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Other Languages: NONE **Author:** Amber Chapman
Viewed: 3131

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Title: SPN 3055 FMI 15 FRP Below Minimum Troubleshooting

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

CHANGE LOG

- 2014/10/16 - Added CPA tool diagnostics. Added SRTs.
- 2014/10/06 - Added the 15L MaxxForce information.
- 2014/07/22 - Revised SRT links and added SRT for Fuel Filter replacement.
- 2014/06/17 - Corrected parts tables (description and number) for the valve referred to in step 12
- 2014/05/19 - Eliminated Fuel Dead test

DESCRIPTION

This document contains the steps to be taken to diagnose and correct a SPN 3055 FMI 15 FRP Below Minimum with Maximum Command. This fault code sets when the Engine Control Module (ECM) detects Fuel Rail Pressure (FRP) is below minimum when the maximum is commanded.

SYMPTOMS

Diagnostic Trouble Codes & Dashboard Indicator Lights:

DTC/Light	Description
SPN 3055 FMI 15	FRP Below Minimum with Maximum Command

Fault Code Entry Conditions:

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	<ul style="list-style-type: none"> 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

Malfunction Indicator Lamp (MIL) Reaction

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

Possible Causes

- Restricted fuel supply
- Restricted engine mounted secondary fuel filter
- Failed High-pressure fuel pump
- Fuel Rail Pressure (FRP) sensor or circuit fault
- Aerated fuel delivery
- Fuel leaks
- Low fuel level
- Internal leak in high-pressure fuel system
- Leaking FRP relief valve
- Stuck or sticking FPCV (not likely)

SPECIAL TOOLS

Tool Description	Tool Number	Comments	Instructions
Fuel Priming Tool	12-922-01		
Clean Fuel Source Tool	15-637-01	Only if necessary	

Compuchek Fitting	ZTSE4526	For fuel restriction or fuel return pressure test, if necessary	
Pressure Test Kit	ZTSE4409	For fuel restriction test, if necessary	
Fuel Pressure Gauge	ZTSE4681	For fuel return pressure test, if necessary	
Fuel Inlet Restriction/Aeration Tool	ZTSE4886	For fuel restriction test, aeration test, or fuel return pressure test, if necessary	
Fuel Block Off Tool	ZTSE4905	For fuel restriction test and aeration test, if necessary	
Fuel Line Coupler	ZTSE4906		
EZ-Tech with CPA software version 5.0.0.1 or higher			
CPA Tool	OE-11178 or 12-999-01-01 (with blue rubber sides)	Tool Letter TL2900079 4328032R2	
CPA Extension Harness	0000062361	4 required	
CPA banana jack breakout	12-999-01-06	4 required	

Link to [Tools Resource Center](#)

SERVICE PARTS INFORMATION

Kit Description	Part Number	Quantity Required	Notes
High pressure fuel pump Kit 11L/13L/N13	3007641C93	1	If required
High pressure fuel pump Kit 15L	3014489C91	1	If required
Kit, Fuel Filter 11L/13L Secondary engine mounted	3007451C91	1	If required
Kit, Fuel Filter 13L primary	See Parts Catalog	1	If required, Restriction Test Point
Kit, Fuel Primer Pump and Strainer 13L	3004477C92	1	If required, Restriction Test Point or Aeration Test
Rail Assm, Fuel	3006765C91		If required
Injector	See Parts Catalog		If required, FRP return flow test part 1
Return Line HPFP to fuel tank	3005913C1	1	If required, Fuel Return Pressure test

DIAGNOSTIC STEPS

Step	Action	Decision
1	Check recent vehicle history noting fuel system repairs. Has the vehicle run issue free since the last fuel system service?	Yes. Go to Step 2.
		No. Inspect for leaks and properly prime the fuel system. Go to Step 2.

Step	Action	Decision
2	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).	Yes. Go to Step 3.

