(k $\Omega$ )	TEMP.[ C( F)]	Resistance(k $\Omega$ )
-40(-40 F)	139.5	80(176 F)	1.08
-20(-4 F)	47.7	100(212 F)	0.63
0(32 F)	18.6	120(248 F)	0.38
20(68 F)	8.1	140(284 F)	0.25
40(104 F)	3.8	160(320 F)	0.16
60(140 F)	1.98		

## MONITOR SCANTOOL DATA

- 1). Connect scantool to data link connector(DLC).
- 2). Engine "ON".
- 3). Monitor the "TRANSAXLE FLUID TEMPERATURE SENSOR" parameter on the scan tool.

**Specification** : Increasing Gradually

1.2 CURRENT DATA		
×	<b>FLUID TEMP. SENSOR</b>	<b>81 °C</b>
	THROTTLE P. SENSOR	12.9 %
	CRK POSITION SNSR	807 rpm
	INPUT SPEED SNSR	784 rpm
	OUTPUT SPEED SNSR	0 rpm
	VEHICLE SPEED	0 Km/h
	L&RSV DUTY	0.0 %
	UDSV DUTY	100.0%

FIX    SCRNM    FULL    PART    GRPH    HELP

FIG.1)

1.2 CURRENT DATA		
×	<b>FLUID TEMP. SENSOR</b>	<b>-40 °C</b>
	THROTTLE P. SENSOR	12.9 %
	CRK POSITION SNSR	807 rpm
	INPUT SPEED SNSR	784 rpm
	OUTPUT SPEED SNSR	0 rpm
	VEHICLE SPEED	0 Km/h
	L&RSV DUTY	0.0 %
	UDSV DUTY	0.0 %

FIX    SCRNM    FULL    PART    GRPH    HELP

signal circuit open

FIG.2)

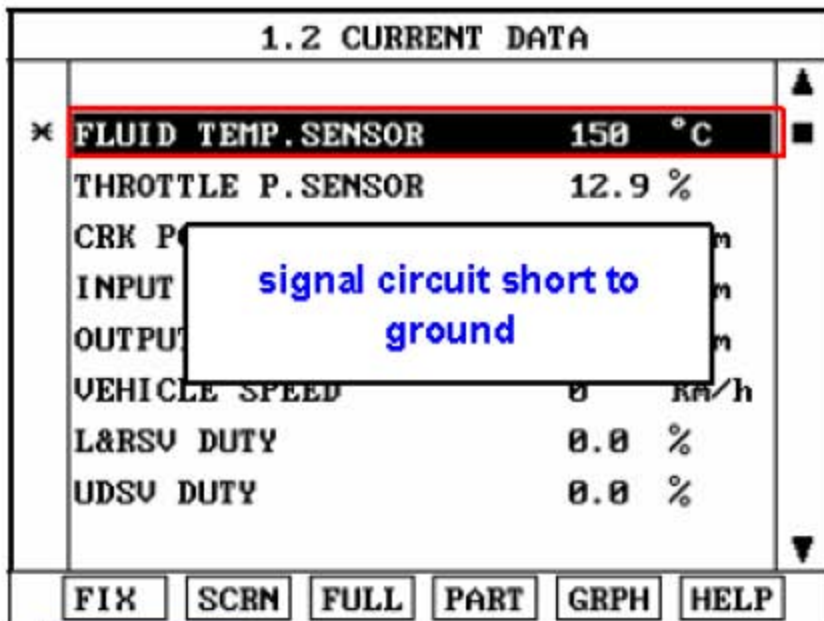


FIG.3)

FIG.1) Normal

FIG.2) Signal harness Open

FIG.3) Signal harness Short

4). Does "TRANSAXLE FLUID TEMPERATURE SENSOR " follow the reference data?

#### YES

- ▶ Fault is intermittent caused by poor contact in the sensor's and/or TCM(PCM)'s connector or was repaired and TCM(PCM) memory was not cleared. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration or damage. Repair or replace as necessary and go to "Verification of Vehicle Repair" procedure.

#### NO

- ▶ Go to "Terminal & connector inspection" procedure.

## TERMINAL & CONNECTOR INSPECTION

- 1). Many malfunctions in the electrical system are caused by poor harness and terminals. Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
- 2). Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.

3). Has a problem been found?

**YES**

▶ Repair as necessary and go to "Verification of vehicle Repair" procedure.

**NO**

▶ Go to "Component inspection" procedure.

