LANDIRENZO®
USA

Workshop Manual

Monofuel CNG Fuel System
2016 to 2019 Ford F-59 6.8L V10

CNG

Revision: A
Date: 08/05/2019

Contents

REPAIR TECHNIQUES

Appropriate service methods and procedures are essential for the safe, reliable operation of all motor vehicles as well as the personal safety of the individual doing the work. This manual provides general directions for performing service with tested, effective techniques. Following them will help assure reliability.

There are numerous variations in procedure, techniques, tools and parts for servicing vehicles, as well as in the skill of the individual doing the work. This workshop manual cannot possibly anticipate all such variations and provide advice or cautions as to each. Accordingly, anyone who departs from the instructions provided in this manual must first establish that they compromise neither their personal safety nor the vehicle integrity by their choice of method, tools, or parts.

NOTES, CAUTIONS, AND WARNINGS

As you read through this manual, you may come across a **NOTE**, **NOTICE**, or **WARNING**. Each one is there is a specific purpose:

- A **NOTE** calls attention to the unique, additional, or essential information related to the subject procedure.
- A **NOTICE** identify a hazard that could damage the vehicle or property.
- A **WARNING** identifies a hazard that could response in severe personal injury or death to yourself or others.

SAFETY WARNINGS

Review carefully the General Service Health and Safety Precautions below before beginning any repair. Following these general service warnings are specific system warnings that must be carefully reviewed before beginning work on any listed system.

<u>General Service Health and Safety Precautions</u>

- **WARNING**: Wear eye protection when servicing a vehicle. Failure to following this instruction may result in serious personal injury.
- **WARNING**: Wear protective gloves when handling components or parts that have pointed or sharp edges. Failure to follow this instruction may results in serious personal injury.
- **WARNING**: Do not work under the hood of a vehicle with a damaged cooling fan, as it can separate during operation. With the ignition OFF, inspect all cooling fans for damage, cracks, or separation and replace with a new fan as necessary. Failure to follow this instruction may results in serious personal injury.
- **WARNING**: Vehicles with engine auto start-stop technology may start automatically with the ignition on. Make sure the ignition is off when servicing or working in close proximity to rotating engine parts. Failure to follow this instruction may results in serious personal injury.
- **WARNING**: Serious injury may occur if the engine is accidently started by another person during service work. Remove the key from the vehicle to prevent unauthorized starts. Failure to follow this instruction may results in serious personal injury.

- **WARNING**: Before raising the vehicle on a hoist, make sure the hoist capacity is adequate for the vehicle weight, including any vehicle cargo or modifications. Position the hoist lift arms to contact at the vehicle manufacture's recommended lifting points. Do not use the engine to power the drive wheels unless all drive wheels are elevated off the ground. Incorrect hoist arm positioning or drive wheels in contact with the ground can cause unintended vehicle movement. Failure to follow these instruction may result in serious personal injury.
- **WARNING**: Before lifting the vehicle with a jack, make sure the jack capacity is adequate for the vehicle weight, including any vehicle cargo or modifications. Identify the correct jacking points in manufacture's repair manual. Position the vehicle on a hard, level surface. After jacking, always support the vehicle with jack stands. Never get under a vehicle supported only by a jack. Set the parking brake and block all wheels remaining on the ground. Failure to follow these instructions may result in serious personal injury.
- **WARNING**: Keep solvents away from ignition sources. Solvents may be flammable and can ignite or explode if not handled correctly. Failure to follow this instruction may results in serious personal injury.
- **WARNING**: Always secure assemblies to their service jack. Avoid obstructions while lowering and raising the jack. Improperly secured assemblies or contact with obstructions may cause the assembly to fall off the jack, which could results in serious personal injury.

<u>Engine Cooling System Health and Safety Precautions</u>

- **WARNING:** Always allow the engine to cool before opening the cooling system. Do not unscrew the coolant pressure relief cap when the engine is operating or the cooling system is hot. The cooling system is under pressure; steam and hot liquid can come out forcefully when the cap is loosened slightly. Failure to follow these instructions may results in serious personal injury.

<u>Fuel System Health and Safety Precautions</u>

- **WARNING:** Before working on or disconnecting any of the fuel tubes or fuel system components, relive the fuel system pressure to prevent accidental leaking of fuel. Fuel in the fuel system remains under high pressure, even when the engine is not running. Failure to follow this instruction may results in serious personal injury.
- **WARNING:** Do not smoke, carry lighted tobacco or have an open flame or any type when working on or near any fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may results in serious personal injury.

COMPONENT LIST

Landi Renzo USA CNG Low Pressure Fuel System Components – 6.8L V-10 Engine (3V), Monofuel

Part Number	Part Description	Qty / Vehicle
1002401-B1	Regulator,70 PSIG, 12V Slnd, HPNGV4	1
1002575	Injector, NGI2 Std., Bosch 8854, Shaved	10
1001326	Harness, Injector, USCAR-Minitimer	10
1001142	Sensor, P/T, 12 bar, 1/4" MNPT, MQS	1
1003188	Adapter, P/T Sensor, Male SAE ORB x Female NPT	1
1001891	Sensor, Press, 0-5000 PSIG, ORB, AMP 3p	1
1001863	Filter, LP Coalescing, SAE#8	1
1000042	Filter, CNG, HP, GR-6,9/16" STB	1
1002081	ECU, FICM, LR, Ford 6.8L, TBC	1
1000086	Emulator, Fuel Gauge	1
1003254	Module, Starter Interrupt, F59	1
1003180	Tee, Coolant, Brass, 5/8" x 5/8" x 3/8"	2
Preventative Maintenance Components		
1000477	Low Pressure, Filter Element, Small CF	1
1000482	High Pressure, Filter Element, CLS112-6	1

FUEL PRESSURE SPECIFICATIONS

6.8L V-10 Engine (3V), Monofuel CNG

Item	Specification
Fuel Pressure	
Key ON Engine Running (KOER)	70 psig Typical range of fuel regulator delivery pressure is +15 / -10 psi from specified setting throughout the range of regulator inlet pressure, temperature, and flow.

