1 03 14-17

Service Information Bulletin

SUBJECT	DATE
SPN 102/FMI 18 - GHG14 Intake Manifold Pressure Too Low Diagnostics for HDEP	March 2017

Additions, Revisions, or Updates

Publication Number / Title	Platform	Section Title	Change
DDC-SVC-MAN-0084	DD Platform Heavy Duty	SPN 102/FMI 18 (MCM) - GHG14 HDEP	The diagnostic procedure has been updated.

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.

13400 Outer Drive, West, Detroit, Michigan 48239-4001
Telephone: 313-592-5000
www.demanddetroit.com

 Copyright © 2017 DETROIT DIESEL CORPORATION

2 SPN 102/FMI 18 – GHG14

Intake Manifold Pressure Too Low

Table 1.

SPN 102/FMI 18 - GHG14			
Description	This Fault Code Sets When the Intake Manifold Pressure is Lower Than Expected While The Engine is Under a Load.		
Monitored Parameter	Intake Manifold Pressure		
Typical Enabling Conditions	Engine is Not in Regeneration		
	Steady State Operation (Highway Cruise Operation)		
	Engine Parameter	Min	Max
	Engine Speed (rpm)	1130	1810
	Engine Torque; N·m (lb·ft)	1100 (811)	
	Intake Air Throttle Position (%)		5
	Engine Coolant Outlet Temperature °C (°F)	65 (149)	
	Barometric Pressure (mbar)	755	
	Ambient Temperature °C (°F)	-8 (17.6)	
	Engine Speed Gradient (rpm/s)	-10	10
	Fuel Mass Gradient ((mg/stroke)/s)	-10	10
Monitor Sequence	None		
Execution Frequency	Continuous when enabling conditions met		
Typical Duration	15 Seconds		
Dash Lamps	MIL, CEL		
Engine Reaction	None		
Verification	Engine Coolant Greater than 65 °C (149°F), Drive at Steady Highway Speed With Loaded Trailer, Engine rpm Greater than 1130 for a Minimum of Five Minutes.		

Check as follows:

1. Connect DiagnosticLink ®.
2. Turn the ignition ON (key ON, engine OFF).
3. Check for multiple fault codes. Are there any intake manifold pressure circuit, air system or aftertreatment fault codes present?
    a. Yes; diagnose the other fault codes first.
    b. No; Go to step 4.
4. Check the Motor Control Module (MCM) software level. Is the MCM software level 4.1.0.47 ZGS 2 or greater?
    a. Yes; Go to step 5.
    b. No; update the MCM software using the latest server information. Verify repair.
5. Remove and inspect the air filter. Is the air filter excessively dirty or restricted?
    a. Yes; replace the air filter. Verify repair.
    b. No; Go to step 6.
6. Visually inspect the air intake system for leaks or damaged components. Are there any damaged hoses, clamps or components?
    a. Yes; repair as necessary. Verify repair.
    b. No; Go to step 7.

Copyright © 2017 DETROIT DIESEL CORPORATION

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.

7. Start and run the engine at idle.

WARNING: PERSONAL INJURY

To avoid injury when working on or near an operating engine, wear protective clothing, eye protection, and hearing protection.

8. Visually inspect the exhaust manifold and turbocharger for leaks or damage. Are there any leaks or damage present?
    a. Yes; repair as necessary.
    b. No; Go to step 9.
9. Check for air leaks at the wastegate actuator and air line. Are there any air leaks present?
    a. Yes; repair the air leaks as necessary. Verify repair.
    b. No; Go to step 10.
10. Stop the engine.
11. Turn the ignition ON (key ON, engine OFF).
12. Compare the barometric pressure reading in DiagnosticLink to the local barometric pressure for your area. Is the reading within .07 bar (1 psi)?
    a. Yes; Go to step 13.
    b. No; replace the MCM.
13. Using DiagnosticLink, compare the intake manifold pressure reading to the barometric pressure reading. Are the readings within .10 bar (1.5 psi) of each other?
    a. Yes; Go to step 16.
    b. No; Go to step 14.
14. Turn the ignition OFF.
15. Disconnect and inspect the intake manifold pressure sensor electrical connector. Is there corrosion, fretting, or damage present?
    a. Yes; replace the electrical connector and intake manifold pressure sensor. Verify repair.
    b. No; replace the intake manifold pressure sensor. Verify repair.
16. Pressure test the Charge Air Cooler. Refer to Original Equipment Manufacturer (OEM) literature for CAC testing procedures. Does the CAC pass the pressure test?
    a. Yes; Go to step 17.
    b. No; replace the CAC. Refer to OEM literature for CAC removal and installation procedures. Verify repair.
17. Is the vehicle equipped with a DD15 AT or DD13 engine?
    a. Yes; Go to step 18.
    b. No; Go to step 39.
18. Inspect the turbocharger wastegate linkage. Is the wastegate link damaged?
    a. Yes; replace the turbocharger.
    b. No; Go to step 19.

