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Coding Information

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Title: MaxxForce 7 DTC 3055 Fuel System Diagnostics

Applies To: 2010 - 2013 MaxxForce 7

CHANGE LOG

07/09/2015 - Corrected "IMPROTANT NOTICE" to reflect the harness needs to be replaced only if an issue is present. Added SRT for road test.
 Corrected FRP sensor circuit diagnostic SRT.
 07/06/2015 - Corrected pressure gauge tool number, and removed step numbers labels from the SRTs for clarity
 04/23/2015 - Updated "Important Notice" to include the harness kit number
 02/26/2015 - Updated snapshot analysis and step based diagnostic steps. Added high pressure fuel pump harness warnings and updated part

DESCRIPTION

This document will guide the user through step based diagnostics and snapshot analysis for the High Pressure Fuel System concerning the DTC 3055.

IMPORTANT NOTICE

High pressure fuel system issues have been directly linked to the high pressure fuel pump harness 7080246C91 ([click here for identifiers](#)). Navistar is currently returning to the use of harness 1889577C92 which is available in kit 2514826C91 ([Kit Contents](#)). Harness 7080246C91 was implemented on 10/4/2012, beginning with ESN 5314897. All engines built after this time and is experiencing fuel system issues or open circuit faults for the control valves will require replacement of the bad harness. Engines built before 5314897 will require a warranty review, to ensure the harness has not been replaced.

SYMPTOMS

Diagnostic Trouble Codes & Dashboard Indicator Lights:

DTC/Light	Description
SPN 3055 FMI 0 (Pending/Active)	FRP Exceeded Maximum
SPN 3055 FMI 1 (Pending/Active)	Low Fuel Pressure at Start
SPN 3055 FMI 2 (Pending/Active)	FPCV/FVCV Adaptation in-range Fault
SPN 3055 FMI 13 (Pending/Active)	Fuel Pressure Offset Check
SPN 3055 FMI 15 (Pending/Active)	FRP below minimum with maximum command
SPN 3055 FMI 16 (Pending/Active)	FRP below minimum with maximum command
SPN 3055 FMI 17 (Pending/Active)	FRP above maximum with minimum command
SPN 3055 FMI 18 (Pending/Active)	FRP above maximum with minimum command
SPN 3055 FMI 31 (Pending/Active)	FPCV/FVCV Adaptation in-range Fault
SPN 1244 FMI 5 (Pending/Active)	FVCV open load / circuit
SPN 633 FMI 5 (Pending/Active)	FPCV open load / circuit

Customer Observations or Concerns:

- Malfunction Indicator Light
- Power Loss
- Inoperable Engine

SPECIAL TOOLS / SOFTWARE

Tool Description	Tool Number	Comments	Instructions
ServiceMaxx Interface cable		NEXIQ or NAVCOM	
Graduated cylinder (0 -700 mL)			
Fuel Pressure Gauge (30psi Limit)	ZTSE4409		
Fuel Pressure Test Kit	ZTSE4657		

[Tools Resource Center](#)

SERVICE PARTS INFORMATION

Kit Description	Part Number	Quantity Required	Notes
KIT, FUEL PUMP HIGH PRESSURE W/ HARNESS	7080839C94	1 - As Needed	Kit Contents (Click Here)
KIT, HPP HARNESS REPLACEMENT	2514826C91	1 - As Needed	Kit Contents (Click Here)
DIELECTRIC GREASE	LOCALLY		
HARNESS, ASSY UVC R	1899577C92	1 - As Needed	
SENSOR ASSY, FUEL RAIL PRESSURE	1873400C92	1 - As Needed	
KIT INJECTOR	1899239C92	1 - 8 - As Needed	
FUEL FILTER MODULE ASSEMBLY	1886166C95	1 - As Needed	
FLANGED NUT HEX CAP M12	1893701C1	ONLY IF REPLACING FUEL SUPPLY LINES ON ENGINES BUILT BEFORE 04/06/2011	Diagram (Click Here)

[Parts Catalog](#)

WARNING

THE 2007-2009 MAXXFORCE 7 HIGH PRESSURE FUEL PUMP AND THE 2010-2013 MAXXFORCE 7 HIGH PRESSURE FUEL PUMPS ARE NOT INTERCHANGABLE BETWEEN ENGINES.

DIAGNOSTIC STEPS**NOTE**

Before beginning step based diagnostics, review warranty history and check with the customer for recent repairs relating to the fuel system. Do not replace the high pressure pump multiple times. Perform step based diagnostics and if needed, skip directions to replace the components that were recently replaced unless the engine has the high pressure fuel pump harness 7080246C91 and exhibits the harness failure symptoms.

