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Service Information Bulletin

SUBJECT	DATE
SPN 411 (MCM) (EPA10;GHG14)	September 2014

Additions, Revisions, or Updates

Publication Number / Title	Platform	Section Title	Change
DDC-SVC-MAN-0084	DD Platform	SPN 411/FMI 1 - EPA10 - GHG14	This is an update to add a software step and schematic to section.



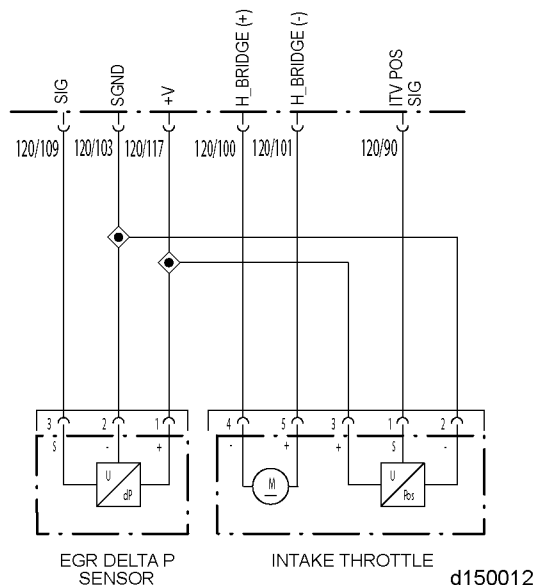
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EGR Differential Pressure Failed (High Box)

Table 1.

SPN 411/FMI 1	
Description	This Fault Code Sets When EGR Delta Pressure is Too Low at High Speeds and Loads
Monitored Parameter	EGR Delta Pressure Sensor
Typical Enabling Conditions	Engine running greater than five minutes, engine speed 1100 to 1850 rpm, engine torque 1400 to 2800 N·m (1033 to 2065 lb·ft), engine not in regeneration mode, engine must be in steady-state mode, intake manifold temperature greater than 0°C (32°F), desired EGR position greater than 30%, coolant temperature greater than 65°C (149°F), ambient temperature greater than -8°C (17°F) ambient, barometric pressure greater than 755 mbar (10.9 psi)
Monitor Sequence	none
Execution Frequency	Always Enabled
Typical Duration	5 min
Dash Lamps	MIL, CEL
Engine Reaction	Derate 10%
Verification	Start engine, warm up such that coolant temperature greater than 65°C (149°F), ensure engine is not in regeneration mode, ensure ambient temperature greater than -8°C (17°F) ambient and ambient barometric pressure greater than 755 mbar (10.9 psi)



Check as follows:

1. Check the Motor Control Module (MCM) software level. Compare the current MCM software level to the server. Is the MCM software at the latest level?
 - a. Yes; Go to step 2.
 - b. No; update the MCM software level and perform the verification procedure in the table above. If the fault code does not return, release the vehicle. If the fault code returns or if unable to duplicate verification cycle, Go to step 2.

2. Turn the ignition ON (key ON, engine OFF).
3. Using DiagnosticLink[®], monitor EGR delta P voltage (pin 109).
4. Is the Exhaust Gas Recirculation (EGR) delta P voltage between 0.55 and 0.83 volts?
 - a. Yes; Go to step 6.
 - b. No; Go to step 5.
5. Inspect the EGR delivery pipe delta P pressure ports for blockage. Is excessive build-up or blockage found?
 - a. Yes; clean the venturi pipe and reinstall the sensor.
Refer to section "Cleaning of the Exhaust Gas Recirculation Venturi Pipe Delta P Sensor Ports".
Refer to section "Installation of the Delta P Sensor".
Go to step 20.
 - b. If no damage is found, Go to step 6.
6. Remove EGR cooler hot pipe, EGR crossover tube and mixer pipe and inspect for excessive build-up or blockage.
Refer to section "Removal of the Exhaust Gas Recirculation Hot Pipe".
Refer to section "Removal of the Exhaust Gas Recirculation Crossover Tube".
Refer to section "Removal of the Mixer Pipe".
Is excessive build-up or blockage found?
 - a. Yes; clean piping and replace EGR cooler.
For the DD13: Refer to section "Removal of the DD13 Exhaust Gas Recirculation Cooler Water Manifold Assembly".
For the DD15 and DD16: Refer to section "Removal of the DD15 and DD16 Exhaust Gas Recirculation Cooler".
Go to step 20.
 - b. No; Go to step 7.
7. Disconnect the EGR delta P sensor harness connector.
8. Inspect the EGR delta P sensor harness connector for loose, bent, spread or corroded pins. Is any damage found?
 - a. Yes; repair as necessary. Go to step 20.
 - b. No; Go to step 9.
9. Visually inspect the EGR system for leaks, obstructions, loose hardware, clamps, or damage. Is any damage found?
 - a. Yes; repair as necessary. Go to step 20.
 - b. No; Go to step 10.