 Copyright © 2017 DETROIT DIESEL CORPORATION

WARNING: ENGINE EXHAUST

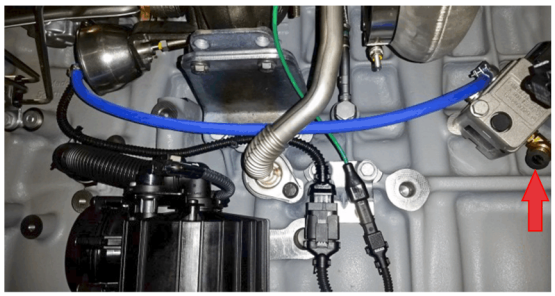
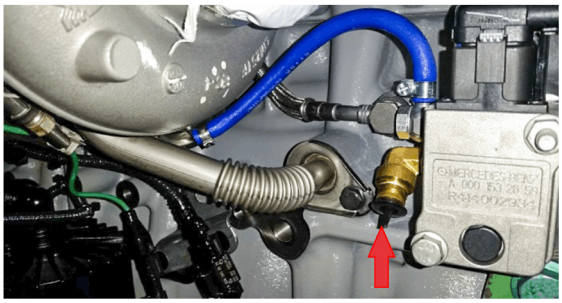
To avoid injury from inhaling engine exhaust, always operate the engine in a well-ventilated area. Engine exhaust is toxic.

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.

19. Start and run the engine until the vehicle air pressure reaches 827 kPa (120 psi). Does the vehicle air supply reach 827 kPa (120 psi)?
    a. Yes; Go to step 20.
    b. No; correct the low vehicle air pressure concern.
20. Stop the engine.
21. Turn the ignition ON (key ON, engine OFF).
22. Use Diagnostic link to activate the turbo control wastegate in the I/O tab. Command the turbo control to 90%. Does the wastegate actuator move?
    a. Yes; Go to step 39.
    b. No; Go to step 23.
23. Drain the vehicle air tanks until the air pressure is zero psi. Refer to Original Equipment Manufacturers (OEM) literature for air tank draining procedures.
24. Remove the plastic air supply line to the wastegate solenoid inlet port.

Table 2.

 d090222	 d090223
DD15 AT	DD13

25. Connect a suitable gauge that can read up to 1034 kPa (150 psi) to the wastegate solenoid.

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.

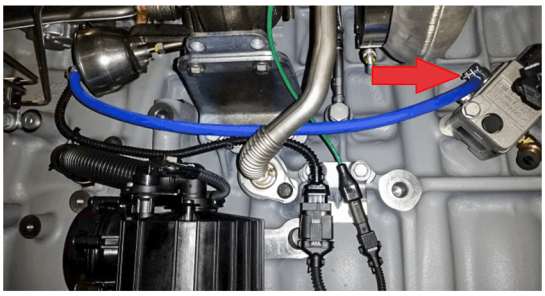
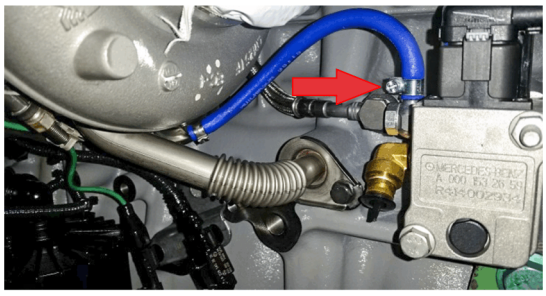
WARNING: ENGINE EXHAUST

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

Copyright © 2017 DETROIT DIESEL CORPORATION

26. Start and run the engine until the vehicle air pressure reaches 827 kPa (120 psi). Does the gauge read a minimum of 621 kPa (90 psi)?
    a. Yes; Go to step 27.
    b. No; determine the cause of the lack of air pressure to the wastegate solenoid. Refer to OEM literature for vehicle air system troubleshooting.
27. Turn the ignition OFF.
28. Drain the vehicle air tanks. Refer to Original Equipment Manufacturers (OEM) literature for air tank draining procedures.
29. Connect the plastic air supply line back to the wastegate solenoid.
30. Remove the rubber air line at the turbocharger wastegate solenoid.

