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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

2014/10/27 - Corrected Step 6 Decision Path
 2014/10/21 - Initial Article Release

DESCRIPTION

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

SYMPTOMS

Diagnostic Trouble Codes & Dashboard Indicator Lights:

DTC/Light	Description	Potential Issues
SPN 3055 FMI 0 (Pending/Active)	FRP Exceeded Maximum	FPCV/FVCV Not Operating Properly, Biased FRP Sensor
SPN 3055 FMI 1 (Pending/Active)	Low Fuel Pressure at Start	Fuel Line Leak, Low FDP, Transfer case unable to draw fuel from one tank when the other is near empty, Previous adaptive values inhibiting proper FRP control
SPN 3055 FMI 2 (Pending/Active)	FPCV/FVCV Adaptation in-range Fault	Biased FRP Sensor, Fuel Line Leak, HPFP Failure, FPCV/FVCV Sticking or Electrical Fault
SPN 3055 FMI 13 (Pending/Active)	Fuel Pressure Offset Check	FRP unable to drop at key off, choked fuel filters, Ignition switch cycled too fast, Pump does not shut down at key off, Resistance in low pressure fuel line
SPN 3055 FMI 15 (Pending/Active)	FRP below minimum with maximum command	HPFP Harness, Biased Low FRP Sensor, UVC Harness to FRP Sensor Connector, Low FDP, HPFP Fuel Supply Restriction, Fuel Supply Aeration, Sticking FPCV, High Pressure Fuel Leak, Over Fueling Injector(s)
SPN 3055 FMI 16 (Pending/Active)	FRP below minimum with maximum command	Same as above (FMI 15)
SPN 3055 FMI 17 (Pending/Active)	FRP above maximum with minimum command	HPFP Harness, Biased High FRP Sensor, Sticking/Leaking FPCV, High Fuel Return Restriction
SPN 3055 FMI 18 (Pending/Active)	FRP above maximum with minimum command	Same as above (FMI 17)
SPN 3055 FMI 31 (Pending/Active)	FPCV/FVCV Adaptation in-range Fault	Biased FRP Sensor, Fuel Line Leak, HPFP Failure, FPCV/FVCV Sticking or Electrical Fault

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	
Cylinder Performance Analyzer Complete Kit	OE-11178		
Cylinder Performance Analyzer Update Kit	12-999-01-E1	See Below	

16-Pin Engine to Chassis Breakout Harness	ZTSE4762	For FPCV/FVCV 12V Supply	
Banana Clip Extension			
180-Pin Breakout Box	00-00956-08		
2010 MaxxForce 7 Harness Kit	00-01461-00	Breakout Box Harness	
Graduated cylinder (0 -700 mL)			
Fuel Pressure Gauge (30psi Limit)	ZTSE4681		
Fuel Pressure Test Kit	ZTSE4657		

[Tools Resource Center](#)

Image	Description	Tool Number	Qty
 0000062361	CPA Harness Extension	12-999-01-05	3
 0000062362	CPA Banana Jack Breakout	12-999-01-06	3

NOTE:

Download instructions for the new CPA software can be found in [IK2700062](#)
For CPA "Recorder" program activation please see [Activate CPA Recorder](#)

SERVICE PARTS INFORMATION

Kit Description	Part Number	Quantity Required	Notes
HARNESS, ASSY HP PUMP	7080246C91	1 - As Needed	
HARNESS, ASSY UVC R	1899577C92	1 - As Needed	
SENSOR ASSY, FUEL RAIL PRESSURE	1873400C92	1 - As Needed	
ASSY KIT HP PUMP & HARNESS	7080839C93	1 - As Needed	
KIT HP FUEL PUMP	7080839C92	1 - As Needed	
KIT INJECTOR	1899239C92	1-8 - As Needed	
FUEL FILTER MODULE ASSEMBLY	1886166C95	1 - As Needed	
ZIPTIES	Obtain Locally	As Needed	

[Parts Catalog](#)

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 duplicate components. Perform step based diagnostics and if needed, skip directions to replace the components that were recently replaced.

