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Service Information Bulletin

SUBJECT	DATE
SPN 100 (MCM) (EPA07;EPA10;GHG14)	January 2016

Additions, Revisions, or Updates

Publication Number / Title	Platform	Section Title	Change
DDC-SVC-MAN-0084	EPA07/10/ GHG14 DD Platform	SPN 100/FMI 1 - EPA07 - EPA10 - GHG14	Steps added to existing sections.
		SPN 100/FMI 17 - EPA07 - EPA10 - GHG14	



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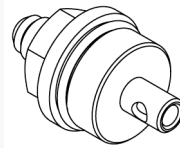
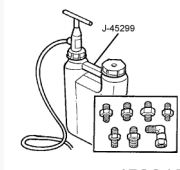
2 SPN 100/FMI 1 - EPA07 - EPA10 - GHG14

Low Engine Oil Pressure

Table 1.

SPN 100/FMI 1	
Description	This fault code sets when the engine oil pressure is less than a calibrated threshold.
Monitored Parameter	Engine Oil Pressure
Typical Enabling Conditions	Always On
Monitor Sequence	Key On Engine Running
Execution Frequency	Continuous When Enabling Conditions Are Met
Typical Duration	Two Seconds
Dash Lamps	CEL
Engine Reaction	None, Engine Derate or Engine Shut Down - Calibration Dependent
Verification	Check At Engine Operating Temperature

Table 2.

J-49181	Oil System Priming Adapter	 d580037
J-45299	Oil System Priming Pump	 d580151

Possible causes:

- Failed Oil Pressure Sensor
- Initial Start After Oil Maintenance
- Vehicle is Parked on a Steep Incline
- Improper Oil Level
- Oil Dilution
- Leaks in the Oil Suction Manifold
- Leaks at the Oil Suction Pipes
- Failed Oil Pump

Table 3.

DD15TC and DD16 Minimum Oil Pressure at operating Temperature		
rpm	BAR	psi
600	0.758	11
1200	1.65	24
1800	2.55	37

Table 4.

DD15AT Minimum Oil Pressure at operating Temperature		
rpm	BAR	psi
600	0.689	10
1200	1.65	24
1800	2.55	37

Table 5.

DD13 Minimum Oil Pressure at operating Temperature		
rpm	BAR	psi
600	0.758	11
1200	1.65	24
1800	2.55	37

NOTE: The oil gauge in the dash is NOT used to diagnose or verify low oil pressure concerns.

Check as follows:

1. Check for multiple codes. Are there multiple oil pressure sensor circuit fault codes?
 - a. Yes; diagnose the oil pressure sensor circuit fault codes first.
 - b. No; Go to step 2.
2. With the vehicle parked on a flat, level surface, check the engine oil level after the engine has been shut off for at least 20 minutes. Is the engine oil at the correct level?
 - a. Yes; Go to step 7.
 - b. No; Go to step 3.

NOTE: An increase in the oil level suggests that there may be fuel or coolant entering the engine oil.

3. Is the oil level overfilled?
 - a. Yes; Go to step 5.
 - b. No; Go to step 4.
4. Use the manufacturer recommended oil to fill the engine oil to the correct level. Check for external engine oil leaks and repair as necessary. Verify repair.
5. Check the oil for signs of coolant intrusion. When there is coolant intrusion, the oil will exhibit a milky appearance or become thick and sludgy. Are there signs of coolant in the oil?
 - a. Yes; Refer to section "Coolant in Oil". Verify repair.
 - b. No; Go to step 6.
6. Check the oil for signs of fuel intrusion. When there is fuel intrusion into the oil, the oil becomes thin and has a fuel odor. Are there signs of fuel in the oil?
 - a. Yes; determine the cause of fuel in the oil. Change the oil and filter. Verify repair.
 - b. No; the oil level may have been over filled by the customer. Correct the oil level. Go to step 7.
7. Turn the ignition ON (key ON, engine OFF).
8. Connect DiagnosticLink[®] and check for a biased oil pressure sensor at key ON, engine OFF. Does the oil pressure sensor read zero psi?
 - a. Yes; Go to step 9.
 - b. No; replace the oil pressure sensor. Refer to section "Removal of the Oil Pressure Sensor". Verify repair.

**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.

9. Start the engine and observe the stability of the oil pressure using the chart. Is the oil pressure stable and within normal operating range as per the chart?
 - a. Yes; Go to step 10.
 - b. No; Go to step 11.
10. Check the Motor Control Module (MCM) software level. Is the MCM software level equal or greater to the levels listed below?
 - GHG14 - 4.7.0.00 fuel map ZGS002
 - EPA10 - 7.6.0.46
 - EPA07 - 13.4.2.0
 - a. Yes; release the vehicle.
 - b. No; update the MCM software level and release the vehicle.
11. Inspect the vehicle for aftermarket components plumbed into the oil system. Are there any aftermarket components installed?
 - a. Yes; isolate the aftermarket components. Recheck the oil pressure.
 - a. No; Go to step 12.

