

DTC P0480, P0481, or P0482 (LSJ, 2.0L)

Circuit Description

The powertrain control module (PCM) controls the low speed cooling fan operation by grounding the cool fan 1 relay control circuit with an internal solid state device called a driver. For high speed cooling fan operation, the PCM grounds the cool fan 2 and S/P relay control circuit at the same time the cool fan 1 control circuit is grounded. Battery positive voltage is supplied to the cool fan 1, cool fan 2 and S/P fan relays. When the PCM is commanding a fan relay ON, the voltage of the control circuit should be low, near 0 volts. When the PCM is commanding a fan relay OFF, the voltage potential of the control circuit should be high, near battery voltage. If the fault detection circuit senses a voltage other than what is expected, the DTC will set.

The PCM will monitor the control circuit for the following conditions:

- A short to ground
- A short to voltage
- An open circuit
- An open relay coil
- An internally shorted or excessively low resistance relay coil

When the PCM detects any of the above conditions, the DTC will set and the affected driver will be disabled.

DTC Descriptors

This diagnostic procedure supports the following DTCs:

- DTC P0480 Cooling Fan Relay 1 Control Circuit
- DTC P0481 Cooling Fan Relay 2 Control Circuit
- DTC P0482 Cooling Fan Relay 3 Control Circuit

Conditions for Running the DTC

- The ignition is ON.
- System voltage is between 9–18 volts.
- The relay control circuit is transitions from OFF to ON or ON to OFF.

Conditions for Setting the DTC

- The PCM detects an open, a short to ground, or a short to voltage on the cooling fan relay control circuit.
- The above conditions are present for at least 30 seconds.

Action Taken When the DTC Sets

- The PCM will illuminate the malfunction indicator lamp (MIL) during the second consecutive trip in which the diagnostic test has been run and failed.
- The PCM will store conditions which were present when the DTC set as Freeze Frame and Failure Records data.

Conditions for Clearing the MIL/DTC

- The PCM will turn OFF the MIL during the third consecutive trip in which the diagnostic has been run and passed.
- The History DTC will clear after 40 consecutive warm-up cycles have occurred without a malfunction.
- The DTC can be cleared by using the scan tool.

Diagnostic Aids

- If the condition is not present, refer to [Testing for Intermittent Conditions and Poor Connections](#).
- Review the Freeze Frame/Failure Records vehicle mileage since the diagnostic test last failed. This may help determine how often the condition that caused the DTC to be set occurs.

Test Description

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

2. [Listen for an audible click when the cool fan 1 relay operates.](#)
3. [Listen for an audible click when the cool fan 2 and cool fan S/P relays operate.](#)
4. [This step tests for voltage at the coil side of the cool fan 1 relay. The COOL FAN 1 fuse supplies battery positive voltage to the coil side of the cool fan 1 relay.](#)

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Step	Action	Yes	No
Schematic Reference: Engine Heating/Cooling Schematics Connector End View Reference: Cooling System Connector End Views			
1	Did you perform the Diagnostic System Check - Vehicle?	Go to Step 2	Go to Diagnostic System Check - Vehicle
2	1. Ground the low speed relay control circuit C1 pin 51 of the powertrain control module (PCM). 2. Turn ON the ignition, with the engine OFF. Does the cool fan 1 relay turn ON and OFF with each command?	Go to Step 3	Go to Step 4
3	Ground the high speed relay control circuit C1 pin 10 of the PCM. Does the cool fan S/P and the cool fan 2 relays turn ON?	Go to Diagnostic Aids	Go to Step 6
4	1. Turn OFF the ignition. 2. Disconnect the cool fan 1 relay. 3. Turn ON the ignition, with the engine OFF. 4. Probe the battery positive voltage circuit of the cool fan 1 relay with a test lamp that is connected to a good ground.	Go to Step 5	Go to Step 16

Step	Action	Yes	No
	Does the test lamp illuminate?		
5	<ol style="list-style-type: none"> 1. Connect a test lamp between the control circuit of the cool fan 1 relay and the battery positive voltage circuit of the cool fan 1 relay. 2. Ground the low speed relay control circuit. Does the test lamp turn ON?	Go to Step 12	Go to Step 9
6	<ol style="list-style-type: none"> 1. Turn OFF the ignition. 2. Disconnect the cool fan 2 relay. 3. Turn ON the ignition, with the engine OFF. 4. Probe the battery positive voltage circuit of the cool fan 2 relay with a test lamp that is connected to a good ground. Does the test lamp illuminate?	Go to Step 7	Go to Step 16
7	<ol style="list-style-type: none"> 1. Connect a test lamp between the control circuit of the cool fan S/P relay and the battery positive voltage circuit of the cool fan S/P relay. 2. Ground the high speed relay control circuit. Does the test lamp turn ON?	Go to Step 14	Go to Step 8
8	<ol style="list-style-type: none"> 1. Turn OFF the ignition. 2. Disconnect the cooling fan S/P relay. 3. Turn ON the ignition, with the engine OFF. 4. Connect a test lamp between the control circuit of the cool fan S/P relay and the battery positive voltage circuit of the cool fan S/P relay. 5. Ground the high speed relay control circuit. Does the test lamp turn ON?	Go to Step 13	Go to Step 9
9	Does the test lamp remain illuminated when the appropriate control circuit is grounded and then not grounded?	Go to Step 11	Go to Step 10
10	Test the control circuit of the appropriate relay for a short to voltage or an open. Refer to Circuit Testing and Wiring Repairs . Did you find and correct the condition?	Go to Step 21	Go to Step 15
11	Test the control circuit of the appropriate relay for a short to ground. Refer to Circuit Testing and Wiring Repairs . Did you find and correct the condition?	Go to Step 21	Go to Step 15

Step	Action	Yes	No
12	Inspect for poor connections at the cool fan 1 relay. Refer to Testing for Intermittent Conditions and Poor Connections and Connector Repairs . Did you find and correct the condition?	Go to Step 21	Go to Step 17
13	Inspect for poor connections at the cool fan S/P relay. Refer to Testing for Intermittent Conditions and Poor Connections and Connector Repairs . Did you find and correct the condition?	Go to Step 21	Go to Step 18
14	Inspect for poor connections at the cool fan 2 relay. Refer to Testing for Intermittent Conditions and Poor Connections and Connector Repairs . Did you find and correct the condition?	Go to Step 21	Go to Step 19
15	Inspect for poor connections at the harness connector of the PCM. Refer to Testing for Intermittent Conditions and Poor Connections and Connector Repairs . Did you find and correct the condition?	Go to Step 21	Go to Step 20
16	Repair the battery positive voltage circuit. Refer to Wiring Repairs . Did you complete the repair?	Go to Step 21	—
17	Replace the cool fan 1 relay. Did you complete the replacement?	Go to Step 21	—
18	Replace the cool fan S/P relay. Did you complete the replacement?	Go to Step 21	—
19	Replace the cool fan 2 relay. Did you complete the replacement?	Go to Step 21	—
20	Replace the PCM. Refer to Control Module References for replacement, setup, and programming. Did you complete the replacement?	Go to Step 21	—
21	<ol style="list-style-type: none"> 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