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Title: SPN 3055 FMI 15 FRP below minimum with maximum command Troubleshooting

Applies To: EPA 2010 MaxxForce 11 / 13 /15 and N13

CHANGE LOG

If this iKNOW Article is being revised, please type in the text box what has changed in the article. The change log is meant for Dealers to be able to see what has updated/changed in the article.

4/3/14 Added specific SRT codes for each model with this engine.
 5/19/14 Eliminated Fuel Dead test.
 6/10/14 Adding the 15L MaxxForce information.
 6/17/14 Corrected parts tables (decription and number) for the valve referred to in step 12

SPN 3055 FMI 15 - FRP Below Minimum with Maximum Command

Condition / Description	Setting Criteria	Enable Conditions / Values	Time Required
FRP Governor deviation above maximum limit	Rail pressure governor error > 725 PSI at 600-750 RPM	- Key ON - Metering unit flow > function engine speed (41500-55000 mm3/s) - Engine mode normal - Engine speed > 0 rpm OR Fuel Rail Pressure > 90000 kpa for more than 20 engine revolutions - Metering unit flow < 327670 mm3/sec	10 seconds

Fault Overview

- Fault code sets when the Engine Control Module (ECM) detects Fuel Rail Pressure (FRP) is below minimum when the maximum is commanded.

Malfunction Indicator Lamp (MIL) Reaction

- MIL will illuminate when this fault is detected during two consecutive drive cycles.

Associated Faults

- SPN 157 FMI 3, 4, 20, 21 (FRP); and SPN 633 FMI 3, 4, and 5 (FPCV)

Drive Cycle to Determine Fault Status

Possible Causes

- Fuel Rail Pressure (FRP) sensor or circuit fault
- Low fuel level
- Fuel leaks
- Restricted engine mounted secondary fuel filter
- Aerated fuel delivery
- Restricted fuel supply
- Internal leak in high-pressure fuel system
- Leaking FRP relief valve
- Stuck or sticking FPCV
- Failed High-pressure fuel pump

Engine Manual links

- [2010 11/13L non SCR](#)
- [2010 N13 SCR](#)
- [MaxxForce® 15](#)

LOW PRESSURE FUEL SYSTEM TESTING		
Step	Action	Decision
1	Check fuel level. Read fuel level using the vehicle instrument panel gauge and perform a visual inspection of fluid level in the fuel tank. Is sufficient fuel in the fuel tanks and not leaking?	Yes: Go to step 2.
		No: Add fuel or repair leaks, and prime engine.
Step	Action	Decision
2	Check recent vehicle history. Verify if the fuel system was recently serviced. Has the vehicle run issue free since the last fuel system service?	Yes: Go to step 3.
		No: Inspect for leaks and properly prime the fuel system.
Step	Action	Decision
3	Check for associated faults. Using Electronic Service Tool (EST) with ServiceMaxx™ software, check Diagnostic Trouble Code (DTC) list for SPN 157 FMI 3, 4, 20, and 21 (FRP) or SPN 633 FMI 3, 4, and 5 (FPCV). Is the EST DTC list free of SPN 157 FMI 3, 4, 20, and 21, and SPN 633 FMI 3, 4, and 5?	Yes: Go to step 4.
		No: Repair SPN 157 FMI 3, 4, 20, and 21, and SPN 633 FMI 3, 4, and 5. See health report for link to diagnostics.
Step	Action	Decision
4	Check that the engine cranks at a minimum of 130 RPM. Does the engine crank at a minimum of 130 RPM?	Yes: Go to step 5.
		No: Repair low cranking speed.
Step	Action	Decision
5	Verify that engine starts. Crank engine for maximum of 20 seconds. If engine does not start, wait 2 minutes and try again. Does engine start and maintain idle?	Yes: Go to step 6
		No: Go to SPN 3055 FMI 1 (IKnow 1201062)
Step	Action	Decision

