



# Service Bulletin

File in Section: -

Bulletin No.: 16-NA-121

Date: April, 2016

## TECHNICAL

**Subject:** Compressed Natural Gas (CNG) Valve Outgassing at Extreme Cold Temperatures

**Attention:** This Bulletin applies to any of the listed models equipped with RPO LC8.

Brand:	Model:	Model Year:		VIN:		Engine:	Transmission:
		from	to	from	to		
Chevrolet, GMC	Express, Savana	2011	2016			All	All

<b>Condition</b>	<p>Some customers may comment that CNG gas is venting, leaking, or releasing during extreme cold temperatures and/or during refueling.</p> <p>During the early stages of a CNG fast-fill event, gas moves rapidly from the dispenser (high pressure) into the vehicle's fuel tank (low pressure). The gas cools rapidly when it expands into the tank.</p> <p>When a fast-fill occurs during cold ambient temperatures (-4°F or -20°C), portions of the fuel tank valve in contact with the expanding gas may hit temperatures below -40°F or -40°C. If the temperature remains below -40°F or -40°C for a period of time, CNG leakage to the atmosphere can occur past an O-ring internal to the tank valve.</p> <p>This is due to the O-ring losing its elasticity at these low temperatures.</p> <p>As more gas enters the tank, its pressure increases and heat is generated during recompression, thereby elevating the tank's internal temperature. The fuel tank valve temperature will rise due to the heat of recompression. When the temperature rises above -40°F or -40°C via recompression or by moving the vehicle to a warmer environment, leakage past the O-ring will stop as elasticity is returned.</p> <p>This scenario can be aggravated by fast-fills completed with dispensers not operating to industry standard. By standard, dispensers should supply gas at pressure no more than 1.25 times the vehicle's fuel tank service pressure. Higher initial dispensing pressures can cause lower temperatures during gas expansion.</p>
<b>Cause</b>	Cold temperatures along with the cooling effects of the refueling process causes the CNG to leak through the valve, causing it to vent.
<b>Additional Options</b>	LC8 & FHZ & UFP & UFM, including C69 & C36

### Correction

1. Verify the condition.
2. Verify the filling station is operating within specifications.
3. Replace the vehicle tank valve with an updated valve with new part number. Follow SI procedures.

The standards for CNG dispensing equipment are as follows:

- ANSI/IAS NGV 4.1-1999 / CSA 12.5-M99 - AMERICAN NATIONAL STANDARD/ CSA STANDARD FOR NGV DISPENSING SYSTEMS
- NFPA 52 – Vehicular Gaseous Fuel Systems Code

### Information

**Note:** If a customer exhibits a leak during the conditions described, the filling station should be verified for proper operation according to the above specifications. If a leak is still present after verification the technician should contact technical assistance for more information and inquire about special tool.

**Warning:** *Natural gas is highly flammable. In order to reduce the risk of fire and personal injury, keep sparks, flames, and smoking materials away from the vehicle while you perform the Compressed Natural Gas (CNG) fuel system service. The Compressed Natural Gas (CNG) system operates at pressures up to 24820 kpa (3600 psi). Relieve the CNG fuel system pressure before servicing CNG fuel system components in order to reduce the risk of fire and personal injury. Any CNG fuel tank which is past its expiration date must be removed from*

**service. Failure to follow these precautions may cause personal injury or death, and/or damage to the vehicle or its components.**

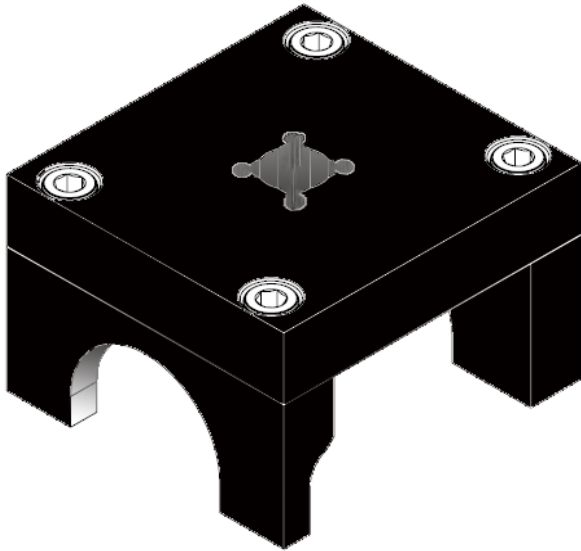
## Service Procedure

### Replacement Tank Valve Preparation

The following information should be used to prepare each valve assembly for installation to the tank. Please follow directions carefully. Additional instructions may be included with the replacement valve.