CNG SYSTEM MAINTENANCE PROCEDURES

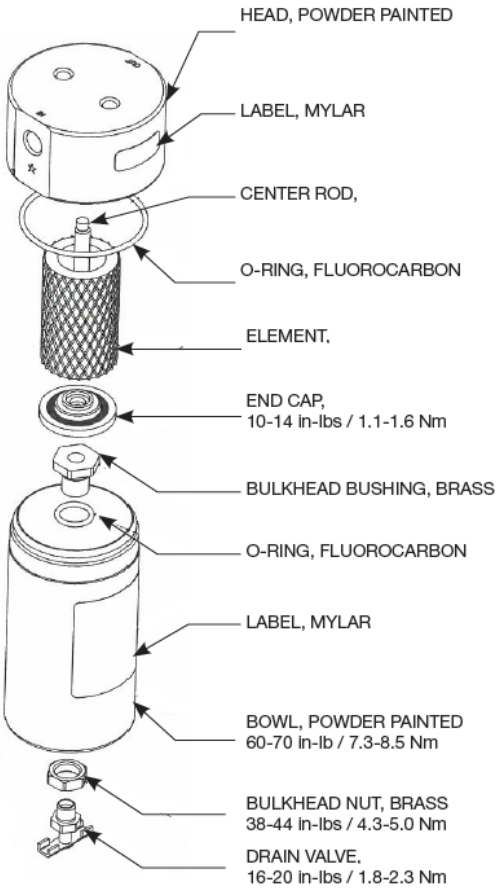
Low Pressure Fuel Filter Maintenance

Draining:

- Drain the housing every **2,000 miles** or as necessary.
- Depressurize housing before servicing:
    - Close the system manual shut-off valve, and run the vehicle until it stalls.
    - Run vehicle until it stalls. Repeat start sequence until vehicle no longer starts.
- Slowly open drain valve.
- Close drain valve.
- Test for leaks, with system pressurized, by using leak detection fluid or methane detection equipment.

Filter Element Replacement:

- Change the element at regular oil change intervals or every **5,000 miles** per Landi Maintenance Manual.
- Depressurize housing before servicing:
    - Close the system manual shut-off valve, and run the vehicle until it stalls.
    - Run vehicle until it stalls. Repeat start sequence until vehicle no longer starts.
- With a strap wrench, unscrew bowl and remove old element and O-ring.
- Replace with new components and install bowl.
- Torque to 60-70 in-lb (7.3-8.5 Nm).
- Test for leaks, with system pressurized, by using leak detection fluid or methane detection equipment.



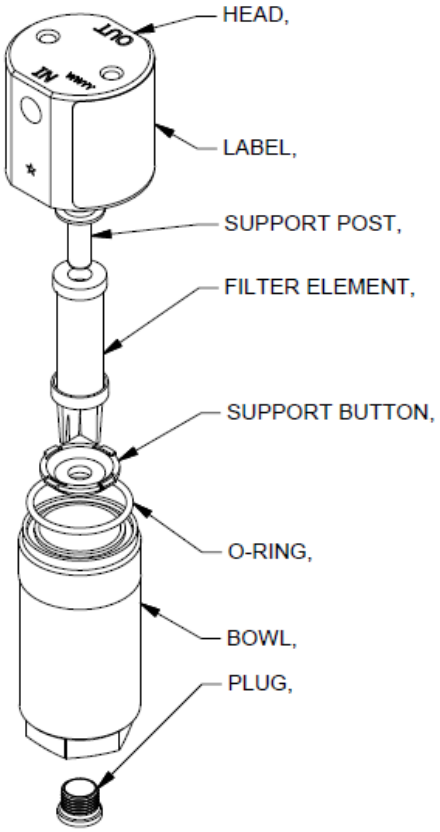
High Pressure Fuel Filter Maintenance

Draining:

- Drain the housing every **2,000 miles** or as necessary.
- Depressurize housing before servicing:
  - Close the system manual shut-off valve, and run the vehicle until it stalls.
  - Run vehicle until it stalls. Repeat start sequence until vehicle no longer starts.
- Remove drain plug with 1/4" hex key wrench and drain until liquid is removed.
- Inspect drain plug O-ring and replace as needed.
- Replace drain plug when completed.
- Torque to 27 ft-lb (37 Nm).
- Test for leaks, with system pressurized, by using leak detection fluid or methane detection equipment.

Filter Element Replacement:

- Change the element at regular oil change intervals or every **5,000 miles** per Landi Maintenance Manual.
- Depressurize housing before servicing:
  - Close the system manual shut-off valve, and run the vehicle until it stalls.
  - Run vehicle until it stalls. Repeat start sequence until vehicle no longer starts.
- With a strap wrench, unscrew bowl and remove old element and O-ring.
- Change the drain plug O-ring each time the filter element is replaced.
- Replace with new components and install bowl.
- Torque to 60-70 in-lb (7.3-8.5 Nm).
- Test for leaks, with system pressurized, by using leak detection fluid or methane detection equipment.



