Fuel System Installation Inspection

These Fuel System Checks are designed to check over 90% of the system without using CNG within the facility. After the system is completely pressurized with CNG (3600) the system will need a quick inspection of fittings and coolant flow that could not be inspected within the facility.

MOMENTUM

Vent System Checks

Check WARNING Sticker is placed by vent end and vent caps are installed.

Make sure hoses are secured so they don't rub but are able to flex and move with the cab.

MOMENTUM

Fuel Gauge Signal Check

To check if the fuel gauge is receiving a signal from the fuel system without pressure conduct a power check.

Without power (Key Off) the needle on the fuel gauge will rest just below the E.

When the key is turned on the needle on the gauge will move up and rest online with E.

When the key is turned off the needle will rest just below the E.

Note: *If fuel gauge does not move, see Fuel Gauge Enabling Instructions.*

MOMENTUM

Starter Interrupt Access Door Check

With door closed and latched, try to engage the starter. Starter should engage.

Open door, try to engage the starter. Starter should not engage.

Note: *If system is not operating correctly see Fuel System Troubleshooting Guide.*

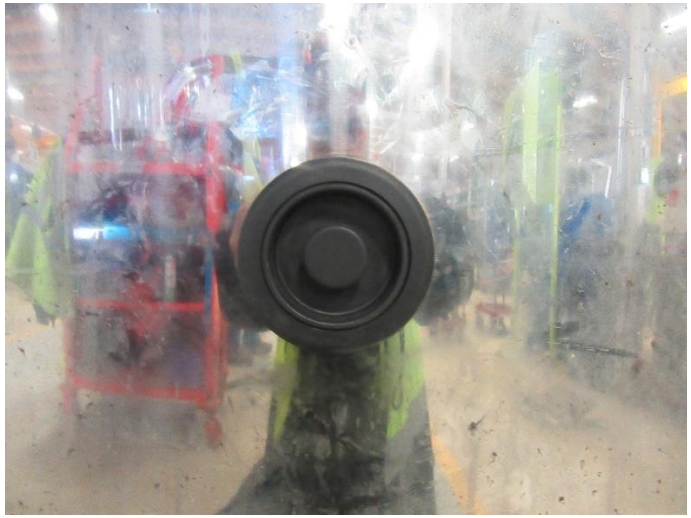
MOMENTUM

Starter Interrupt Bumper Fill Check

With bumper fill cap inserted, try to engage the starter. Starter should engage.

Remove the bumper fill cap, try engage the starter. Starter should not engage.

Note: *If system is not operating correctly see Fuel System Troubleshooting Guide.*



MOMENTUM

Bumper Fill Inspection

Inspect the bumper fill cap for proper installation.

Wiring should be secured to protect it from damage.

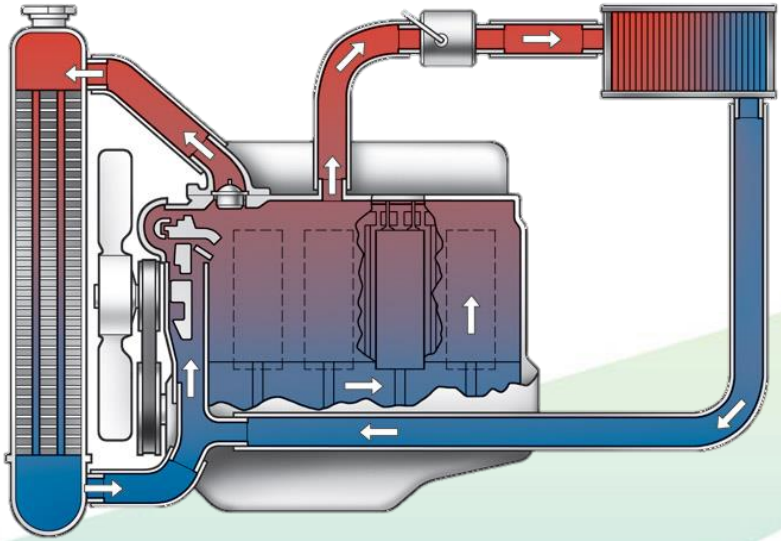
Leak check all fittings on the high pressure fuel line.

