

	Date	Group	No.	Release	Page
This PI replaces PV729-PI0846 (USA65208), "Fuel Management Module, Replacement" dated 10.2014.	10.2014	386	846	02	1(38)

Fuel Management Module, Replacement CXU

PI0846, Fuel Management Module, Replacement

(October 2014)

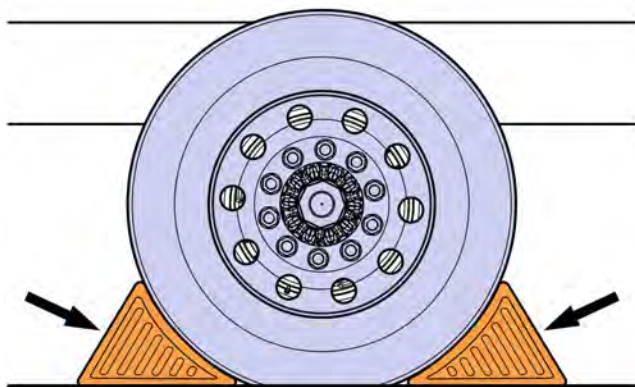
On certain Mack CNG (Compressed Natural Gas) models, built between 05/01/2013 and 07/25/2014, the low fuel warning may come on too early and the fuel gauge may show full if the fuel level sensor signal becomes open. In addition the gauge may show lower tank levels at cold temperatures or higher tank levels at hotter temperatures. This is due to the fact that the software in the fuel management module (FMM) did not have the correct calibration, open circuit fault criteria and was not temperature compensated. To correct this issue follow the procedure below.

Inspection

You must read and understand the precautions and guidelines in Service Information, group 3, "General Safety Practices, Electrical" before performing this procedure. If you are not properly trained and certified in this procedure, ask your supervisor for training before you perform it.

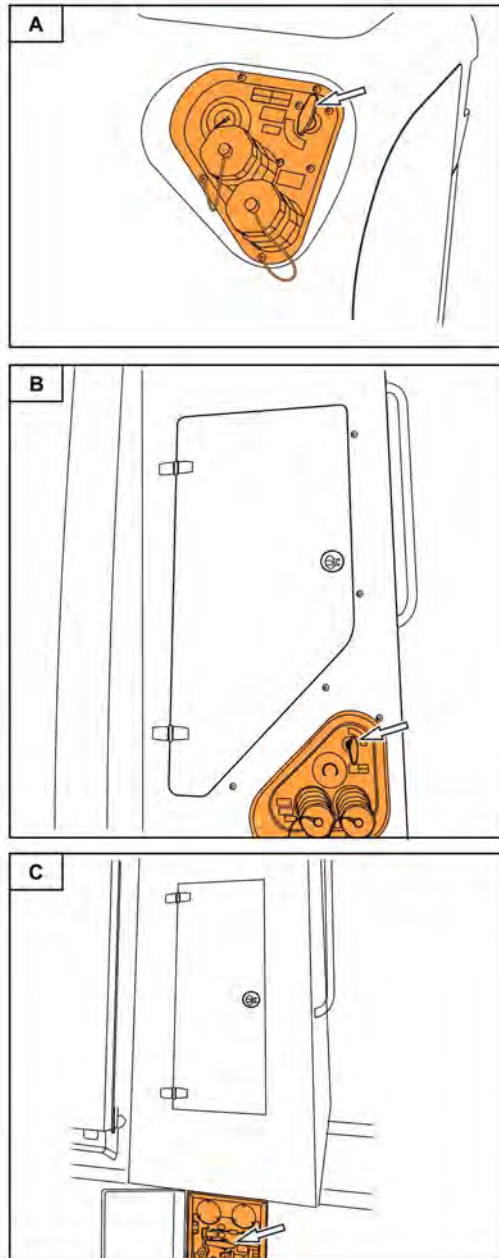
The FMM may be located on the rail with frame mounted tank or either inside or outside of the access door with a cabinet mounted tanks. Look to see where the shut off valve is located and choose the correct repair below when replacing the FMM.

- 1 Secure the vehicle for service by parking it on a flat level surface, applying the parking brake, chocking the rear wheel, and placing the transmission in neutral.



W7086748

- 2 Check to see where the FMM is mounted by locating the shut off valve per the illustrations below.



W3091600

Repair A: Tank mounted
Repair B: Internal
Repair C: External

- 3 Once the FMM location has been determined go to the appropriate Repair section labeled, A, B, or C.

Required Parts

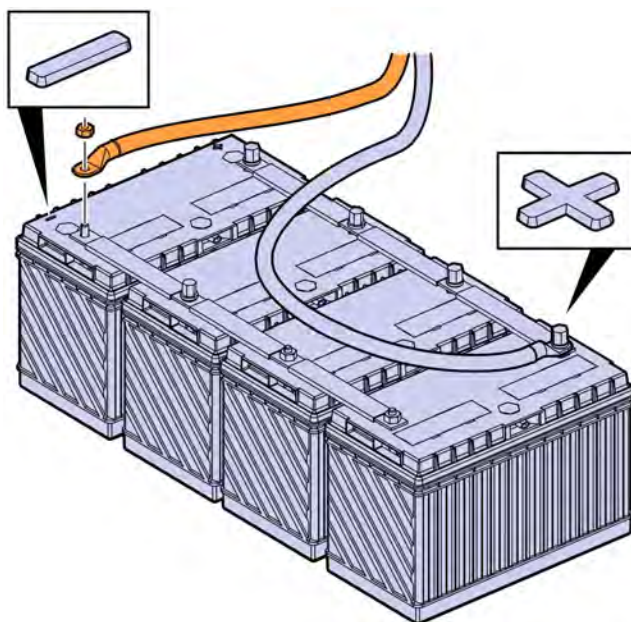
Quantity	Part Number	Description
1	85143376	Control Unit CNG Fuel Levels

Repair A

You must read and understand the precautions and guidelines in Service Information, group 3, "General Safety Practices, Electrical" before performing this procedure. If you are not properly trained and certified in this procedure, ask your supervisor for training before you perform it.

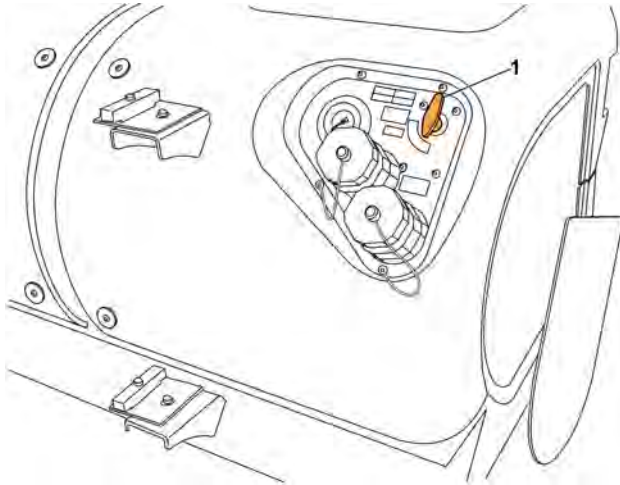
Tank mounted FMM

- 1 Disconnect all cables from the negative (ground) battery terminals to prevent personal injury from electrical shock and prevent damage to electrical components.



W3086747

- 2 Turn the CNG fuel system off, follow procedures as outlined:
 - 2a. Turn the Manual Fuel System valve (red knob) to Closed.

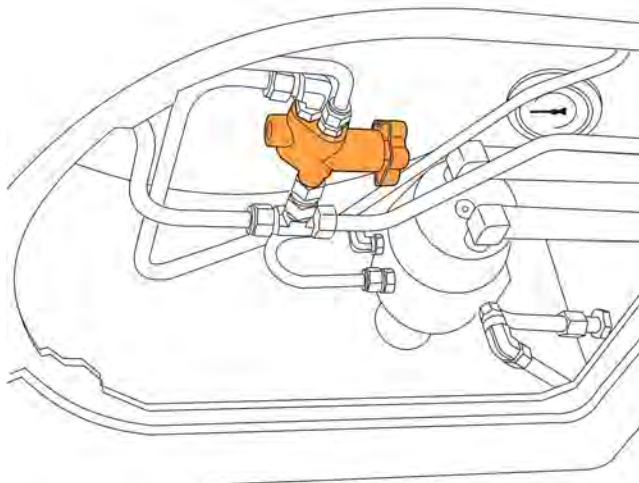


W3090943

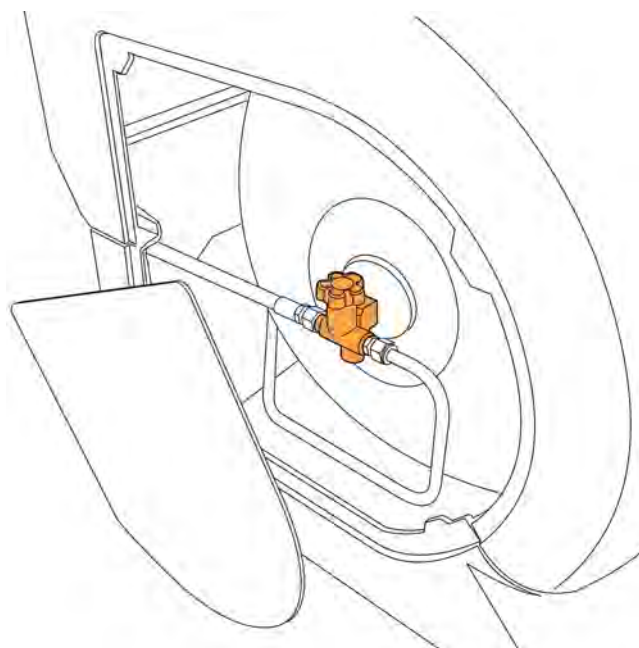
1. CNG Fuel System Shut Off Valve

Note: This valve isolates the fuel system from the engine.

