POWERTRAIN CONTROL MODULE (PCM) - DIESEL PARTICULATE FILTER REGENERATION TOO FREQUENT (6.7L DSL)

P2459-00-DIESEL PARTICULATE FILTER REGENERATION TOO FREQUENT

For a complete AFTERTREATMENT SYSTEM wiring diagram, **(refer to the Wiring Information)** .

Theory of Operation

The engine aftertreatment system monitors the soot load in the Diesel Particulate Filter. Under normal operating conditions the Diesel Particulate Filter is self-cleaning, where soot is converted to ash. The soot load in the aftertreatment Diesel Particulate Filter is estimated using the Exhaust Differential Pressure Sensor and the calculated soot output of the engine. The Powertrain Control Module (PCM) will set this fault if it detects that the time between three regeneration events is less than the calibrated time threshold. The PCM will illuminate the Malfunction Indicator Lamp (MIL) immediately when the diagnostic runs and fails.

When Monitored and Set Conditions

When Monitored: This diagnostic runs continuously when the following conditions are met:

- With the engine running.

Set Conditions:

- The PCM detects that the time between Diesel Particular Filter regeneration events is less than a calibrated threshold.

Default Actions:

- The MIL will illuminate.

Possible Causes
FUEL SYSTEM OR AIR HANDLING SYSTEM SENSOR FAILURE
CHARGE AIR LEAKS
LEAKS BETWEEN EXHAUST MANIFOLD AND DOC/DPF
BASE ENGINE FAILURE
FUEL SYSTEM FAILURE
AIR HANDLING SYSTEM FAILURE
DIESEL OXIDATION CATALYST/DIESEL PARTICULATE FILTER RESTRICTED
AFTERTREATMENT DPF DIFFERENTIAL PRESSURE SENSOR
FUEL FILTER(S)

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

Diagnostic Test

1. **CHECK FOR OTHER RELATED DTCS**

1. Turn the ignition on.
2. With the scan tool, read DTCs.

Were there any Fuel System, Air Handling, and/or Exhaust Gas Recirculation (EGR) System sensor DTCs present?

Yes

- If this DTC is present along with any Fuel System and/or Air Handling System sensor DTCs, repair those DTCs before proceeding.
- Perform the POWERTRAIN VERIFICATION TEST. (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).

No

- Go To **2**

2. **CHECK FOR AN EXHAUST LEAK**

1. Perform the CHECKING THE EXHAUST SYSTEM FOR LEAKS diagnostic procedure. (Refer to 29 - Non-DTC Diagnostics/Drivability - Diesel - Diagnosis and Testing) .

Are leaks found?

Yes

- Repair or replace as necessary.
- Perform the POWERTRAIN VERIFICATION TEST. (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).

No

- Go To **3**

3. **CHECK THE AIR CLEANER BOX FOR PROPER SEALING**

1. Check the Air Cleaner Box for being cracked, out of position, lid not secure, or other damage. Also, check the connection between the Inlet Air Tube and the Air Cleaner Box to make sure that it is sealed properly.

Is the Air Cleaner Box free of damage and the Inlet Air tube installed and sealed properly?

Yes

- Go To **4**

No

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

4. **CHECK THE TURBOCHARGER FOR OIL LEAK INTO THE INTAKE SYSTEM**

1. Remove the inlet to the Turbocharger assembly.
2. Inspect the Turbocharger inlet compressor for oil leaking into the Air Handling system.

Was oil leaking into the Air Handling system from the Turbocharger?

Yes

- Check the Turbocharger oil drain for a restriction. If restricted, clean or replace the oil drain tube. If not restricted, replace the Turbocharger assembly.
- Perform the AFTERTREATMENT INSPECTION GUIDELINE procedure. (Refer to 29 - Non-DTC Diagnostics/Drivability - Diesel - Diagnosis and Testing) .
- Perform the POWERTRAIN VERIFICATION TEST. (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).

No

- Go To **5**

5. **CHECK THE TURBOCHARGER FOR WHEEL CLEARANCE**

1. Inspect Turbocharger for excessive wheel clearance and/or damage to the impeller.

Were any problems found?

Yes

- Replace the Turbocharger in accordance with the Service Information. (Refer to 09 - Engine/Turbocharger System/TURBOCHARGER/Removal and Installation) .
- Perform the POWERTRAIN VERIFICATION TEST. (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).

No

- Go To **6**

6. **CHECK THE TURBOCHARGER FOR OIL LEAK INTO THE EXHAUST SYSTEM**

1. Inspect the Turbocharger turbine for oil leaking into the exhaust system.

Was oil leaking into the exhaust system from the Turbocharger?

Yes

- Go To **11**

No

- Go To **7**

7. **CHECK THE INTAKE SYSTEM**

1. Perform the CHECKING THE INTAKE AIR SYSTEM PRESSURE diagnostic procedure. (Refer to 29 - Non-DTC Diagnostics/Drivability - Diesel - Diagnosis and Testing) .

Were any problems found?

Yes

- Repair as necessary. Inspect and clean any soot fouling in the Air Handling and Exhaust systems as needed.
- Perform the POWERTRAIN VERIFICATION TEST. (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).