	Is the EST DTC list free of SPN 157 FMI 3, 4, 20, and 21, and SPN 633 FMI 3, 4, and 5?	<p>No. Repair other fault codes, first. See health report for link to diagnostics.</p> <p>If the code is still present, go to Step 3.</p>
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Step	Action	Decision
3	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 4 .
		No. Repair low cranking speed. Recheck for Fault Codes.

Step	Action	Decision
4	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 5 .
		No. Go to SPN 3055 FMI 1 (IKnow 1201062)

Step	Action	Decision
5	Perform High-pressure Pump Inlet Pressure Test. Does the fuel pressure gauge read > 30 PSI?	Yes. Go to Step 7 .
		No. Go to Step 6 .

Step	Action	Decision
6	Remove and inspect secondary engine-mounted fuel filter. Is filter plugged?	Yes. Replace Secondary engine-mounted Fuel Filter and retest for 3055-15 code.
		No. Replace the high pressure fuel pump. Make sure to use fuel priming tool (12-922-01). Go to Step 13 .

Step	Action	Decision
7	Check for aeration in low pressure fuel system. Perform Fuel Aeration Test.	Yes. Go to Step 8 .
	Is fuel system free from aeration?	No. Repair aeration in low pressure fuel system, according to Fuel Aeration Test. Recheck for Fault Codes.

Step	Action	Decision
8	Check for restriction in low pressure fuel system. Perform Fuel Restriction Test.	Yes. Go to Step 9 .
	Is the fuel system free of restriction?	No. Repair restriction in low pressure fuel system, according to Fuel Restriction Test. Recheck for Fault Codes.

Step	Action	Decision
9	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.	Yes. Go to Step 10 .
	Is the fuel volume < 60 ml?	No. Go to Step 12 .

Step	Action	Decision
10	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.	Yes. Go to Step 11 .
	Is the line free of return fuel from fuel rail?	No. Replace fuel rail. Recheck for Fault Codes.

Step	Action	Decision
11	Using ServiceMaxx and the Cylinder Performance Analyzer (CPA) Tool Activate the CPA recorder (link to instructions Activate CPA Recorder) Record data with CPA Tool (link to instructions CPA Tool & Test Instructions) Open a Tech Services case file,	Yes. Replace the High Pressure Fuel Pump. Make sure to use fuel priming tool (12-922-01). Go to Step 13 .
		No. Proceed with repair recommended by Tech Services.

<ul style="list-style-type: none"> - Attach CPA zip file to the case file - Attach ServiceMaxx snapshot of High pressure fuel pump test - List the tests and corresponding results of any other diagnostic tests already performed - Submit the case referencing "Request CPA data review per IK1201063 3055/15" <p>Does the high pressure pump need to be replaced?</p>	
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Step	Action	Decision
12	Check for an internal leak in the high pressure fuel system. Perform Fuel Rail Pressure (FRP) Leak Isolation.	Yes. Verify each step was completed correctly and contact your supervisor.
	Is engine free of leaking injector?	No. Replace the last capped injector and all HP lines removed during this test. Recheck for Fault Codes.

Step	Action	Decision
13	Check for restricted fuel return line. Perform HP Pump Fuel Return Pressure Test.	Yes. Release the unit.
	Is fuel return pressure below specification, < 13 psi?	No. Repair restriction in fuel return line between high-pressure fuel pump and fuel tank. Recheck for Fault Codes.

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.

WARRANTY INFORMATION

Claim Requirements/Approvals:

There are no special requirements for this repair.