- 2b. Open rear access door(s) on both tank(s) if applicable.
2c. Turn each tank valve OFF.



W3090944

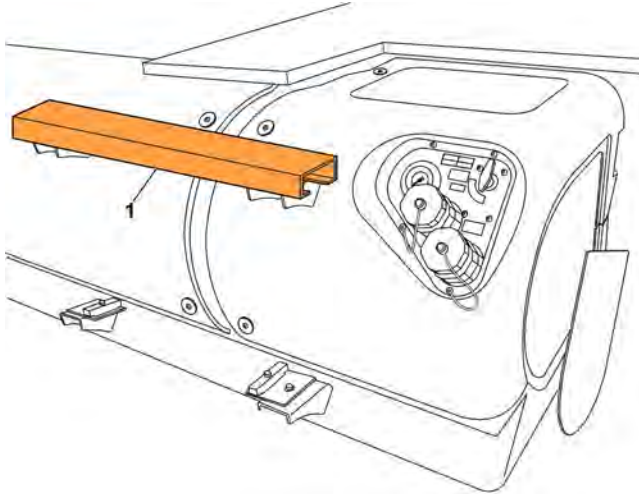


W3090945

Note: This will isolate each fuel tank separately from the CNG fuel system.

- 3 Remove the rear step tread from the tank identified as containing the FMM.

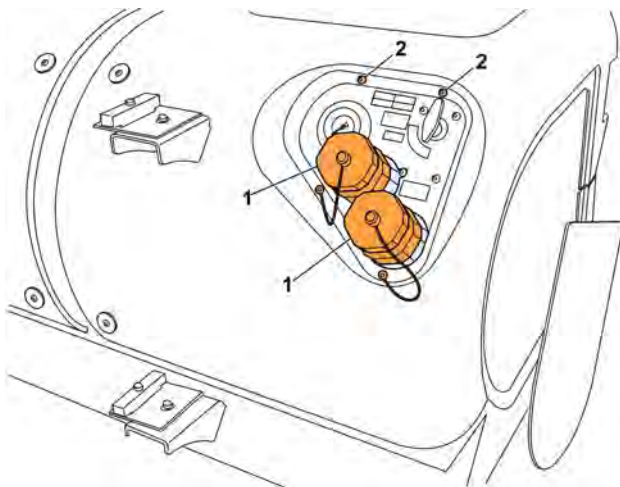
Note: Left frame rail mount shown, right side similar.



W3091719

1. Step tread

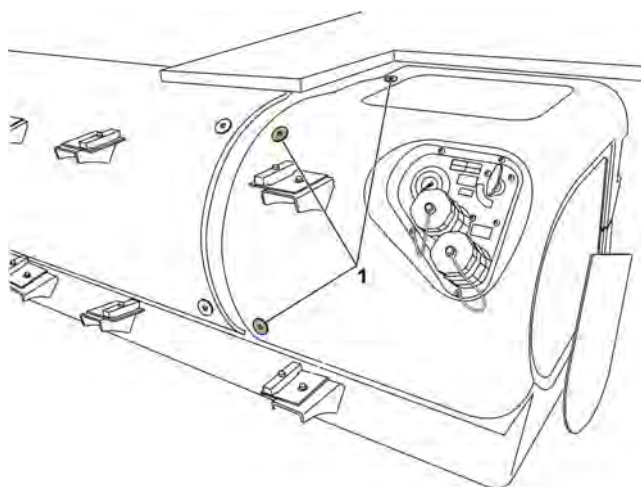
- 4 Remove the tank caps, tethers and top two housing screws.



W3090947

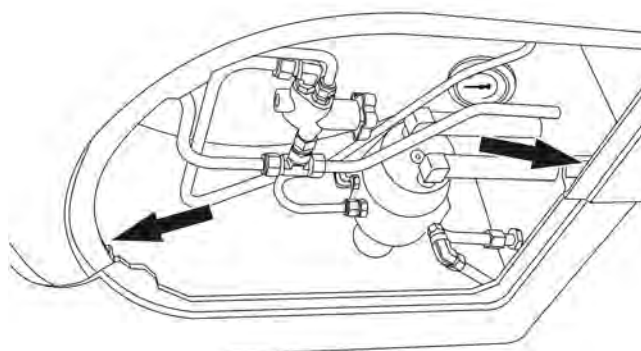
1. CNG fuel caps
2. Housing screws

- 5 Remove the top cover from the tank including rear access door and tether.

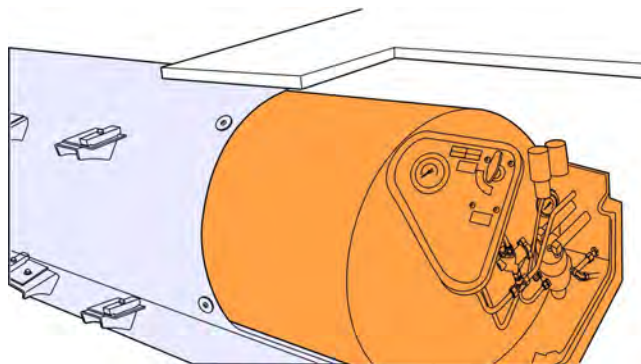


W3090949

1. Fasteners

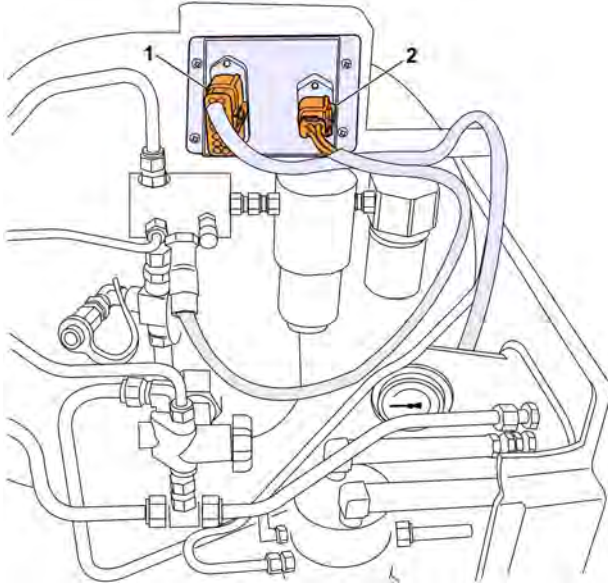


W3090950



W3090952

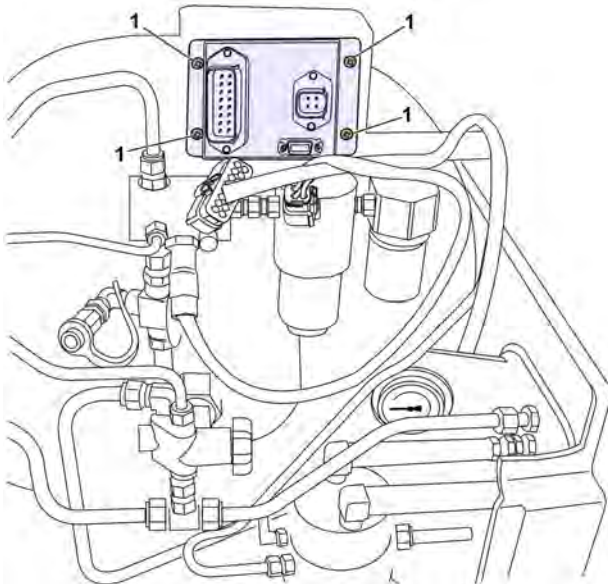
6 Disconnect the FMM harnesses.