## SIGNAL CIRCUIT INSPECTION

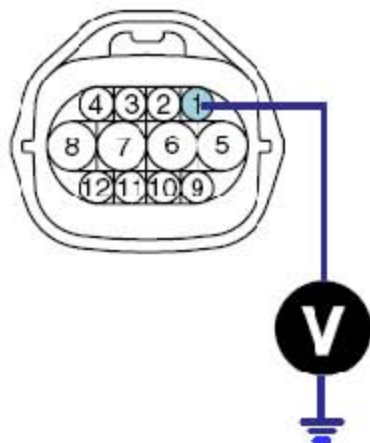
1). Ignition "ON" & Engine "OFF".

2). Disconnect the "TRANSAXLE FLUID TEMPERATURE SENSOR" connector.

3). Measure the voltage between terminal "1" of the "TRANSAXLE FLUID TEMPERATURE SENSOR" harness connector and chassis ground.

**Specification** : Approx. 5 V

**C09**



**1. TRANSAXLE FLUID TEMPERATURE SENSOR**  
2. Sensor ground

4). Is voltage within specifications?

**YES**

▶ Go to "Component Inspection" procedure.

**NO**

▶ Check for short to ground in harness. Repair as necessary and Go to "Verification of Vehicle Repair" procedure.

## GROUND CIRCUIT INSPECTION

- 1). Ignition "ON" & Engine "OFF".
- 2). Disconnect the "TRANSAXLE FLUID TEMPERATURE SENSOR" connector.
- 3). Measure the resistance between terminal "2" of the "TRANSAXLE FLUID TEMPERATURE SENSOR" harness connector and chassis ground.



- 4). Is resistance within specifications?

### YES

- ▶ Go to "Component inspection" procedure.

### NO

- ▶ Check for open in harness. Repair as necessary and Go to "Verification of Vehicle Repair" procedure .

## COMPONENT INSPECTION

- 1). CHECK "TRANSAXLE FLUID TEMPERATURE SENSOR"
  - A). Ignition "OFF".
  - B). Disconnect the "TRANSAXLE FLUID TEMPERATURE SENSOR" connector.
  - C). Measure the resistance between terminals "1" and "2" of the "TRANSAXLE FLUID TEMPERATURE SENSOR".

<b>Specification</b> : Refer to "Reference data"
--



**[REFERENCE DATA]**

TEMP.[ C( F)]	Resistance(k $\Omega$ )	TEMP.[ C( F)]	Resistance(k $\Omega$ )
-40(-40 F)	139.5	80(176 F)	1.08
-20(-4 F)	47.7	100(212 F)	0.63
0(32 F)	18.6	120(248 F)	0.38
20(68 F)	8.1	140(284 F)	0.25
40(104 F)	3.8	160(320 F)	0.16
60(140 F)	1.98		

D) Is resistance within specifications?

**YES**

- ▶ Go to "CHECK PCM/TCM " as below.

**NO**

- ▶ Replace "TRANSAXLE FLUID TEMPERATURE SENSOR" as necessary and Go to "Verification of Vehicle Repair" procedure.

2). CHECK TCM

- A). Ignition "ON" & Engine "OFF".
- B). Connect "TRANSAXLE FLUID TEMPERATURE SENSOR" connector.
- C). Install scan tool and select a SIMU-SCAN.
- D). Simulate voltage (0→5V) to "TRANSAXLE FLUID TEMPERATURE SENSOR" signal circuit.

