

# P0712 & P0713 Fault Analysis

## DTC Explanation:

DTC	Explanation
P0712	Transmission Fluid Temperature Sensor A Circuit Low Input
P0713	Transmission Fluid Temperature Sensor A Circuit High Input

**Note:** When P0712 and P0713 occur, it's necessary to check Continuously Variable Transmission (CVT Fluid Temperature Sensor), ECM and related harness and plugs.

## Analysis:

- CVT (Continuously Variable Transmission) Fluid Temperature Sensor converts fluid temperature into resistance value which can be detected by ECM (Engine Control Module).
- Sensor resistance value changes with CVT fluid temperature. When temperature goes up, sensor resistance decreases. ECM calculates fluid temperature by the voltage signal passing through temperature sensor at terminal TH01 of ECM.

### P0712 Faulty Status:

- CVT Fluid Temperature Sensor Short Circuit

### P0712 Faulty Components:

- Continuously Variable Transmission (CVT Fluid Temperature Sensor)
- ECM

### P0713 Diagnostic Conditions:

- At least 10sec after engine starts (Engine coolant temperature and intake air temperature above  $-29.375^{\circ}\text{C}/-20.875^{\circ}\text{F}$  at engine starting).
- At least 10min after engine starts (Engine coolant temperature and intake air temperature equal  $-29.375^{\circ}\text{C}/-20.875^{\circ}\text{F}$  or lower at engine starting).

### P0713 Faulty Status:

- CVT Fluid Temperature Sensor Open Circuit

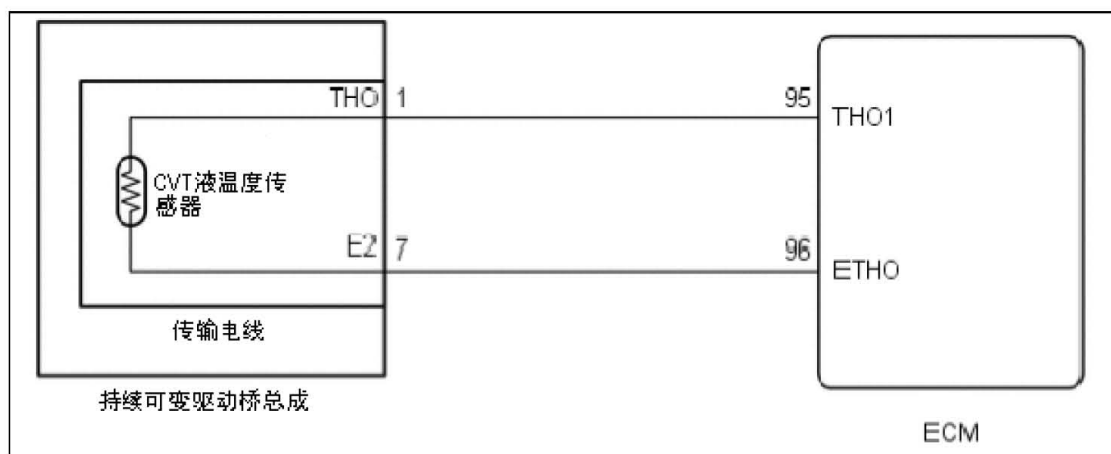
### P0712 Faulty Components:

- Continuously Variable Transmission (CVT Fluid Temperature Sensor)

- ECM

CVT Fluid Temperature Sensor converts CVT fluid temperature into a resistance value. According to this resistance value, ECM confirms CVT fluid temperature and detects short/open circuit in fluid temperature circuit. When CVT fluid temperature resistance value under 79Ohm ( $150^{\circ}\text{C}/302^{\circ}\text{F}$  or higher) or above 156K Ohm ( $-40^{\circ}\text{C}/-40^{\circ}\text{F}$ ), ECM determines that CVT Fluid Temperature Sensor or circuit is faulty. ECM will then light up MIL and store fault code.

CVT fluid temperature can be viewed by X-431 series comprehensive diagnostic tool.