W3090953

- 1. FMM Harness Connector
- 2. FMM Harness Connector

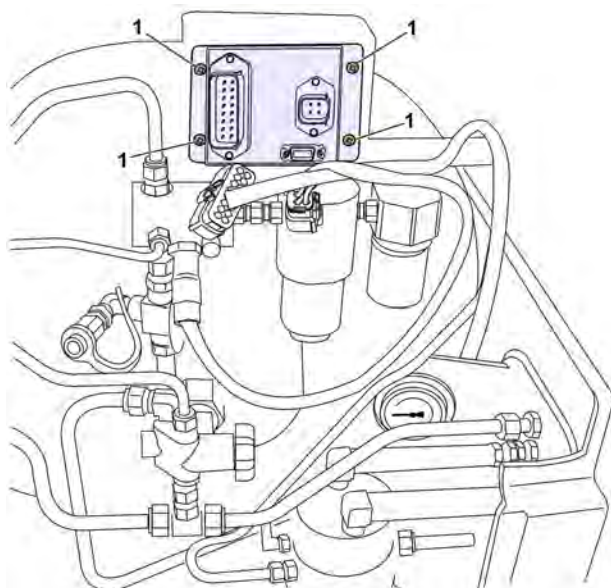
7 Remove FMM.



W3090954

- 1. Fasteners

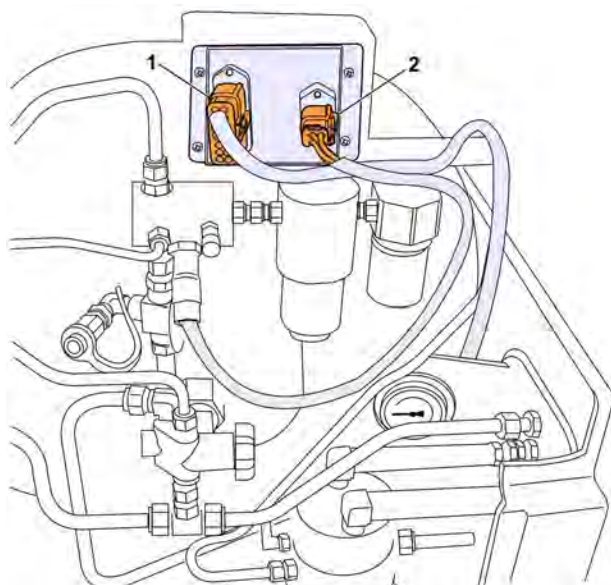
8 Install new FMM



W3090954

1. Fasteners

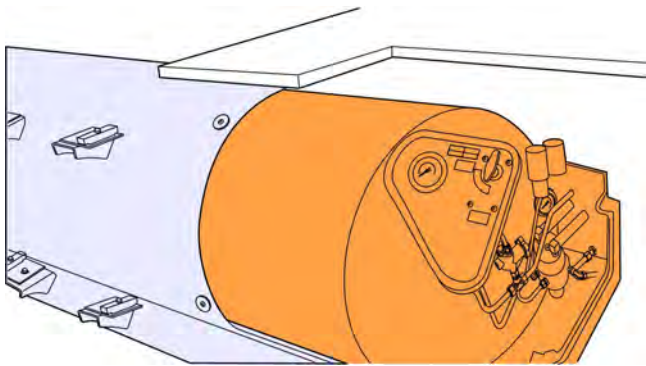
9 Connect the FMM harnesses.



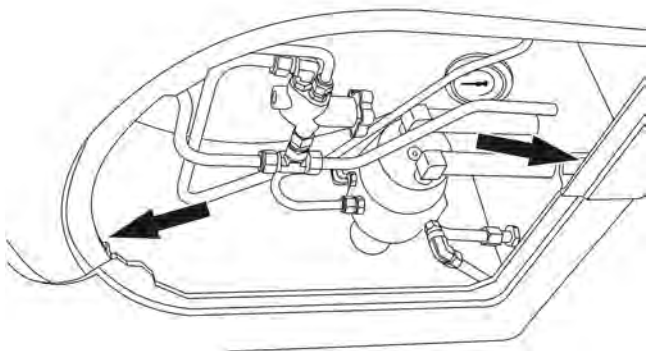
W3090953

1. FMM Harness Connector
2. FMM Harness Connector

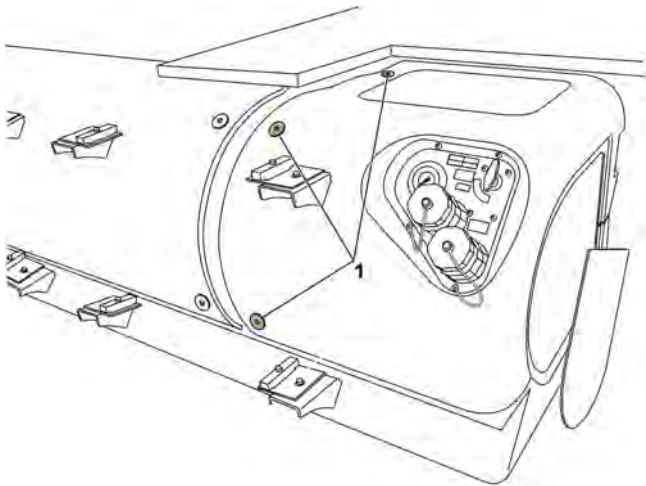
10 Install top cover.



W3090952



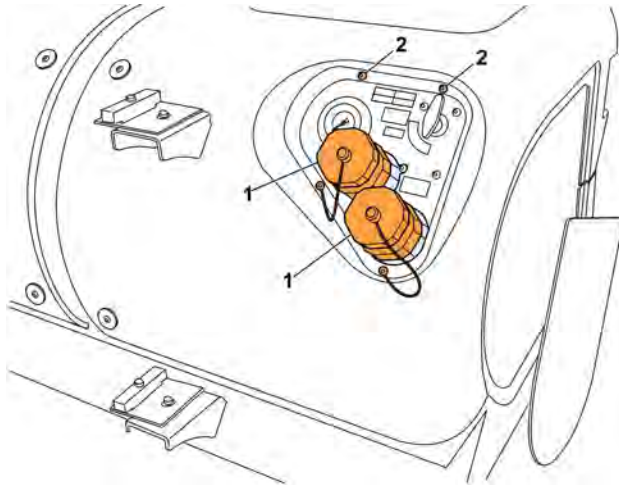
W3090950



W3090949

1. Fasteners

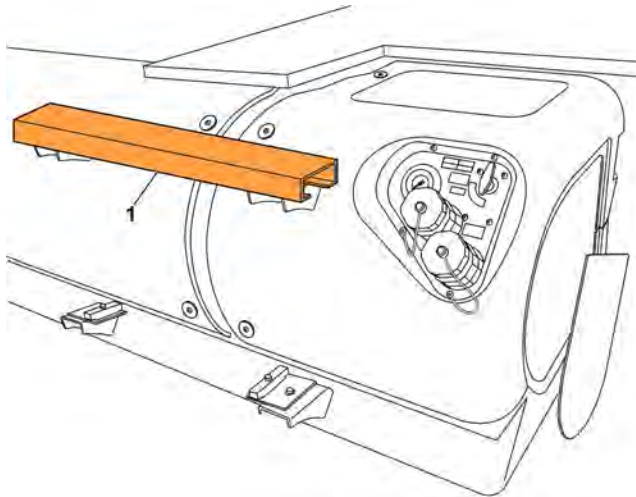
11 Install cap tethers, caps and additional top two screws.



W3090947

- 1. CNG fuel caps
- 2. Housing screws

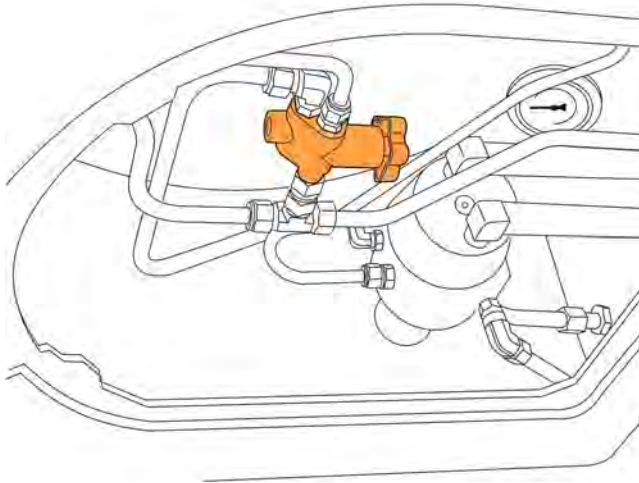
12 Install the step tread.