Warranty Claim Coding:

Group:	12000 - Engine
Noun:	454 - High Pressure Fuel Pump

Step	Hrs	Code	Model	Engine	Description
2	0.3	N12-2174U	WorkStar	MAXXFORCE 11/13 2010 EPA	Electronic Engine Performance, Diagnose Step 4 EST Connection and Data Recording
2	0.3	Q12-2174U	TranStar	MAXXFORCE 11/13 2010 EPA	Electronic Engine Performance, Diagnose Step 4 EST Connection and Data Recording
2	0.3	R12-2174U	ProStar	MAXXFORCE 11/13 2010 EPA	Electronic Engine Performance, Diagnose Step 4 EST Connection and Data Recording
2	0.3	T12-2063U	PayStar	MAXXFORCE 11/13 2010 EPA	Electronic Engine Performance, Diagnose Step 4 EST Connection and Data Recording
2	0.3	N12-2174US	WorkStar	N13	Electronic Engine Performance, Diagnose Step 5 EST Data List
2	0.3	Q12-2174US	TranStar	N13	Electronic Engine Performance, Diagnose Step 5 EST Data List
2	0.3	R12-2174US	ProStar	N13	Electronic Engine Performance, Diagnose Step 5 EST Data List
2	0.3	T12-2174US	PayStar	N13	Electronic Engine Performance, Diagnose Step 5 EST Data List
3	3.0	N12-7454U-20	WorkStar	MAXXFORCE 11/13 2010 EPA	High Pressure Fuel Pump & Drive Gear, Replace, if required
3	3.0	Q12-7454U-20	TranStar	MAXXFORCE 11/13 2010 EPA	High Pressure Fuel Pump & Drive Gear, Replace, if required
3	3.0	R12-7454U-20	ProStar	MAXXFORCE 11/13 2010 EPA	High Pressure Fuel Pump & Drive Gear, Replace, if required
3	3.0	S12-7454U-20	LoneStar	MAXXFORCE 11/13 2010 EPA	High Pressure Fuel Pump & Drive Gear, Replace, if required
3	3.0	T12-7454U-20	PayStar	MAXXFORCE 11/13 2010 EPA	High Pressure Fuel Pump & Drive Gear, Replace, if required
3	4.0	Q12-7454US	TranStar	N13	High Pressure Fuel Pump & Drive Gear, Replace, if required

