Service Information Bulletin

SUBJECT

SPN 520268/FMI 16 GHG14 (MCM2.1)

DATE

October 2013

Additions, Revisions, or Updates

<table>
<thead>
<tr>
<th>Publication Number / Title</th>
<th>Platform</th>
<th>Section Title</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>DDC-SVC-MAN-0084</td>
<td>DD Platform</td>
<td>SPN 520268/FMI 16</td>
<td>This is an updated section for tools, other SPNs listed, contamination, and connector inspection.</td>
</tr>
</tbody>
</table>

DETOUR

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www.demanddetroit.com
2 SPN 520268/FMI 16 - GHG14

This diagnostic is typically Fuel Rail Pressure Too High, Similar Condition.

Table 1.

<table>
<thead>
<tr>
<th>SPN 520268/FMI 16</th>
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</thead>
<tbody>
<tr>
<td>Description</td>
<td>Fuel Rail Pressure High</td>
</tr>
<tr>
<td>Monitored Parameter</td>
<td>Fuel Rail Pressure</td>
</tr>
<tr>
<td>Typical Enabling Conditions</td>
<td>Closed Loop &amp; Actual Rail psi greater than 200 Bar of Desired Rail psi</td>
</tr>
<tr>
<td>Monitor Sequence</td>
<td>None</td>
</tr>
<tr>
<td>Execution Frequency</td>
<td>Continuous when enabling conditions met</td>
</tr>
<tr>
<td>Typical Duration</td>
<td>8 Seconds</td>
</tr>
<tr>
<td>Dash Lamps</td>
<td>MIL</td>
</tr>
<tr>
<td>Engine Reaction</td>
<td>None</td>
</tr>
<tr>
<td>Verification</td>
<td>Steady Engine rpm 1400 - 1500 (2 minute)</td>
</tr>
</tbody>
</table>

The Motor Control Module (MCM) sets this fault code when fuel rail pressure deviation is greater than 200 Bar (2900 psi) while under a load (low speed).

**NOTE:** SPN 157/16 may also set as a result of this fault code.

This fault can occur due to the conditions listed below:

- External fuel leakage between the high pressure pump and fuel injectors
- Pressure Limiting Valve (PLV) leakage (internal)
- Fuel filter integrity (loose caps, plugged filters)
- Fuel supply issues (fuel level, fuel aeration, leaking fuel lines, fuel restrictions)
- Intermittent loss of engine speed signal
- High pressure pump internal failure
- Fuel injector (amplifier or needle) leakage
- Fuel Contamination
- Rail pressure sensor Failure
- MCM Failure
### Table 2.

<table>
<thead>
<tr>
<th>Tool Number</th>
<th>Tool Description</th>
<th>Tool Graphic</th>
</tr>
</thead>
<tbody>
<tr>
<td>J-48876</td>
<td>Test Gauge, Primer Port, HDE</td>
<td><img src="d560033" alt="Image" /></td>
</tr>
<tr>
<td>J-48704</td>
<td>Caps, HP Fuel Rail, HDE</td>
<td><img src="d560002" alt="Image" /></td>
</tr>
<tr>
<td>DDDL 7.10 or newer</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:** It is important to obtain information from the customer about check engine lamp occurance and any performance concerns.

1. Did SPN 520268/FMI 16 appear after the fuel system was repaired or fuel filter maintenance was performed?
   a. Yes; Clear fault code and road test to verify complaint. If fault code does not set, release the vehicle. If fault code sets, Go to step 2.
   b. No; Go to step 2.
2. Using DDDL/DDRS 7.10 or newer, check for multiple fault codes.
   a. If any of the additional fault codes listed below are active, perform the associated diagnostics first:
      • SPN 94 / FMI 15 Fuel Filter Service Warning
      • SPN 94 / FMI 16 Fuel Filter Replacement Required
      • SPN 97 / FMI 15 Water in Fuel (WIF) Warning
      • SPN 164 / FMI (all) Rail Pressure Sensor Fault Codes
      • SPN 174 / FMI 0 Fuel Temperature Before High Pressure Pump Too High
      • SPN 723 / FMI (all) Camshaft Position Sensor Fault Codes
      • SPN 636 / FMI (all) Crankshaft Position Sensor Fault Codes
      • SPN 1077 / FMI 5, 6 or 14 Quality Control Valve Fault Codes
   b. If only SPN 1077/7, 157/16 or 1077/31 is present, Go to step 3.
   **NOTE:** Fuel tank level at the time the fault triggered can be viewed in extended data #5, “Enhanced Environmental data” Fuel Tank Level.
3. Turn the ignition ON (key ON, engine OFF). Check and record fuel level in all fuel tanks.
   a. If fuel level is below ¼ tank (or 25%), add fuel, clear fault codes, and road test vehicle. If the fault code does not become active during the road test, release the vehicle. If the fault code becomes active during the road test with over ¼ tank (or 25%) of fuel, Go to step 4.
   b. If the fuel level is over ¼ tank (or 25%), view the fuel tank level in extended data. If the level was under ¼ tank (or 25%), fuel sloshing in the tank could be the cause of aerated fuel that could cause this fault code. If the fuel level was over ¼ tank (or 25%) when the fault code was set, Go to step 4.
4. Check for fuel contamination, including Diesel Exhaust Fluid (DEF), water, gasoline, coolant, etc.
   a. If metal is found,
      • Three-Filter Fuel System; Refer to section "Metal in the Fuel System – Three-Filter Fuel System".
      • Two-Filter Fuel System; Refer to section "Metal in the Fuel System – Two-Filter Fuel System".
   If coolant is found, Refer to section "Fuel in Coolant/Coolant in Fuel".