Regulator Replacement

Overview and Vehicle Prep

Purpose:
The following procedure describes the methods to replace the fuel pressure regulator used in Landi Renzo USA CNG fuel systems. The fuel pressure regulator has an integrated fuel shutoff solenoid valve. This procedure is used to isolate a potentially defective or non-operating regulator that causes the vehicle to intermittently not start or shutdown.

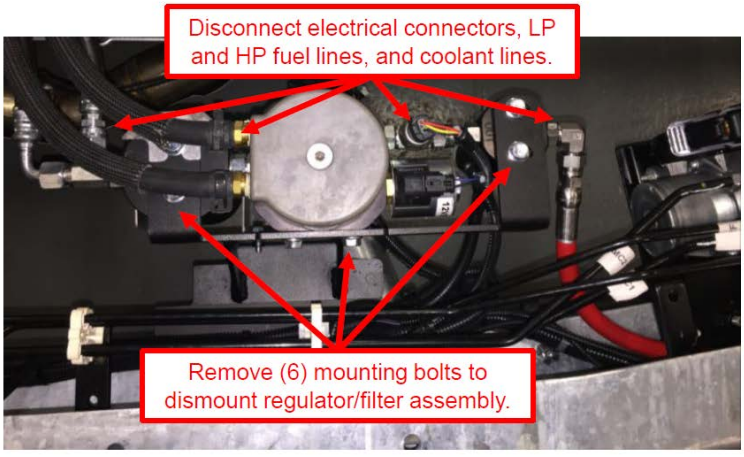
Landi Renzo P/N:
- **1002401-B1** – "Regulator,70 PSIG, 12V SInd, HPNGV4"

Vehicle Prep:
Defuel the regulator assembly:
1. CLOSE the CNG system manual shutoff valve.
2. RUN the vehicle until it stalls. REPEAT start sequence until vehicle stalls.

If the procedure above cannot be completed because the vehicle cannot start, please contact Landi Renzo USA Service. Instructions will follow on how to defueling the high pressure portion of the system upstream from the regulator assembly to allow safe troubleshooting of the solenoid valve.

Dismount Regulator/Filter Assembly

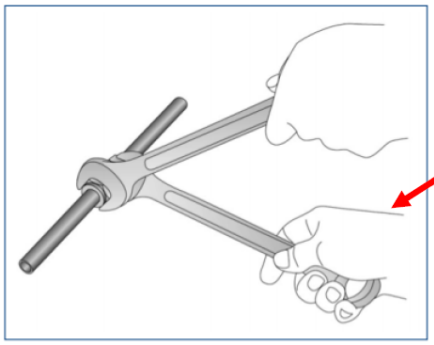
- DISCONNECT high pressure sensor connector, fuel shutoff solenoid connectors, low pressure fuel lines, high pressure fuel line, and coolant lines.
- REMOVE (6) mounting bolts to dismount regulator/filter assembly.



Fuel Lines and Fittings Removal and Installation Guidelines (1 of 2)

Fuel Lines and Fittings Assembly/Disassembly Guidelines:

1. Use a touch of non-synthetic, non-detergent oil (i.e. 30W engine oil) to lubricate O-rings prior to installation. **CAUTION! DO NOT USE silicone grease or any other type of lubricant**
2. Per Parker recommendations, install all high pressure fittings, tubing, and hoses finger tight to ensure proper fitment before fully torqueing components. Torque values for fittings used in this installation is listed below. When tightening all connections, it is important to have a wrench applying equal opposite force on the fitting as a wrench tightens the nut to the fitting. Following Parker (fitting and tube) manufacturer instructions when assembling system (www.parker.com)
3. Ensure O-rings are not damaged during the assembly/disassembly process. If replacement O-rings are required, please contact Landi Renzo USA.



Note: When assembling/disassembling fittings, a hose, or stainless steel line to fittings, ensure that the fitting body is secured with a **back-up wrench** while tightening nut on tube or hose to proper torque spec.

Fuel Lines and Fittings Removal and Installation Guidelines (2 of 2)

Torque Values for Fuel Line and Fitting Connections:

SAE J1926 O-Ring Boss (ORB) Fittings

Used On:
- LP Fuel Lines
- HP Fuel Lines
- PRD Vent Lines

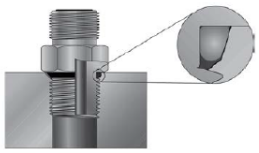


Fig. S7 — Non-Adjustable Port End Assembly

SAE Straight Thread Port Assembly (SAE J1926)

SAE Dash Size	Thread Size UN/UNF	Assembly Torque (+10% -0) Non-Adjustables Seal-Lok (Heavy Duty SAE J1926-2) ft.lbs. (in. lbs)	N-m	Non-Adjustables Triple-Lok Ferulok Adapters (Light Duty SAE J1926-3) ft.lbs. (in. lbs)	N-m	Adjustables Seal-Lok (Heavy Duty SAE J1926-2) ft.lbs. (in. lbs)	N-m	Adjustables Triple-Lok Ferulok Adapters (Light Duty SAE J1926-3) ft.lbs. (in. lbs)	N-m	Plugs Hollow Hex HP5ON-S (Light Duty SAE J1926-3) ft.lbs. (in. lbs)	N-m	Plugs Hex Head P5ON-S (Light Duty SAE J1926-3) ft.lbs. (in. lbs)	N-m
6	9/16-18	(420)	47	(350)	40	(420)	47	(350)	40	(350)	40	(350)	40
8	3/4-16	(720)	81	(620)	70	(720)	81	(620)	70	(620)	70	(620)	70

Notes: Lubricate threads before assembly. Values in chart are for plated steel fittings in steel ports. For stainless steel fittings, use the upper limit of torque range. For brass and aluminum, decrease torque value by 35%.

