P0278

Fault code description

Cylinder 6 - Torque contribution too low

Possible Cause

1. Faulty solenoid valve of MX Engine Brake cylinder 6 (B416)
2. Short circuit to supply on pin A20 of the ECU
3. Mechanical defect:

   Symptom: Slightly reduced power

   1. Incorrect valve clearance
   2. Large unbalance in the driveshaft

   Symptom: Engine block vibration at high load

   1. Leakage in the high-pressure fuel line
   2. Worn pump unit
   3. Flywheel damaged
   4. Fuel supply issues (dirt, air in system)

Additional information

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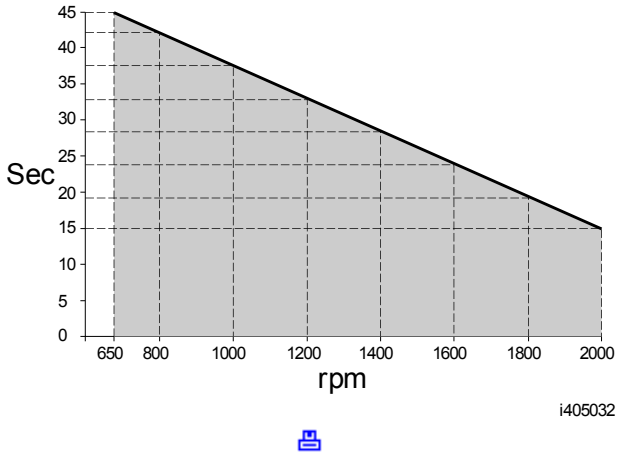
Set condition of fault code

This diagnostic runs:

- 30 seconds after the engine has been started, and;
- with the engine coolant temperature above 40 °C [104 °F], and;
- when the engine load and engine speed is steady

This fault code becomes active if the PMCI-2 ECU detects cylinder unbalance for more than a specific time. This time is dependent on engine speed. See graph for detailed information about the relation between the set time and the engine speed.



The graph shows the minimum time for the fault code to become active.

Reset condition of fault code

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

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This information applies exclusively to the entered chassis number or the selected engine type. Please take into account that this information may change daily. Therefore the provided information is only valid on 12-12-2015. You cannot derive any rights from the information provided with respect to vehicles and/or components of another series, with another chassis number, and/or of another date. (/)

P0278, Diagnostic information

Technical data

"MX Engine Brake solenoid valve"

Location of component(s)

"Location information, PMCI-2"

Electrical diagram(s)

"PMCI-2"

Description of component(s)

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Block diagram

"PMCI-2"

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.

- This troubleshooting tree is based on the assumption that supply power and earth to the PMCI are functioning properly.
- Disconnecting the PMCI 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 in Rapido.

- It is necessary to exit the 'active errors' screen 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 codes. Refer to the 'possible causes' section in Rapido.

Step by step 1: Check fault codes

Step 1A: Fuel system related codes

Troubleshooting steps

1. Use DAVIE to check for any fuel-related system codes.

Are there any fuel related faults active?

- Yes – Proceed with troubleshooting fuel-related faults.
- No – Proceed to step 2A.

Step by step 2: Visual Inspections

Step 2A: Check fuel injector connectors and PMCI-2 connections

Troubleshooting steps

1. Visually inspect the associated component connections and wiring for any of the following:
   - Damaged or loose connectors
   - Bent, broken, corroded or loose connector pins
   - Moisture or dirt in the connections
   - Damage to the wire harness or insulation
   - The correct parts are not installed
   - ECU connections are damaged or disconnected

Was there evidence of any of the above?

- Yes – Repair any issues found.
- No – Proceed to step 2B.

Step 2B: Fuel system components

Troubleshooting steps

1. Visually inspect the associated fuel system component connections for any of the following:
   - Signs of fuel leaks occurring in any related joints, lines, and pumps
   - Clogged filter
   - Bent or broken fuel lines or fittings
   - Fuel component parts not installed correctly

Was there evidence of any of the above?

- Yes – Correct or repair any issues found. Refer to set fault condition to perform the corresponding repair verification cycles to confirm that the related fault condition has been corrected. Use DAVIE to retest active faults.
- No – Proceed to step 3A

Step 2C: Check flywheel

Troubleshooting steps

1. Check for damage to the flywheel.

Is there damage to the flywheel?

- Yes – Proceed to step 6A.
- No – Proceed to step 3A.

Step by step 3: Sensors

Step 3A: Check the crankshaft and camshaft sensor

Troubleshooting steps

1. Switch off the ignition.

2. Disconnect the crank speed sensor.
3. Measure the resistance between the signal and earth pins of the crank speed sensor.
4. Perform a continuity test on all the wires associated with the crank speed sensor.
5. Inspect the crank speed sensor for damage or debris.
6. Reconnect the crank speed sensor.
7. Perform the same tests on the camshaft sensor.
8. Reconnect the camshaft sensor.

Did both sensors pass these tests?

- Yes – Proceed to step 4A.
- No – If the resistance on either sensor is incorrect or it has physical damage, replace that sensor. Use DAVIE to verify the repair.

  If the continuity of the wires to the sensors is incorrect, find and solve the source of the problem.

Step by step 4: Valve clearances

Step 4A: Check valve clearances

Troubleshooting steps

1. Check the valve clearances to the specifications.

Are the valve clearances to specification?

- Yes – Proceed to step 5.
- No – Set the valve clearances to the correct specification. If the fault still exists, proceed to Step 5.

Step by step 5: Engine brake

Step 5A: Check the engine brake

Troubleshooting steps

1. Test Drive the Truck with engine brakes ON 100%.
2. Drive the truck using the engine brakes in all RPM ranges after 1000 rpm.

Are the engine brakes functioning is all operational areas?

- Yes – Proceed to step 6A.
- No – Replace the engine brake Unit associated with the misfiring cylinder. If the fault still exists, proceed to Step 6A.

Step by step 6: Contact PACCAR Engine Support Center

Step 6A: Assistance.

Contact the PACCAR Engine Support Center for further assistance.

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