Symptom List:

P0541-LOW VOLTAGE ON THE #1 INTAKE AIR HEATER RELAY
P2607-LOW VOLTAGE AT THE #2 INTAKE AIR HEATER RELAY

Test Note: All symptoms listed above are diagnosed using the same tests. The title for the tests will be P0541-LOW VOLTAGE ON THE #1 INTAKE AIR HEATER RELAY.

When Monitored and Set Condition:

P0541-Low Voltage On The #1 Intake Air Heater Relay

When Monitored: When the ignition is on.

Set Condition: When the signal from the #1 intake air heater output does not match the signal from the #1 intake air heater feedback.

P2607-LOW VOLTAGE AT THE #2 INTAKE AIR HEATER RELAY

When Monitored: When the ignition is on.

Set Condition: When the signal from the #2 intake air heater output does not match the signal from the #2 intake air heater feedback.

POSSIBLE CAUSES
LOOSE CONNECTION
INTAKE AIR HEATER RELAY
SIGNAL CIRCUIT OPEN FROM RELAY TO ECM
SIGNAL CIRCUIT SHORTED TO BATTERY NEGATIVE
ECM
INTERMITTENT CONDITION

TEST	ACTION	APPLICABILITY
1	Ignition on, engine not running. With the DRBIII®, actuate the #1 Intake Air Heater. Can you hear the Relay clicking? Yes → Go To 2 No → Go To 3	ENGINE- 5.9L CUMMINS 24V DIESEL
2	While the relay is clicking , wiggle the wiring harness and connectors. Does this interrupt the clicking? Yes → Repair the poor connection. Perform POWERTRAIN VERIFICATION TEST VER - 1 (DIESEL). No → Go To 3	ENGINE- 5.9L CUMMINS 24V DIESEL

P0541-LOW VOLTAGE ON THE #1 INTAKE AIR HEATER RELAY — Continued

TEST	ACTION	APPLICABILITY
3	Turn the ignition off. Remove the Intake Air Heater #1 Relay. Check connectors - Clean/repair as necessary. Measure the resistance between the signal and return posts of the intake air heater relay. Is the resistance between 15 and 25 Ohms? Yes → Go To 4 No → Replace the Intake Air Heater #1 relay. Perform POWERTRAIN VERIFICATION TEST VER - 1 (DIESEL).	ENGINE- 5.9L CUMMINS 24V DIESEL
4	Disconnect the ECM harness connectors. Check connectors - Clean/repair as necessary. Measure the resistance of the intake air heater relay signal circuit between the ECM connector and the intake air heater relay connector. Is the resistance less than 10 Ohms? Yes → Go To 5 No → Repair the open signal circuit from PDC to ECM harness connector. Perform POWERTRAIN VERIFICATION TEST VER - 1 (DIESEL).	ENGINE- 5.9L CUMMINS 24V DIESEL
5	Measure the voltage between the signal circuit of the intake air heater relay and battery negative. Is the voltage greater than 1 volts? Yes → Repair the signal circuit shorted to Battery negative. Perform POWERTRAIN VERIFICATION TEST VER - 1 (DIESEL). No → Go To 6	ENGINE- 5.9L CUMMINS 24V DIESEL
6	Reconnect the ECM harness connectors. Disconnect the intake air heater relay signal wire and use a jumper to connect it to battery negative. Turn the ignition on. With the DRBIII®, read DTCs. Did DTC P0542 set? Yes → Refer to the INTERMITTENT CONDITION Symptom (Diagnostic Procedure). Perform POWERTRAIN VERIFICATION TEST VER - 1 (DIESEL). No → Replace the ECM. Perform POWERTRAIN VERIFICATION TEST VER - 1 (DIESEL).	ENGINE- 5.9L CUMMINS 24V DIESEL