Step	Action	Decision
1	Engine Calibration.	Yes. Step 2
	Is the ECM Calibration up-to-date?	No. Update calibration then go to Step 2

Step	Action	Decision
2	Perform visual inspections per the Diagnostic Manual and Performance Diagnostic Sheet.	Yes. Correct issues, Step 3

	Were any issues found?	No. Step 3
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Step	Action	Decision
3	Diagnostic trouble codes. Are there any other pending or active DTCs (aside from SPN 3055 FMI XX)?	Yes. See Diagnostic Manual EGED 0000001681 . Step 4
		No. Step 5

Step	Action	Decision
4	Diagnostic trouble codes. Were the DTCs corrected using the Diagnostic Manual?	Yes. Step 5
		No. If unrelated to the fuel system continue with Step 5 and address codes at a later time. If relevant to the fuel system 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.

Step	Action	Decision
5	Reset the Fuel Pressure Adaptives. Can the code(s) be recreated (road test if required)?	Yes. Step 6
		No. Complete any other work required and then release unit to the customer, if this is a repeat offender please continue with Step 6.

Step	Action	Decision
6	At KOEO (0 psi Fuel Rail Pressure, FRP) during the continuous monitor test, check the FRP sensor voltage. Sensor Voltage Specification: $FRP\ Voltage = (VREF1) * 0.1$ FRP Sensor Voltage Specification: 0.475V - 0.525V (Typically 0.48-0.5V) Is the FRP sensor voltage within specification? NOTE: The FRP Sensors Reference Voltage (VREF1) is located at pin E-26 on the ECM. If desired manually check VREF1 and use for comparison to the specification. VREF1 Specification: VREF1 = 4.75V - 5.25V (Sensor/Voltage Discrepancy Example: VREF1 measures 4.8V and KOEO FRP voltage reads 0.53V)	Yes. Step 7
		No. Complete any other work required and then release unit to the customer, if this is a repeat offender please continue with Step 7.

Step	Action	Decision
7	Reassemble and reset the Fuel Pressure Adaptives. Can the code(s) be recreated?	Yes. Step 8
		No. Release unit to the customer

Step	Action	Decision
8	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.	Yes. Repair/clean as needed Reassemble and Step 9.

	Were any issues noted?	No. Step 10
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Step	Action	Decision
9	Reset the Fuel Pressure Adaptives. Can the code(s) be recreated?	Yes. Step 10
		No. Release unit to the customer

Step	Action	Decision
10	See EGED 0000001681 1. Hard Start No Start Diagnostics Special Test Procedures Low-pressure Fuel System (LP.1 - LP.8) NOTE: Do not continue to the High Pressure Fuel System Diagnostic section once complete Were any low pressure fuel system issues noted?	Yes. Repair and rediagnose for the issue. If resolved Step 11.
		No. Perform Fuel Rail Pressure Monitoring with ServiceMaxx as outlined below; then see Step 12

Step	Action	Decision
11	Reset the Fuel Pressure Adaptives. Can the code(s) be recreated?	Yes. Perform Fuel Rail Pressure Monitoring with ServiceMaxx as outlined below then see Step 12
		No. Release unit to the customer

Step	Action	Decision
12	Review monitored data. After monitoring, does the Fuel Rail Pressure Trace resemble Figure 3 (FRP drops below desired at times but can meet desired intermittently)? DTCs associated with this are 3055 FMI 15/16	Yes. Step 14
		No. Step 13

Step	Action	Decision
13	Review monitored data. Does the Fuel Rail Pressure Trace resemble Figure 4 (FRP rises above desired at times but can meet desired intermittently)? DTCs associated with this are 3055 FMI 17/18	Yes. Step 14
		No. See Cylinder Performance Analyzer Data Collection section below. Record the data as outlined in this section then see Step 16

Step	Action	Decision
14	Replace the High Pressure Fuel Pump Harness 7080246C91 Per the Engine Service Manual. Zip-tie the FPCV and FVCV connectors as outlined in the Installation Procedure at the end of this document and use dielectric grease on the connector. Reset the fuel pressure adaptives assemble enough to run the engine with the turbochargers and HPFP cover removed. Repperform ServiceMaxx Recording. WARNING: Please keep clear of moving gears and use extreme caution. Failure to do so may result in serious injury, or death. If desired, cover and secure cardboard over the opening to contain oil splash to engine compartment. Can the codes be recreated?	Yes. Step 15
		No. Reassemble and reevaluate performance. If the codes still do not return road test. Upon passing the road test release unit to the customer

Step	Action	Decision
15		Yes. See Cylinder Performance Analyzer Data Collection section

	If not already done so, replace the FRP sensor and UVC harness Reset the Fuel Pressure Adaptives.	below. Record the data as outlined in this section then see Step 16
	Can the code(s) be recreated?	No. Release unit to the customer

Step	Action	Decision
16	Review the data recording.	Yes. Open a case file with Navistar's Technical Support group with all relevant information and recordings for further assistance.
	Was the recording successful?	No. Attempt to resolve the issue. If required contact Navistar's EZtech support group for assistance or open a case file with Navistar's Technical Support group with all relevant information and recordings for further assistance.

