P3971

Fault code description

NOx sensor after catalyst - Data valid but too high

Possible cause

1. Build up of DEF deposits in decomposition tube is the most common cause.
2. The EAS-3 unit has detected that the NOx reading is higher or lower than is possible from the engine output.
3. Exhaust system leaks.
4. An incorrectly installed NOx after SCR catalyst sensor.
5. Malfunctioning NOx after catalyst sensor.
6. Malfunctioning NOx before catalyst sensor.
7. Possible engine misfire.

Additional information

The NOx sensor is permanently attached to the NOx control module. They are serviced as single component and cannot be replaced individually.

The first DPF regeneration test, when the fault code became active, may have cleared the deposits. A second 'DPF regeneration test' will need to be performed in the troubleshooting tree for the fault code to be inactive.

Set condition of fault code

The set condition depends on the "release sequence number"

Release sequence number <9:

This diagnostic runs when the key switch is in the ON position, the engine is running and the exhaust gas temperature after the SCR catalyst is above 302ºF (150ºC) for five seconds.

The diagnostic runs only during the DPF regeneration test.

The EAS-3 actuator detects that the NOx reading is higher or lower than is possible from the engine output.

Release sequence number ≥9:

This diagnostic runs when the key switch is in the ON position, the engine is running and the exhaust gas temperature after the SCR catalyst is above 392ºF (200ºC) for 60 seconds.

The diagnostic runs only during the DPF regeneration test.

The EAS-3 actuator detects that the NOx reading is higher or lower than is possible from the engine output.

Reset condition of fault code

The reset condition depends on the "release sequence number"

Release sequence number <9:

This fault code cannot be cleared with DAVIE.

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

To validate the repair, start the engine and let it idle for one minute. Run the NOx sensor monitor with the service tool and validate if the sensor will work correctly when the warning light off temperature of 302°F (150°C) has been met.

If after the completion of the DPF regeneration test, the fault becomes inactive, the repair has been validated.

Release sequence number ≥9:

This fault code cannot be cleared with DAVIE.

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

To validate the repair, start the engine and let it

idle for one minute. Run the NOx sensor monitor with the service tool and validate if the sensor will work correctly when the warning light off temperature of 392°F (200°C) has been met.

If after the completion of the DPF regeneration test, the fault becomes inactive, the repair has been validated.

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P3971, Diagnostic information

Technical data

"Sensor, NOx 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)

"Sensor, NOx after catalyst (F843)"

Block diagram

"Block diagram EAS-3"

Step by step troubleshooting

Please perform the troubleshooting steps below using the breakout harness if necessary to check electrical components such as sensors, electrical control units or 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 electrical components.

- Disconnecting the EAS connectors during the troubleshooting process will result in 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 or 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 line heating fault codes.

Is fault code P3971 active?

- Yes – Proceed to step 1B
- No – Proceed to step 3A

Step 1B: Check for fault codes

Troubleshooting steps

1. Turn the key switch ON.
2. Use DAVIE to check for fault codes related to the NOx after catalyst sensor.

Are fault codes related to the NOx after catalyst sensor active?

- Yes – Proceed with the appropriate fault code
- No – Proceed to step 1C

Step 1C: Check for fault codes

Troubleshooting steps

1. Turn the key switch ON.
2. Use DAVIE to check for fault codes related to the NOx before catalyst sensor.

Are fault codes related to the NOx before

catalyst sensor active?

- Yes – Proceed with the appropriate fault code
- 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 crystallisation.

Are excessive deposits/crystallisation found inside the decomposition pipe?

- Yes – Clean and re-install the decomposition pipe - Proceed to step 4A
- No – Proceed to step 3A

Step by step 3: Check the condition of the NOx sensors

Step 3A: Inspect the condition of the NOx sensors

Troubleshooting steps

1. Turn the key switch ON.
2. Start the engine.
3. Perform the 'DPF regeneration test'. For more information, go to 'Explanatory notes to DAVIE'.

   

   This regeneration test is in addition to the first regeneration test that was performed when fault code 3971 became active. A second regeneration test must be performed at this time.
4. Use DAVIE to check for fault codes

Is fault code P3971 active?

- Yes – Proceed to step 3B
- No – Proceed to step 4A

Step 3B: Check for fault codes

Troubleshooting steps

1. Turn the key switch ON.
2. Check for active fault codes related to the NOx before catalyst sensor.

Are fault codes related to the NOx before catalyst sensor active?

- Yes – Proceed with the appropriate fault code - Proceed to step 4A
- No – Replace the NOx after catalyst sensor - Proceed to step 4A

Step by step 4: Clear the fault code

Step 4A: Disable the fault code

Troubleshooting steps

1. Connect all components.
2. Operate the system within the 'reset condition of the fault code' found in the fault code information.
3. Use DAVIE to verify if the fault codes are inactive.

Is fault code P3971 inactive?

- Yes – Proceed to step 3B
- No – Return to the troubleshooting steps. Proceed to step 1A

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

Step 4B: 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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