Table S1 – SAE J1926 Straight Thread Port Assembly Torques

SAE J1453 O-Ring Face Seal Fittings (ORFS)

Used On:
- LP Fuel Lines
- HP Fuel Lines

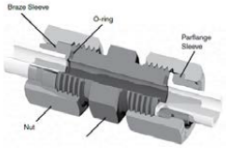


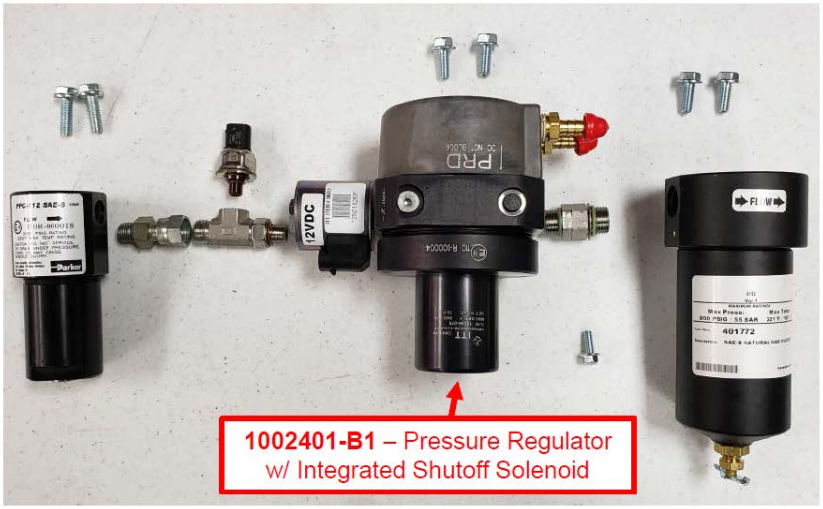
Fig. S15 – Seal-Lok Union cutaway with flanged and brazed assemblies

O.D. (in.)	O.D. (mm)	SAE Dash Size	Tube Side Thread Size (UN/UNF)	Tube Side Assembly Torque (+10% -0%) in.-lb.	ft.-lb.	N-m	Flats from Wrench Resistance (F.F.W.R.) Tube Nuts	Swivel & Hose Ends
3/8	8, 10	-6	11/16-16	360	30	40	1/4 to 1/2	1/2 to 3/4

Table S14 – Seal-Lok and UPTC assembly torque and F.F.W.R. For brass, aluminum (and other soft metals) decrease torque value by 35%, however F.F.W.R. is the same.

Replace Regulator (1 of 2)

- DISASSEMBLE regulator assembly as shown to replace regulator with new pressure regulator.
- NOTE: The following page describes interferences between components during disassembly, and the preparation required to allow disassembly of components from the regulator.



1002401-B1 – Pressure Regulator w/ Integrated Shutoff Solenoid

Replace Regulator (2 of 2)

NOTE: In order to provide clearances for fittings and components to rotate out from the regulator:

- Remove the solenoid coil nut and coil as shown below to allow HP tee to be removed.
- Loosen coolant bowl screw then rotate bowl clockwise to allow LP filter to rotate freely out from the regulator outlet without interfering with the brass coolant barbs.

Remove solenoid nut and coil to provide clearance for HP Sensor tee removal.

Loosen coolant bowl screw then rotate bowl as shown to provide clearance for Low Pressure Filter removal.

Prep Vehicle for Operation

Prep Vehicle for Operation:

- REMOUNT the regulator assembly.
- RECONNECT shutoff solenoid connector and HP sensor connector.
- RECONNECT fuel and coolant lines.
- OPEN the main CNG manual shutoff valve.

DTC CHART

DTCs specific to Landi Renzo USA CNG systems

DTC	Description	Possible Cause(s)	Pin Point Test
P0006	Fuel Pressure Regulator Solenoid Supply Voltage Control Circuit Low	Shorted to ground/OPEN	--
P0007	Fuel Pressure Regulator Solenoid Supply Voltage Control Circuit High	Shorted to power	--
P01A5	Alternative Fuel Rail Pressure Sensor Circuit Low	Sensor shorted to ground	A
P01A6	Alternative Fuel Rail Pressure Sensor Circuit High	Sensor OPEN/shorted to power	A
P01B6	Alternative Fuel Rail Temperature Sensor Circuit Low	Sensor shorted to ground	A
P01B7	Alternative Fuel Rail Temperature Sensor Circuit High	Sensor OPEN/shorted to power	A
P01A0	Alternative Fuel Tank Pressure Sensor Circuit Low	Sensor shorted to ground	B
P01A1	Alternative Fuel Tank Pressure Sensor Circuit High	Sensor OPEN/shorted to power	B
P224E	Alternative Fuel Tank Shutoff Valve "A" Control Circuit Low	Shorted to ground/OPEN	--
P224F	Alternative Fuel Tank Shutoff Valve "A" Control Circuit High	Shorted to power	--

LANDI RENZO USA SYMPTOM CHART DIAGNOSIS

Condition	Possible Sources / Actions
• Vehicle stalls/quits during idle, acceleration, cruising. • Vehicle stalls after starting. • Vehicle runs rough, misses, buck-jerks, hesitates and stumbles, surges, idle rolls.	• Refer to Pin Point Tests (PPT) A and B in the following pages. • Perform manual fuel pressure test. • Perform filter maintenance. Drain oil in low and high pressure filters, and replace filter elements as necessary. • Incorrect fuel tubing size. • Reference Ford resources for further diagnosis and resolution, including Ford Integrated Diagnostic System (IDS) and Ford technical information on Motorcraft Service.
• Fuel gauge inoperable or reading incorrectly.	• Refer to Pin Point Test B.
• Vehicle cranks but does not start	• Check for low fuel using manual gauge. • With ignition in Key On position, check Landi fuse and relay block (connector C2) and replace as necessary: o Landi Fuse #1 (20 amp) o Landi ISO Relay • Check if PCM connectors are loose / damaged. • Listen for tank solenoid click when key cycle on. • Check ground wires for proper connection.