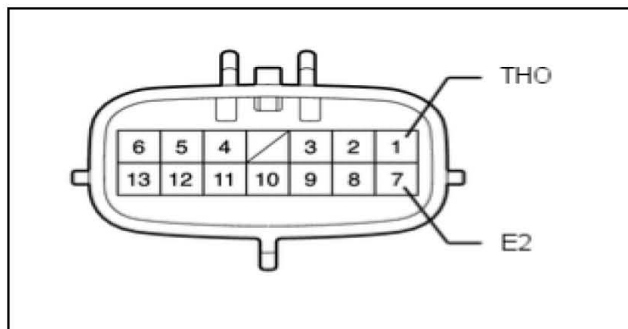
Picture 1

## Diagnostic Procedure:

- 1).Read Data Stream "Transmission Oil Temperature 1"
  - A).Engine warm-up;
  - B).Connect diagnostic tool to car diagnostic socket;
  - C).Turn ignition switch to ON;
  - D).Access diagnostic tool menu "Driving Chain→Engine and ECT→Read Current Data"
  - E).CVT Fluid Temperature Sensor value corresponds to data stream "Transmission Oil Temperature 1: "
    - a).Data stream value pick-up range: Minimum:  $-40^{\circ}\text{C}/-40^{\circ}\text{F}$ , Maximum:  $215^{\circ}\text{C}/419^{\circ}\text{F}$ ;
    - b).Normal Condition: After stall test, tested transmission oil temperature is about  $100^{\circ}\text{C}/212^{\circ}\text{F}$ . After cooling, it equals ambient temperature.
    - c).Abnormal Condition: If the value is  $-40^{\circ}\text{C}/-40^{\circ}\text{F}$ ,  $150^{\circ}\text{C}/302^{\circ}\text{F}$  or higher, CVT Fluid Temperature Sensor open circuit or short circuit.
      - Data stream value displays abnormally: Turn to Step 2.
      - Data stream value displays normally: Turn to Step 8.

## 2).Check Transmission Circuit (CVT Fluid Temperature Sensor)

A).Disconnect the connector of CVT at the left side of Picture 1.



Picture 2

B).Measure resistance according to the below table:

Connector	Specified Condition
1 (THO) – 7(E2)	79 Ohm-156k Ohm
1 (THO) - Body ground or other terminals	10K Ohm or higher
7 (E2) Body ground or other terminals	10K Ohm or higher

**Note:** If resistance value exceeds limit at any following CVT fluid temperature, car driving capability may be affected.

CVT Fluid Temperature	Specified Condition
10°C (50°F)	5.6K-7.3K Ohm
25°C (77°F)	3.5K Ohm
110°C (230°F)	0.22K-0.27K Ohm

C).Connect the connector of CVT at the left side of Picture 1.

D).Is the tested result normal?

- YES: Go to Step 3.
- NO: Go to Step 6.

## 3).Check Harness and Plug (Transmission Circuit-ECM)

A).Disconnect the connector of CVT at the left side of Picture 1.

B).Measure resistance according to the below table:

Connector	Specified Condition
Picture 1-95(TH01) – Picture 1-96(ETH0)	79 Ohm-156k Ohm
Picture 1-95 (TH01) Body ground or other terminals	10K Ohm or higher
Picture 1-96 (ETH0) Body ground or other terminals	10K Ohm or higher

C).Connect the connector of CVT at the left side of Picture 1.

D).Is the tested result normal?

- YES:Go to Step 4.
- NO:Repair or replace the harness or plug (Transmission Circuit-ECM).

4).Replace ECM. Go to Step 5.

5).Perform initialization.

**NOTE:**

- Resetting memory will clear yaw rate and acceleration sensor learned value (deceleration sensor zero point calibration) and CVT oil pressure (CVT oil pressure calibration). After replacing any of following components, make sure to perform Reset Memory, Yaw Rate and Acceleration Sensor Zero Point Calibration and CVT Oil Pressure Calibration.

Components
<ul style="list-style-type: none"> <li>● Continuously Variable Transmission</li> <li>● ECM</li> <li>● Oil Pressure Sensor</li> <li>● Airbag Sensor Assembly (Yaw Rate and Acceleration Sensor)</li> </ul>

- After performing "Reset Memory", Yaw Rate and Acceleration Sensor (deceleration sensor zero point) Calibration must be performed followed by CVT Oil Pressure Calibration.
- Always perform calibration on flat surface.
- During calibration, do not vibrate the car.

A).Perform Reset Memory, Deceleration Sensor Zero Point Calibration and CVT Oil Pressure Calibration with diagnostic tool.

B).Check DTC again.

C).Test completed.

6).Replace Continuously Variable Transmission

A).Replace Continuously Variable Transmission. Carry out Step 7.

7).Perform initialization.

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<b>Components</b>
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- During calibration, do not vibrate the car.

A).Perform Reset Memory, Deceleration Sensor Zero Point Calibration and CVT Oil Pressure Calibration with diagnostic tool.

B).Check DTC again.

C).Test completed.

8).Replace ECM.

9).Perform initialization.

**NOTE:**

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- During calibration, do not vibrate the car.

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B).Check DTC again.

C).Test completed.