

DS: Air Conditioning Pressure (ACP) Transducer Sensor

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DS1 CHECK FOR DIAGNOSTIC TROUBLE CODES (DTCS)

Are DTCs P0532, P0533, P1461, P1462, or P1463 present?

Yes	No
For DTC P0533, P1461, GO to DS2 .	For symptoms without DTCs, GO to DS17 . For all others, GO to Section 4, Diagnostic Trouble Code (DTC) Charts and Descriptions .
For DTC P0532, P1462, GO to DS7 .	
For DTC P1463, GO to DS15 .	

DS2 DTC P0533, P1461: CHECK THE ACP PID

- Ignition ON, engine OFF.
- Access the PCM and monitor the ACP_V PID.

Is the voltage less than 4.9 V?

Yes	No
The ACP transducer sensor voltage is now below maximum. To determine if an intermittent condition exists, GO to DS14 .	GO to DS3 .

DS3 CHECK THE VOLTAGE BETWEEN THE VREF AND SIGRTN CIRCUITS AT THE ACP TRANSDUCER SENSOR VEHICLE HARNESS CONNECTOR

- Air Conditioning Pressure (ACP) Transducer Sensor connector disconnected.
- Ignition ON, engine OFF.
- Measure the voltage between:

(+) Air Conditioning Pressure (ACP) Transducer Sensor Connector, Harness Side	(-) Air Conditioning Pressure (ACP) Transducer Sensor Connector, Harness Side
VREF	SIGRTN

Is the voltage between 4 - 6 V?

Yes	No
GO to DS4 .	GO to Pinpoint Test C .

DS4 CHECK THE ACP CIRCUIT FOR A SHORT TO VREF

- Ignition OFF.
- PCM connector disconnected.
- Measure the resistance between:

(+) Air Conditioning Pressure (ACP) Transducer Sensor Connector, Harness Side	(-) Air Conditioning Pressure (ACP) Transducer Sensor Connector, Harness Side
ACP	VREF

Is the resistance greater than 10K ohms?

Yes	No
GO to DS5 .	REPAIR the short circuit. CLEAR the DTCs. REPEAT the self-test.

DS5 CHECK THE ACP CIRCUIT FOR A SHORT TO VOLTAGE IN THE HARNESS

- Ignition ON, engine OFF.
- Measure the voltage between:

(+) Air Conditioning Pressure (ACP) Transducer Sensor Connector, Harness Side	(-)
ACP	Ground

Is the voltage less than 1 V?

Yes	No
GO to DS6 .	REPAIR the short circuit to PWR. CLEAR the DTCs. REPEAT the self-test.

DS6 CHECK FOR AN OPEN ACP CIRCUIT IN THE HARNESS

- Ignition OFF.
- Measure the resistance between:

(+) Air Conditioning Pressure (ACP) Transducer Sensor Connector, Harness Side	(-) PCM Connector, Harness Side
ACP	ACP

Is the resistance less than 5 ohms?

Yes	No
INSTALL a new Air Conditioning Pressure (ACP) Transducer Sensor. CLEAR the DTCs. REPEAT the self-test. If the concern or DTC is still present, GO to DS21 .	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

DS7 DTC P0532, P1462: CHECK THE ACP PID

- Ignition ON, engine OFF.

- Access the PCM and monitor the ACP_V PID.

Is the voltage greater than 0.15 V?

Yes	No
The ACP transducer sensor voltage is now above the minimum. To determine if an intermittent condition exists, GO to DS14 .	GO to DS8 .

DS8 CHECK THE VOLTAGE BETWEEN THE VREF AND SIGRTN CIRCUITS AT THE ACP TRANSDUCER SENSOR VEHICLE HARNESS CONNECTOR

- Air Conditioning Pressure (ACP) Transducer Sensor connector disconnected.
- Ignition ON, engine OFF.
- Measure the voltage between:

(+) Air Conditioning Pressure (ACP) Transducer Sensor Connector, Harness Side	(-) Air Conditioning Pressure (ACP) Transducer Sensor Connector, Harness Side
VREF	SIGRTN

Is the voltage between 4 - 6 V?