No

- Go To **8**

8. **CHECKING THE EGR SYSTEM**

1. Please inspect for the following:
    - Visible signs of an external EGR system leak.
    - Check the Exhaust manifold pressure sensor 1/1 and EMP tube 1/1 for blockage or debris.
    - Remove EGR Crossover Tube from EGR cooler and EGR Valve. Inspect the tube for a restriction.
    - Verify EGR Cooler is not leaking. Check for coolant in EGR plumbing.
    - Check the air intake grid heater for excessive soot build up or restriction.

Were any problems found?

Yes

- Go To **14**

No

- Go To **9**

9. **CHECK THE AFTERTREATMENT DPF DIFFERENTIAL PRESSURE SENSOR/HOSES FOR BLOCKAGE OR LEAKS**

1. Check the aftertreatment DPF differential pressure sensor tubes for plugging, kinks, or leakage.

Are the Aftertreatment DPF differential pressure sensor tubes blocked, kinked, or leaking?

Yes

- Clean or replace the Aftertreatment DPF Differential Pressure Sensor Tube(s) in accordance with the Service Information.
- Perform the POWERTRAIN VERIFICATION TEST. (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).

No

- Go To **10**

10. **CHECK THE SOOT DELTA PRESSURE (K491) SIGNAL CIRCUIT FOR A SHORT TO VOLTAGE**

1. Disconnect the Aftertreatment DPF Differential Pressure Sensor harness connector.
2. Disconnect the PCM C2 harness connector.
3. Check for resistance between the Soot Delta Pressure (K491) Signal circuit and all other pins at the PCM C2 harness connector.

Was the resistance less that 10k Ohms between the Soot Delta Pressure (K491) Signal circuit and any other circuit at the PCM C2 harness connector?

Yes

- Repair the Soot Delta Pressure (K491) Signal circuit for a short to the circuit that measured less than 10k Ohms.
- Perform the POWERTRAIN VERIFICATION TEST. (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).

No

- Replace the Aftertreatment DPF Differential Pressure Sensor in accordance with the Service Information.
- Perform the POWERTRAIN VERIFICATION TEST. (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).

11. **CHECK FOR OIL LEAKING INTO THE EXHAUST MANIFOLD**

1. Remove the Turbocharger and inspect for oil leaking into the Exhaust Manifold.

Was oil leaking into the exhaust manifold from the Turbocharger?

Yes

- Replace the Turbocharger in accordance with the Service Information. (Refer to 09 - Engine/Turbocharger System/TURBOCHARGER/Removal and Installation) .
- Perform the POWERTRAIN VERIFICATION TEST. (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).

No

- Go To **12**

12. **CHECK THE VALVE TRAIN**

1. Remove the valve cover.
2. Inspect the Valve seals. Look for any broken, brittle, or improperly installed seals.

Were any problems found?

Yes

- Perform the appropriate repairs.
- Perform the AFTERTREATMENT INSPECTION GUIDELINE procedure. (Refer to 29 - Non-DTC Diagnostics/Drivability - Diesel - Diagnosis and Testing) .

No

- Go To **13**

13. **CHECK THE CCV FILTER AND SYSTEM**

1. Perform an inspection of the CCV system. Are there signs of a restriction in the system.

Are there signs of a restriction in the CCV system?

Yes

- Replace CCV Filter and determine the root cause of the restriction.
- Perform the AFTERTREATMENT INSPECTION GUIDELINE procedure. (Refer to 29 - Non-DTC Diagnostics/Drivability - Diesel - Diagnosis and Testing) .

No

- Go To **14**

14. **CHECK THE FUEL DELIVERY SYSTEM**

1. Perform the CHECKING THE FUEL DELIVERY SYSTEM diagnostic procedure. (Refer to 29 - Non-DTC Diagnostics/Drivability - Diesel - Diagnosis and Testing) .

Were any problems found?

Yes

- Repair as needed.
- Perform the AFTERTREATMENT INSPECTION GUIDELINE procedure. (Refer to 29 - Non-DTC Diagnostics/Drivability - Diesel - Diagnosis and Testing) .
- Perform the POWERTRAIN VERIFICATION TEST. (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).

No

- Go To **15**

15. **CHECK THE DOC/DPF (AFTERTREATMENT INSPECTION GUIDELINE)**

1. Remove the Aftertreatment DOC / DPF and perform a visual inspection.
2. Perform the AFTERTREATMENT INSPECTION GUIDELINE procedure. (Refer to 29 - Non-DTC Diagnostics/Drivability - Diesel - Diagnosis and Testing) .

Was any internal damage found in the inlet of the DOC/ DPF or face plugging?

Yes

- Replace the DOC/DPF in accordance with the Service Information. (Refer to 11 - Exhaust System/FILTER, Diesel Particulate/Removal and Installation) .
- Perform the POWERTRAIN VERIFICATION TEST. (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).

No

- Go To **16**

16. **CHECK THE ENGINE PERFORMANCE**

1. Perform the CHECKING ENGINE MISFIRE / RUNS ROUGH / PERFORMANCE TEST diagnostic procedure. (Refer to 29 - Non-DTC Diagnostics/Drivability - Diesel - Diagnosis and Testing) .

Were any problems found?

Yes

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

No

- Perform the INTERMITTENT CONDITION diagnostic procedure. (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).