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NOTE: A code will be set when the oil temperature sensor is unplugged.

12. Remove the oil temperature sensor and connect a manual gauge into the oil temperature sensor port. Refer to section "Removal of the Engine Oil Temperature Sensor". Start and run the engine at the rpm listed in the chart. Is the oil pressure, observed on the manual gauge, stable and within normal operating range as per the chart?
 - a. Yes; reinstall the oil temperature sensor; Refer to section "Installation of the Engine Oil Temperature Sensor". Replace the oil pressure sensor. Refer to section "Removal of the Oil Pressure Sensor". Verify repair. Clear the code. Release the vehicle.
 - b. No; Go to step 13.
13. Remove and inspect the inlet air temperature sensor, intake manifold pressure sensor, and charge air temperature sensor for signs of damage. Is there damage present?
 - a. Yes;
 - Refer to section "Test-E - Two-Filter Fuel System"
 - Refer to section "Test-E - Three-Filter Fuel System"
 - b. No; Go to step 14.

14. Remove the oil filter and verify that the correct oil filter is installed. Refer to section "Replacement of the Oil Filter". Is the correct oil filter installed?
 - a. Yes; Go to step 15.
 - b. No; install the correct oil filter. Verify repair.
15. Inspect the outside of the oil filter for signs of metal or bearing material. Is there an excessive amount of metal or bearing material present on the outside of the filter?
 - a. Yes; determine the cause of the excessive metal in the oil. Repair as necessary.
 - b. No; Go to step 16.
16. Inspect the oil filter stand pipe and oil bypass valve (located on the top of the stand pipe) for damage. Is there any damage present or is the oil bypass valve missing?
 - a. Yes; replace the oil filter module. Verify repair.
 - b. No; Go to step 17.
17. Inspect the oil filter drain back valve located in the bottom of the oil filter housing. Is the oil filter drain back valve damaged or missing?
 - a. Yes; replace the oil filter module. Verify repair.
 - b. No; reinstall the oil filter. Refer to section "Replacement of the Oil Filter". Go to step 18.
18. Remove the rocker cover. Refer to section "Removal of the Rocker Cover". Go to step 19.
19. Use the oil system adapter J-49181 and oil primer pump tool J-45299 to check for leaks in the upper portion of the engine. Refer to section "Priming the Engine Lubrication System". Are there any leaks present?
 - a. Yes; repair as necessary. Verify repair.
 - b. No; Go to step 20.
20. Remove the oil pan. Refer to section "Removal of the Oil Pan". Go to step 21.
21. Check the torque on the oil suction manifold bolts and oil pump using a torque wrench. Refer to section "Installation of the Oil Pump, Oil Suction Manifold, and Oil Lines". Are the bolts torqued to specification?
 - a. Yes; Go to step 22.
 - b. No; remove the oil suction manifold and the oil pump. Replace the O-rings, then reinstall the oil pump and oil suction manifold. Refer to section "Removal of the Oil Pump, Oil Suction Manifold, and Oil Lines". Verify repair.
22. Remove the oil pump, oil suction manifold, and oil lines. Refer to section "Removal of the Oil Pump, Oil Suction Manifold, and Oil Lines". Check the condition of the oil pump, oil suction manifold, suction lines and O-rings. Is there any damage present?
 - a. Yes; repair as necessary. Verify repairs.
 - b. No; Go to step 23.
23. Inspect the rod and main bearings. Are the rod and main bearings excessively worn or damaged?
 - a. Yes; repair as necessary. Verify repair.
 - b. No; replace the oil pump. Refer to section "Installation of the Oil Pump, Oil Suction Manifold, and Oil Lines". Verify repair.

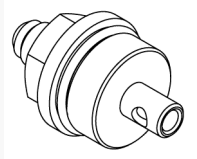
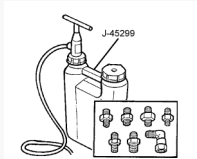
3 SPN 100/FMI 17 - EPA07 - EPA10 - GHG14

Very Low Engine Oil Pressure

Table 6.