FUEL RAIL PRESSURE MONITORING WITH SERVICEMAXX

Recording Steps

1. Connect ServiceMaxx
2. Warm up the engine
3. Under "Tests" deselect "Load Test Specific Session" (See Figure 1)
4. Begin recording in the "Default Session"
5. Run the "Standard Test" twice
6. Perform 2 Snap Throttles
7. End Recording

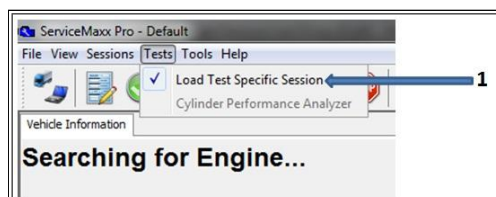


Figure 1: ServiceMaxx Test Preparation

Item 1: Load Test Specific Session

Reviewing the Recording in ServiceMaxx

1. In ServiceMaxx Select "File" then "Open Snapshot Recording File..." as shown in Figure 2

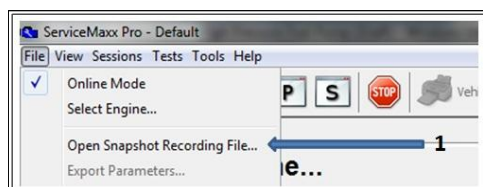


Figure 2: Opening a Recording in ServiceMaxx

Item 1: Open Snapshot Recording File...

2. Select the Parameters "FRP Desired" and "Fuel Rail Pressure" and study the FRP trace as well as Figure 3.

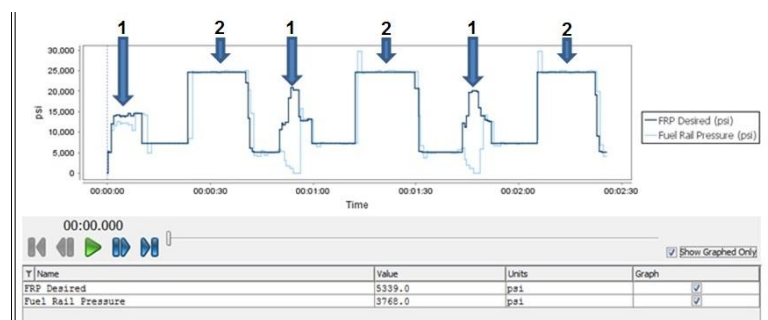


Figure 3: Fuel Rail Pressure Data Recording

Item 1: FRP Drops Below Desired

Item 2: FRP Meets Desired

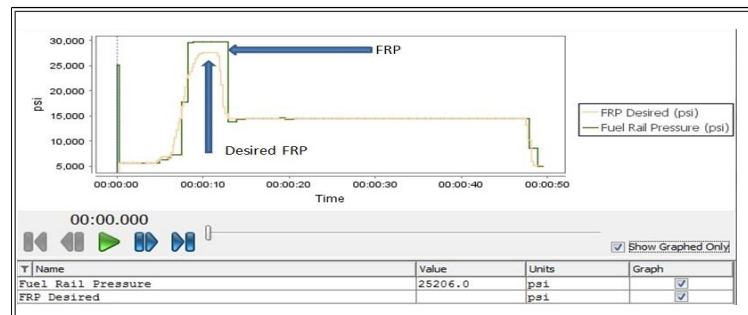


Figure 4: Fuel Rail Pressure Data Recording

Item 1: FRP Above Desired

[RETURN TO STEP 12](#)

CYLINDER PERFORMANCE ANALYZER DATA COLLECTION

NOTE: The data recording channels will not be used as labeled on the CPA box. FPCV and FVCV will be recorded using channels 1 and 2 while the Cam will be recorded using channel 3 and FRP sensor recorded using channel 4. Figure 2 below shows the CPA box and labeled channels.