Step	Action	Decision
1	Perform a Health Report and Upload. Is the ECM Calibration up-to-date?	If required update the calibration; Continue to STEP 2

Step	Action	Decision
2	Perform visual inspections per the Diagnostic Manual and HS/NS Diagnostic Sheet. 1. Inspect Fuel System to Verify Fuel Level 2. Inspect Engine Oil Level (If severely over full see IK1201259) 3. Inspect Coolant Recovery Bottle for Coolant Level 4. Inspect Electrical Group for Poor or Loose Connections 5. Inspect Air Filter Minder 6. Inspect Exhaust System Were any issues found?	If required correct noted issues; Continue to STEP 3

Step	Action	Decision
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3	<p>Fault Code Ranking.</p> <p>Are there any other pending or active DTCs aside from 3055 FMI XX?</p> <p>NOTE: FPCV/FVCV circuit issues (May/May-Not Throw 633/1244) can cause the SPN 3055 FMI 15/16 code to become ACTIVE, this issue should be treated with a higher ranking.</p>	<p>Yes. For fuel system concerns (ex. FPCV/FVCV/FRP Sensor Faults) - Follow FCAP to correct the issue, then see STEP 4</p> <p>For all other faults continue to STEP 5</p>
		<p>No. STEP 5</p>

Step	Action	Decision
4	<p>Diagnostic trouble codes.</p> <p>Were the DTCs corrected?</p>	<p>Yes. STEP 5</p>
		<p>No. Contact a supervisor and ensure all the proper decisions were made. Open a case file with Navistar's Technical Support group with all relevant information and recordings for further assistance.</p>

Step	Action	Decision
5	<p>Reset the Fuel Pressure Adaptives.</p> <p>In ServiceMaxx go to <i>Procedures >> KOEO Procedures >> Fuel Pressure Adaptation Reset</i> and follow the on screen commands.</p> <p>If the engine is in a no start condition before and after resetting the Fuel Pressure Adaptives Please see the Engine Service Manual (Click Here) under <i>Fuel System >> Installation >> Priming the High-Pressure Fuel System</i>. If after bleeding the system the engine starts, diagnose for aeration source. After attempting to prime the engine and if it still will not start follow the <i>Hard Start No Start Diagnostic Sheet</i> (Click Here).</p> <p>Can the fuel system code(s) be recreated (road test if required)?</p>	<p>Yes. STEP 6</p>
		<p>No. Complete any other work required and then release unit to the customer, if this is a repeat offender please continue with STEP 6.</p>

Step	Action	Decision
6	<p>At KOEO (0 psi Fuel Rail Pressure, FRP) during the continuous monitor test, check the FRP sensor voltage.</p> <p>Sensor Voltage Specification: $FRP\ Voltage = (VREF1) * 0.1$ FRP Sensor Voltage Specification: 0.475V - 0.525V (Typically 0.48-0.5V)</p> <p>NOTE: The FRP Sensors Reference Voltage (VREF1) is located at pin E-26 on the ECM. Manually check VREF1 and use for comparison to the specification. VREF1 Specification: VREF1 = 4.75V - 5.25V</p> <p>Sensor/Voltage Discrepancy Example: VREF1 measures 4.8V and KOEO FRP voltage reads 0.53V. This is a bad reading, with VREF1 reading 4.8V the sensor voltage should be 0.48V.</p> <p>Is the FRP sensor voltage within specification?</p>	<p>Yes. STEP 8</p>
		<p>No. Perform circuit checks on UVC harness. If no issues found replace FRP sensor and UVC harness. If the harness has a bad connection replace only the UVC harness and recheck sensor voltage with wiggle testing. STEP 7</p>

Step	Action	Decision
7	<p>Reassemble and reset the Fuel Pressure Adaptives.</p> <p>In ServiceMaxx go to <i>Procedures >> KOEO Procedures >> Fuel Pressure Adaptation Reset</i> and follow the on screen commands.</p> <p>Can the code(s) be recreated?</p>	<p>Yes. STEP 8</p>
		<p>No. Finish any other work necessary and release to customer</p>

Step	Action	Decision
8		

<p>Were any issues noted?</p>	<p>Visually and physically inspect the low pressure fuel system lines, including fuel tank. Feel for kinks or disruptions in the tube geometry. Also inspect the fuel filter module for dirty filters and/or debris.</p>	<p>Yes. Repair/clean as needed Reassemble. STEP 9</p> <p>No. Perform Fuel Rail Pressure Monitoring with ServiceMaxx as outlined below then see appropriate Step.</p>
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Step	Action	Decision
<p>9</p>	<p>Reset the Fuel Pressure Adaptives.</p> <p>In ServiceMaxx go to <i>Procedures >> KOEO Procedures >> Fuel Pressure Adaptation Reset</i> and follow the on screen commands.</p> <p>Can the code(s) be recreated?</p>	<p>Yes. Perform Fuel Rail Pressure Monitoring with ServiceMaxx as outlined below then see appropriate Step.</p> <p>No. Finish any other work necessary and release to customer</p>