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If DEF is found, Refer to section "Diesel Exhaust Fluid in Fuel".
If other contamination is found, contact the Detroit™ Customer Support Center at 800-445-1980.

b. If no contamination is found, Go to step 5.

5. Visually inspect for external fuel leaks on the engine and on the chassis.
   a. If a leak is found, repair leak. Refer to section "Verify Repairs".
   b. If no leaks are found, Go to step 6.

NOTE: Do not reset this counter unless the PLV is being replaced. Replacing the PLV does not address the root cause of this overpressure fault code. Continue troubleshooting after replacing the PLV.

6. Check the value of PLV openings. With ignition ON (key ON, engine OFF), select the Actions tab in the top tool bar. Select Fuel System, then PLV Change or view (E2P_RPG_CTR_PLV_OPEN) under “Extended Data Record Number 5th” list. View and record the PLV open counts.
   a. If the counter is greater than 50, replace the PLV.
      • Three-Filter Fuel System, Refer to section "Removal of the Pressure Limiting Valve - Three-Filter System".
      • Two-filter fuel system, Refer to section "Removal of the Pressure Limiting Valve - Two-Filter System".
   b. If counter is less than 50, Go to step 7.

   WARNING: ENGINE EXHAUST
   To avoid injury from inhaling engine exhaust, always operate the engine in a well-ventilated area. Engine exhaust is toxic.

   WARNING: PERSONAL INJURY
   To avoid injury before starting and running the engine, ensure the vehicle is parked on a level surface, parking brake is set, and the wheels are blocked.

7. Perform Automatic Fuel System Integrity Check (FSIC) routine. Once the engine shuts down, leave the key on for five minutes. Disconnect DDDL/DRRS and open the log file.

8. Review the rail pressure bleed-off time from the FSIC log file. Is the bleed-off time between 35 seconds and 2 minutes, 30 seconds?
   a. Yes; Go to step 10.
   b. No; Go to step 9.

9. Review the rail pressure bleed-off time from the Automatic Fuel System Integrity Check. Is the bleed-off time below 35 seconds?
   a. Yes; Perform a low pressure fuel system leak test.
      • For the three-filter fuel system, Refer to section "FIS Low Pressure Leak Test - Three-Filter Fuel System".
      • For the two-filter fuel system, Refer to section "FIS Low Pressure Leak Test-Two-Filter Fuel System".
      If the low pressure leak test passes, replace the high pressure fuel pump.
      • For the three-filter fuel system, Refer to section "Removal of the High Pressure Fuel Pump - Three-Filter System".
      • For the two-filter fuel system, Refer to section "Removal of the High Pressure Fuel Pump – Two-Filter System".
      Verify repairs, Refer to section "Verify Repairs".
   b. No; Install six new fuel injectors.
      • For the three-filter fuel system, Refer to section "Removal of the Fuel Injector - Three-Filter System".
      • For the two-filter fuel system, Refer to section "Removal of the Fuel Injector - Two-Filter System".
      Verify repairs, Refer to section "Verify Repairs".

10. Review the fuel temperature from the FSIC log file. Was the fuel temperature rise greater than 10 degrees?
    a. Yes; Go to step 12.
    b. No; Go to step 11.

11. Review the FSIC log file. At 600 rpm, is ASL003 Fuel Compensation Pressure within range per the fuel pressure chart?
    • For the three-filter fuel system, Refer to section "Normal Fuel System Pressures - Three-Filter Fuel System".

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• For the two-filter fuel system, Refer to section "Normal Fuel System Pressures- Two-Filter System".
  a. Yes; Go to step 12.
  b. No; Go to step 13.

12. Review the AS124 LPPO sensor from the FSIC log file. Is the pressure in range at 600 and 1800 rpm?
   • For the three-filter fuel system, Refer to section "Normal Fuel System Pressures - Three-Filter Fuel System".
   • For the two-filter fuel system, Refer to section "Normal Fuel System Pressures- Two-Filter System".
     a. Yes; Go to step 13.
     b. No; replace the fuel filters. Then verify repairs, Refer to section "Verify Repairs".