Table 3.

 d090224	 d090225
DD15 AT	DD13

31. Connect a suitable gauge that can read up to 689 kPa (100 psi) and fit a ¼ inch rubber air line to the wastegate solenoid. Secure the rubber air line to the gauge and wastegate solenoid with clamps.

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.

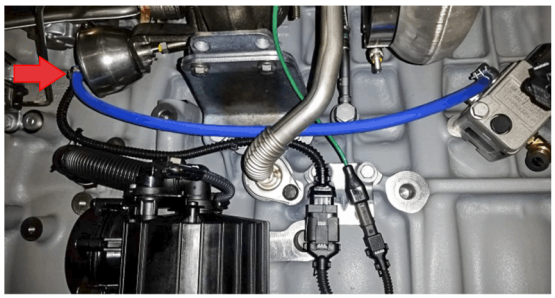
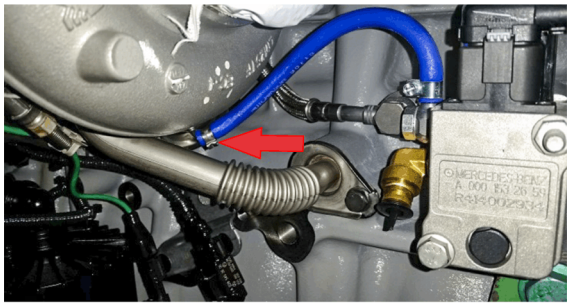
WARNING: ENGINE EXHAUST

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

32. Start and run the engine until the vehicle air pressure reaches 827 kPa (120 psi).
33. Stop the engine.
34. Turn the ignition ON (key ON, engine OFF).
35. Use Diagnostic link to activate the turbo control wastegate in the I/O tab. Command the turbo control to 95%. Is the reading on the gauge between 262 and 296 kPa (38 and 43 psi)?
    a. Yes; replace the turbocharger.
    b. No; Go to step 36.
36. Remove the rubber hose from the wastegate on the turbocharger.

 Copyright © 2017 DETROIT DIESEL CORPORATION

Table 4.

 d090226	 d090227
DD15 AT	DD13

37. Use shop air to check for restrictions in the rubber hose. Are there any restrictions present?
    a. Yes; replace the hose.
    b. No; Go to step 38.
38. Disconnect and inspect the wastegate solenoid electrical connector. Is there corrosion, fretting or damage present?
    a. Yes; repair as necessary. Verify repair.
    b. No; replace the turbocharger.
39. Remove the clean air intake pipe from the turbocharger.
40. Inspect the turbocharger for damage. Is the turbocharger damaged?
    a. Yes; replace the turbocharger. Verify repair.
    b. No; Go to step 41.
41. Reinstall the clean air intake pipe to the turbocharger.

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.

42. Start and run the engine until the engine coolant temperature is greater than 65°C (149°F).

WARNING: HOT EXHAUST

During parked regeneration the exhaust gases will be extremely HOT and could cause a fire if directed at combustible materials. The vehicle must be parked outside.

43. Perform a parked regeneration.

NOTE: Normal DOC pressure is less than 10 kPa (1.5 psi) for a 1-Box™ emissions package and 13 kPa (1.9 psi) for a Two-Box option.

44. Monitor the Diesel Oxidation Catalyst (DOC) inlet pressure reading. Does the DOC inlet pressure start out high and stay high?

Copyright © 2017 DETROIT DIESEL CORPORATION

a. Yes; Go to step 45.
b. No; Go to step 46.

45. Is the DOC inlet pressure less than 20 kPa (2.9 psi)?
    a. Yes; perform the DOC face plugging routine. Refer to section "EPA10 and GHG14 Diesel Oxidation Catalyst Face Cleaning". Verify repair.
    b. No; replace the DOCs due to the excessive restriction.
46. Did the DOC inlet pressure start high and then decrease?
    a. Yes; the regeneration cleared the restriction in the DOC/DPF.
    b. No; replace the turbocharger.
       For DD13: Refer to section "Removal of the DD13 Turbocharger". Verify repair.
       For DD15 (non-AT) and DD16: Refer to section "Removal of the DD15 and the DD16 Turbocharger". Verify repair.
       For DD15 AT: Refer to section "Removal of the GHG14 DD15 Asymmetrical Turbocharger". Verify repair.

03 14-17 Copyright © 2017 DETROIT DIESEL CORPORATION