Step	Action	Decision
<p>10</p>	<p>DTC: 3055 FMI 15/16</p> <p>High Pressure Fuel Pump Insufficient Fuel Supply Failure Characteristics</p> <p>See EGED 0000001681 (Diagnostic Manual)</p> <p>1. Hard Start No Start Diagnostics Special Test Procedures Low-pressure Fuel System (LP.1 - LP.8)</p> <p>Also, check for fuel return aeration and fuel supply pressure under a torque stall.</p> <p>NOTE: Do not continue to the High Pressure Fuel System Diagnostic section once complete</p> <p>Were any low pressure fuel system issues noted?</p>	<p>Yes. Repair and rediagnose for the issue. If resolved STEP 9.</p> <p>No. Re-evaluate condition, perform the Fuel Rail Pressure Monitoring with ServiceMaxx as outlined below again with a new recording, follow the next See the next closest representation of the issue.</p>

Step	Action	Decision
<p>11</p>	<p>DTC: 3055 FMI 15/16</p> <p>High Pressure Fuel Pump Harness FVCV Connection Failure Characteristics High Pressure Fuel Pump Harness PVCV Connection Failure Characteristics</p> <p>Replace the High Pressure Fuel Pump Harness per the revised replacement SRT steps (Click Here). For properly installing and securing the harness see the Repair Steps: Installation Procedure section below. Reset the fuel pressure adaptives and perform ServiceMaxx Recording.</p> <p>NOTE: To access the high pressure fuel pump it is no longer required to remove the turbochargers, please review the SRT steps for greater detail.</p> <p>Can the codes be recreated?</p>	<p>Yes. STEP 14</p> <p>No. Finish any other work necessary and release to customer</p>

Step	Action	Decision
<p>12</p>	<p>DTC: 3055 FMI 15/16/17/18</p> <p>High Pressure Fuel Pump Efficiency Loss Characteristics</p> <p>If not done so already, Perform Step 10 then return to this step.</p> <p>Were any issues noted?</p>	<p>Yes. Correct issue and see STEP 13</p> <p>No. STEP 14</p>

Step	Action	Decision
<p>13</p>	<p>Reset the Fuel Pressure Adaptives.</p>	<p>Yes. STEP 14</p>

<p>In ServiceMaxx go to <i>Procedures >> KOEO Procedures >> Fuel Pressure Adaptation Reset</i> and follow the on screen commands.</p> <p>Can the code(s) be recreated?</p>	<p>No. Finish any other work necessary and release to customer</p>
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Step	Action	Decision
14	<p>High Pressure Fuel Pump Replacement</p> <p>Replace the High Pressure Fuel Pump (Kit 7080839C94) following the revised replacement SRT (Click Here) and the Service Manual (Click Here). For properly installing and securing the harness see the Repair Steps: Installation Procedure section below.</p> <p>NOTE: To access the high pressure fuel pump it is no longer required to remove the turbochargers, please review the SRT steps for greater detail.</p> <p>Reassemble, reset the fuel pressure adaptives.</p> <p>In ServiceMaxx go to <i>Procedures >> KOEO Procedures >> Fuel Pressure Adaptation Reset</i> and follow the on screen commands.</p> <p>NOTE: If the engine is in a no start condition after replacing the pump, the fuel system could be bound by air. Please see the Engine Service Manual (Click Here) under <i>Fuel System >> Installation >> Priming the High-Pressure Fuel System</i>.</p> <p>Can the code(s) be recreated?</p>	<p>Yes. Open a case file with Navistar's Technical Support group with all relevant information and recordings for further assistance.</p> <hr/> <p>No. Finish any other work necessary and release to customer</p>

FUEL RAIL PRESSURE MONITORING WITH SERVICEMAXX

Attention

If after performing the ServiceMaxx data review no options appear to relate to the unique issue on hand, open a case file with Navistar's Technical Support group with all relevant information and recordings for further assistance.

Recording Steps

1. Connect ServiceMaxx
2. Warm up the engine

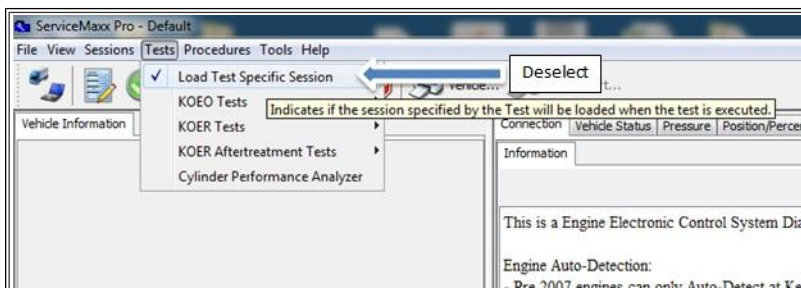


Figure 1: Deselect Load Specific Session

3. Under "Tests" deselect "Load Test Specific Session" this will allow one continuous recording of any tests performed (EX: Recording multiple standard tests to one recording). However, if required to see the test screen (EX: Resetting the fuel pressure adaptives) this will need to be reselected.
4. Begin recording in the "Default Session"
5. Duplicate DTC concern however possible (Stationary Recording, Brake Stalls, Road Test) review the recording and analyze per the instructions below.

