DTC P0531, P0532, or P0533

Circuit Description

The following DTCs are for the A/C refrigerant pressure sensor:

- DTC P0531 – A/C refrigerant pressure sensor performance
- DTC P0532 – A/C refrigerant pressure sensor circuit low voltage
- DTC P0533 – A/C refrigerant pressure sensor circuit high voltage

The engine control module (ECM) monitors the high side refrigerant pressure through an A/C refrigerant pressure sensor. When the pressure is high the signal voltage is high. When the pressure is low, the signal voltage is low. When the pressure is high, the ECM commands the cooling fans ON. When the pressure is too high or too low, the ECM will not allow the A/C compressor clutch to engage.

Conditions for Running the DTC

The engine is running. A/C OFF when P0531 is set.

Conditions for Setting the DTC

P0531: The ECM detects the A/C pressure signal circuit is more than 4.5 volts for 4 minutes.

P0532: The ECM detects an A/C pressure of less than 0.1 volt for 1.6 seconds.

P0533: The ECM detects an A/C pressure of more than 4.9 volts for 1.6 seconds.

Action Taken When the DTC Sets

- The ECM will not illuminate the malfunction indicator lamp (MIL).
- The ECM stores the failure records.
- The A/C compressor clutch is disabled.
- SERVICE A/C SYSTEM displays on the DIC.
- A/C OFF displays on the HVAC control module.
- The A/C compressor clutch will not be disabled if only DTC P0531 is set.

Conditions for Clearing the DTC

- The ECM will not store failure records if only DTC P0531 is set.
- The DTC will become history if the ECM no longer detects a failure.
- The history DTC will clear after 40 fault-free ignition cycles.

- Clear the DTC with a scan tool then cycle the ignition.

Diagnostic Aids

If the condition is not present, refer to Testing for Intermittent and Poor Connections on page 8-13 in Wiring Systems.

Test Description

The numbers below refer to the step numbers on the diagnostic table.

4. Tests for the proper operation of the circuit in the low voltage range.
5. Tests for the proper operation of the circuit in the high voltage range. If the fuse in the jumperopens when you perform this test, the signal circuit is shorted to ground.
6. Tests for a short to voltage in the 5-volt reference circuit.
7. Tests for a high resistance or an open in the low reference circuit.
16. Perform the recalibration procedure for the powertrain control module.

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Step	Action	Values	Yes	No
Schematic Reference: HVAC Schematics on page 1-4 Connector End View Reference: HVAC Connector End Views on page 1-21				
1	Did you perform the Vehicle Diagnostic System Check?	—	Go to Step 2	Go to Diagnostic System Check - Vehicle in Vehicle DTC Information
2	**Important: The ambient air temperature must be above** 3°C (38°F). 1).Turn OFF the ignition. 2).Inspect the A/C compressor for free rotation operation. 3).Start the engine. 4).Place the HVAC Control Module in the OFF position. Does the A/C compressor operate?	—	Go to HVAC Compressor Clutch Does Not Disengage	Go to Step 3

Step	Action	Values	Yes	No
3	1).Install a scan tool. 2).Start the engine. 3).Run the engine with the engine OFF for 4 minutes. 4).With the scan tool, observe the A/C High Side Pressure parameter in the Engine control module, Data list. Does the scan tool indicate that the A/C High Side Pressure parameter is within the specified range?	0.09–4.50 V	Go to Diagnostic Aids	Go to Step 4
4	1).Turn OFF the ignition. 2).Disconnect the A/C Refrigerant Pressure Sensor. 3).Turn ON the ignition, with the engine OFF. 4).With a scan tool, observe the A/C High Side Pressure parameter. Does the scan tool indicate that the A/C High Side Pressure parameter is less than the specified value?	0.09 V	Go to Step 5	Go to Step 11
5	1).Turn OFF the ignition. 2).With a test lamp connected to a battery positive, probe the low reference circuit of the A/C refrigerant pressure sensor connector. Does the test lamp illuminate?	—	Go to Step 6	Go to Step 9
6	1).Disconnect the fused jumper wire. 2).Measure the voltage between the 5-volt reference circuit of the A/C refrigerant pressure sensor and the low reference circuit of the A/C refrigerant pressure sensor. Does the voltage measure less than the specified value?	5.1 V	Go to Step 7	Go to Step 8

Step	Action	Values	Yes	No
7	1).Turn OFF the ignition. 2).Disconnect the negative battery cable. 3).Measure the resistance from the low reference circuit of the A/C refrigerant pressure sensor to a good ground. Does the resistance measure less than the specified value?	5 W	Go to Step 13	Go to Step 12
8	Test the 5-volt reference circuit of the A/C refrigerant pressure sensor for a short to voltage. Did you find and correct the condition?	—	Go to Step 17	Go to Step 14
9	Test the 5-volt reference circuit of the A/C refrigerant pressure sensor for a short to ground, a high resistance, or an open. Did you find and correct the condition?	—	Go to Step 17	Go to Step 10
10	Test the signal circuit of the A/C refrigerant pressure sensor for a short to ground, a high resistance, or an open. Did you find and correct the condition?	—	Go to Step 17	Go to Step 14
11	Test the signal circuit of the A/C refrigerant pressure sensor for a short to voltage. Did you find and correct the condition?	—	Go to Step 17	Go to Step 14
12	1).Disconnect the engine control module. 2).Test the low reference circuit of the A/C refrigerant pressure sensor for a high resistance or an open. Did you find and correct the condition?	—	Go to Step 17	Go to Step 14

Step	Action	Values	Yes	No
13	Inspect for poor connections at the harness connector of the A/C refrigerant pressure sensor. Did you find and correct the condition?	—	Go to Step 17	Go to Step 15
14	Inspect for poor connections at the harness connector of the engine control module. Did you find and correct the condition?	—	Go to Step 17	Go to Step 16
15	Replace the A/C refrigerant pressure sensor. Refer to Air Conditioning (A/C) Refrigerant Pressure Sensor Replacement in Heating Ventilation and Air Conditioning. Did you complete the replacement?	—	Go to Step 17	—
16	Important: Perform the setup procedure for the engine control module. Replace the engine control module. Refer to Engine Control Module (ECM) Replacementin Engine Controls–4.6L. Did you complete the replacement?	—	Go to Step 17	—
17	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