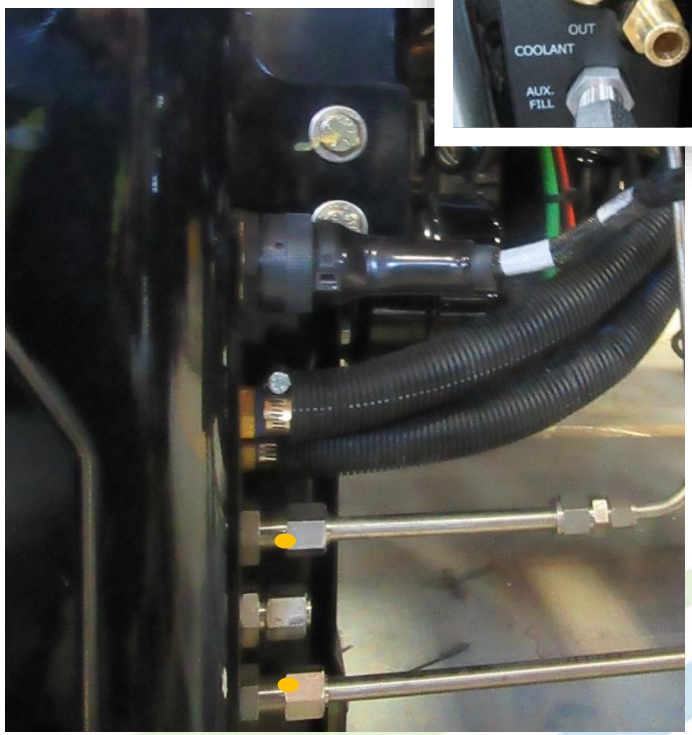
Make sure fitting is torque striped when completed.

MOMENTUM

Coolant Hose Connection

As CNG expands it gets very cold known as the *Joule-Thomson* effect. Moisture in CNG can form ice and hydrate deposits. To prevent icing inside the regulator engine coolant is cycled through the regulator. To ensure coolant flow the IN connector needs to come from the hot-side (red) and the out connector return to the cool-side (blue).





