P3805

Fault code description

NOx sensor after catalyst - Data valid but too high, During driving

Possible cause

1. Ammonia released during motoring/coasting being read as NOx, this can be caused by:
   - Leaking AdBlue dosing valve.
   - AdBlue deposits/crystallisation releasing ammonia during motoring.
2. SCR Catalyst releasing excessive stored ammonia, this can be caused by:
   - Incorrect measurement of NOx into catalyst causing excessive dosing.
   - Above normal AdBlue concentration.
   - Poor AdBlue atomisation from the AdBlue dosing valve causing some parts of catalyst to receive more AdBlue than other parts.
   - Exhaust leak before AdBlue dosing valve reducing NOx in catalyst.
3. Drifted NOx after catalyst sensor.

Additional information

The NOx sensor is permanently attached to the NOx control module and reports continuously to the EAS-3 unit. The NOx sensor assembly is serviced as a single component and individual components cannot be replaced.

The signal value was detected to be higher than expected during a fuel inhibit coasting or engine brake event.

The signal from this sensor is monitored only when the conditions listed in 'set conditions of faultcode' are met.

This fault may result in engine torque reduction or limited vehicle speed.

Set condition of fault code

This diagnostic runs when the exhaust gas temperature at the aftertreatment intake NOx sensor is above 302°F (150°C) and the average temperature before and after the SCR catalyst is below 482°F (250°C). The engine has been running under the conditions where the EAS-3 unit has been monitoring the NOx level for a minimum of 18 seconds.

The EAS-3 unit detects that the outlet NOx sensor reading is not stable at zero during these conditions.

Reset condition of fault code

To validate the repair, start and run the engine to raise the exhaust temperature. This may be done by either driving the vehicle or initiating a stationary regeneration using DAVIE.

The exhaust gas temperature after the SCR catalyst must be above 302°F (150°C) before the sensor can run its internal diagnostic.

In order for this internal diagnostic to run, it will be necessary to induce fuel inhibit coasting or an engine brake event for a minimum of 18 seconds.

This fault code will change to inactive immediately after the diagnostic runs and passes.

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P3805, Diagnostic information

Technical data

"NOx sensor after catalyst (F843)"

Location of component(s)

"Location Information, EAS-3"

Electrical diagram(s)

Refer to the OEM service manual for more information.

Description of component(s)

"NOx sensor after catalyst (F843)"

Block diagram

"Block Diagram, EAS-3"

Step-by-step troubleshooting

Perform the troubleshooting steps below using the breakout harness, if necessary, to check electrical components such as sensors, electrical control units, and harnesses. Back probing is not recommended, as it could damage the harness. The ignition should always be in the OFF position when connecting or disconnecting electrical components to reduce the likelihood of damage to the components.

- Disconnecting the EAS connectors during the troubleshooting process causes multiple errors.
- For specific electrical component information and pin out locations, always refer to the technical data.
- It is necessary to exit the fault code menu in DAVIE and run the diagnostic test again to identify a

change in errors.

- Remember that the truck's operational and mechanical issues may be the root cause of both active and inactive fault codes. Refer to the 'possible causes' section.

Step-by-Step 1: Check Fault Codes

Step 1A: Check for Fault Codes

Troubleshooting steps

1. Turn the key switch ON.
2. Use DAVIE to check for fault codes.

Is fault code P3805 active?

- Yes – Proceed to step 1B
- No – Proceed to step 6A

Step 1B: Check for related fault codes

Troubleshooting steps

1. Turn the key switch ON.
2. Use DAVIE to check for fault codes.

Is fault code P3808, P3809, P3812, P3962, P3963, P3806, P3818, P3807 or P1711 active?

- Yes – Stop troubleshooting P3805. Refer to the troubleshooting information for these fault codes before continuing with this procedure.
- No – Proceed to step 2A

Step by step 2: Check the DEF decomposition pipe

Step 2A: Check for Deposits in the Decomposition Pipe

Troubleshooting steps

1. Turn the key switch OFF.
2. Engine off.

3. Remove the decomposition pipe from the vehicle.
4. Inspect for excessive DEF deposits and crystallization.

Are excessive deposits/crystallization found inside the decomposition pipe?

- Yes – Clean the decomposition pipe - Proceed to step 2B
- No – Proceed to step 2B

Step 2B: Check for poor DEF spray atomization and distribution

Troubleshooting steps

1. Inspect decomposition pipe and SCR inlet pipe for evidence of liquid DEF accumulating and running through exhaust pipe toward the catalyst.

Is there evidence of liquid DEF accumulating and running in the pipe toward the catalyst?

- Yes – Check dosing valve tip for debris and crystallization. Clean and reinstall dosing valve and reinstall decomposition pipe - Proceed to step 2C
- No – Reinstall decomposition pipe. Proceed to step 2C

Step 2C: Check for exhaust leakage

Troubleshooting steps

1. Inspect all exhaust connections between engine outlet and decomposition pipe inlet for loose/missing clamps and broken pipes.

Are there loose clamps or broken exhaust pipes?