Yes	No
GO to DS9 .	GO to Pinpoint Test C .

DS9 CHECK THE ACP CIRCUIT FOR A SHORT TO GND

- Ignition OFF.
- PCM connector disconnected.
- Measure the resistance between:

(+) Air Conditioning Pressure (ACP) Transducer Sensor Connector, Harness Side	(-)
ACP	Ground

Is the resistance greater than 10K ohms?

Yes	No
GO to DS10 .	REPAIR the short circuit. CLEAR the DTCs. REPEAT the self-test.

DS10 CHECK THE ACP CIRCUIT FOR A SHORT TO SIGRTN

- Measure the resistance between:

(+) Air Conditioning Pressure (ACP) Transducer Sensor Connector, Harness Side	(-) Air Conditioning Pressure (ACP) Transducer Sensor Connector, Harness Side
ACP	SIGRTN

Is the resistance greater than 10K ohms?

Yes	No
GO to DS11 .	REPAIR the short circuit. CLEAR the DTCs. REPEAT the self-test.

DS11 CHECK THE ACP CIRCUIT(S) FOR AN OPEN IN THE HARNESS

- Measure the resistance between:

(+) Air Conditioning Pressure (ACP) Transducer Sensor Connector, Harness Side	(-) PCM Connector, Harness Side
ACP	ACP

Is the resistance less than 5 ohms?

Yes	No
<p>For A/C clutch engagement concerns, GO to DS12.</p> <p>For DTC P0532 or P1463, INSTALL a new Air Conditioning Pressure (ACP) Transducer Sensor.</p> <p>CLEAR the DTCs. REPEAT the self-test.</p> <p>If the concern or DTC is still present, GO to DS21.</p>	<p>REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.</p>

DS12 CHECK FOR THE A/C CLUTCH TO ENGAGE

- PCM connector connected.
- Air Conditioning Pressure (ACP) Transducer Sensor connector connected.
- Ignition ON, engine running.
- While listening for the A/C clutch to engage, turn the A/C on. Repeat if necessary.

Does the A/C engage when the A/C is turned on?

Yes	No
GO to DS21 .	GO to DS13 .

DS13 VERIFY THE A/C SYSTEM FUNCTION, INCLUDING THE REFRIGERANT CHARGE

- Restore the vehicle.
- Verify the A/C system function, including the refrigerant charge. Refer to the Workshop Manual Section 412-00, Climate Control System.

Does the A/C system have the correct refrigerant charge and if so does the A/C system function correctly?

Yes	No
GO to DS21 .	REFER to the Workshop Manual Section 412-00, Climate Control System, and DIAGNOSE the A/C is inoperative/does not operate correctly symptom.

DS14 CHECK THE ACP CIRCUIT FOR AN INTERMITTENT CONCERN

Note: A concern is indicated by a sudden change in voltage.

- Ignition ON, engine OFF.
- Access the PCM and monitor the ACP_V PID.
- Observe the ACP for an indication of a concern while carrying out the following:
 - Shake, wiggle, and bend the ACP, SIGRTN, and VREF wires between the ACP sensor and PCM
 - Lightly tap on the ACP transducer sensor to simulate road shock

Is a concern present?

Yes	No
ISOLATE the concern and REPAIR as necessary. CLEAR the DTCs. REPEAT the self-test.	Unable to duplicate or identify the concern at this time. GO to Pinpoint Test Z .

DS15 DTC P1463: VERIFY THE A/C CLUTCH CAN DISENGAGE

- Turn the A/C and defroster OFF.
- Ignition ON, engine running.
- Verify the A/C clutch can disengage.

Is the A/C clutch disengaged?

Yes	No
GO to DS16 .	REFER to the Workshop Manual Section 412-00, Climate Control System, and DIAGNOSE the A/C is always on symptom.

DS16 CHECK FOR VOLTAGE AND GROUND TO THE A/C CLUTCH USING A NON-POWERED TEST LAMP

Note: If voltage and ground to the A/C clutch have already been checked or the A/C clutch can be heard clicking on when the A/C is turned on, go to the question at the end of this test step.