PIN POINT TESTS (PPT)

Pin Point Test A:
Fuel Rail Pressure Temperature Sensor (P/T Sensor)

This pin point test is intended to diagnose the following:

- Fuel rail pressure temperature sensor (Landi P/N 1001142).
- Landi Renzo harness circuits for fuel rail pressure and temperature.
- Landi Renzo Fuel Injection Control Module (FICM) circuitry.

Component Locations:

- P/T Sensor is located at driver side fuel rail front.
- FICM is located at driver's island bulkhead under horn.

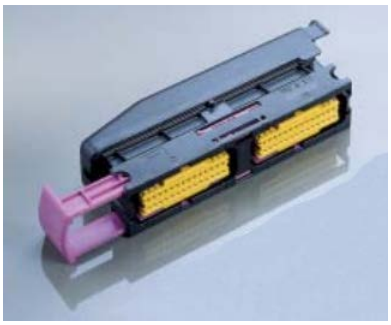
NOTE: With the engine running, manual fuel pressure value is approximately 70 psig.

WARNING: Vehicle fuel systems are pressured even when the engine is not running. To avoid fire or personal injury, disable the fuel delivery system and relieve fuel system pressure before removing any fuel system component.

Landi Renzo USA P/T Sensor Connector View (connector C7)

Pin	Wire Color	Wire Gauge	Circuit Function
1	Black	20	Ground / Signal Return
2	Light Blue	20	Fuel Rail Pressure, 2.5V (FRP)
3	Orange	20	Fuel Rail Temperature (FRT)
4	Red	20	Reference Voltage, 5V (VREF)

Landi Renzo USA FRPT FICM Connector View (connector C1)



Pin	Wire Color	Wire Gauge	Circuit Function
48	Black	20	Ground / Signal Return
46	Orange	20	Fuel Rail Temperature (FRT)
45	Light Blue	20	Fuel Rail Pressure, 2.5V (FRP)
19	Red	20	Reference Voltage, 5V (VREF)

Pin Point Test A Steps: Landi Renzo P/T Sensor

Test Steps		Results ▸	Action to Take
A1	**Check for Diagnostic Trouble Codes (DTCs)**		
	- Are DTCs P01A5, P01A6, P01B6, or P01B7 present?	Yes ▸ No ▸	GO to **A2**. Refer to Symptom Chart.
A2	**Check P/T Sensor and Landi FICM Connectors for Damage**		
	- Check the P/T sensor and Landi FICM connectors for connection, damage, or corrosion. **- Is a concern present?**	Yes ▸ No ▸	ISOLATE the concern and REPAIR as necessary. GO to **A3**.
A3	**Check the P/T Sensor Ref. Voltage and Ground Circuit**		
	- Disconnect P/T sensor. - With Ignition ON and engine OFF, measure the voltage between: + P/T Sensor, PIN 1 (Ground), Harness Side + P/T Sensor, PIN 4 (Ref. Voltage), Harness Side **- Is the voltage between 4.5V - 5.5V?**	Yes ▸ No ▸	GO to **A4**. REPAIR the open circuit. CLEAR the PCM DTC, and REPEAT self-test step.
A4	**Check the P/T Sensor <u>Pressure</u> Circuit**		
	- With Ignition OFF, disconnect Landi FICM connector - Measure the resistance between: + P/T Sensor, PIN 2 (Fuel Rail Pressure), Harness Side + Landi FICM, PIN 45 (Fuel Rail Pressure), Harness Side **- Is the resistance less than 5 ohms?**	Yes ▸ No ▸	Go to **A5**. REPAIR the open circuit. CLEAR the PCM DTC, and REPEAT self-test step.
A5	**Check the P/T Sensor <u>Temperature</u> Circuit for Ground Short**		
	- With Ignition OFF - Measure the resistance between: + P/T Sensor, PIN 3 (Fuel Rail Temp.), Harness Side + Ground **- Is the resistance greater than 10K ohms?**	Yes ▸ No ▸	Go to **A6**. REPAIR the open circuit. CLEAR the PCM DTC, and REPEAT self-test step.
A6	**Check the P/T Sensor <u>Temperature</u> Circuit for Voltage Short**		
	- With Ignition ON, engine OFF - Measure the voltage between: + P/T Sensor, PIN 3 (Fuel Rail Temp.), Harness Side + Ground **- Is there any voltage present?**	Yes ▸ No ▸	REPAIR the open circuit. CLEAR the PCM DTC, and REPEAT self-test step. CONTACT Landi Renzo USA Service

Pin Point Test B:
High Pressure Sensor (HP Sensor) and Landi Renzo Fuel Level Emulator

This pin point test is intended to diagnose the following:

- High pressure sensor (Landi P/N 1001891).
- Landi Renzo Fuel Level Emulator (Landi P/N 1000086).
- Landi Renzo harness circuits.

Component Locations:

- High pressure sensor is located on regulator assembly near transmission on driver side frame rail.
- Fuel level emulator is located under dash panel near parking brake.