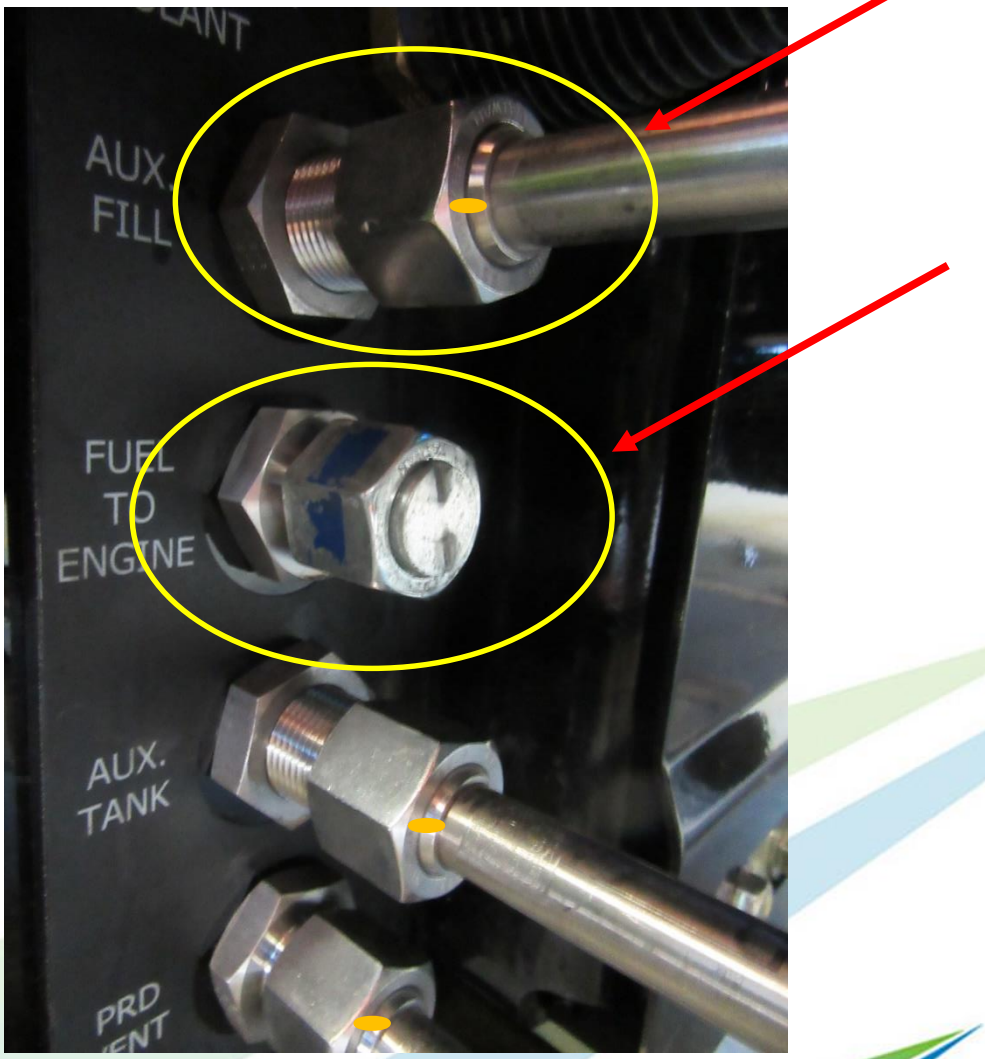
MOMENTUM

System Pressure Checks Set-Up

To set up for pressure testing with out using CNG cap off the Fuel to Engine port and ensure the cross over line is installed and torqued.

The AUX Fill needs to be installed if equipped or cap if not required.

Note: The testing gas will be **Nitrogen.** *Nitrogen is an inert gas and will be kept isolated to just the fuel system, and not entered into the engine.*



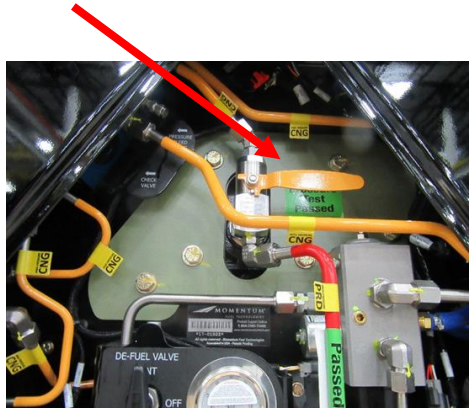
MOMENTUM

Pressure Test Without CNG

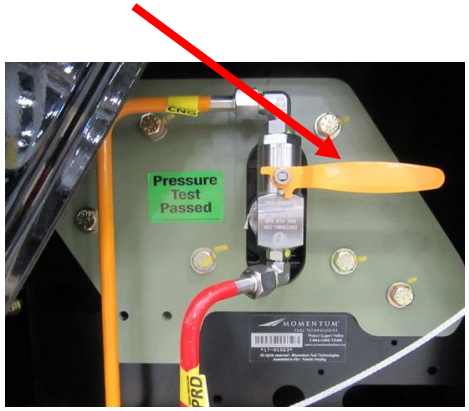
Make sure that both fuel system cylinders Manual Shut Off Valves are closed before adding pressurized inert gas (**Nitrogen)** to the fuel system.

Ensure the fuel receptacle that is used is clean.

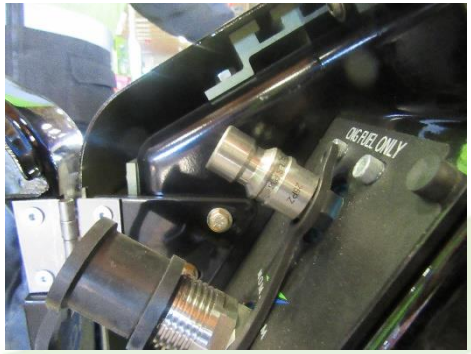
Attach fuel nozzle to receptacle and pull back to ensure it is lock into place.

