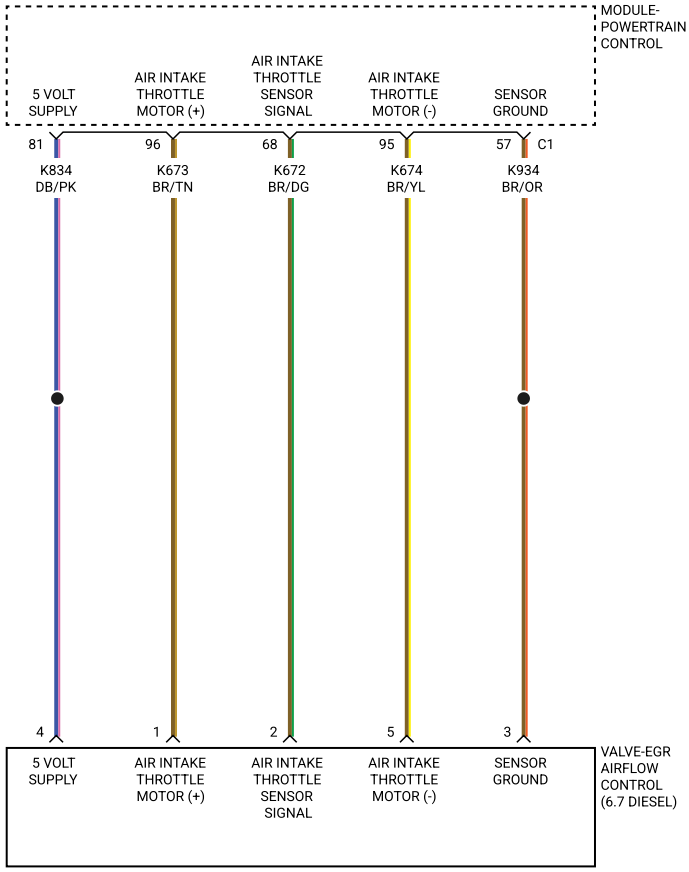
POWERTRAIN CONTROL MODULE (PCM) - DIESEL INTAKE AIR FLOW CONTROL CIRCUIT HIGH (6.7L DSL)

P02E3-DIESEL INTAKE AIR FLOW CONTROL CIRCUIT HIGH



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Theory of Operation

The Exhaust Gas Recirculation (EGR) Airflow Control Valve is controlled by the Powertrain Control Module (PCM) and is actuated by an electric motor. A spring internal to the actuator assembly attempts to drive the valve to the fully-open position. The electric motor works to overcome the spring force when the PCM commands the valve to close. Position feedback from the valve is sent to the PCM to allow for closed-loop control. Discrepancy in position feedback

sent to the PCM, and commanded position sent to the EGR Airflow Control Valve by more than a prescribed amount will result in failure of device rationality diagnostics. Failure to properly actuate the EGR Airflow Control Valve can result in poor engine performance. This may cause active Exhaust Aftertreatment regenerations to last longer.

- **When Monitored:**
  With the ignition on.
- **Set Condition:**
  The Powertrain Control Module detects that the control circuit voltage for the EGR Airflow Control Valve is above the calibrated threshold.

Possible Causes
AIR INTAKE THROTTLE MOTOR (-) CIRCUIT OPEN/HIGH RESISTANCE
AIR INTAKE THROTTLE MOTOR (-) CIRCUIT SHORT TO VOLTAGE
AIR INTAKE THROTTLE MOTOR (+) CIRCUIT OPEN/HIGH RESISTANCE
AIR INTAKE THROTTLE MOTOR (+) CIRCUIT SHORT TO VOLTAGE
EGR AIRFLOW CONTROL VALVE
POWERTRAIN CONTROL MODULE (PCM)

Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).

1. **ACTIVE DTC**

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1. Turn the ignition on.
2. With the scan tool, record all Freeze frame data.
3. With the scan tool, erase DTCs.
4. Turn the ignition off for 75 seconds.
5. Start the engine and let idle for one minute.
6. With the scan tool, read DTCs.

Did the DTC return?

Yes

- Go To **2**

No
- Perform the INTERMITTENT CONDITION diagnostic procedure. (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).

2. **CHECK THE (K673) AIR INTAKE THROTTLE MOTOR (+) CIRCUIT FOR A SHORT TO VOLTAGE**

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1. Disconnect the PCM C1 harness connector.
2. Disconnect the EGR Airflow Control Valve harness connector.
3. Measure the voltage on the (K673) Air Intake Throttle Motor (+) circuit at the EGR Airflow Control Valve harness connector.

Is there voltage present?

Yes
- Repair the (K673) Air Intake Throttle Motor (+) circuit for a short to voltage.
- Perform the POWERTRAIN VERIFICATION TEST - 6.7L. (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).

No
- Go To **3**

3. **CHECK THE (K673) AIR INTAKE THROTTLE MOTOR (+) CIRCUIT FOR A SHORT TO THE (K834) 5 VOLT SUPPLY CIRCUIT**

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1. Measure the resistance between the (K673) Air Intake Throttle Motor (+) circuit and the (K834) 5 Volt Supply circuit.