NOTE

ServiceMaxx Recording Reviewer has limited functionality, if the recording is too long reviewing the data maybe impossible to interpret. This can be avoided if the DTC sets under predictable conditions or by setting a recording trigger.

Reviewing the Recording in ServiceMaxx

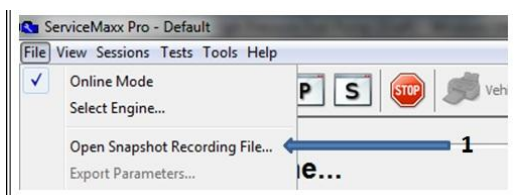


Figure 2: Opening a Recording in ServiceMaxx

1. In ServiceMaxx Select "File" then "Open Snapshot Recording File..." as shown in Figure 2
2. Select the Parameters "FRP Desired" and "Fuel Rail Pressure" and study the FRP trace.
3. For DTC 3055 FMI 17/18 FRP Above Maximum with Minimum Command ([Click Here](#))
4. For DTC 3055 FMI 15/16 FRP Below Minimum with Maximum Command See Below

Diagnostic Trouble Codes: SPN 3055 FMI 15/16 FRP Below minimum with Maximum Command

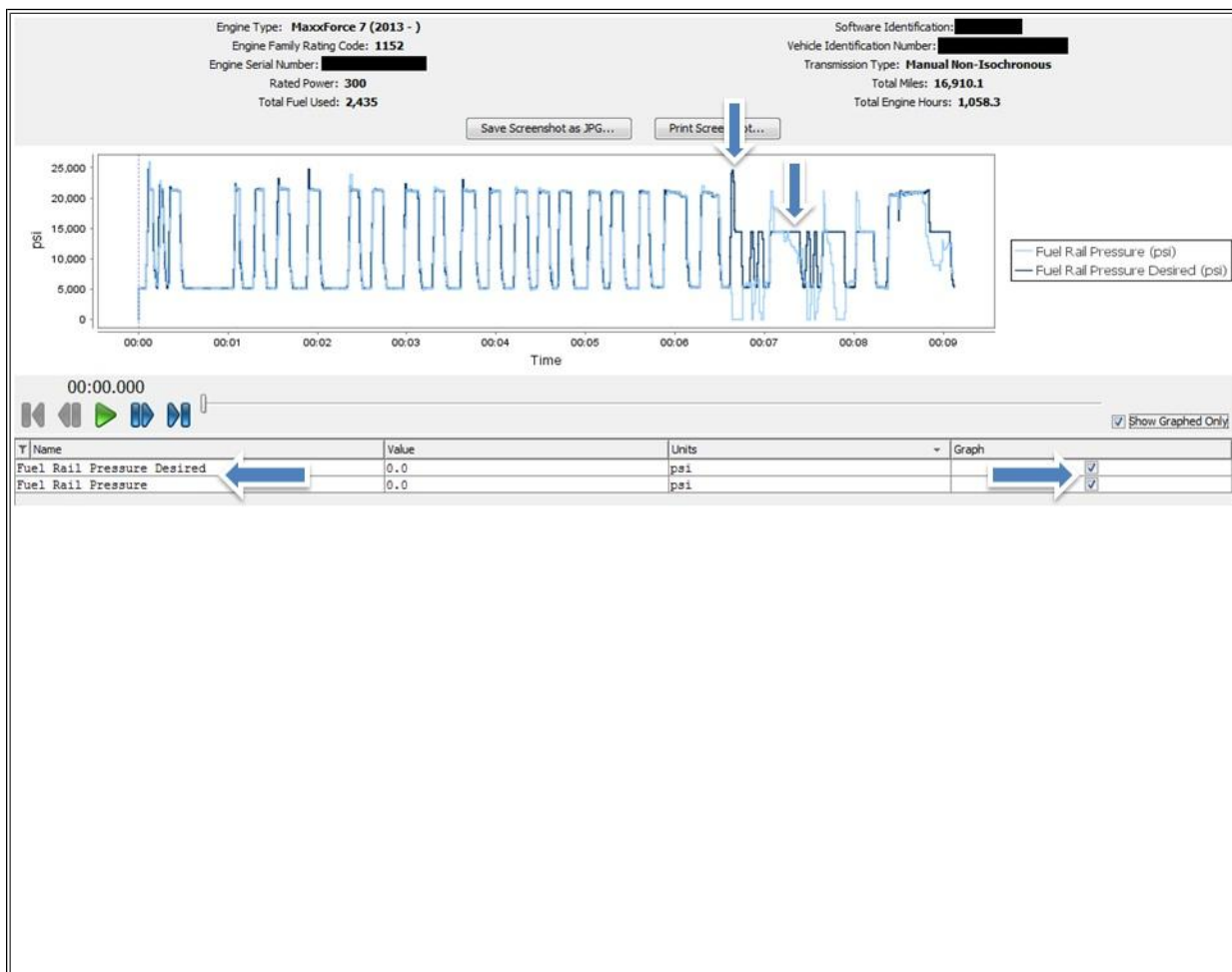
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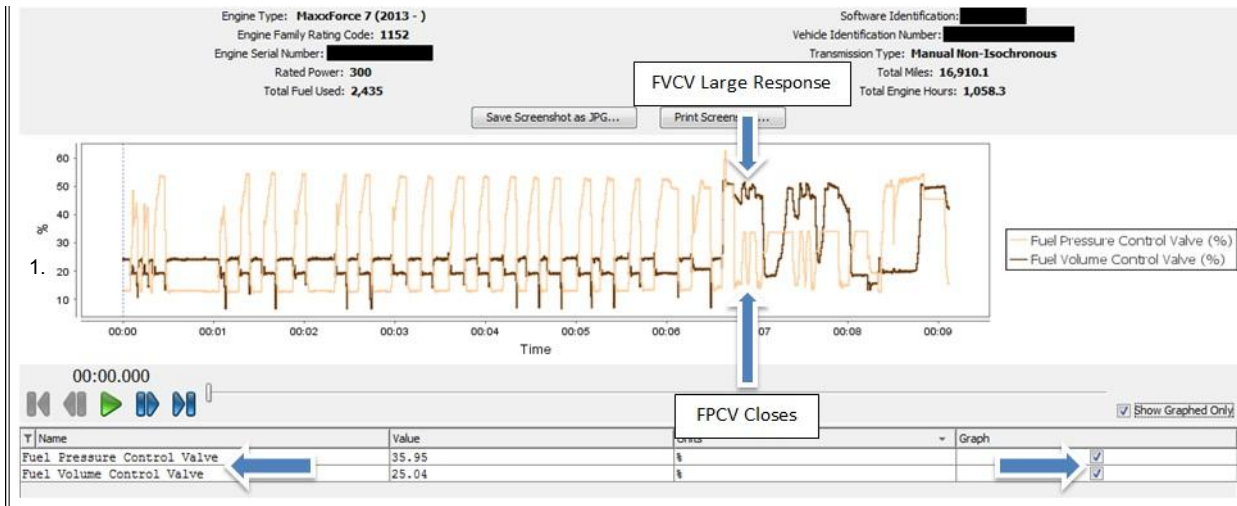
Review all options before making a decision.