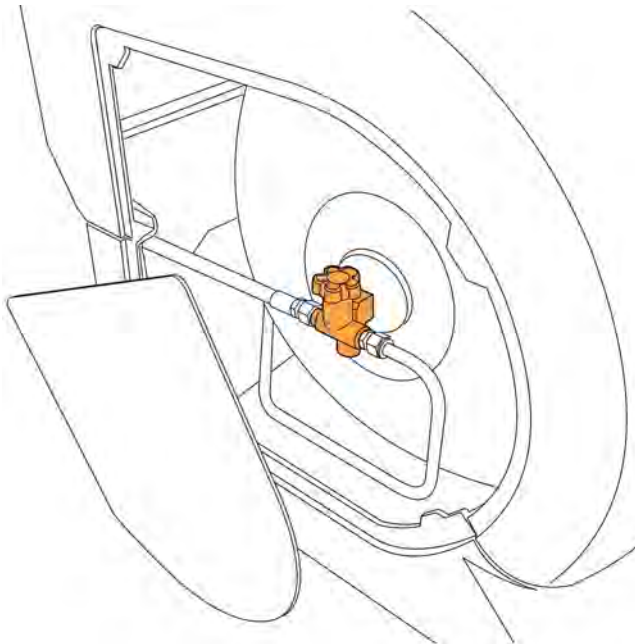
W3091719

- 1. Step tread

- 13 Turn fuel system ON, follow procedures as outlined:
13a. Turn tank valve(s) on.

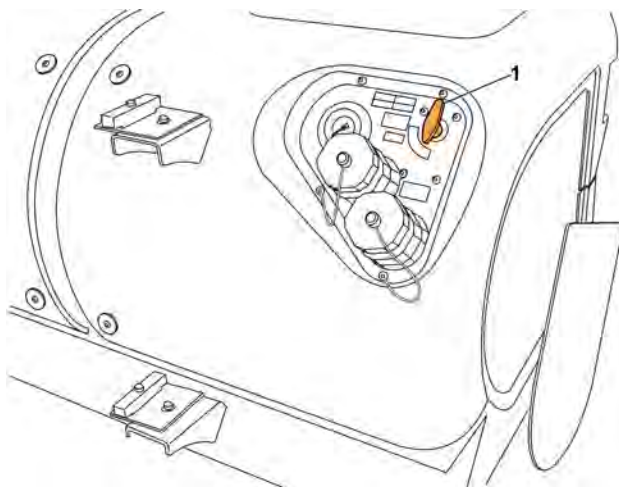


W3090944



W3090945

13b. "SLOWLY" turn the Fuel System Valve (red knob) to OPEN.



W3090943

1. CNG Fuel System Shut Off Valve

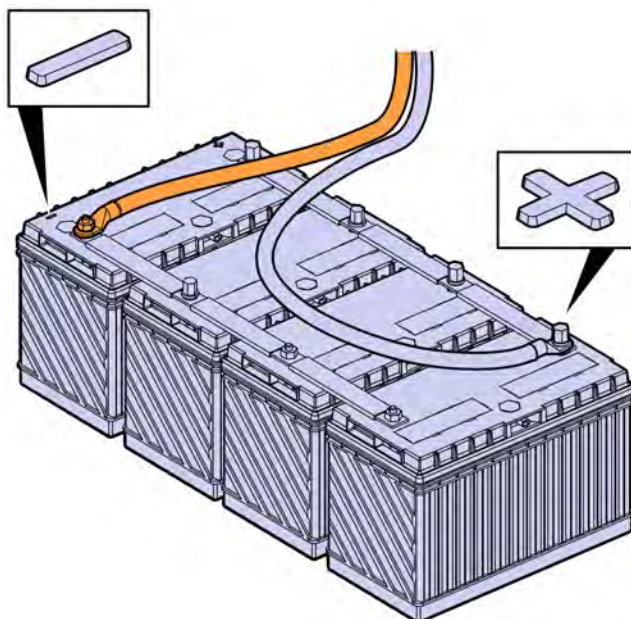
Note: Allow approximately 10 seconds of time to perform.



CAUTION

Failure to slowly open valve could cause damage to system by high pressure gas if opened too quickly.

14 Install all the previously removed cables to the negative (ground) battery terminals.



W3086758

15 Test the safety feature of the system.

15a. Start engine and then turn the engine off.

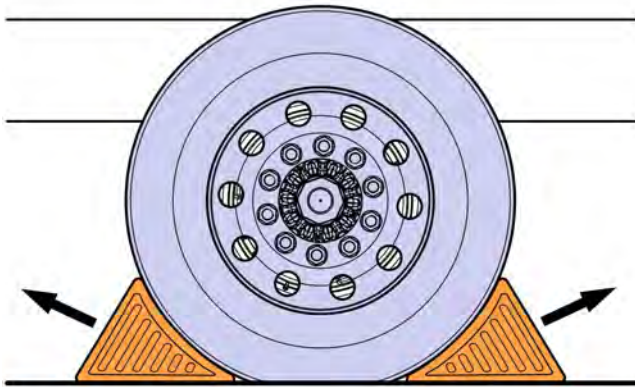
15b. Remove both tank caps and try to start the engine.

- If the engine does not start, the safety feature is working properly. Proceed to next step.
- If the engine starts, the safety feature is not working correctly and will need to be serviced.

Note: See Agility for more information.

16 Install both fuel caps.

17 Remove the wheel chocks.



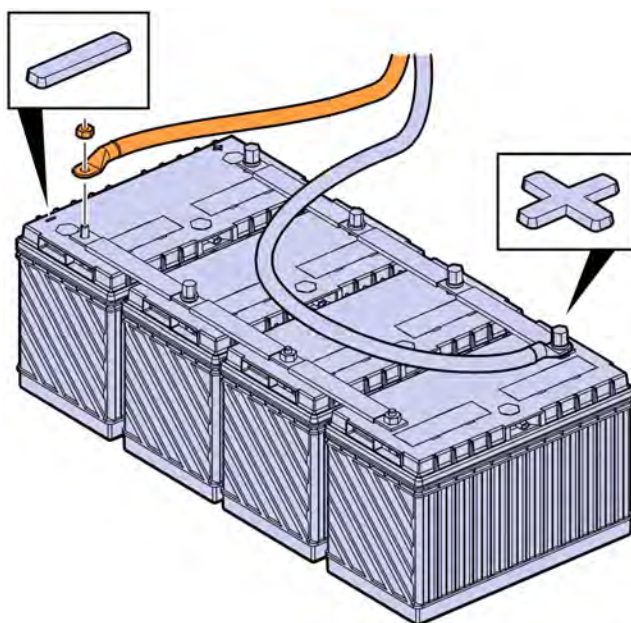
W7086759

Repair B

You must read and understand the precautions and guidelines in Service Information, group 3, "General Safety Practices, Electrical" before performing this procedure. If you are not properly trained and certified in this procedure, ask your supervisor for training before you perform it.

Internal FMM

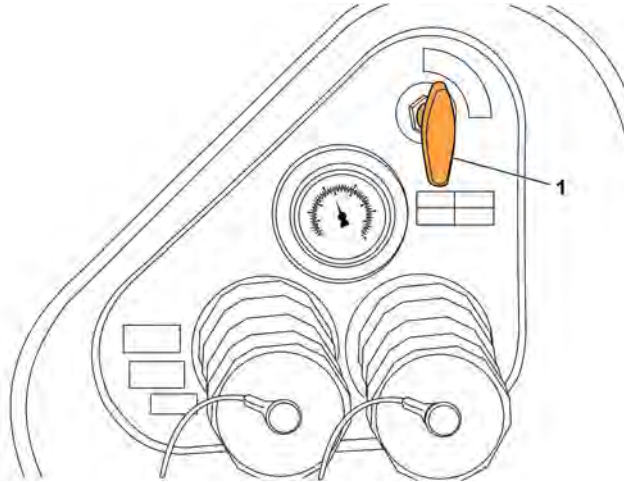
- 1 Disconnect all cables from the negative (ground) battery terminals to prevent personal injury from electrical shock and prevent damage to electrical components.



W3086747

- 2 Turn the CNG fuel system off, follow procedures as outlined:
 - 2a. Turn the Manual Fuel System valve (red knob) to Closed.

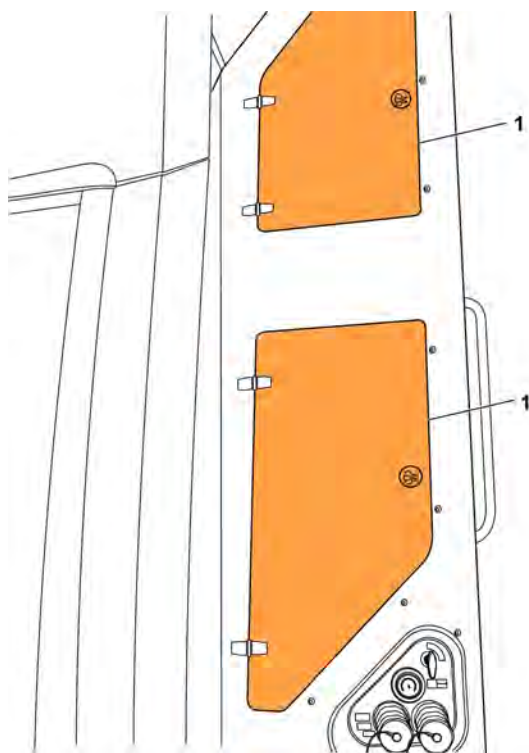
Note: This valve isolates the fuel system from the engine.