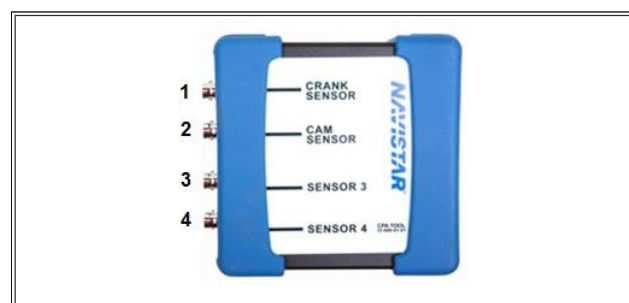


Figure 2: Cylinder Performance Analyzer Data Acquisition Box

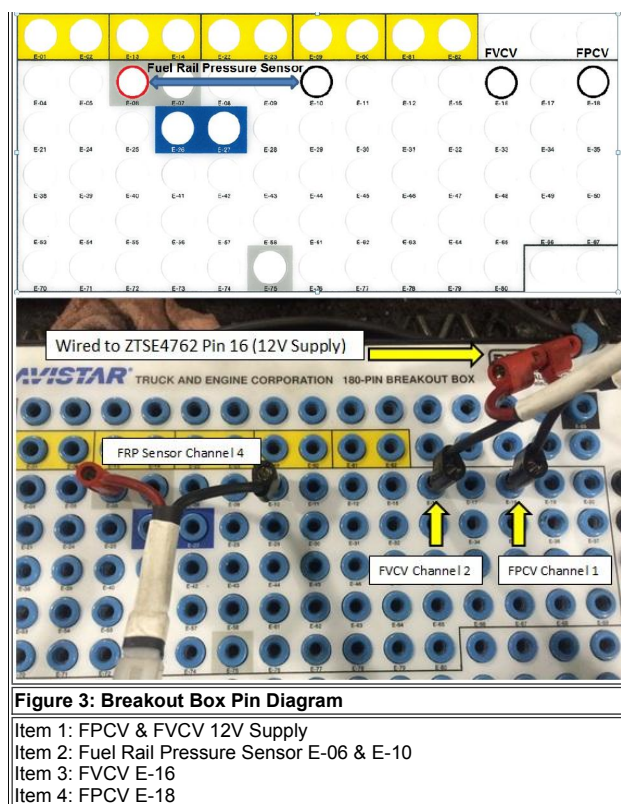
Item 1: Fuel Pressure Control Valve (Black Pin E-18 and Red 12V Power Pinned from Pin-16 on ZTSE4762 with Banana Clip Extension)

Item 2: Fuel Volume Control Valve (Black Pin E-16 Red 12V Power Pinned from Pin-16 on ZTSE4762 with Banana Clip Extension)

Item 3: Cam Sensor (Connected using the Standard YELLOW CPA Cable)

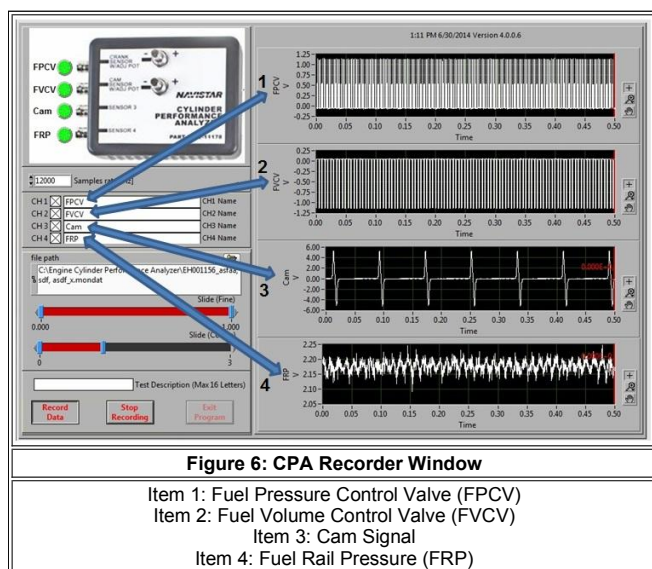
Item 4: Fuel Rail Pressure Sensor (Pinned from E-10 Red & E-6 Black on the Breakout Box)

Figure 3 below shows the pin locations of the desired signals. As stated above the FPCV and FVCV 12V supply needs to be wired using ZTSE4762 with a banana clip extension (NOTE: Use electrical tape to wrap the exposed metal clip, failure to do so may result in personal injury or component damage). The Cam signal will require the use of the standard CPA cable connected directly to the sensor (This is reverse from Navistar's DT 9 & 10 Diesel Engine Connections)



To access the proper recording program see [Activate CPA Recorder](#) document and follow the instructions.