Ranked Possible Issues:

1. High Pressure Fuel Pump Harness Connections (May or may-not activate 1244/633 Open Circuit Codes)
2. Low Side Fuel Supply Issues (Pressure or Volume Supply)
3. Failed High Pressure Fuel Pump: Pump can not physically produce the desired pressures
4. Failed Pressure or Volume Control Valves: Valves are not operating as desired

High Pressure Fuel Pump Insufficient Fuel Supply Failure Characteristics





Recording
Notes:
Most likely to

Figure 3: Fuel Rail Pressure Data Recording

- Item 1: FRP Drops Below Desired
- Item 2: FRP Meets Desired

1. occur during high fuel volume demand
2. FRP may rise to desired then fall below
3. FRP may fall to 0 psi and the engine will remain running
4. During this time the FPCV & FVCV will attempt to compensate for the loss in FRP
5. The FVCV will open as much as possible to attempt letting more fuel reach the pump

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High Pressure Fuel Pump Harness FVCV Connection Failure Characteristics



Figure 4: Fuel Rail Pressure Data Recording

- Item 1: FRP Drops Below Desired
- Item 2: FRP Meets Desired

Recording

Notes:

1. Most likely to occur at the beginning of a hard acceleration
2. FRP Drops to nearly 1000psi or lower then can return to desired FRP
3. During this time the FPCV will attempt to compensate and the FVCV will remain low.

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High Pressure Fuel Pump Harness FPCV Connection Failure Characteristics