13. Review the AS124 LPPO and ASL003 Fuel Compensation Pressure from the FSIC log file at all engine speeds.
   a. If pressures are stable with no oscillations, Go to step 14.
   b. If pressures are unstable WITH oscillations of more than 1.5 psi at a steady rpm, do the Aerated Fuel Test.
     • For the three-filter fuel system, Refer to section "Aerated Fuel Test - Three-Filter Fuel System"
     • For the two-filter fuel system, Refer to section "Aerated Fuel Test – Two-Filter Fuel System"

14. Check the Idle Speed Balance (ISB) Values. Refer to section "Idle Speed Balance Test". Are there any cylinders above 70% or below -70%?
   a. Yes; Follow repair procedures in “Idle Speed Balance (ISB) Test” and verify repairs. Refer to section "Verify Repairs".
   b. No; Go to step 15.

NOTE: View the examples below of erratic pressure showing (1) ASL001 Rail pressure and (2) AS098 Desired rail pressure.

15. Is ASL001 Rail Pressure erratic or have a saw tooth pattern?

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a. Yes; Go to step 16.
b. No; Go to step 17.

16. Perform the aerated fuel test.
   • For the three-filter fuel system, Refer to section "Aerated Fuel Test - Three-Filter Fuel System".
   • For the two-filter fuel system, Refer to section "Aerated Fuel Test – Two-Filter Fuel System".

Was fuel aerated?
   b. No; replace the Quantity Control Valve (QCV).
      • For the three-filter fuel system, Refer to section "Removal of the Quantity Control Valve - Three-Filter System".
      • For the two-filter fuel system, Refer to section "Removal of the Quantity Control Valve - Two-Filter System".

Verify repairs, Refer to section "Verify Repairs".

17. Perform Pressure Limiting Valve (PLV) flow test.
   • For the three-filter fuel system, Refer to section "Pressure Limiting Valve Flow Test - Three-Filter Fuel System".
   • For the two-filter fuel system, Refer to section "Pressure Limiting Valve Flow Test – Two-Filter Fuel System".

Did the PLV flow test pass?
   a. Yes; Go to step 18.
   b. No; replace the PLV.
      • For the three-filter fuel system, Refer to section "Removal of the Pressure Limiting Valve - Three-Filter System".
      • For the two-filter fuel system, Refer to section "Removal of the Pressure Limiting Valve - Two-Filter System".

Verify repairs, Refer to section "Verify Repairs".

18. Perform a low pressure fuel system leak test.
   • For the three-filter fuel system, Refer to section "FIS Low Pressure Leak Test - Three-Filter Fuel System".
   • For the two-filter fuel system, Refer to section "FIS Low Pressure Leak Test-Two-Filter Fuel System".

Are leaks present?
   a. Yes; Repair as necessary. Then verify repairs, Refer to section "Verify Repairs".
   b. No; Go to step 19.

19. Prime fuel system prior to going to next step.
   • For the three-filter fuel system, Refer to section "Priming the Fuel System Using ESOC 350 Fuel Priming Pump - Three-Filter System".
   • For the two-filter fuel system, Refer to section "Priming the Fuel System Using ESOC 350 Fuel Priming Pump - Two-Filter System".

20. Cap the rail at all six injector feed connections using J-48704 injector rail caps and crank the engine for 10 seconds.

Does the ASL001 rail pressure reach AS098 desired rail pressure?
   a. Yes; Go to step 21.
b. No; Remove the J-48704 injector rail caps.
   Replace the high pressure fuel pump.
   • For the three-filter fuel system, Refer to section "Removal of the High Pressure Fuel Pump - Three-Filter System".
   • For the two-filter fuel system, Refer to section "Removal of the High Pressure Fuel Pump – Two-Filter System".
   Verify repairs, Refer to section "Verify Repairs".
21. With the rail still capped after cranking engine for 10 seconds, does the rail pressure bleed down under 100 bar in less than five minutes?
   a. Yes; Remove the J-48704 injector rail caps.
      Replace the high pressure fuel pump.
      • For the three-filter fuel system, Refer to section "Removal of the High Pressure Fuel Pump - Three-Filter System".
      • For the two-filter fuel system, Refer to section "Removal of the High Pressure Fuel Pump – Two-Filter System".
   b. No; Go to step 22.
22. Disconnect the MCM 120-Pin connector.
23. Inspect the MCM, harness wiring and connector for signs of damage, bent, spread, corroded or unseated (pushed out) pins, moisture in the connector or wire damage near the connector.
   a. If damage is found, repair as necessary. Verify repairs
   b. If no damage is found, Go to step 24.
24. Install a test MCM using the extension harness and test drive the truck. Does the fault code come active?
   a. Yes; contact the Detroit™ Customer Support Center at 800-445-1980. Be prepared to provide the FSIC log files and completed troubleshooting.
   b. No; replace the MCM. Refer to section "Removal of the Motor Control Module". Verify repairs, Refer to section "Verify Repairs".