Is the resistance below 5.0 Ohms?

Yes
- Repair the short between the (K673) Air Intake Throttle Motor (+) circuit and the (K834) 5 Volt Supply circuit..
- Perform the POWERTRAIN VERIFICATION TEST - 6.7L. (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).

No

- Go To **4**

4. CHECK THE (K674) AIR INTAKE THROTTLE MOTOR (-) CIRCUIT FOR A SHORT TO VOLTAGE

1. Measure the voltage on the (K674) Air Intake Throttle Motor (-) circuit at the EGR Airflow Control Valve harness connector.

Is there voltage present?

Yes

- Repair the (K674) Air Intake Throttle Motor (-) circuit for a short to voltage.
- Perform the POWERTRAIN VERIFICATION TEST - 6.7L. (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).

No

- Go To **5**

5. CHECK THE (K674) AIR INTAKE THROTTLE MOTOR (-) CIRCUIT FOR A SHORT TO THE (K834) 5 VOLT SUPPLY CIRCUIT

1. Measure the resistance between the (K674) Air Intake Throttle Motor (-) circuit and the (K834) 5 Volt Supply circuit.

Is the resistance below 5.0 Ohms?

Yes

- Repair the short between the (K674) Air Intake Throttle Motor (-) circuit and the (K834) 5 Volt Supply circuit.
- Perform the POWERTRAIN VERIFICATION TEST - 6.7L. (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).

No

- Go To **6**

6. CHECK THE (K674) AIR INTAKE THROTTLE MOTOR (-) CIRCUIT FOR AN OPEN/HIGH RESISTANCE

1. Measure the resistance of the (K674) Air Intake Throttle Motor (-)circuit between the EGR Airflow Control Valve harness connector and the PCM C1 harness connector.

Is the resistance below 5.0 Ohms?

Yes

- Go To **7**

No

- Repair the (K674) Air Intake Throttle Motor (-) circuit for an open or high resistance.
- Perform the POWERTRAIN VERIFICATION TEST - 6.7L. (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).

7. **CHECK THE (K673) AIR INTAKE THROTTLE MOTOR (+) CIRCUIT FOR AN OPEN/HIGH RESISTANCE**

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1. Measure the resistance of the (K673) Air Intake Throttle Motor (+) circuit between the EGR Airflow Control Valve harness connector and the PCM C1 harness connector.

Is the resistance below 5.0 Ohms?

Yes

- Go To **8**

No

- Repair the (K673) Air Intake Throttle Motor (+) circuit for an open or high resistance.
- Perform the POWERTRAIN VERIFICATION TEST - 6.7L. (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).

8. **EGR AIRFLOW CONTROL VALVE**

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1. Replace the EGR Airflow Control Valve in accordance with the Service Information.(Refer to 25 - Emissions Control/Exhaust Gas Recirculation, Diesel/VALVE, Exhaust Gas Recirculation (EGR) Airflow Control/Removal)
2. Reconnect the EGR Airflow Control Valve harness connector.
3. Reconnect the PCM C1 harness connector.
4. Turn the ignition on.

5. With the scan tool, erase DTCs.
6. Start the engine and allow it to idle for one minute.
7. With the scan tool, read DTCs.

Did the DTC return?

Yes

- Go To **9**

No

- Repair complete.
- Perform the POWERTRAIN VERIFICATION TEST - 6.7L. (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).

9. **POWERTRAIN CONTROL MODULE**

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1. Disconnect all PCM harness connectors.
2. Disconnect all related in-line harness connections (if equipped).
3. Disconnect the related component harness connectors.
4. Inspect harness connectors, component connectors, and all male and female terminals for the following conditions:
   - Proper connector installation.
   - Damaged connector locks.
   - Corrosion.
   - Other signs of water intrusion.
   - Weather seal damage (if equipped).
   - Bent terminals.
   - Overheating due to a poor connection (terminal may be discolored due to excessive current draw).
   - Terminals that have been pushed back into the connector cavity.
   - Perform a terminal drag test on each connector terminal to verify proper terminal tension.

   Repair any conditions that are found.
5. Reconnect all PCM harness connectors. Be certain that all harness connectors are fully seated and the connector locks are fully engaged.
6. Reconnect all in-line harness connectors (if equipped). Be certain that all connectors are fully seated and the connector locks are fully engaged.

7. Reconnect all related component harness connectors. Be certain that all connectors are fully seated and the connector locks are fully engaged.
8. With the scan tool, erase DTCs.
9. Using the recorded Freeze Frame and Environmental Data, along with the When Monitored and Set Conditions above, operate the vehicle in the conditions that set the DTC.
10. With the scan tool, read PCM DTCs.

Did the DTC return?

Yes

- Replace the Powertrain Control Module (PCM) in accordance with the Service Information. (Refer to 08 - Electrical/8E - Electronic Control Modules/MODULE, Powertrain Control/Removal) .
- Perform the PCM VERIFICATION TEST. (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).

No

- Test complete.
- Perform the PCM VERIFICATION TEST. (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).