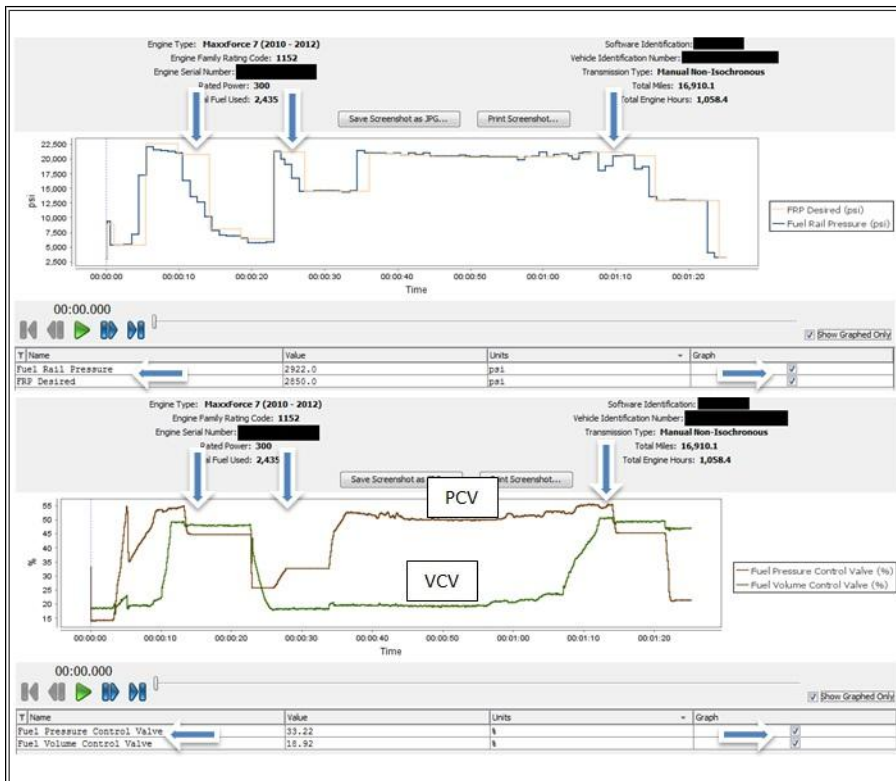


Figure 5: Fuel Rail Pressure Data Recording

- Item 1: FRP Drops Below Desired
 Item 2: FRP Meets Desired

Recording Notes:

1. Most likely to occur during the peak of a hard acceleration
2. FRP will rise with desired but may not fully reach it or reaches it then drops below
3. During this time the FPCV & FVCV will attempt to compensate for the loss in FRP
4. FPCV will be nearly maxed while FVCV has a gradual response
5. Could also be a representation of Fuel Supply Issues

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Diagnostic Trouble Codes: SPN 3055 FMI 17/18 FRP Above Maximum with Minimum Command