3	3.0	R12-7454US	ProStar	N13	High Pressure Fuel Pump & Drive Gear, Replace, if required
3	3.9	FA12-7454O	9900i	MAXXFORCE 15	High Pressure Fuel Pump & Drive Gear, Replace, if required
3	3.9	R12-7454O	ProStar	MAXXFORCE 15	High Pressure Fuel Pump & Drive Gear, Replace, if required
3	3.9	T12-7454O	PayStar	MAXXFORCE 15	High Pressure Fuel Pump & Drive Gear, Replace, if required
4	0.7	FA15-4167U-20	9900I	MAXXFORCE 11/13 2010 EPA	Fuel Filter, replace if required, includes fuel system priming
4	0.7	N15-4167U-20	WorkStar	MAXXFORCE 11/13 2010 EPA	Fuel Filter, replace if required, includes fuel system priming
4	0.6	Q15-4167U-20	TranStar	MAXXFORCE 11/13 2010 EPA	Fuel Filter, replace if required, includes fuel system priming
4	0.6	R15-4167U-20	ProStar	MAXXFORCE 11/13 2010 EPA	Fuel Filter, replace if required, includes fuel system priming
4	0.6	S15-4167U-20	LoneStar	MAXXFORCE 11/13 2010 EPA	Fuel Filter, replace if required, includes fuel system priming
4	0.6	Q15-4167US-20	TranStar	N13	Fuel Filter, replace if required, includes fuel system priming
4	0.6	R15-4167US-20	ProStar	N13	Fuel Filter, replace if required, includes fuel system priming
4	0.5	R15-4167O	ProStar	MAXXFORCE 15 2010 EPA	Fuel Filter, replace if required, includes fuel system priming
10	3.1	N12-7542U	WorkStar	MAXXFORCE 11/13 2010 EPA	High Pressure Fuel Rail, replace if required
10	3.1	Q12-7542U	TranStar	MAXXFORCE 11/13 2010 EPA	High Pressure Fuel Rail, replace if required
10	3.1	R12-7452U	ProStar	MAXXFORCE 11/13 2010 EPA	High Pressure Fuel Rail, replace if required
10	3.1	T12-7452U	PayStar	MAXXFORCE 11/13 2010 EPA	High Pressure Fuel Rail, replace if required
10	3.1	N12-7452US	WorkStar	N13	High Pressure Fuel Rail, replace if required
10	3.1	Q12-7452US	TranStar	N13	High Pressure Fuel Rail, replace if required
10	3.1	R12-7452US	ProStar	N13	High Pressure Fuel Rail, replace if required
10	3.1	T12-7452US	PayStar	N13	High Pressure Fuel Rail, replace if required
10	3.1	FA12-5452O	9900i	MAXXFORCE 15	High Pressure Fuel Rail, replace if required
10	3.1	R12-5452O	ProStar	MAXXFORCE 15	High Pressure Fuel Rail, replace if required
10	3.0	T12-5452O	PayStar	MAXXFORCE 15	High Pressure Fuel Rail, replace if required
11	0.5	T-Time	All	All models	Cylinder Performance Analyzer Tool Diagnostics
11	3.0	N12-7454U-20	WorkStar	MAXXFORCE 11/13 2010 EPA	High Pressure Fuel Pump & Drive Gear, Replace, if required
11	3.0	Q12-7454U-20	TranStar	MAXXFORCE 11/13 2010 EPA	High Pressure Fuel Pump & Drive Gear, Replace, if required
11	3.0	R12-7454U-20	ProStar	MAXXFORCE 11/13 2010 EPA	High Pressure Fuel Pump & Drive Gear, Replace, if required
11	3.0	S12-7454U-20	LoneStar	MAXXFORCE 11/13 2010 EPA	High Pressure Fuel Pump & Drive Gear, Replace, if required
11	3.0	T12-7454U-20	PayStar	MAXXFORCE 11/13 2010 EPA	High Pressure Fuel Pump & Drive Gear, Replace, if required
11	4.0	Q12-7454US	TranStar	N13	High Pressure Fuel Pump & Drive Gear, Replace, if required
11	3.0	R12-7454US	ProStar	N13	High Pressure Fuel Pump & Drive Gear, Replace, if required
11	3.9	FA12-7454O	9900i	MAXXFORCE 15	High Pressure Fuel Pump & Drive Gear, Replace, if required
11	3.9	R12-7454O	ProStar	MAXXFORCE 15	High Pressure Fuel Pump & Drive Gear, Replace, if required
11	3.9	T12-7454O	PayStar	MAXXFORCE 15	High Pressure Fuel Pump & Drive Gear, Replace, if required
13	0.3	N12-2192U	WorkStar	MAXXFORCE 11/13 2010 EPA	HP Pump Fuel Return Pressure Test, if required
13	0.3	Q12-2192U	TranStar	MAXXFORCE 11/13 2010 EPA	HP Pump Fuel Return Pressure Test, if required
13	0.3	R12-2192U	ProStar	MAXXFORCE 11/13 2010 EPA	HP Pump Fuel Return Pressure Test, if required
13	0.3	S12-2030U	LoneStar	MAXXFORCE 11/13 2010 EPA	HP Pump Fuel Return Pressure Test, if required
13	0.3	T12-2081U	PayStar	MAXXFORCE 11/13 2010 EPA	HP Pump Fuel Return Pressure Test, if required
13	0.3	N12-2192US	WorkStar	N13	HP Pump Fuel Return Pressure Test, if required
13	0.3	Q12-2192US	TranStar	N13	HP Pump Fuel Return Pressure Test, if required
13	0.3	R12-2192US	ProStar	N13	HP Pump Fuel Return Pressure Test, if required
13	0.3	T12-2192US	PayStar	N13	HP Pump Fuel Return Pressure Test, if required

[SRT Manual](#)

OTHER RESOURCES

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