NOTE: HP Sensor output voltage span is:

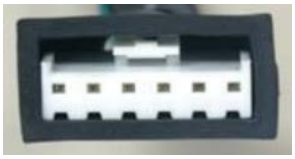
- *0.5 VDC at 0 PSIG*
- *4.5 VDC at 5000 PSIG*
- *Accuracy is ±1.7% span*

WARNING: Vehicle fuel systems are pressured even when the engine is not running. To avoid fire or personal injury, disable the fuel delivery system and relieve fuel system pressure before removing any fuel system component.

HP Sensor Connector View (connector C10)

Pin	Wire Color	Wire Gauge	Circuit Function
1	Black	20	Ground
2	Yellow	20	Pressure Signal
3	Red	20	Reference Voltage, 5V (VREF)

Landi Renzo Fuel Level Emulator Connector View



Pin	Wire Color	Wire Gauge	Circuit Function
1	Red/White	20	Ignition, 12V
2	Black	20	Fuel Level Return (to Ford C140)
3	Red	20	Sensor Reference Voltage, 5V (VREF)
4	Black	20	Sensor Ground
5	Yellow	20	Sensor Pressure Signal
6	Green	20	Fuel Level Signal

Pin Point Test B Steps: HP Sensor and Landi Fuel Level Emulator

Test Steps		Results ▸	Action to Take
B1	**Check for Diagnostic Trouble Codes (DTCs)**		
	- Are DTCs P0462, P0463, P01A0, or P01A1 present?	Yes ▸ No ▸	GO to **B2**. Refer to Symptom Chart.
B2	**Check HP Sensor and Emulator Connectors for Damage**		
	- Check the HP sensor and Landi emulator connectors for connection, damage, or corrosion. - Inspect emulator wires at Ford C140 connector. BLACK wire is inserted in PIN 52, and GREEN wire is inserted in PIN 63. **- Is a concern present?**	Yes ▸ No ▸	ISOLATE the concern and REPAIR as necessary. GO to **B3**.
B3	**Check the HP Sensor Ref. Voltage and Ground Circuit**		
	- Disconnect HP sensor. - With Ignition ON and engine OFF, measure the voltage between: + HP Sensor, PIN 1 (Ground), Harness Side + HP Sensor, PIN 3 (Ref. Voltage), Harness Side **- Is the voltage between 4.5V - 5.5V?**	Yes ▸ No ▸	GO to **B4**. REPAIR the open circuit. CLEAR the PCM DTC, and REPEAT self-test step.
B4	**Check the HP Sensor Pressure Circuit**		
	- With Ignition OFF, disconnect Landi emulator connector - Measure the resistance between: + HP Sensor, PIN 2 (Pressure Signal), Harness Side + Landi emulator, PIN 5 (Pressure Signal), Harness Side **- Is the resistance less than 1 ohms?**	Yes ▸ No ▸	Go to **B5**. REPAIR the open circuit. CLEAR the PCM DTC, and REPEAT self-test step.
B5	**Check the HP Ref. Voltage Circuit for High Resistance**		
	- With Ignition OFF - Measure the resistance between: + HP Sensor, PIN 3 (Ref. Voltage), Harness Side + Landi emulator, PIN 2 (Ground), Harness side **- Is the resistance less than 1 ohms?**	Yes ▸ No ▸	Go to **B6**. REPAIR the open circuit. CLEAR the PCM DTC, and REPEAT self-test step.
B6	**Check the HP Sensor for Internal Fault**		
	- With Ignition OFF, HP sensor connector disconnected - Measure resistance across sensor side between: + HP Sensor, PIN 1 (Ground), Sensor Side + HP Sensor, PIN 3 (Ref. Voltage), Sensor Side **- Is the resistance less than 6.5k ohms?**	Yes ▸ No ▸	GO to **B7**. REPLACE HP Sensor. CONTACT Landi Renzo USA Service.