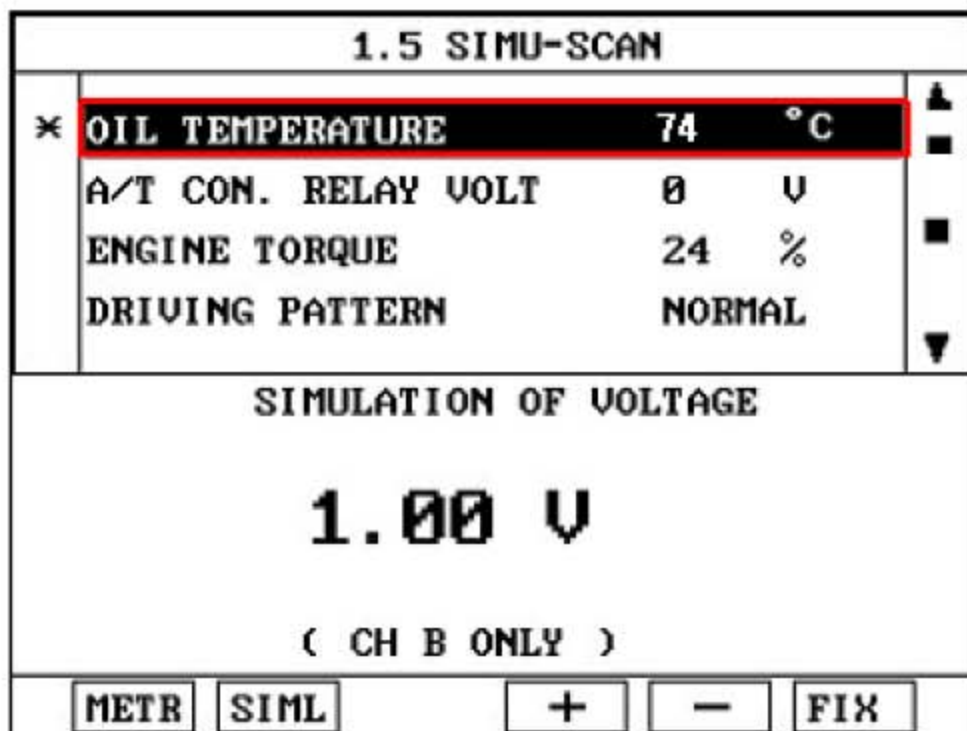


FIG.1)

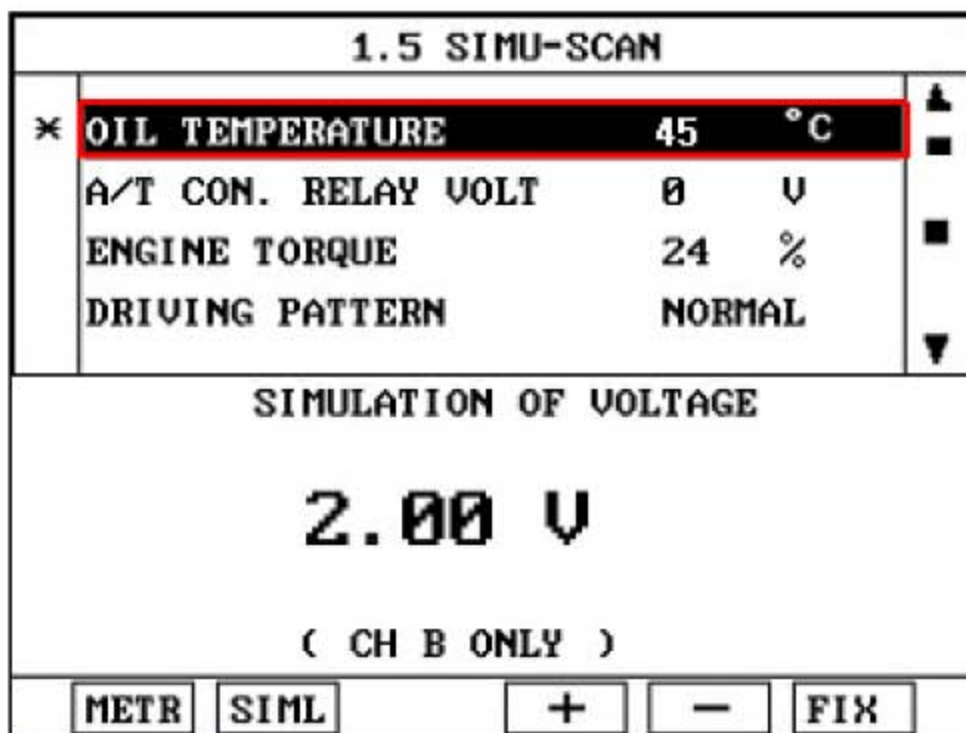
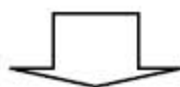


FIG.2)



FIG.1) INPUT 1.00V → 74°C

FIG.2) INPUT 2.00V → 45°C

The values are subject to change according to vehicle model or conditions.

E) Is FLUID TEMP. SENSOR signal value changed according to simulation voltage?

**YES**

- ▶ Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

**NO**

- ▶ Substitute with a known-good PCM/TCM and check for proper operation. If the problem is corrected, replace PCM/TCM as necessary and then go to "Verification of Vehicle Repair" procedure.

## VERIFICATION OF VEHICLE REPAIR

After a repair, it is essential to verify that the fault has been corrected.

- 1). Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
- 2). Using a scantool, Clear DTC.
- 3). Operate the vehicle within DTC Enable conditions in General information.
- 4). Are any DTCs present?

**YES**

- ▶ Go to the applicable troubleshooting procedure.

**NO**

- ▶ System performing to specification at this time.