- Ignition OFF.
- A/CCS Switch connector disconnected.
- Connect a jumper wire in the A/C low pressure cycling switch harness connector to complete the circuit.
- A/CC Assembly connector disconnected.
- Connect a non-powered test lamp between the voltage pin and ground pin at the A/C clutch harness connector.
- Ignition ON, engine running.
- Turn the A/C on, and wait 15 seconds.
- Monitor the test lamp.
- Connect the A/C clutch and A/C cycling switch when done testing.

Does the lamp illuminate, or can the A/C clutch be heard clicking on?

Yes	No
	REFER to the Workshop Manual Section 412-00,

GO to [DS17](#).

Climate Control System, and DIAGNOSE the A/C is inoperative/does not operate correctly symptom.

DS17 DETERMINE IF A SUFFICIENT A/C PRESSURE CHANGE CAN BE DETECTED BY THE ACP PID

- Ignition ON, engine running.
- Turn the A/C and defroster OFF.
- Access the PCM and monitor the ACP_V PID.
- Turn the A/C and defroster OFF.
- Five seconds after A/C clutch engagement, note the voltage. If the clutch does not engage, follow the NO answer instructions.

Does the ACP PID change more than 0.3 volt within 5 seconds of clutch engagement?

Yes	No
The ACP transducer sensor and the PCM can detect a sufficient change in the A/C pressure. For symptom without DTC P1463, REFER to Section 3 , Symptom Charts. For all others, REFER to the Workshop Manual Section 412-00, Climate Control System, and DIAGNOSE the A/C is inoperative/does not operate correctly symptom.	GO to DS18 .

DS18 CHECK THE A/C SYSTEM PRESSURE AND PRESSURE CHANGE

- Ignition OFF.
- Install an A/C system manifold gauge set and check the A/C system high pressure reading.
- Turn the A/C and defroster OFF.
- Ignition ON, engine running.
- Note the A/C high pressure reading.
- While monitoring the A/C system high pressure reading, turn the A/C on. Five seconds after clutch engagement, note the pressure (the pressure should increase).
- A/C and defroster OFF.

Does the A/C high pressure reading change more than 207 kPa (30 psi) within 5 seconds of clutch engagement?

Yes	No
GO to DS19 .	REFER to the Workshop Manual Section 412-00, Climate Control System, and DIAGNOSE the A/C is inoperative/does not operate correctly symptom.

DS19 CHECK THE VOLTAGE BETWEEN THE VREF AND SIGRTN CIRCUITS AT THE ACP TRANSDUCER SENSOR VEHICLE HARNESS CONNECTOR

- Ignition OFF.
- Air Conditioning Pressure (ACP) Transducer Sensor connector disconnected.
- Ignition ON, engine OFF.

- Measure the voltage between:

(+) Air Conditioning Pressure (ACP) Transducer Sensor Connector, Harness Side	(-) Air Conditioning Pressure (ACP) Transducer Sensor Connector, Harness Side
VREF	SIGRTN

Is the voltage between 4 - 6 V?

Yes	No
GO to DS20 .	GO to Pinpoint Test C .

DS20 CHECK THE ACP CIRCUIT(S) FOR AN OPEN IN THE HARNESS

- PCM connector disconnected.
- Measure the resistance between:

(+) Air Conditioning Pressure (ACP) Transducer Sensor Connector, Harness Side	(-) PCM Connector, Harness Side
ACP	ACP

Is the resistance less than 5 ohms?

Yes	No
INSTALL a new Air Conditioning Pressure (ACP) Transducer Sensor. CLEAR the DTCs. REPEAT the self-test.	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

DS21 CHECK FOR CORRECT PCM OPERATION

- Disconnect all the PCM connectors.
- Visually inspect for:
 - pushed out pins
 - corrosion
- Connect all the PCM connectors and make sure they seat correctly.
- Carry out the PCM self-test and verify the concern is still present.

Is the concern still present?

Yes	No
INSTALL a new PCM. REFER to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) , Programming the VID Block for a Replacement PCM.	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector.

