P3970

Fault code description

NOx sensor after catalyst power supply - Out of range

Possible cause

1. The voltage supplied to the NOx after catalyst sensor is below +11.5 VDC for 12 VDC systems.
2. The voltage supplied to the NOx after catalyst sensor is above +16.5 VDC for 12 VDC systems.
3. The NOx after catalyst sensor has malfunctioned or is damaged.
4. The NOx after catalyst sensor internal heater has malfunctioned.

Additional information

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

Set condition of fault code

This diagnostic runs continuously when the key switch is in the ON position and the engine is running.

The EAS-3 ECU detects that the NOx after catalyst sensor supply voltage is outside the specified values.

Reset condition of fault code

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

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P3970, 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 by utilising 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 fault codes.

Is fault code P3970 inactive?

- Yes – Proceed to step 4A
- No – Proceed to step 2A

Step by step 2: Check the NOx sensor after catalyst and the circuit

Step 2A: Inspect the NOx after catalyst sensor and connector pins

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:
    1. corroded or dirty pins
    2. damaged pins
    3. pushed back or expanded pins
    4. loose connector
    5. moisture in or on the connector
    6. connector shell damaged
    7. missing or damaged connector seals
    8. wire insulation damage

Dirty or damaged pins/connector?

- Yes – A dirty or damaged connection has been detected. Clean, repair or replace the damaged connection or harness if possible - Proceed to step 4A
- No – Proceed to step 2B

Step 2B: Check the voltage to the NOx after catalyst sensor

Troubleshooting steps

1. Turn the key switch OFF.
2. Disconnect the NOx after catalyst sensor from the harness.
3. Turn the key switch ON.
4. Check the power supply and return circuit to the NOx after catalyst sensor.
5. Measure the voltage between the NOx after catalyst sensor supply circuit and return circuit at the NOx sensor harness connector.

Check the voltage at key ON, while cranking the engine and with the engine running at idle.

Is the voltage between 11.5 VDC and 16.5 VDC?

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

Step by step 3: Check the battery and the harness

Step 3A: Check the battery connections

Troubleshooting steps

1. Turn the key switch OFF.
2. Check the positive and negative battery terminals.

Are the connections tight and corrosion-free?

- Yes – Proceed to step 3B
- No – Tighten and/or clean the connections.

Refer to the OEM manual. Proceed to step 4A

Step 3B: Check for an open circuit in the battery voltage supply

Troubleshooting steps

1. Turn the key switch OFF.
2. Disconnect the NOx after catalyst sensor from the harness.
3. Turn the key switch ON.
4. Check for an open circuit.
5. Measure the voltage between the NOx after catalyst sensor battery supply pin and the engine block earth.

Is the voltage between 11.5 VDC and 16.5 VDC?

- Yes – An open circuit has been detected in the NOx after catalyst sensor earth circuit. Repair or replace the wiring. Proceed to step 4A
- No – An open circuit has been detected in the NOx after catalyst sensor supply circuit. Check for an open circuit, short circuit or blown fuses in the power supply circuit. Repair or replace the wiring/fuse. Proceed to step 4A

Step by step 4: Clear the fault code

Step A: 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 P3970 inactive?

- Yes – Proceed to step 4B

- 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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