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## Service Information Bulletin

SUBJECT	DATE
SPN 1077 / FMI 14 (GHG14) (GHG17) (MCM)	January 2017

### Additions, Revisions, or Updates

Publication Number / Title	Platform	Section Title	Change
DDC-SVC-MAN-0084	DD Platform - Heavy Duty	SPN 1077/FMI 14 - GHG14	Update for new routine available.
DDC-SVC-MAN-0191	DD Platform - Heavy Duty	SPN 1077/FMI 14 - GHG17	

DiagnosticLink users: Please update the troubleshooting guides in DiagnosticLink with this newest version. To update the tool troubleshooting guide, open DiagnosticLink and from the Help – Troubleshooting Guides menu, select the appropriate troubleshooting manual, then click Update.



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## 2 SPN 1077/FMI 14 - GHG14

Internal or External Leakage of the High Pressure Fuel System (Too High, Leak Down Test)

The Motor Control Module (MCM) monitors rail pressure during engine shut down and compares it to a stored learned value. If the bleed-down rate has changed due to leakage and it is below the learned value, this code will set.

**Table 1.**

SPN 1077/FMI 14	
Description	Leakage in High Pressure Fuel System Too High (Leak Down Test)
Monitored Parameter	Fuel Rail Pressure
Typical Enabling Conditions	Key OFF
Monitor Sequence	None
Execution Frequency	Once When Enabling Conditions Met
Typical Duration	30 Seconds
Dash Lamps	MIL, CEL
Engine Reaction	
Verification	Fuel Injection System (FIS) Leak Detection (GHG14)

Check as follows:

1. Check for multiple codes. Are additional fault codes present with SPN 1077/FMI 14?
  - a. Yes; service the additional fault codes first.
  - b. No; only SPN 1077/FMI 14 is present. Go to step 2.
2. Is the Motor Control Module (MCM) at or above the software level and fuel map ZGS specified in the chart shown below based on horsepower rating?

**Table 2.**

Model	HP Rating	Software Version	MCM Fuel Map
DD13	450 HP @ 1450/1650 lb-ft	4.7.0.0	ZGS 004
DD15 AT	455 HP @ 1550/1750 lb-ft	4.7.0.0	ZGS 004
DD15 AT	400 HP @ 1750 lb-ft	4.7.0.0	ZGS 004
All Other Models and Ratings		4.7.0.0	ZGS 003

- a. Yes; Go to step 4.
  - b. No; Go to step 3.
3. Using DiagnosticLink, go to the fault code in the Fault Codes panel. Under section "Extended Data Record #6 DPF Data," check 'rpg\_leak\_div\_int'. Is 'rpg\_leak\_div\_int' greater than 2.25?
  - a. Yes; update MCM software and fuel map to level specified in step 2 and Go to step 4.
  - b. No; update MCM software and fuel map to level specified in step 2 and release vehicle.



### WARNING: PERSONAL INJURY

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

- Always start and operate an engine in a well ventilated area.
- If operating an engine in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system or emission control system.

**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.

**WARNING: ENGINE EXHAUST**

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

4. Start and run the engine until fuel temperature is greater than 35°C (95°F) and coolant temperature is greater than 70°C (158°F).
5. Shut the engine down.

**NOTICE:** The high pressure fuel rail feed lines, vibration dampers, P-clips, mounting bracket and hardware are one-time-use components and MUST be replaced any time they are removed. Refer to TS letter [16 TS-9Rev2](http://ddcsn-ddc.freightliner.com/cps/rde/xbcr/ddcsn/16TS9Rev2.pdf) (<http://ddcsn-ddc.freightliner.com/cps/rde/xbcr/ddcsn/16TS9Rev2.pdf>) 16 TS-9Rev2 for the high pressure fuel line kit numbers.

6. Check for an external high pressure fuel system leak(s). Are any leaks present at the following components?
  - High Pressure Fuel Pump
  - High Pressure Fuel Rail Feed Lines
  - High Pressure Fuel Rail
  - High Pressure Fuel Injector Lines
  - Fuel Rail Pressure Sensor
  - Pressure Limiting Valve
    - a. Yes; repair leaks. Verify repairs.
    - b. No; Go to step 7.
7. Check the engine oil dipstick. Is there any fuel in the oil?
  - a. Yes; Refer to section "Fuel in Oil".
  - b. No; Go to step 8.
8. Check for leakage from the Pressure Limiting Valve (PLV). Refer to section "Pressure Limiting Valve Flow Test – Two-Filter Fuel System ". Does the PLV flow test pass?
  - a. Yes; Go to step 9.
  - b. No; replace the PLV and verify repairs.  
For Two-Filter systems, Refer to section "Removal of the Pressure Limiting Valve - Two-Filter System".

**NOTE:** The ignition has to be off for five minutes between High Pressure Leak Detection routines.

**NOTE:** DiagnosticLink<sup>®</sup> 8.05 or higher is necessary to complete this troubleshooting.

9. One cylinder at a time, remove the injector fuel transfer tube and cap the rail at each injector using J-48704. Run High Pressure Leak Detection. Repeat for each injector. Record results.

**Table 3.**

HP Leak Detection Test Results					
#1 Cap	#2 Cap	#3 Cap	#4 Cap	#5 Cap	#6 Cap
Pass / Fail	Pass / Fail	Pass / Fail	Pass / Fail	Pass / Fail	Pass / Fail

10. With any one injector capped off, does Leak Detection pass?
  - a. Yes; replace the injector that passes Leak Detection when capped. Refer to section "Removal of the Fuel Injector - Two-Filter System" and then run the HP Leak Detection Test again to verify repair.

- b. No; Go to step 11.
- 11. Install all six rail caps. Crank engine for 10 seconds and then monitor rail pressure bleed down. Does rail pressure bleed down under 100 bar in less than five minutes?
  - a. Yes; replace the high pressure fuel pump. Refer to section "Removal of the High Pressure Fuel Pump – Two-Filter System".
  - b. No; replace all six fuel injectors. Refer to section "Removal of the Fuel Injector - Two-Filter System" and then run the HP Leak Detection Test again to verify repairs.

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Typical Enabling Conditions	Key OFF
Monitor Sequence	None
Execution Frequency	Once When Enabling Conditions Met
Typical Duration	30 Seconds
Dash Lamps	MIL, CEL
Engine Reaction	
Verification	Fuel System Integrity Check (FSIC)

Check as follows:

1. Check for multiple codes. Are there any additional SPN 1077 codes present?
  - a. Yes; service the additional fault codes first.
  - b. No; Go to step 2.
2. Is the Motor Control Module (MCM) at or above software level 6.4.0.5 and fuel map ZGS 007?
  - a. Yes; Go to step 4.
  - b. No; Go to step 3.
3. Using DiagnosticLink<sup>®</sup>, go to the fault code in the Fault Codes panel. Under section "Extended Data Record #6 DPF Data," check 'rpg\_leak\_div\_int'. Is 'rpg\_leak\_div\_int' greater than 2.25?
  - a. Yes; update MCM software to latest software level and Go to step 4.
  - b. No; update MCM software to latest software level and release vehicle.



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  - b. No; Go to step 11.
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