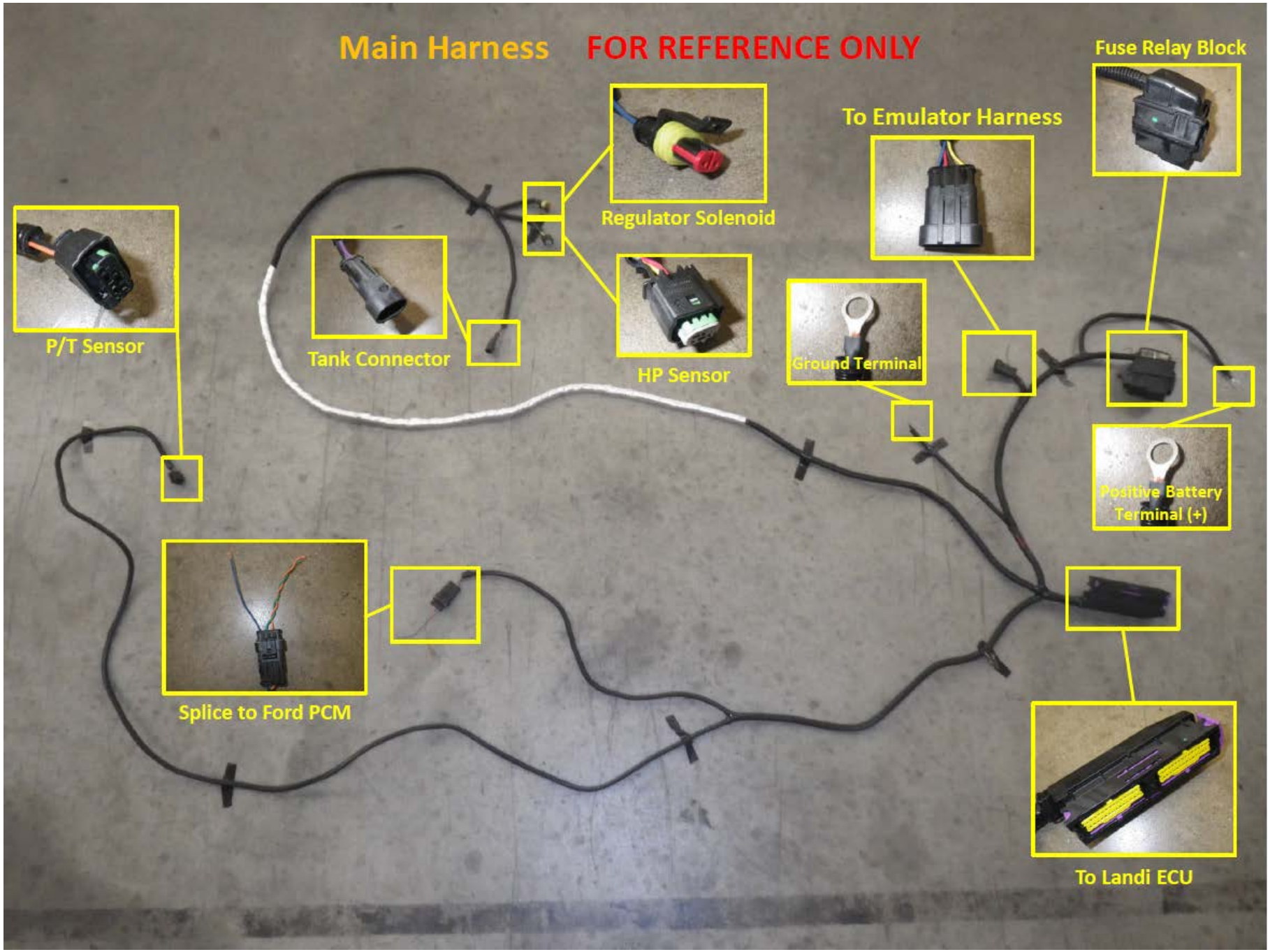
<table>
<tr><th colspan="2">Test Steps</th><th>Results ▸</th><th>Action to Take</th></tr>
<tr><td>B7</td><td>Check Emulator for Proper Voltage Reading</td><td></td><td></td></tr>
<tr><td colspan="2">- With Ignition ON, HP sensor and Emulator connected
- Measure the voltage between:
+ Emulator, PIN 5 (Pressure Signal), Harness Side
+ PIN 2 (Signal Ground)
- Reference system pressure on HP Manual Gauge near Fill Receptacle and the following chart:

- Is the voltage reading within the reference values ±0.25V?</td><td>Yes ▸

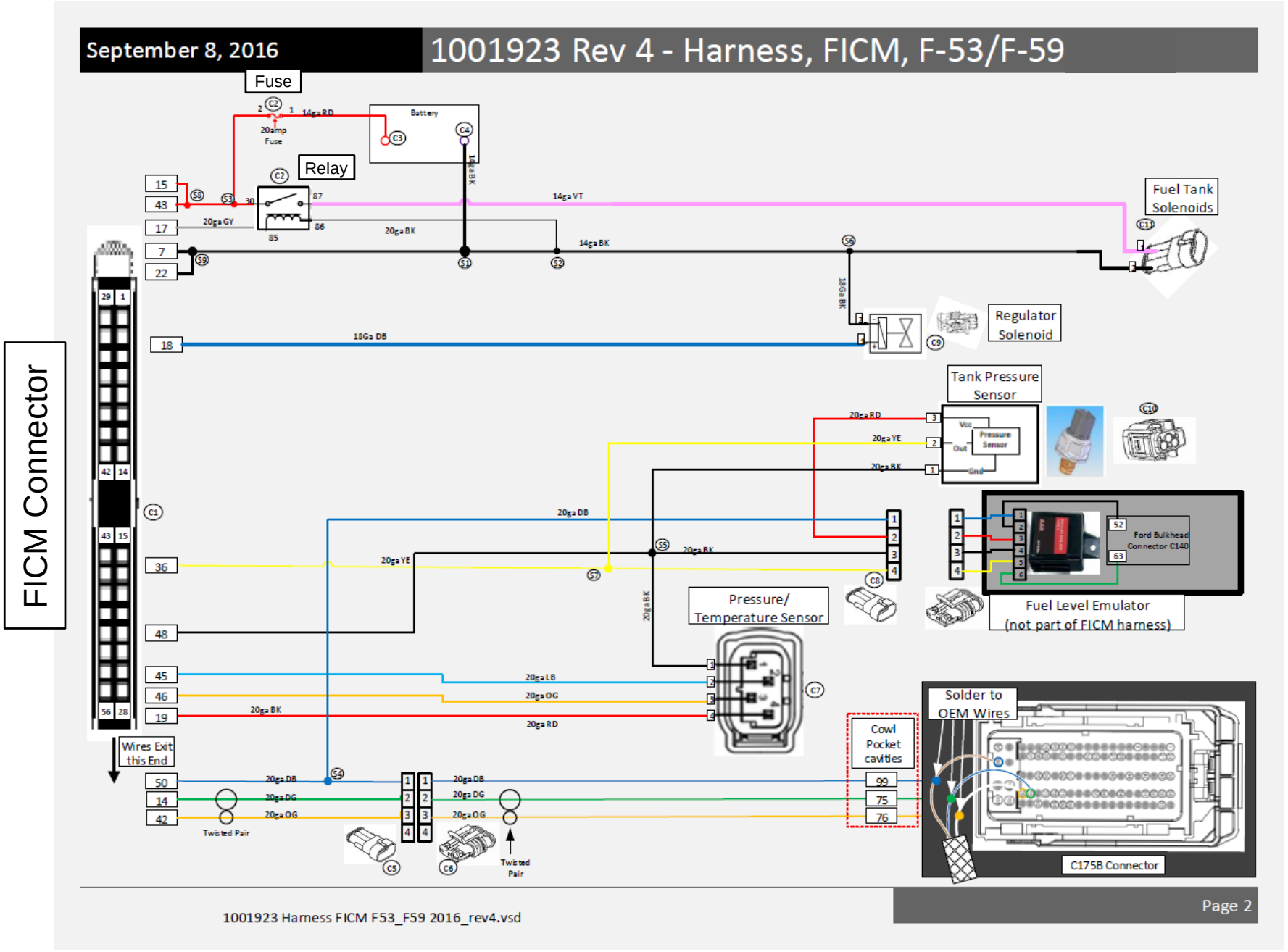
No ▸</td><td>CONTACT Landi Renzo USA Service.
REPLACE Emulator.
CONTACT Landi Renzo USA Service.</td></tr>
</table>