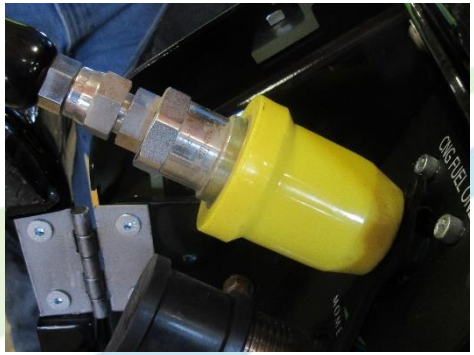


Driver Side Valve OFF



Passenger Side Valve OFF

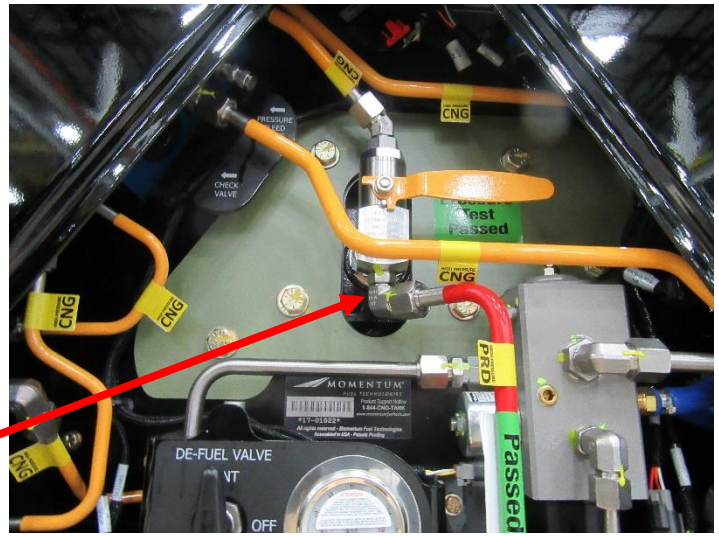




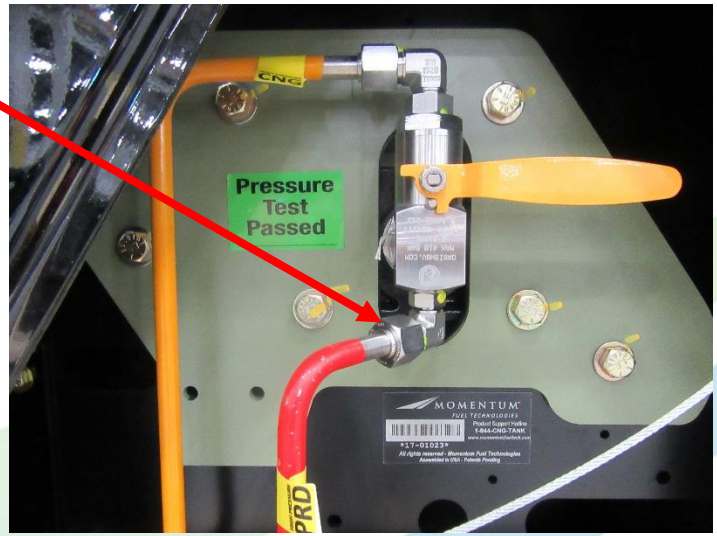
MOMENTUM

PRD Fitting Pressure Check

Pressure testing of the PRD elbows attached to the lower part of the cylinder valve CAN NOT be pressure tested until the crossover line is installed and both cylinders are filled to 3600 psi. The install location is responsible for pressure testing these fittings.



Driver Side PRD Fitting



Passenger Side PRD Fitting

MOMENTUM

Bumper Fill Pressure Test with Inert Gas

Installer Inspection Requirements:

1) Pressure test fuel system to service pressure of **3600** psi using natural gas or inert gas. Each connection shall have no bubbles in **three** minutes.
2) Leak-check connections on Bumper Fill Line and Bumper Fill Receptacle.

MOMENTUM

Pressure Test with Inert Gas

Passing inspection shall require the following:

1) Each connection shall have no bubbles in **three** minutes.
2) Any leakage as noted shall be corrected; and
3) The fuel system shall be leak-checked again after any corrections, modifications, disassembly, repairs or replacement of components of the natural gas system.

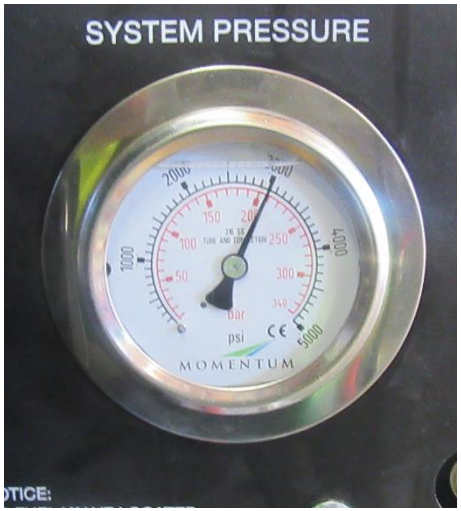
MOMENTUM

Fuel Gauge Level Testing

MOMENTUM

Fuel Level Reading

Fuel Level Per Psi Reading



0 psi = E
900 psi = ¼ Tank
1800 psi = ½ Tank
2700 psi = ¾ Tank
3600 psi = Full Tank

All readings are at 70 °F

Accurate temperature compensation allows dispensers to place a full fuel load on the vehicle during all weather conditions. Anytime the temperature of the gas in a cylinder is higher than 70° F, the full cylinder pressure will be greater than the commonly rated 3,600 psi service pressure at 70° F.