W3090955

1. CNG Fuel System Shut Off Valve

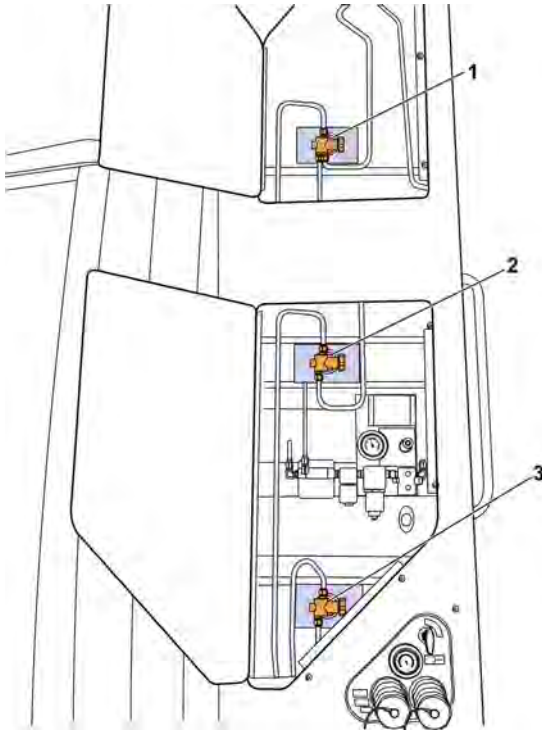
2b. Open access door(s)



W3090956

1. Access door

2c. Turn each tank valve OFF.

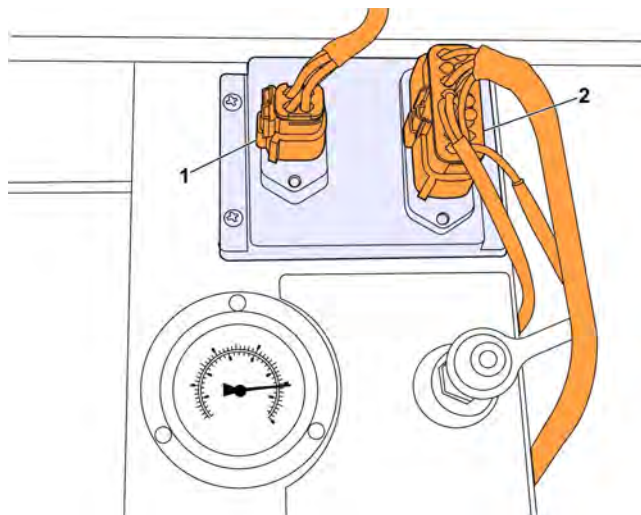


W3090957

- 1. Tank shut-off valve
- 2. Tank shut-off valve
- 3. Tank shut-off valve

Note: This will isolate each fuel tank separately from the CNG fuel system.

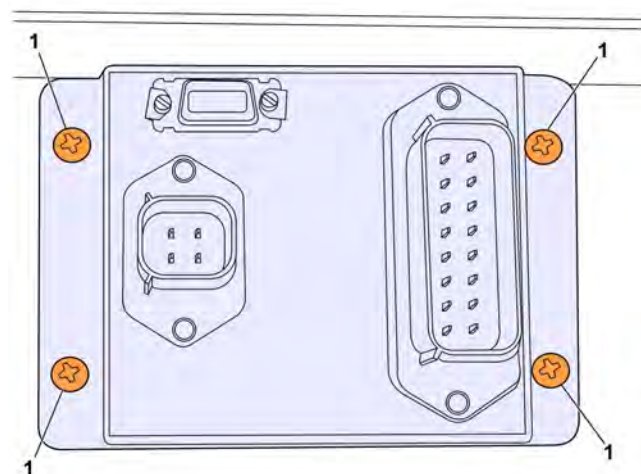
- 3 Disconnect the FMM harnesses.



W3090958

1. FMM harness connector
2. FMM harness connector

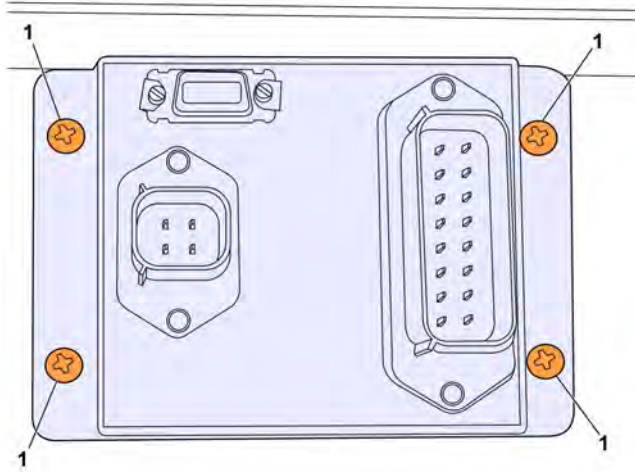
- 4 Remove the FMM.



W3090959

1. Fasteners

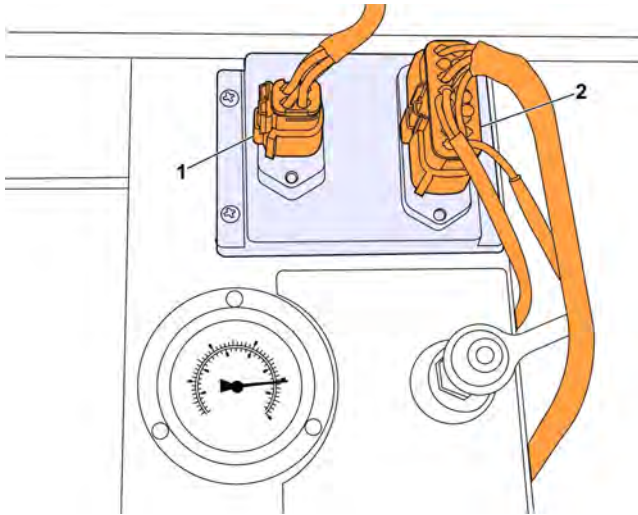
5 Install the FMM.



W3090959

1. Fasteners

6 Connect the FMM harness.

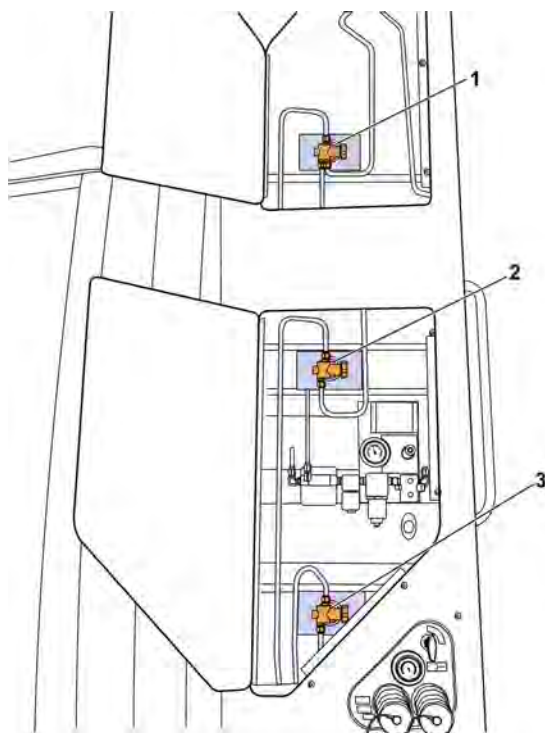


W3090958

1. FMM harness connector
2. FMM harness connector

7 Turn fuel system ON, follow procedures as outlined:

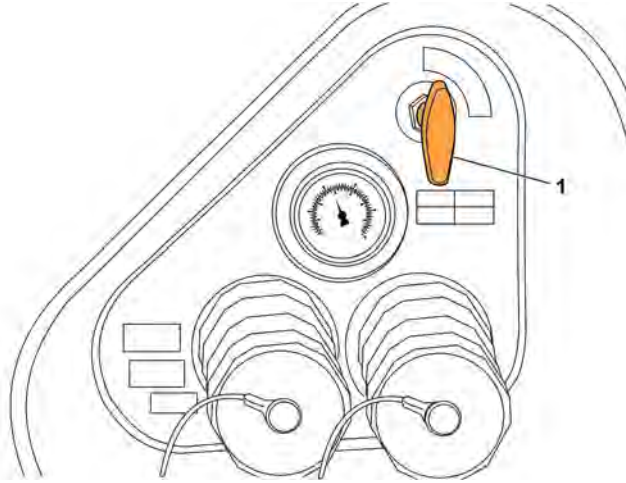
7a. Turn tank valve(s) on.