SPN 100/FMI 17	
Description	This fault code sets when the engine oil pressure is less than a calibrated threshold.
Monitored Parameter	Engine Oil Pressure
Typical Enabling Conditions	Always On
Monitor Sequence	Key On Engine Running
Execution Frequency	Continuous When Enabling Conditions Are Met
Typical Duration	Two Seconds
Dash Lamps	CEL
Engine Reaction	None, Engine Derate or Engine Shut Down - Calibration Dependent
Verification	Check At Engine Operating Temperature

Table 7.

J-49181	Oil System Priming Adapter	 d580037
J-45299	Oil System Priming Pump	 d580151

Possible causes:

- Failed Oil Pressure Sensor
- Initial Start After Oil Maintenance
- Vehicle is Parked on a Steep Incline
- Improper Oil Level
- Oil Dilution
- Leaks in the Oil Suction Manifold
- Leaks at the Oil Suction Pipes
- Failed Oil Pump

Table 8.

DD15TC and DD16 Minimum Oil Pressure at operating Temperature		
rpm	BAR	psi
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Table 9.

DD15AT Minimum Oil Pressure at operating Temperature		
rpm	BAR	PSI
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1800	2.55	37

Table 10.

DD13 Minimum Oil Pressure at operating Temperature		
rpm	BAR	PSI
600	0.758	11
1200	1.65	24
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 - a. Yes; Go to step 7.
 - b. No; Go to step 3.

NOTE: An increase in the oil level suggests that there may be fuel or coolant entering the engine oil.

3. Is the oil level overfilled?
 - a. Yes; Go to step 5.
 - b. No; Go to step 4.
4. Use the manufacturer recommended oil to fill the engine oil to the correct level. Check for external engine oil leaks and repair as necessary. Verify repair.
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 - a. Yes; determine the cause of fuel in the oil. Change the oil and filter. Verify repair.
 - b. No; the oil level may have been over filled by the customer. Correct the oil level. Go to step 7.
7. Turn the ignition ON (key ON, engine OFF).

8. Connect DiagnosticLink[®] and check for a biased oil pressure sensor at key ON engine OFF. Does the oil pressure sensor read zero psi?
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 - b. No; replace the oil pressure sensor. Refer to section "Removal of the Oil Pressure Sensor". Verify repair.

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 - a. Yes; reinstall the oil temperature sensor, Refer to section "Installation of the Engine Oil Temperature Sensor". Replace the oil pressure sensor. Refer to section "Removal of the Oil Pressure Sensor". Verify repair. Clear the code. Release the vehicle.
 - b. No; Go to step 13.
13. Remove and inspect the inlet air temperature sensor, intake manifold pressure sensor, charge air temperature sensor for signs of damage. Is there damage present?

- a. Yes;
Refer to section "Test-E - Two-Filter Fuel System".
Refer to section "Test-E - Three-Filter Fuel System".
 - b. No; Go to step 14.
- 14. Remove the oil filter and verify that the correct oil filter is installed. Refer to section "Replacement of the Oil Filter". Is the correct oil filter installed?
 - a. Yes; Go to step 15.
 - b. No; install the correct oil filter. Verify repair.
- 15. Inspect the outside of the oil filter for signs of metal or bearing material. Is there an excessive amount of metal or bearing material present on the outside of the filter?
 - a. Yes; determine the cause of the excessive metal in the oil. Repair as necessary.
 - b. No; Go to step 16.
- 16. Inspect the oil filter stand pipe and oil bypass valve (located on the top of the stand pipe) for damage. Is there any damage present or is the oil bypass valve missing?
 - a. Yes; replace the oil filter module. Verify repair.
 - b. No; Go to step 17.
- 17. Inspect the oil filter drain back valve located in the bottom of the oil filter housing. Is the oil filter drain back valve damaged or missing?
 - a. Yes; replace the oil filter module. Verify repair.
 - b. No; reinstall the oil filter. Refer to section "Replacement of the Oil Filter". Go to step 18.
- 18. Remove the rocker cover. Refer to section "Removal of the Rocker Cover". Go to step 19.
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 - a. Yes; Go to step 22.
 - b. No; remove the oil suction manifold and the oil pump. Replace the O-rings, then reinstall the oil pump and oil suction manifold. Refer to section "Removal of the Oil Pump, Oil Suction Manifold, and Oil Lines". Verify repair.
- 22. Remove the oil pump, oil suction manifold, and oil lines. Refer to section "Removal of the Oil Pump, Oil Suction Manifold, and Oil Lines". Check the condition of the oil pump, oil suction manifold, suction lines, and O-rings. Is there any damage present?
 - a. Yes; repair as necessary. Verify repairs.
 - b. No; Go to step 23.
- 23. Inspect the rod and main bearings. Are the rod and main bearings excessively worn or damaged?
 - a. Yes; repair as necessary. Verify repair.
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