MOMENTUM

Temperature Compensated Cylinder Pressure

Temperature Compensated Cylinder Pressure	
3,600 psi service pressure calculated from the standard gas composition used to create the gasoline gallon equivalent	
Gas Temperature, Degrees F	Pressure in Full 3,600 psi CNG Container, psig
123.6	4,500
120.0	4,455
110.0	4,272
100.0	4,105
90.0	3,936
80.0	3,768
70.0	3,600
60.0	3,432
50.0	3,263
40.0	3,094
30.0	2,926
20.0	2,757
10.0	2,589
0.0	2,421
-10.0	2,253
-20.0	2,086
-30.0	1,919
-40.0	1,753

MOMENTUM

Pressure Test With Out CNG

With the regulator at 1000 psi

The gauge on the fuel system should read the same pressure.

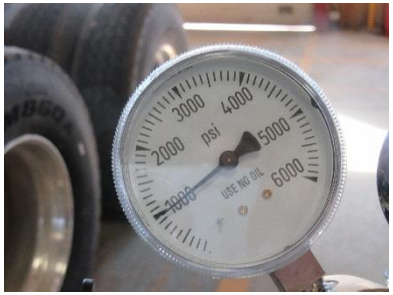
Check the low pressure gauge on the fuel system should read 0

With the key on, check the low pressure fuel gauge. It should have approximately 125 psi. You should also be able to hear fuel solenoid valve click open.

Check the fuel gauge it should read around a quarter tank.

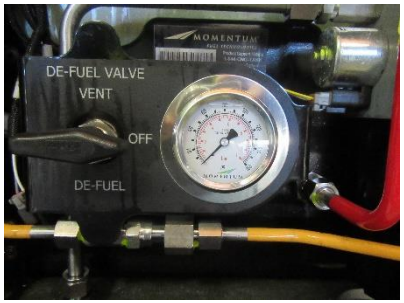
Note: *If there is no reading on the low pressure gauge or you hear no solenoid click see Fuel System Troubleshooting Guide*

Inert Gas Pressure



System Pressure

Low Pressure Key Off



Low Pressure Key On

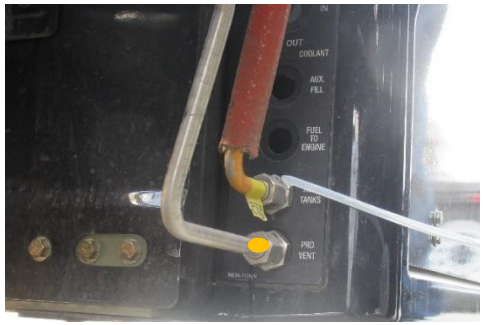
Fuel Gauge Key On

MOMENTUM

Requirements for Leak Check Using Inert Gas

Installer Inspection Requirements:

Pressure test fuel system to service pressure of **3600** psi using natural gas or inert gas. Each connection shall have no bubbles in **three** minutes.

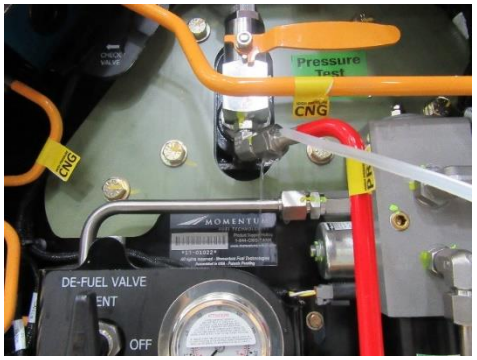


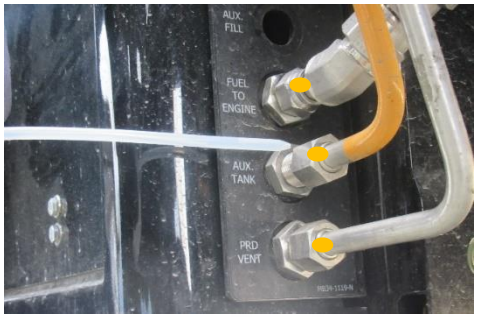
MOMENTUM

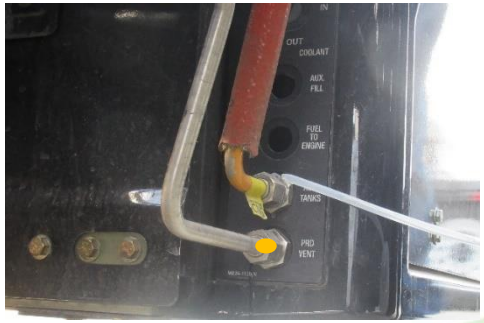
Leak Check with CNG

Installer Inspection Requirements:

1) Pressure test fuel system to service pressure of **3600** psi using natural gas or inert gas. Each connection shall have no bubbles in **three** minutes.
2) Leak test driver and passenger PRD elbows.
3) Leak-check connections on cross over lines.
4) Leak-check connections on Bumper Fill Line and Bumper Fill Receptacle.
5) Leak-check connections on Low Pressure Line.
6) Make sure fitting is torque striped when completed.



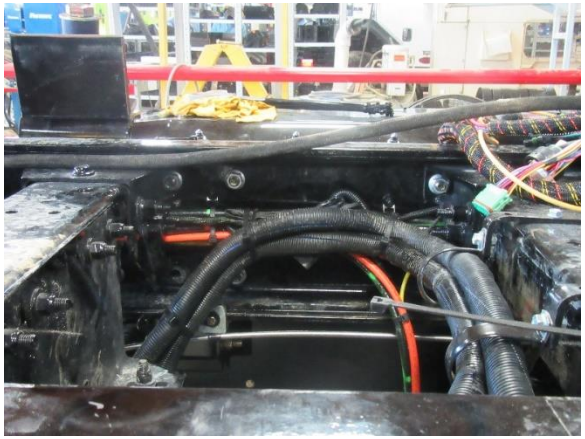


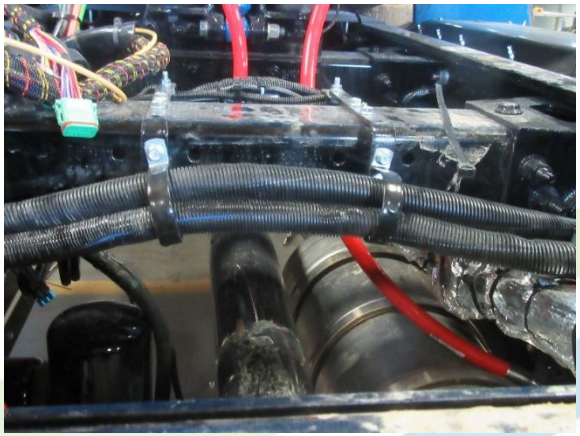


MOMENTUM

Coolant Hoses

Make sure coolant hoses are secured with no flow being slowed or cut of due to clamps or zip ties that are too tight.





MOMENTUM

Coolant to Regulator Check

Before releasing the truck to the customer ensure you run truck until you feel warm air coming out of the heater vents and the regulator should feel as warm with heater is on or off when touched.

MOMENTUM

Fill Out Check Sheet

1. **REQUIRED HARDWARE:** 5/8" Grade 8 hardware used to attach module mounting brackets to vehicle frame. **Torque: 210ft/lbs.** _____

2. **REQUIRED HARDWARE:** 9/16" Grade 8 hardware used to attach module to mounting brackets. **Torque: 150ft/lbs.** _____

3. Visually inspect for torque marks/striping on all installed components, hardware, and lines. _____

4. Pressurize fuel system with tank valves closed to 3600 psi using nitrogen gas. Verify with liquid leak detector that all fittings and connections have no visible signs of a leak. System must be able to hold pressure for **THREE** minutes without any signs of a leak per NFPA 52 standards and regulations. _____

5. Verify that coolant hose connections are installed correctly and tight. No spring style clamps are allowed to be used. Pressurize coolant circuit to 15 psi to verify. _____

6. Verify that "starter interrupt circuit" is working correctly. Vehicle starter should not crank with fueling door open or fueling caps off. _____

7. Verify that the fuel gauge is working correctly. If no fuel is available, gauge needle will move to "E" if it is receiving a signal. If needle drops below "E", no signal is being received by the gauge. _____

8. Verify that the high pressure regulator is operating properly when powered. _____

9. All labels and decals are properly installed. _____

10. All high pressure hard lines and low pressure soft lines are properly supported and routed correctly. _____

11. All unforeseen changes or alterations have been documented and communicated to Momentum Fuel Technologies prior to sign off. _____

12. During initial full pressure CNG fill, PRD connections checked for leaks. _____

13. Road tested to verify function. _____

MOMENTUM

MOMENTUM