W3090957

- 1. Tank shut-off valve
- 2. Tank shut-off valve
- 3. Tank shut-off valve

7b. "SLOWLY" turn the Fuel System Valve (red knob) to OPEN.



W3090955

1. CNG Fuel System Shut Off Valve

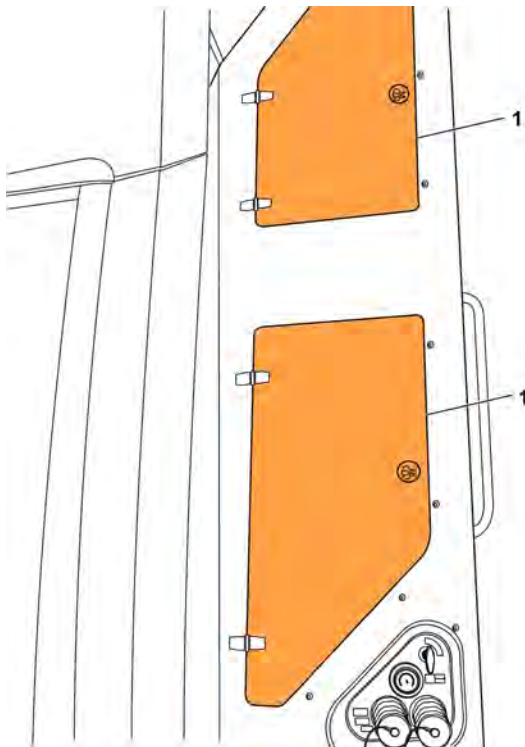
Note: Allow approximately 10 seconds of time to perform.



CAUTION

Failure to slowly open valve could cause damage to system by high pressure gas if opened too quickly.

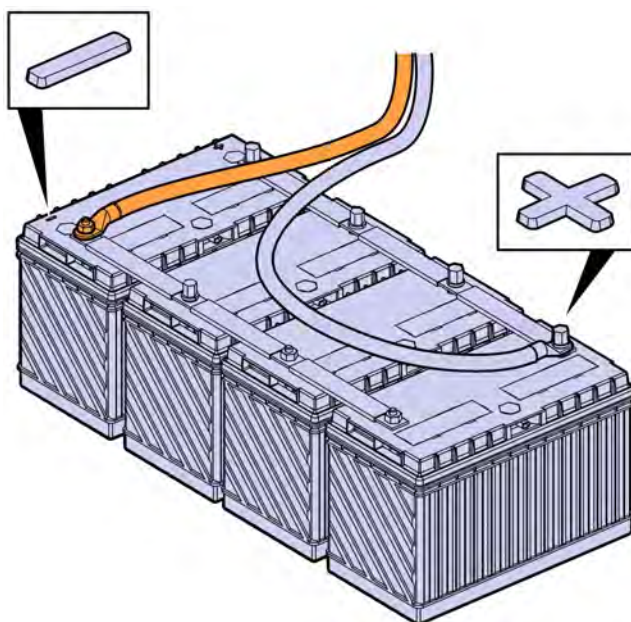
8 Close the access doors.



W3090956

1. Access Door

9 Install all the previously removed cables to the negative (ground) battery terminals.



W3086758

10 Test the safety feature of the system.

10a. Start engine and then turn the engine off.

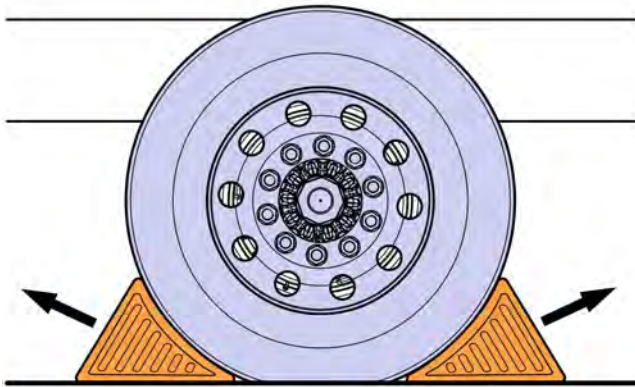
10b. Remove both tank caps and try to start the engine.

- If the engine does not start, the safety feature is working properly. Proceed to next step.
- If the engine starts, the safety feature is not working correctly and will need to be serviced.

Note: See Agility for more information.

11 Install both fuel caps.

12 Remove the wheel chocks.



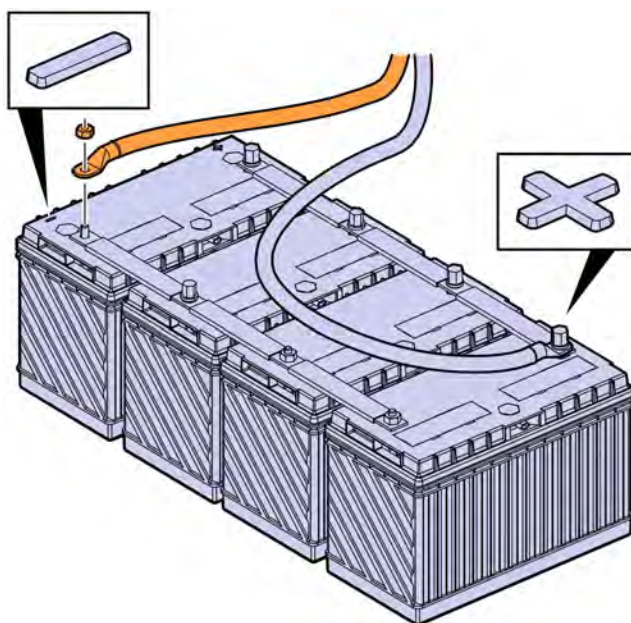
W7086759

Repair C

You must read and understand the precautions and guidelines in Service Information, group 3, "General Safety Practices, Electrical" before performing this procedure. If you are not properly trained and certified in this procedure, ask your supervisor for training before you perform it.

External FMM

- 1 Disconnect all cables from the negative (ground) battery terminals to prevent personal injury from electrical shock and prevent damage to electrical components.



W3086747

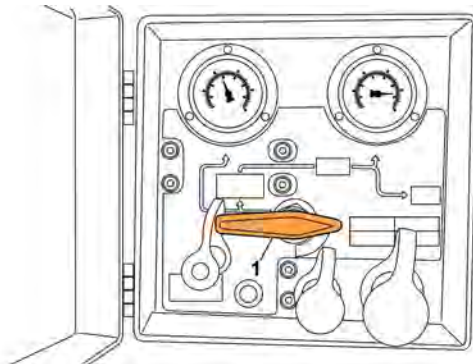
- 2 Turn the CNG fuel system off, follow procedures as outlined:
 - 2a. Open the access door and turn the Manual Fuel System valve (red knob) to Closed.

Note: This valve isolates the fuel system from the engine.



W3090960

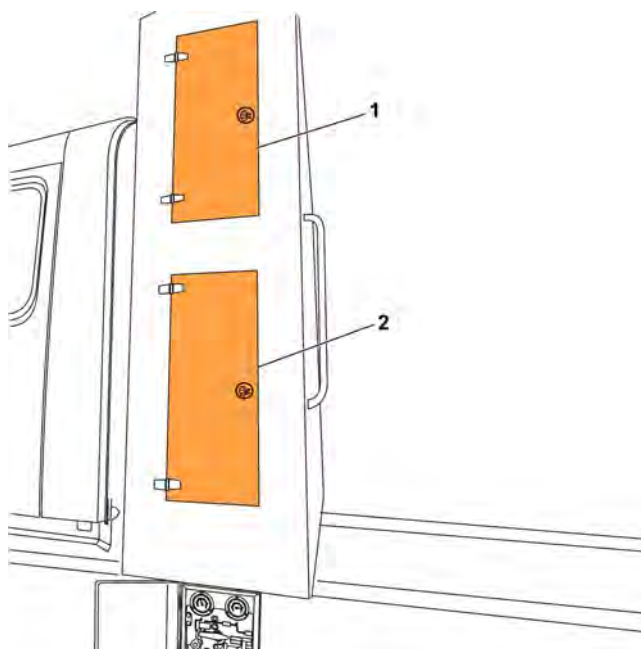
1. Access door



W3090961

1. CNG Fuel System Shut Off Valve

2b. Open access door(s)

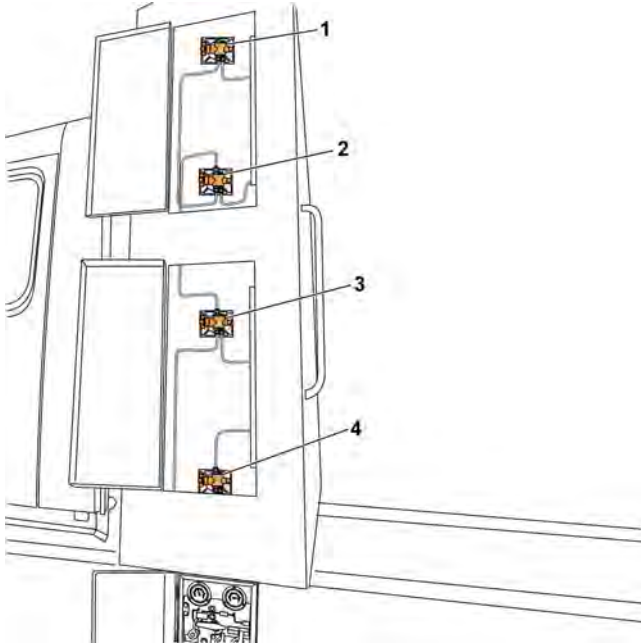


W3090962

- 1. Upper access door
- 2. Lower access door

2c. Turn each tank valve OFF.