6	Perform High-pressure Pump Inlet Pressure Test. Does the fuel pressure gauge read > 30 PSI?	Yes: Go to step 8.
		No: Got to step 7
Step	Action	Decision
7	Remove and inspect engine fuel filter. Is filter plugged?	Yes: Replace fuel filter and retest.
		No: Replace fuel pump Make sure to use fuel priming tool (12-922-01).
Step	Action	Decision
8	Check for aeration in low pressure fuel system. Perform Fuel Aeration Test (page 127). Is fuel system free from aeration?	Yes: Go to step 9.
		No: Repair aeration in low pressure fuel system (according to Fuel Aeration Test).
Step	Action	Decision
9	Check for restriction in low pressure fuel system. Perform Fuel Restriction Test (page 130). Is fuel system free of restriction?	Yes: Go to step 10.
		No: Repair restriction in low pressure fuel system (according to Fuel Restriction Test).
HIGH PRESSURE FUEL SYSTEM TESTING		
Step	Action	Decision
10	Check for fuel return. Perform Fuel Rail Pressure (FRP) Return Flow Test part 1. Disconnect fuel drain tube assembly at rear of cylinder head. Connect High Pressure Return Line Tester ZTSE4887 to cylinder head and route other end to diesel fuel container. Start engine and monitor fuel return from High Pressure Return Line Tester ZTSE4887 for 60 seconds at low idle. Is the fuel volume < 60 ml?	Yes: Go to step 11.
		No: Go to step 13.
Step	Action	Decision
11	Check for a failed fuel pressure relief valve. Perform Fuel Rail Pressure (FRP) Return Flow Test part 2. Restore all fuel line connections. Disconnect fuel rail return line at fuel rail. Connect High Pressure Return Line Tester ZTSE4887 to fuel rail return port and route other end to diesel fuel container. Start engine and monitor fuel return from High Pressure Return Line Tester ZTSE4887 for 60 seconds at high idle. Is the line free of return fuel from fuel rail?	Yes: Go to step 12.
		No: Replace fuel rail.
Step	Action	Decision
12	Check for a failed FPCV. Using EST, perform the High Pressure Pump Test using ServiceMaxx™ Open recorded signal file and graph out FRP and FRP desired. Does the pressure differential maintain < 1160 psi (80 bar) throughout the test? (Viewing ServiceMaxx™ SnapShots)	Yes: Verify each step was completed correctly and contact your supervisor.
		No: Replace FPCV. After repairs are complete, retest for SPN 3055 FMI 15. If SPN 3055 FMI 15 returns replace HP fuel pump and perform step 14
Step	Action	Decision
13	Check for an internal leak in the high pressure fuel system. Perform Fuel Rail Pressure (FRP) Leak Isolation (page 173). Is engine free of leaking injector?	Yes: Verify each step was completed correctly and contact your supervisor.

		No: Replace the last capped injector and all HP lines removed during this test.
Step	Action	Decision
14	Run HP Pump Fuel Return Pressure Test (page 174). Is pressure < 13 psi?	Yes: Release the unit.
		No: Repair restriction in fuel return line between high pressure fuel pump and fuel tank.

NOTE: After performing all diagnostic steps, if SPN 3055 FMI 15 remains verify each step was completed correctly and the proper decision was made. Notify supervisor for further action.

EPA 2010 MaxxForce 11 / 13 and N13

Qty	Part Description	Part Number	Step	SRT Description	SRT link	Model	HRs	Group	Noun
1	High pressure fuel pump kit	3007641C93	7	High Pressure Fuel Pump & Drive Gear, Replace	N12-7454U-20 Q12-7454U-20 R12-7454U-20 S12-7454U-20 T12-7454U-20	WorkStar TranStar ProStar LoneStar PayStar	3.0	12000-Engine	454
1	High pressure fuel rail	3006765C91	11	High pressure fuel rail, Replace	N12-7542U Q12-7542U R12-7452U T12-7452U	WorkStar TranStar ProStar PayStar	3.8	12000-Engine	452
1	Fuel Pressure Control Valve (FPCV)	7092109C91	12	Electronic Engine Control Sensors / Valves (MaxxForce 11/13), Replace	A12-5034	All Models	1.5	12-Engine	454

EPA 2010 MaxxForce 15

Qty	Part Description	Part Number	Step	SRT Description	SRT link	Model	HRs	Group	Noun
1	High pressure fuel pump kit	3014489C91	7	High Pressure Fuel Pump & Drive Gear, Replace	FA12-7454O R12-7454O T12-7454O	9900 ProStar PayStar	3.9	12000-Engine	454
1	High pressure fuel rail	3006765C91	11	High pressure fuel rail, Replace	FA12-7542O R12-7452O T12-7452O	9900 ProStar PayStar	3.8	12000-Engine	452
1	Fuel Pressure Control Valve (FPCV)	7092109C91	12	Electronic Engine Control Sensors / Valves (MaxxForce 11/13), Replace	A12-5034	All Models	1.5	12000-Engine	454

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