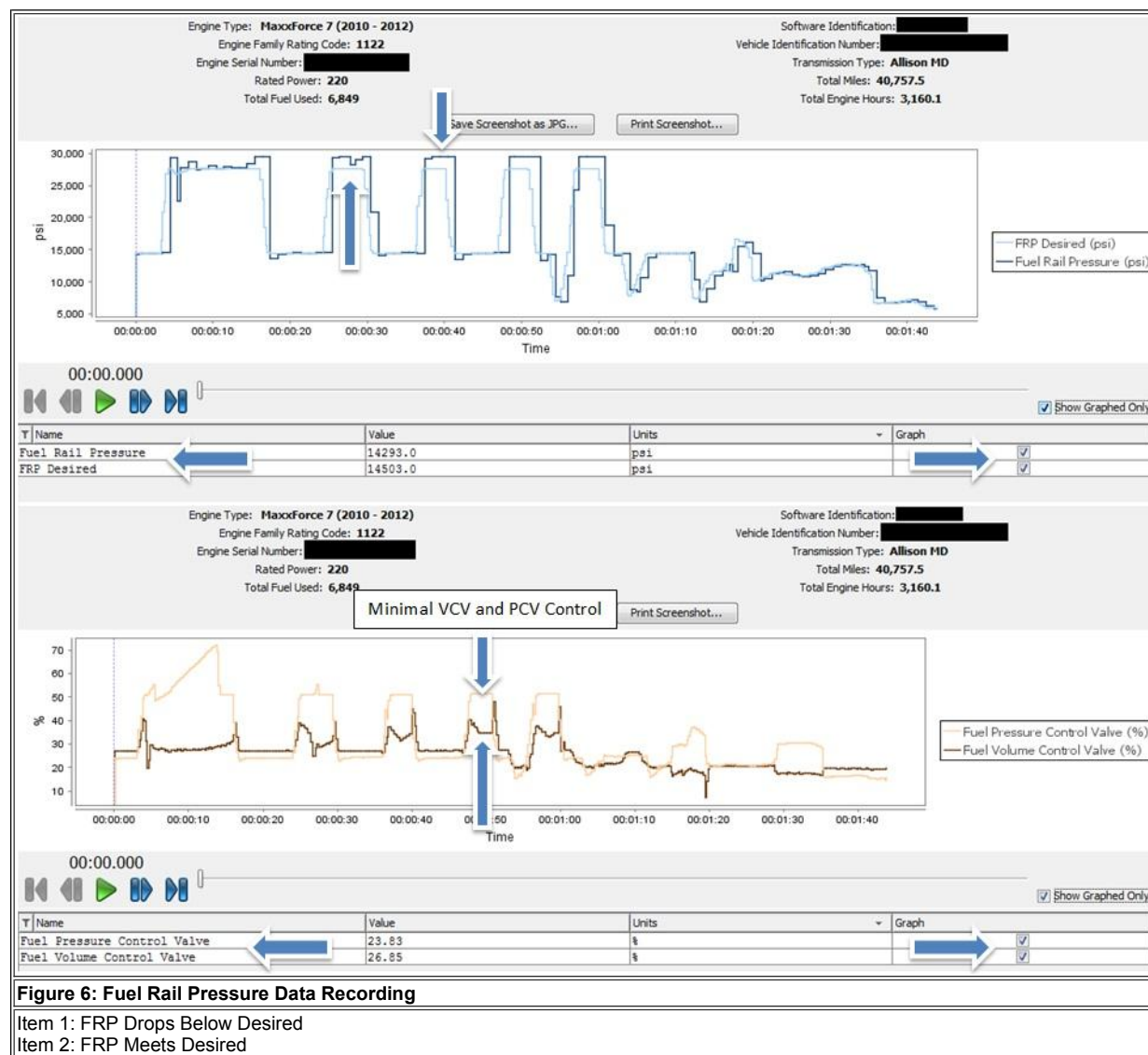
NOTE

Review all options before making a decision.

Ranked Possible Issues:

1. Biased Fuel Rail Pressure Sensor (Most of the time is accompanied with FRP Sensor Codes)
2. Faulty Under Valve Cover Harness (Most of the time is accompanied with UVC/FRP Sensor Codes)
3. High Pressure Fuel Pump Harness Connections (May or may-not activate 1244/633 Open Circuit Codes).
4. Failed High Pressure Fuel Pump: Pump inefficiencies may require the fuel pressure adaptives to compensate for the loss at lower RPMs. This compensation may lead to control instabilities under different loading conditions resulting in FRP staying above desired
5. Failed Pressure/Volume Control Valves: Valves are not operating as desired

High Pressure Fuel Pump Efficiency Loss Characteristics



Recording

Notes:

1. FRP can meet desired at lower pressures but FRP rises above desired at higher demand 3055 FMI 17/18 (Above Maximum)
2. FRP can meet desired at high pressures but FRP drops below desired at lower demand 3055 FMI 15/16 (Below Minimum)
3. Resetting the Fuel Pressure Adaptives may resolve the issue temporarily

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REPAIR STEPS

REMOVAL PROCEDURE:

SEE REVISED STANDARD REPAIR TIME STEPS [\(CLICK HERE\)](#)

NOTICE: THE REPAIR SRT STEPS HAVE BEEN ALTERED, IT IS NO LONGER REQUIRED TO REMOVE THE TURBOCHARGERS TO ACCESS THE HIGH PRESSURE FUEL PUMP ON THE 2010 - 2014 MAXXFORCE 7 ENGINE.

INSTALLATION PROCEDURE:

1. Remove the old harness, clean and dry the inside of the high pressure fuel pump control valve connectors (Oil intrusion is common in the harness; it needs to be cleaned out and dried before installing the new harness)
2. Obtain both wire ties and high pressure fuel pump harness

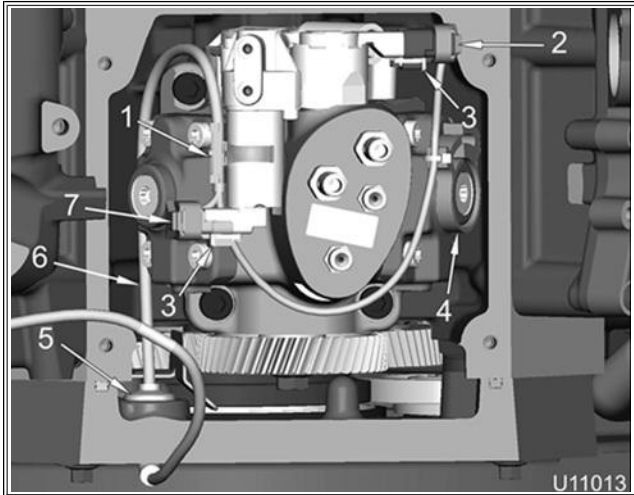


Figure 7: High Pressure Fuel Pump Harness

- Item 1: C-clip
- Item 2: PCV Connector (Black)
- Item 3: Yellow CPA
- Item 4: Snapper Clip
- Item 5: Pass-through Overmold Plug
- Item 6: High Pressure Pump Harness Assembly
- Item 7: VCV Connector (Orange)