Pressure (psig)	Ref. Voltage (V)
0	0.5
500	0.9
1,000	1.3
1,500	1.7
2,000	2.1
2,500	2.5
3,000	2.9
3,500	3.3
4,000	3.7
4,500	4.1
5,000	4.5

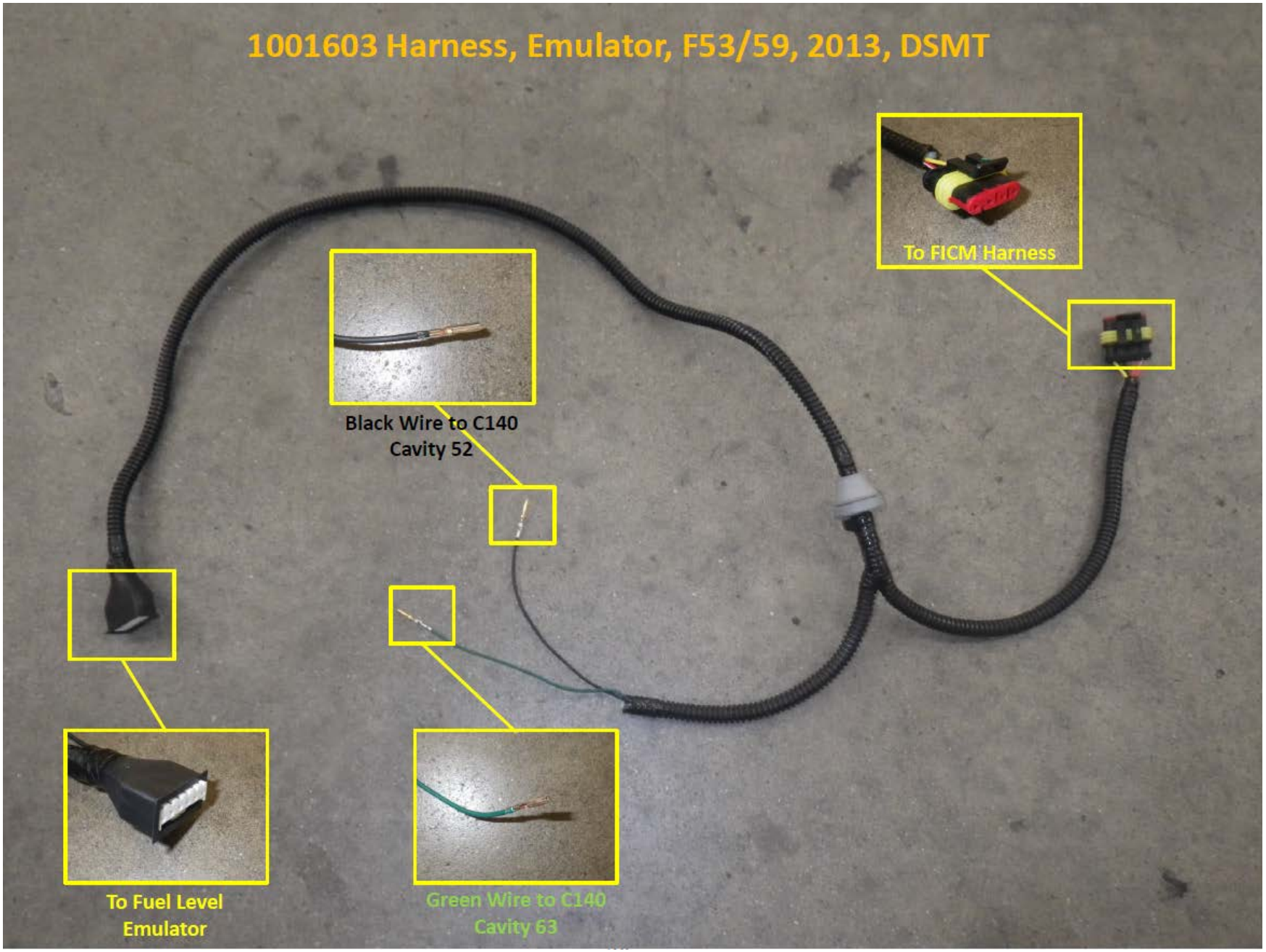
LANDI RENZO MAIN HARNESS OVERVIEW



LANDI RENZO MAIN HARNESS WIRING DIAGRAM



LANDI RENZO EMULATOR HARNESS OVERVIEW



STARTER INTERRUPT INSTALLATION WIRING DIAGRAM