

DTC B0159 or B0164

Circuit Description

The following DTCs are for the ambient air temperature sensor and for the inside air temperature sensor assembly:

- DTC B0159 is for the ambient air temperature sensor.
- DTC B0164 is for the inside air temperature sensor assembly.

The ambient air temperature sensor allows the HVAC control module to monitor the temperature of the air surrounding the front of the vehicle. The inside air temperature sensor assembly allows the HVAC control module to monitor the temperature of the air inside the passenger compartment. The inside air temperature assembly contains an electric fan which pulls the air from the passenger compartment to the sensor. The module applies 5 volts to internal input resistors that are connected to the signal circuits of the air temperature sensors. The module provides ground to the air temperature sensors through the low reference circuits. The HVAC control module monitors the voltage drops across the air temperature sensors and uses the inputs for automatic control calculations. The HVAC control module also uses the ambient air temperature input to calculate the value of the ambient air temperature display. When the air temperatures are cold, the resistances of the sensors are high and the voltage signals are high. When the air temperatures are hot, the resistances of the sensors are low and the voltage signals are low.

Conditions for Running the DTC

- Battery voltage to the HVAC control module is greater than 8.7 volts and less than 16.5 volts.
- The ignition is turned ON.

Conditions for Setting the DTC

The HVAC control module determines that the voltage applied to the input for the air temperature sensor is less than -40°C to 215°C (-40°F to 419°F).

Action Taken When the DTC Sets

- The DIC will display a default value of 75 in place of the ambient air temp sensor.
- The HVAC control module uses a default air temperature value for further automatic control calculations. The default values are not displayed on the scan tool.

Conditions for Clearing the DTC

- The DTC will become history if the HVAC control module no longer detects the condition that set the DTC.
- The history DTC will clear after 100 fault free ignition cycles.
- The DTC can be cleared with a scan tool.

Test Description

The numbers below refer to the step numbers on the diagnostic table. 2. Verifies that the temperature displayed is not within the calibrated range. 5. Tests for the proper operation of the circuit in the high voltage range. 6. Tests for the proper operation of the circuit in the low voltage range. If the fuse in the jumper opens when you perform this test, the signal circuit is shorted to voltage.

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Step	Action	Value	Yes	No
Schematic Reference: HVAC Schematics on page 1-4				
1	Did you perform the Diagnostic System Check – Vehicle?	—	Go to Step 2	Go to Diagnostic System Check - Vehicle on page 10-1 in Vehicle DTC Information

Step	Action	Value	Yes	No
2	<p>Important: Perform instant outside air temperature update by simultaneously pressing Recirc, Rear Defog and mode up if OAT is the appropriate sensor.</p> <p>1). Install a scan tool.</p> <p>2). Turn ON the ignition, with the engine OFF.</p> <p>3). With a scan tool, observe the appropriate Air Temp. Sensor parameter in the HVAC Systems Automatic data list.</p> <p>4). The following four values are circuit failure values: • 38°C (101°F) • -38°C (-38°F) • -17°C (0°F) • -18°C (-1°F) Does the scan tool indicate that the appropriate Air Temp. Sensor parameter displays one of the four values listed?</p>	—	Go to Step 3	Go to Testing for Intermittent and Poor Connections
3	Does the scan tool display a value of -17°C (0°F) or -18°C (-1°F) for the appropriate air temperature sensor?	—	Go to Step 4	Go to Step 5
4	Reprogram the HVAC module. Did you complete the programming procedure?	—	Go to Step 5	—
5	<p>Important: For instant outside air temperature update simultaneously press Recirc, Rear Defog and mode up.</p> <p>1). Turn OFF the ignition.</p> <p>2). Disconnect the appropriate air temperature sensor.</p> <p>3). Turn ON the ignition, with the engine OFF.</p> <p>4). With a scan tool, observe the appropriate Air Temp. Sensor parameter. Does the scan tool indicate that the appropriate Air Temp. Sensor parameter is displayed?</p>	-38°C (-38°F)	Go to Step 6	Go to Step 7

Step	Action	Value	Yes	No
6	<p>Important: For instant outside air temperature update simultaneously press Recirc, Rear Defog and mode up.</p> <p>1). Turn OFF the ignition.</p> <p>2). Connect a 3-amp fused jumper wire between the signal circuit of the appropriate air temperature sensor and the low reference circuit of the appropriate air temperature sensor.</p> <p>3). Turn ON the ignition, with the engine OFF.</p> <p>4). With a scan tool, observe the appropriate Air Temp. Sensor parameter. Does the scan tool indicate that the appropriate Air Temp. Sensor parameter is displayed?</p>	38° (101°F)	Go to Step 10	Go to Step 8
7	<p>Test the signal circuit of the appropriate air temperature sensor for a short to ground.</p> <p>Did you find and correct the condition?</p>	—	Go to Step 14	Go to Step 11
8	<p>Test the signal circuit of the appropriate air temperature sensor for a short to voltage, a high resistance, or an open.</p> <p>Did you find and correct the condition?</p>	—	Go to Step 14	Go to Step 9
9	<p>Test the low reference circuit of the appropriate air temperature sensor for a high resistance or an open.</p> <p>Did you find and correct the condition?</p>	—	Go to Step 14	Go to Step 11
10	<p>Inspect for poor connections at the harness connector of the appropriate air temperature sensor.</p> <p>Did you find and correct the condition?</p>	—	Go to Step 14	Go to Step 12
11	<p>Inspect for poor connections at the harness connector of the HVAC control module.</p> <p>Did you find and correct the condition?</p>	—	Go to Step 14	Go to Step 13
12	<p>Replace the appropriate air temperature sensor.</p> <p>Did you complete the replacement?</p>	—	Go to Step 14	—

Step	Action	Value	Yes	No
13	Important: Perform the calibration procedure for the HVAC control module. Replace the HVAC control module. Did you complete the replacement?	—	Go to Step 14	—
14	1).Use the scan tool in order to clear the DTCs. 2).Operate the vehicle within the Conditions for Running the DTC as specified in the supporting text. Does the DTC reset?	—	Go to Step 2	System OK

LAUNCH