NOTE: The actuator nut may visually appear tight but still allow movement.

10. Inspect EGR valve linkage. Is lever secure to actuator with lock nut and linkage able to move freely? Is EGR valve linkage tight or lever is loose?
 - a. Yes; repair as necessary.
For the DD13: Refer to section "Removal of the Exhaust Gas Recirculation Valve Actuator Pull Rod".
For the DD15 and DD16: Refer to section "Removal of the Exhaust Gas Recirculation Valve Actuator Pull Rod".
Go to step 20.
 - b. No; Go to step 11.
11. Inspect the EGR valve for physical damage such as broken butterfly. Is any damage found?
 - a. Yes; replace the EGR valve.
For the DD13: Refer to section "Removal of the Exhaust Manifold".
For the DD15 and DD16: Refer to section "Removal of the DD15 and DD16 Exhaust Gas Recirculation Valve".
Go to step 20.
 - b. No; Go to step 12.
12. Disconnect the Motor Control Module (MCM) 120-pin connector.
13. Inspect the MCM 120-pin connector and the 120-pin connector harness side for signs of corrosion, spread, unseated (pushed out) or damaged pins, connector seal for damage (signs of water or oil intrusion) or signs of wire damage. Is any damage found?
 - a. Yes; repair as necessary. Go to step 20.
 - b. No; Go to step 14.
14. Measure the resistance between pins 1 and 2 of the EGR delta P sensor connector harness side. Is the resistance greater than 10K ohms?
 - a. Yes; Go to step 15.

- b. No; repair the short between pins 1 and 2 of the EGR delta P sensor connector harness side and pins 103 and 117 of the MCM 120-pin connector harness side. Go to step 20.
- 15. Measure the resistance between pins 2 and 3 of the EGR delta P sensor connector harness side. Is the resistance greater than 10K ohms?
 - a. Yes; Go to step 16.
 - b. No; repair the short between pins 2 and 3 of the EGR delta P sensor connector harness side and pins 103 and 109 of the MCM 120-pin connector harness side. Go to step 20.
- 16. Measure the resistance between pin 1 of the EGR delta P sensor connector harness side and pin 117 of the MCM 120-pin connector harness side. Is the resistance less than 5 ohms?
 - a. Yes; Go to step 17.
 - b. No; repair the open circuit between pin 1 of the EGR delta P sensor connector harness side and pin 117 of the MCM-120 pin connector harness side. Go to step 20.
- 17. Measure the resistance between pin 1 of the EGR delta P sensor connector harness side and battery ground. Is the resistance greater than 10K ohms?
 - a. Yes; Go to step 18.
 - b. No; repair the short circuit between pin 1 of the EGR delta P sensor connector harness side and battery ground. Go to step 20.
- 18. Measure the resistance between pin 3 of the EGR delta P sensor connector harness side and pin 109 of the MCM 120-pin connector. Is the resistance less than 5 ohms?
 - a. Yes; Go to step 19.
 - b. No; repair the open circuit between pin 3 of the EGR delta P sensor connector harness side and pin 109 of the MCM 120-pin connector harness side. Go to step 20.
- 19. Measure the resistance between pin 3 of the EGR delta P sensor and battery ground. Is the resistance greater than 10K ohms?
 - a. Yes; replace the EGR delta P sensor. Refer to section "Removal of the Delta P Sensor". After sensor replacement, perform EGR Delta P sensor re-calibration service routine. Go to step 20.
 - b. No; repair the short circuit between pin 3 of the EGR delta P sensor connector harness side and battery ground. Go to step 20.

**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.

- 20. Start engine, allow to warm up so coolant temperature is greater than 65°C (149°F) , ensure engine is not in regeneration mode, ensure ambient temperature is greater than -8°C (17°F) ambient and ambient barometric pressure greater than 755 mbar (10.9 psi) to verify repairs.