P3817

Fault code description

Diesel exhaust fluid (DEF) quality - Incorrect

Possible cause

1. Degraded, diluted or incorrect DEF.
2. Exhaust system leaks.
3. Malfunctioning SCR system.
4. Diesel exhaust fluid deposits in decomposition pipe.
5. Malfunctioning SCR catalyst.
6. Engine EGR measurement incorrect, restricted EGR cooler.

Additional information

The EAS-3 ECU is able to detect when anything other than pure diesel exhaust fluid (DEF) is in the diesel exhaust fluid tank.

The DEF quality must be checked. The DEF tank must be drained and refilled with pure DEF (conforming to ISO 22241-1 standard). No DEF, diluted DEF or contaminated DEF is present in the DEF tank.

Set condition of fault code

This diagnostic runs after the diesel exhaust fluid tank has been refilled, and the SCR system is actively dosing DEF.

The EAS-3 ECU detects that the expected NOx reduction across the SCR catalyst is not occurring, and the DEF tank has recently been refilled.

Reset condition of fault code

To validate the repair, drive the truck at freeway speed for 15 minutes until the Engine Out NOx Sensor comes online.

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

passes.

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

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P3817, Diagnostic information

Location of component(s)

"Location information, EAS-3"

Electrical diagram(s)

Refer to the OEM service manual for more information.

Description of component(s)

"Diesel Exhaust Fluid (DEF)"

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 fault codes.

Is fault code P3816 or P3817 active?

- Yes – If the mileage is less than 2500, proceed with a stationary regeneration to degreen the system. Otherwise, proceed to step 1B
- No – Proceed to step 1B

Step 1B: Check for NOx sensor related fault codes

Are NOx related fault codes (for example P3971, P3972, P3804, P3805 or P3813) active or inactive?

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

Step 1C: Check for active DEF dosing system related fault codes

Are fault codes related to the DEF dosing system (for example P3931) active?

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

Step 1D: Check for engine emissions related fault codes

Are fault codes related to the EGR system or NOx sensor plausibility active (for example P1711 or P1713)?

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

Step 1E: Check the freeze frame for P3816

Is the NOx engine out (before catalyst NOx) more than four times the NOx tailpipe out (after catalyst NOx)?

- Yes – Proceed with fault code P1711 (even though it is not present)
- No – Proceed to step 2

Step by step 2: Check the DEF dosing valve circuit

Step 2A: Inspect the DEF dosing system for external leaks

Troubleshooting steps

1. Turn the key switch OFF.
2. Inspect all components of the DEF dosing system for signs of leaks, including:
   - DEF tank connections
   - DEF pump module and pump module connections
   - DEF lines
   - DEF dosing valve

DEF will form white deposits around leaking connections.

External leaks detected in the system?

- Yes – Repair the leak. Proceed to step 2B
- No – Proceed to step 2B

Step 2B: Inspect the DEF quality

Troubleshooting steps

1. Turn the key switch OFF.
2. Check the DEF quality:
   - Visually inspect the DEF in the tank

for signs of debris or contamination.

- Use a DEF refractometer to measure the urea concentration.
- Use the oil test paper to test for diesel fuel or oil contamination in the DEF tank.

DEF free of contamination and within the specifications?

- Yes – Proceed to step 2C
- No – The fluid in the tank is not pure DEF. Drain the tank, clean the system and fill the tank with DEF. Proceed to step 2C

Step 2C: Inspect the DEF pump module

Troubleshooting steps

1. Turn the key switch OFF.
2. Connect all DEF lines and electrical connections.
3. Remove the DEF dosing valve.
4. Place the DEF dosing valve in a measuring container and cover.
5. Perform the DEF pump module override test. For more information, go to 'Explanatory notes to DAVIE'.

Does the DEF pump module meet the specifications?

- Yes – Proceed to step 3A
- No – Replace the DEF filter and perform the test again. If the pump module does not meet the specifications, replace the pump module. Proceed to step 3A

Step by step 3: Check the aftertreatment system

Step 3A: Check the exhaust system for leaks

Troubleshooting steps

1. Turn the key switch OFF.

2. Check the exhaust for leaks.
3. Inspect the exhaust system between the turbocharger and the SCR catalyst outlet. Check for:
   - loose connections
   - leaking connections
   - broken exhaust system components.

Are exhaust system leaks found?

- Yes – Repair the exhaust system leak. Proceed to step 3B
- No – Proceed to step 3B

Step 3B: Check for deposits in the decomposition pipe

Troubleshooting steps

1. Turn the key switch OFF.
2. Remove the decomposition pipe.
3. Inspect the decomposition pipe for excessive DEF deposits.

Excessive DEF deposits found?

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

Step by step 4: Check the EGR venturi

If no other conditions that could explain the fault have been found, it may be caused by a fouled EGR venturi.

Step 4A: Aftertreatment system problems

Have problems with the aftertreatment system been found and corrected?

- Yes – Proceed to step 5A
- No – Proceed to step 4B

Step 4B: Check the EGR system

Troubleshooting steps

1. Turn the key switch OFF.

2. Remove and inspect the EGR delta-P sensor, mounting block and pressure tubes.

Are any of the components blocked or restricted by soot build-up?

- Yes – Clean the components and repair any connections or seals that show signs of a leak. Proceed to step 4C
- No – Proceed to step 4C

Step 4C: Check the EGR venturi

Troubleshooting steps

1. Turn the key switch OFF.
2. Remove and inspect the EGR venturi. Any coating or build-up greater than 0.5 mm (1/32") can cause P3817.

Is there a coating more than 0.5 mm thick on the inside of the venturi?

- Yes – Clean the inside of the venturi. If the venturi has a corrosion layer greater than 0.5 mm, contact the Engine Support Center for further instructions. Proceed to step 5A
- No – Proceed to step 5A

Step by step 5: Check for active fault codes

Step 5A: Warm the truck and check for active fault codes

Troubleshooting steps

1. Connect all components.
2. Turn the key switch ON
3. Bring the NOx sensors to operating temperature by driving the truck at freeway speed for 15 minutes.
4. Use DAVIE to check for active fault codes.

Is fault code P3971 or P3972 active?

- Yes – Proceed with the appropriate fault

code

- No – Proceed to step 5B

Step 5B: Check for active fault codes

Troubleshooting steps

1. Turn the key switch ON.
2. Engine running.
3. Check for active faults.

Is fault code P3977 active?

- Yes – Proceed with the appropriate fault code
- No – Proceed to step 5C

Step 5C: Check for active fault codes

Troubleshooting steps

1. Turn the key switch ON.
2. Engine running.
3. Check for active faults.

Is fault code P3978 active?

- Yes – 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.
- No – 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. 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 P3817 inactive?

- Yes – Proceed to step 6B
- 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 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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