3. Route the harness through the bell housing and lay it in the high pressure pump galley

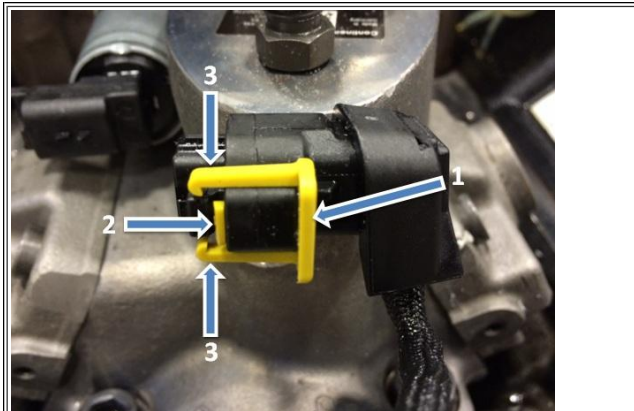


Figure 8: Harness Connector and CPA

- Item 1: Yellow CPA
- Item 2: CPA Center Tab
- Item 3: CPA Hooks

4. Disengage the Pressure Control Valve (Black) Yellow CPA on the harness by pressing down on the center tab and pulling backwards

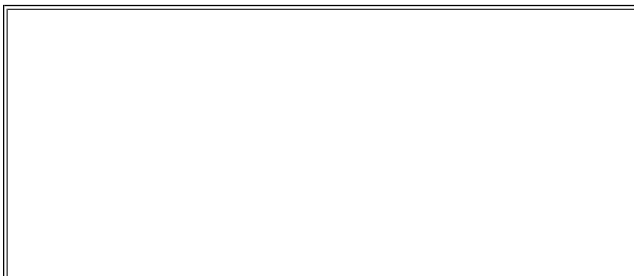




Figure 9: Fully Disengaged CPA

5. Fully disengage the Yellow CPA by pulling outward on the CPA hooks and again pulling backwards on the CPA



Figure 10: Apply Dielectric Grease

6. Apply Dielectric Grease to the connector terminal openings



Figure 11: Fully Seated PCV Connector with CPA Disengaged

7. Fully seat the harness connector onto the Pressure Control Valve with the CPA remaining disengaged



Figure 12: Wire Tie the Connector Clip

8. Wrap the tie strap around the harness connector over the harness clip where the Yellow CPA center tab rests and tighten down (Note: Provided tie will be blue)



Figure 13: Reengaged CPA (Completed)

9. Reengage the Yellow CPA by pushing it all the way forward until the center tab rests on top of the wire tie and exits the CPA housing fully.

10. Repeat steps 3-8 for the Volume Control Valve connector

WARRANTY INFORMATION

Warranty Claim Coding:

Group:	12000 - Engines
Noun:	563 - Injector Unit (Electrical)
	792 - Injector Fuel Lines (High PSI)
	454 - Pump, Oil / Fuel (High Pressure Injection System)
	168 - Sensor, ICP / FRP
	791 - Engine Mechanical or Electrical Fuel Lift Pump

Use appropriate noun, relative to the actual repair made.

Link to the Coding Manual: [Click Here](#)

Standard Repair Times:

Due to the number of engine/vehicle combinations and possibilities for repairs, see appropriate SRT manual section, linked below.


Description	Manual Section
ECM Calibration	ELECTRONIC CONTROL MODULE (ECM OR ECM/IDM) - ENGINE PROGRAM
Visual Inspections	ELECTRONIC ENGINE HARD START/NO START, DIAGNOSE
Reset Fuel Pressure Adaptives	FUEL PRESSURE ADAPTATION RESET, PERFORM
FRP Sensor Diagnose (2010 Emissions - Does NOT include valve cover removal)	ELECTRONIC ENGINE CONTROL SYSTEM OR SCR SYSTEM (FAULT CODE/CIRCUIT), DIAGNOSIS
Valve Cover Removal	VALVE COVER(S) AND/OR GASKET (V ENGINES), R&R AND/OR REPLACE

UVC Harness Replacement	ENGINE COMPARTMENT ELECTRONIC HARNESSSES, REPLACE
FRP Sensor Replacement	ELECTRONIC ENGINE CONTROL SENSORS/REGULATORS (MAXXFORCE 7), REPLACE
Low Pressure Fuel System (LP.1 - LP.8) Diagnostics	ELECTRONIC ENGINE HARD START/NO START, DIAGNOSE
Stationary Recording	STATIONARY SNAPSHOT, PERFORM
Road Test	ELECTRONIC ENGINE PERFORMANCE, DIAGNOSE
High Pressure Pump Harness Replacement	ENGINE COMPARTMENT ELECTRONIC HARNESSSES, REPLACE
Harness Wiggle Test	HARNESS WIGGLE TEST (INTERMITTENT DIAGNOSIS), PERFORM
High Pressure Pump Replacement	HIGH PRESSURE FUEL PUMP & DRIVE GEAR, REPLACE
Road Test	ROADTEST AND SNAPSHOT, PERFORM

Link to the Standard Repair Time Manual: [Click Here](#)

OTHER RESOURCES

[Master Service Information Site](#)

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