- Yes – Repair leak - Proceed to step 3A
- No – Proceed to step 3A

Step by step 3: Check the DEF concentration

Step 3A: Check DEF Concentration

Troubleshooting steps

1. Check the DEF concentration according to the job 'check DEF' in Engine Rapido.

Is the DEF concentration between 32% and 33%?

- Yes – Proceed to step 3B
- No – Replace DEF - Proceed to step 3B

Step 3B: Check for crystallization, blockage, exhaust leaks, and incorrect DEF concentration

Troubleshooting steps

1. If crystallization, dosing valve blockage, exhaust leaks, or incorrect DEF concentration has been found and corrected, then confirm repair.

Have crystallization, dosing valve blockage, exhaust leaks, or incorrect DEF concentration been found and corrected?

- Yes – Proceed to step 6A
- No – Proceed to step 4A

Step by step 4: Check DEF dosing valve

Step 4A: Check DEF dosing valve accuracy

Troubleshooting steps

1. Perform the DEF pump module override test as described in “Explanatory Notes to DAVIE'

Does the amount of collected DEF meet the specifications displayed by DAVIE?

- Yes – Reinstall DEF dosing valve. Proceed to step 5A
- No – Replace DEF dosing valve. Repeat DEF pump module override test. If the amount is still incorrect then contact the Engine Support Center. Otherwise

continue to step 6A.

Step by step 5: Check the NOx sensor after catalyst

Step 5A: Check for physical damage

Troubleshooting steps

1. Turn the key switch OFF.
2. Disconnect the NOx after catalyst sensor from the harness.
3. Inspect the NOx after catalyst sensor harness and connector for:
   - Corroded or dirty pins
   - Damaged pins
   - Pushed back or expanded pins
   - Loose connector
   - Moisture in or on the connector
   - Connector shell damage
   - Missing or damaged connector seals
   - Wire insulation damage
4. Remove the NOx after catalyst sensor.
5. Inspect the NOx after catalyst sensor tip for:
   - corrosion
   - blockages
   - physical damage

Has any damage been found?

- Yes – Repair damage. Proceed to step 6A to confirm repair. If fault recurs then return to step 5B.
- No – Proceed to step 5B

Step 5B: Check for sensor contamination

Troubleshooting steps

1. This test can be negatively affected by truck exhaust inside the shop. Before beginning this test, the truck must be

moved outside or efforts must be made to vent the exhaust outside the shop.

2. Remove the NOx sensor before catalyst from the exhaust system, leaving it connected to the wiring harness.

   Lubricate the NOx sensor or plug threads with high temperature lubricant to aid in sealing and removal. Install another NOx sensor or other plug into the NOx sensor mounting hole. If using a plug, the mating thread is M20x1.5-6e and the total threaded length must not exceed ¾ inch. Ensure that the removed NOx sensor is not in contact with non-metallic parts as it will become hot during this procedure.
3. Initiate a stationary regeneration.
4. Use DAVIE to monitor the NOx sensor before catalyst.
5. It is normal for any of the following fault codes to be set during this test and they do not indicate a problem. If codes P3971, P3977, P3978 are set they should be cleared before proceeding.

Is the NOx concentration (NOx PPM) between -20 and 40?

- Yes – Abort the regeneration and reinstall the NOx sensor and proceed to Step 5C. Use caution during installation, the NOx sensor could be hot.
- No – Contact Engine Support Center for further instructions.

Step 5C: Confirm operation and check accuracy

Troubleshooting steps

1. Connect all components.
2. Move electrical and DEF connections from truck-mounted DEF dosing valve to another DEF dosing valve. Put secondary DEF dosing valve in a bucket

to catch dosed DEF. The bucket should be no smaller than 1 gallon.

3. Perform a stationary regeneration and record an SCR overview. For more information, go to 'Explanatory notes to DAVIE'
4. Compare the NOx before catalyst sensor value to the NOx after catalyst sensor value shortly before the end of the regeneration. The NOx before catalyst sensor value should be within 40 ppm of the NOx after catalyst sensor value.
5. It is normal for fault codes P3978 and/or P3977 to be set during this test and they do not indicate a problem. If they are set, they should be cleared before proceeding.
6. Return the DEF dosing valve connections to their original configuration.

Shortly before the end of the stationary regeneration is the NOx before catalyst sensor value within 40 ppm of the NOx after catalyst sensor value?

- Yes – Contact the Engine Support Center for further instructions.
- No – Replace the NOx before catalyst sensor. Proceed to step 6A.

Step-by-Step 6: Clear the Fault Code

Step 6A: Disable the Fault Code

Troubleshooting steps

1. Connect all components.
2. Drive the truck for 30 minutes at freeway speed.
3. Check for active faults after completion of the drive.

Is fault code P3805 inactive?

- Yes – Proceed to step 6B
- No – Return to the last completed troubleshooting steps

  If all the steps have been completed and rechecked, contact the Engine Support Center for further instructions.

Step 6B: Clear the inactive fault codes

Troubleshooting steps

1. Connect all components.
2. Turn the key switch ON.
3. Use DAVIE to clear the inactive fault codes.

Have all the fault codes been cleared?

- Yes – Repair complete
- No – Troubleshoot any remaining active fault codes

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