Note: This will isolate each fuel tank separately from the CNG fuel system.

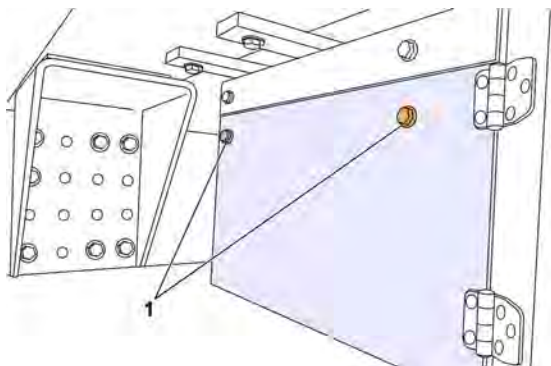


W3090963

- 1. Tank shut-off valve
- 2. Tank shut-off valve
- 3. Tank shut-off valve
- 4. Tank shut-off valve

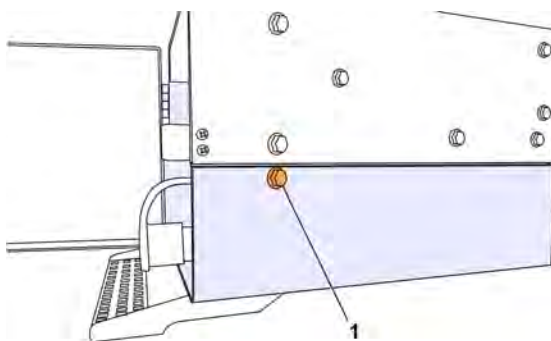
- 3 Remove the lower panel from the FMM control box.

Note: There are 3 screws total: 2 on the left side and 1 on the right side.



W3090964

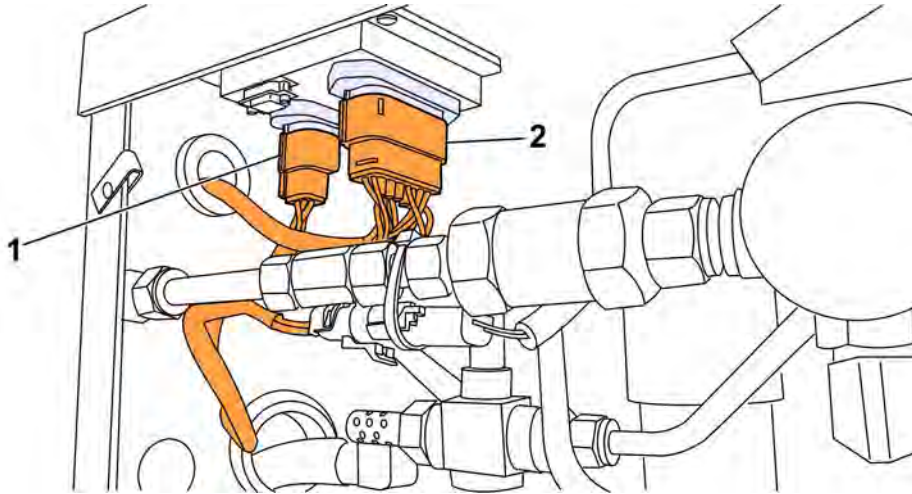
1. Fastener



W3090965

1. Fastener

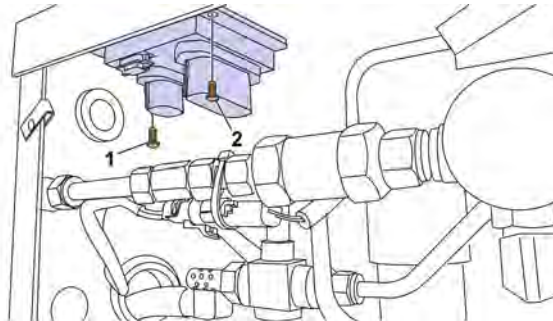
- 4 Disconnect the FMM harnesses.



W3090966

1. FMM harness connector
2. FMM harness connector

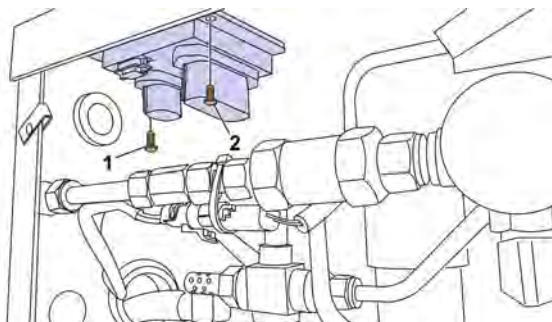
- 5 Remove the FMM.



W3090967

1. Fastener
2. Fastener

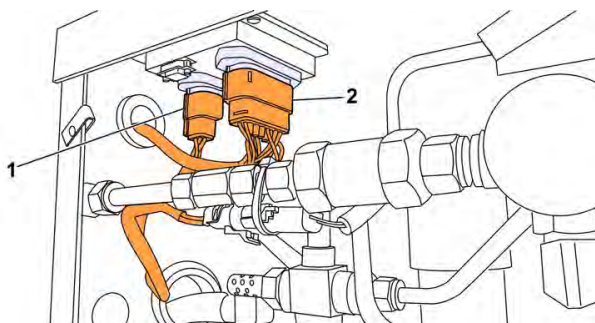
6 Install the FMM.



W3090967

- 1. Fastener
- 2. Fastener

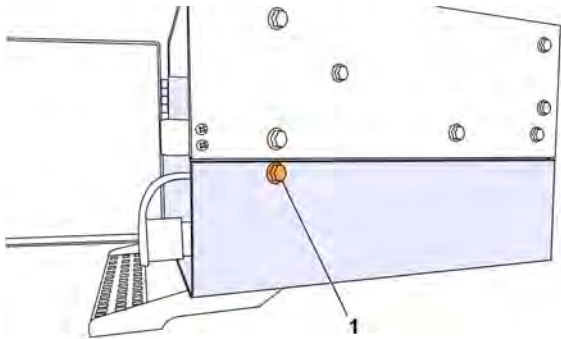
7 Connect the FMM harnesses.



W3090966

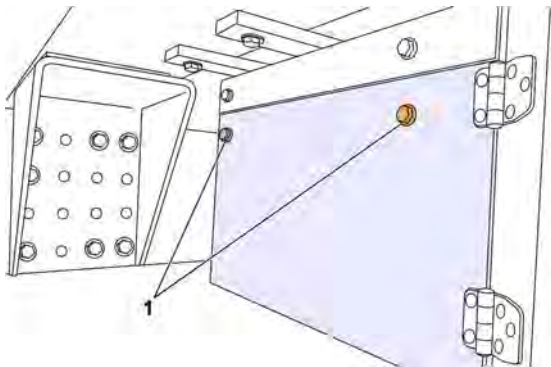
- 1. FMM harness connector
- 2. FMM harness connector

