

Component Procedures: Outside Temperature Display

Table of Contents

1. All Technical Service Bulletins (itype_100)
2. Outside Air Temperature Display Malfunction (Article 11038)
3. Poor performance (itype_162)

Component Procedures: Outside Temperature Display

All Technical Service Bulletins (itype_100)

Tsbs

- Inaccurate or Slow Response of Outside Air Temperature Display (PI0233E, 2015/06/26)

Outside Air Temperature Display Malfunction (Article 11038)

Diagnostic Instructions

- Perform the Diagnostic System Check - Vehicle prior to using this diagnostic procedure.
- Review Strategy Based Diagnosis for an overview of the diagnostic approach.
- Diagnostic Procedure Instructions provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit Short to Ground Open/High Resistance Short to Voltage Signal Performance

Ambient Air Temperature Sensor Signal B0158 02, 1 B0158 05, 1 B0158 05, 1 1

Low Reference — B0158 05, 1 B0158 05, 1 —

1. Outside Air Temperature Display Malfunction

Circuit/System Description

The instrument cluster monitors the ambient air temperature sensor with a low reference circuit and 5V signal circuit. The instrument cluster monitors the voltage drop across the sensor, which is proportional to temperature. When the ambient air temperatures are cold, the resistance of the sensor is high and the voltage signals are high. When the ambient air temperatures are hot, the resistance of the sensors is low and the voltage signals are low. The instrument cluster converts the voltage value to a temperature value of Celsius or Fahrenheit that will be displayed by the Driver Information Center Display or the Head-Up Display.

Reference Information

Schematic Reference

Instrument Cluster Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Driver Information Center (DIC) Description and Operation

Electrical Information Reference

- Circuit Testing
- Connector Repairs
- Testing for Intermittent Conditions and Poor Connections
- Wiring Repairs

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

- Ignition ON.
- Verify the scan tool Ambient Air Temperature parameter between -40°C (-40°F) to $+88^{\circ}\text{C}$ ($+190^{\circ}\text{F}$) and changes with air temperature changes.
- If parameter is not between -40°C (-40°F) to $+88^{\circ}\text{C}$ ($+190^{\circ}\text{F}$) or changes with air temperature changes Refer to Circuit/System Testing.
- If parameter is between -40°C (-40°F) to $+88^{\circ}\text{C}$ ($+190^{\circ}\text{F}$) and changes with air temperature changes
- All OK.

Circuit/System Testing

- Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the B9 ambient air temperature sensor. It may take up to 2 minutes for all vehicle systems to power down.
- Test for less than 1 V between the low reference circuit terminal B and ground.
- If 1 V or greater repair the short to voltage on the circuit.
- If less than 1 V
- Test for less than 10 Ω between the low reference circuit terminal B and ground.
- If 10 Ω or greater
- Ignition OFF, disconnect the harness connector at the P16 instrument cluster.
- Test for less than 2 Ω in the low reference circuit end to end.
- If 2 Ω or greater, repair the open/high resistance in the circuit.
- If less than 2 Ω , replace the P16 instrument cluster.
- If less than 10 Ω
- Verify the scan tool Ambient Air Temperature parameter is greater than 98%.
- If 98% or less

- Test for infinite resistance between the signal circuit and ground.
- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance, replace the P16 instrument cluster.
- If greater than 98%
- Install a 3 A fused jumper wire between the signal circuit terminal A and the low reference circuit terminal B.
- Verify the scan tool Ambient Air Temperature parameter is less than 8%.
- If 8% or greater
- Ignition OFF, disconnect the harness connector at the P16 instrument cluster, ignition ON.
- Test for less than 1 V between the signal circuit and ground.
- If 1 V or greater, repair the short to voltage on the circuit.
- Ignition OFF
- Test for less than 2 Ω in the signal circuit end to end.
- If less than 8%
- Test or replace the B9 Ambient Air Temperature Sensor.

Component Testing

Static Test

- Test the B9 Ambient Air Temperature Sensor by varying the sensor temperature while monitoring the sensor resistance.
- Compare the readings with the Ambient Air Temperature Sensor Resistance
- If not within the specified range Replace the B9 Ambient Air Temperature Sensor.
- If within specified range

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair.

- Ambient Air Temperature Sensor Replacement
- Control Module References for Instrument Cluster replacement, programming and setup

Poor performance (itype_162)

Tsbs

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