Once in the recorder the user will be able to label the channels as desired. To begin the recording the user selects "Record Data" then to stop the recording select "Stop Recording" shown in Figure 6. The CPA tool records a file know as a ".mondatt", this is what this technical support team will need for analysis.



Data Recording

NOTE: Clear active/pending codes after each test if required

Cold Recordings

1. In the Recorder Label the "Test Description" as "KOEO Output State"
2. While cold and at KOEO, begin recording CPA data (No need to record ServiceMaxx data at this time)
3. With ServiceMaxx, perform Output State Tests High and Low alternating between the two 5 times to cycle the valves
4. End recording

Warm-Up Recordings

1. In the Recorder Label the "Test Description" as "Engine Warm Up"
2. At KOEO begin to record CPA data as well as ServiceMaxx Data (Default Session)
3. Start the engine and set the cruise to 1500rpm allow the engine to warm up until ECT reaches 180F
4. End both recordings

Hot Recordings

1. In the Recorder Label the "Test Description" as "Standard Tests"
2. In ServiceMaxx deselect "Load Test Specific Session" if not already done so
3. Begin recording CPA and ServiceMaxx data
4. Run the "Standard Test" 3 times
5. Perform 3 WOT throttle snaps allowing to sit at WOT for at least 10 seconds each time
6. End both recordings

Brake Stall Recording

1. Begin recording CPA and ServiceMaxx (Default Session)
2. Perform 3 brake stalls with the Parking Brake OFF while recording allow to idle for 1 minute after completing the 3rd stall
3. End both recordings

[RETURN TO STEP 16](#)**REPAIR STEPS****INSTALLATION PROCEDURE:**

See links below for HPFP harness zip tie images.

[HARNESS 1889577C92 ZIPTIE IMAGES](#)

[HARNESS 7080246C91 ZIPTIE IMAGES](#)

[RETURN TO STEP 14](#)**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.

Standard Repair Times:

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

Step	Description	Manual Section
Step 1	ECM Calibration	ELECTRONIC CONTROL MODULE (ECM OR ECM/IDM) - ENGINE PROGE
Step 2	Visual Inspections	ELECTRONIC ENGINE PERFORMANCE, DIAGNOSE
Step 3	Check for DTCs & Reset Adaptives	ELECTRONIC ENGINE PERFORMANCE, DIAGNOSE
Step 6	FRP Sensor Diagnose	"FRP" SENSOR, DIAGNOSTICS
Step 6	Valve Cover Removal	VALVE COVER(S) AND/OR GASKET (V ENGINES), R&R AND/OR REPLAC
Step 6	UVC Harness Replacement	ENGINE COMPARTMENT ELECTRONIC HARNESSSES, REPLACE
Step 6	FRP Sensor Replacement	ELECTRONIC ENGINE CONTROL SENSORS/REGULATORS (MAXXFORC
Step 10	Low Pressure Fuel System (LP.1 - LP.8) Diagnostics	ELECTRONIC ENGINE HARD START/NO START, DIAGNOSE
Step 12 & 13	Stationary Recording	STATIONARY SNAPSHOT, PERFORM
Step 13 & 15	Breakout Box/CPA Installation and Recording	ELECTRONIC ENGINE CONTROL SYSTEMS DIAGNOSTICS
Step 14	High Pressure Pump Harness Replacement	ENGINE COMPARTMENT ELECTRONIC HARNESSSES, REPLACE
Step 6 & 14	Harness Wiggle Test	HARNESS WIGGLE TEST (INTERMITTENT DIAGNOSIS), PERFORM
CASE DIRECTION ONLY	High Pressure Pump Replacement	HIGH PRESSURE FUEL PUMP & DRIVE GEAR, REPLACE

Special Requirements:

Do not replace the HPFP without Navistar's Technical Support Groups approval.

OTHER RESOURCES

[Master Service Information Site](#)

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