8 Install the lower cover.



W3090965

1. Fastener

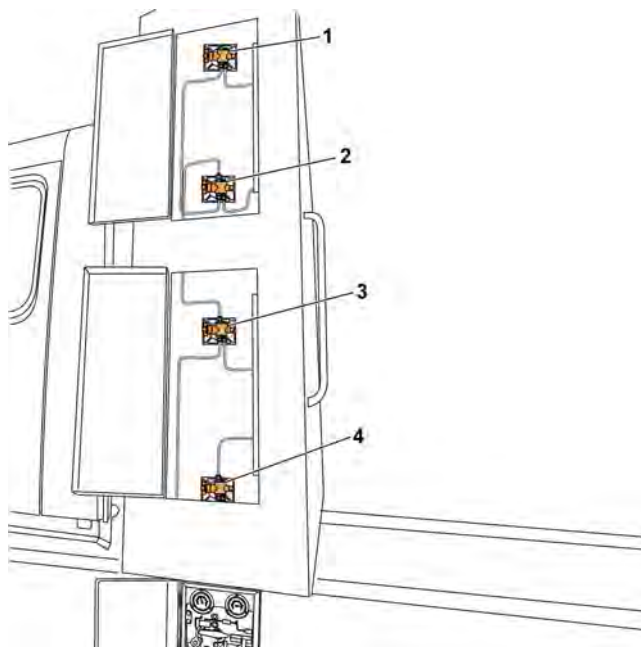


W3090964

1. Fastener

9 Turn fuel system ON, follow procedures as outlined:

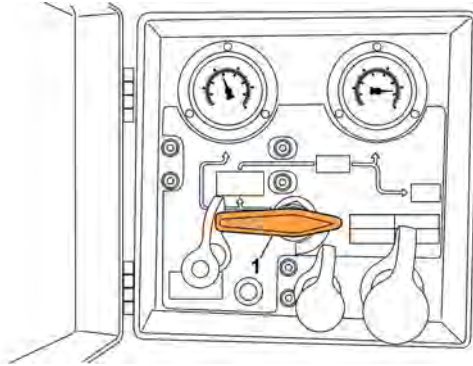
9a. Turn tank valve(s) on.



W3090963

1. Tank shut-off valve
2. Tank shut-off valve
3. Tank shut-off valve
4. Tank shut-off valve

9b. "SLOWLY" turn the Fuel System Valve (red knob) to OPEN.



W3090961

1. CNG Fuel System Shut Off Valve

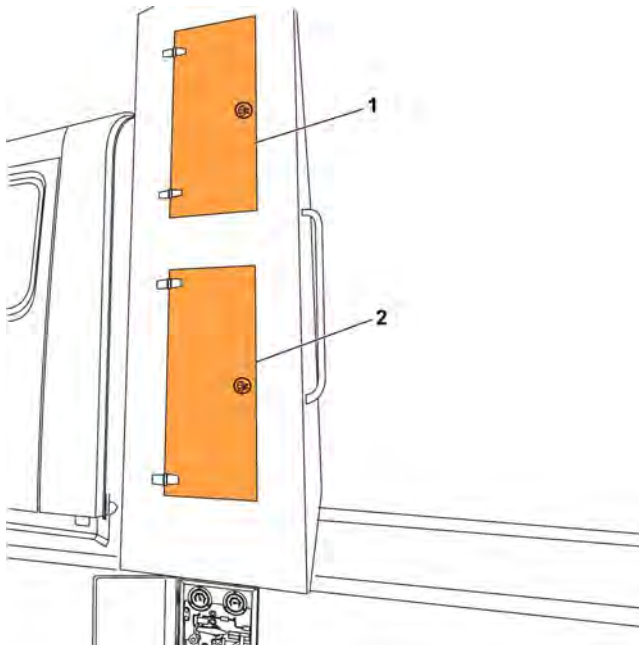
Note: Allow approximately 10 seconds of time to perform.



CAUTION

Failure to slowly open valve could cause damage to system by high pressure gas if opened too quickly.

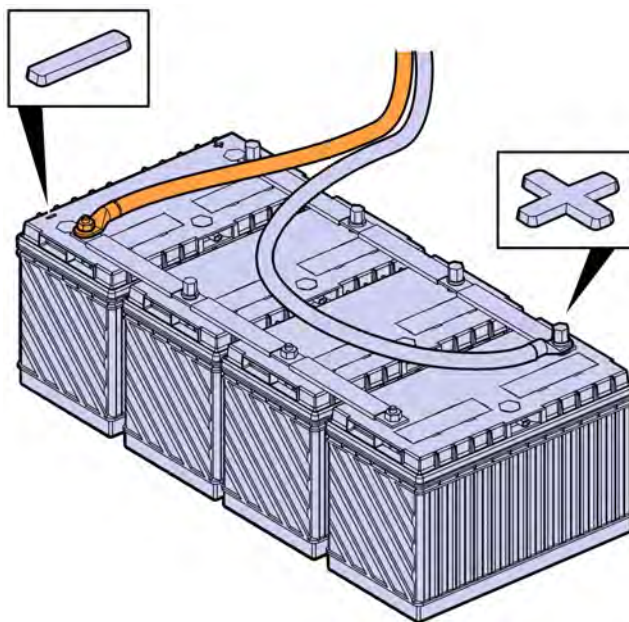
10 Close the access doors.



W3090962

- 1. Upper Access Door
- 2. Lower Access Door

11 Install all the previously removed cables to the negative (ground) battery terminals.



W3086758

12 Test the safety feature of the system.

12a. Start engine and then turn the engine off.

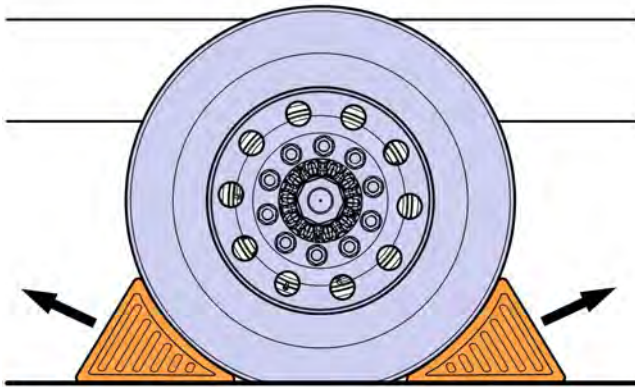
12b. Remove both tank caps and try to start the engine.

- If the engine does not start, the safety feature is working properly. Proceed to next step.
- If the engine starts, the safety feature is not working correctly and will need to be serviced.

Note: See Agility for more information.

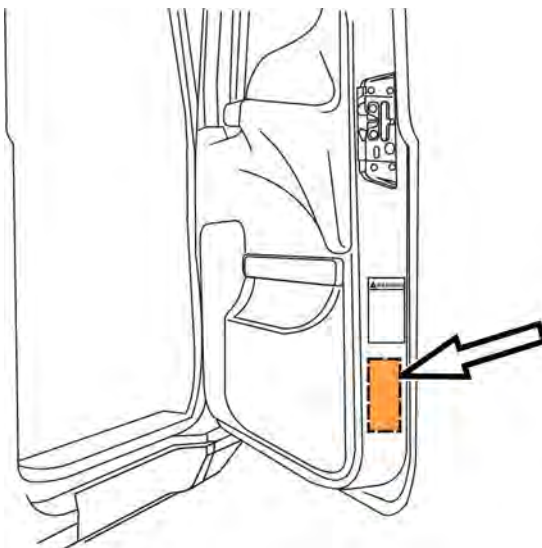
13 Install both fuel caps.

14 Remove the wheel chocks.



W7086759

Note: To signify that the campaign has been completed, using a permanent-type marker (such as a Sharpie®) write the campaign number (PI0846) and completion date in the spaces provided on the Campaign Completion label located inside the cab as shown in the illustration below. If a label is not already affixed inside the cab, apply a label (part No. TS897) and supply the information as required. Campaign Completion labels are available in packs of 50 and can be ordered by faxing a completed BR313 to Pacesetters Business Services at 610-264- 9465.



W8034103

Reimbursement

This repair is covered by an authorized Service Program. Reimbursement is obtained via the normal claim handling process.	UCHPReimbursement	eWarranty Reimbursement
Claim Type (used only when uploading from the Dealer Bus. Sys.)	41	41
Recall Status		
Vehicle inspected, repair not required		1- Inspected OK
Vehicle repaired per instruction		2- Modified per instruction
Labor Code		
Primary Labor Code Inspection	3000-06-09-01 0.3 hrs	2315J-ZP-96 0.3 hrs
Repair only (Repair A)	3866-03-09-01 0.8 hrs	2315C-ZP-96 0.8 hrs
Repair only (Repair B)	3866-03-09-01 0.3 hrs	2315D-ZP-96 0.3 hrs
Repair only (Repair C)	3866-03-09-01 0.5 hrs	2315E-ZP-96 0.5 hrs
Take to take charge and determine campaign status	1700-16-01-01 0.3 hrs	101AA-0A-00 0.3 hrs
Causal Part	85143376	85143376
Parts Disposition		
SCC Code	S6575	NA
Authorization Number	NA	PI0846
Expiration Date	01- Oct- 2015	01- Oct- 2015

Note: Take Charge Time is not included in the Labor Code for this operation. Take charge may be eligible but can only be used once per repair visit. If vehicle is having other warranty repairs performed, take charge should be charged to the warranty repair, otherwise take charge can be charged to this service program.