Once you receive the new valve, the following components will be in the box:

- Black O-ring
- Installation instructions
- OMB Lyra CV valve
- O-ring placement cap
- Solenoid cable
- White snap ring

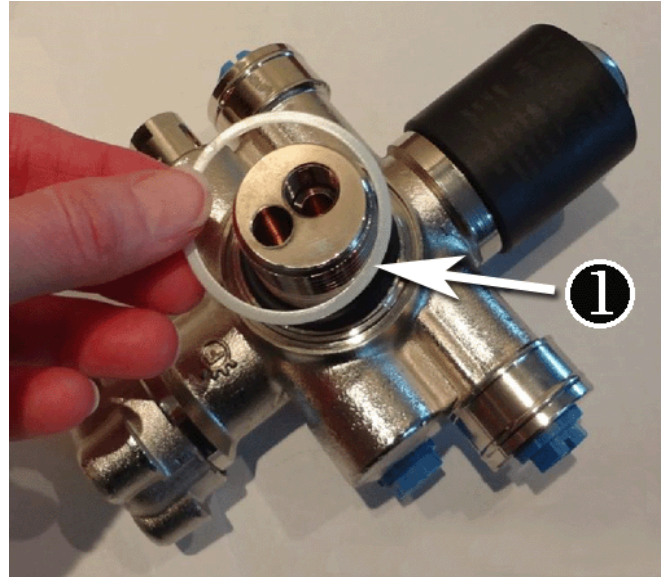


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### Valve removal/installation tool for LYRA CV type valve

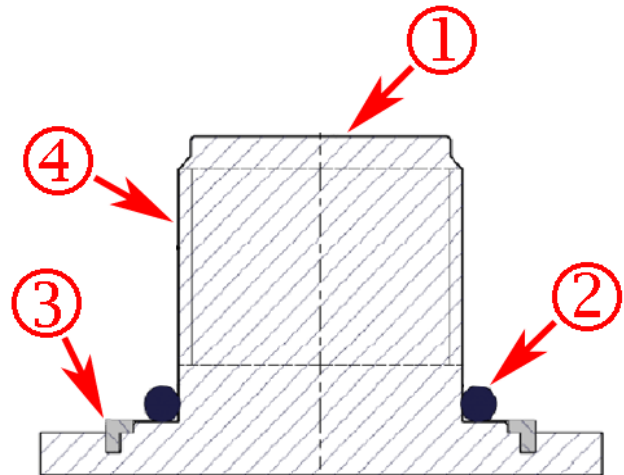
The Valve Removal/Installation tool is also provided.

Once all components are accounted for, follow the procedure outlined below:



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### OMB Lyra CV valve with white snap ring



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**OMB Lyra CV valve stem (1) with O-ring (2) and snap ring (3) in place over threads (4)**

1. Install the white snap ring over the threaded stem of the valve such that the ridge is oriented down, and it snaps securely into the groove outside of the O-ring as shown.



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**OMB Lyra CV valve threaded stem (1)**

2. Inspect valve port threads for damage or debris.
3. Clean threads and O-ring groove on valve as required with a clean lint-free shop cloth and isopropyl alcohol. (Only the supplied O-ring in the OMB kit with the new valve should be used when installing a Lyra CV valve).
4. Dry threads and O-ring groove thoroughly with a clean lint-free cloth. Make sure threads and O-ring sealing surfaces are clean, dry, and free of contaminants.



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**OMB Lyra CV valve with O-ring placement cap (1) covering threads of valve stem, and O-ring lubricant**

5. For ease of O-ring installation and protection, install the supplied cap (1) over the valve stem threads to ensure that the new O-ring is not damaged during installation on the valve threads. Lubricate the new valve O-ring with Molykote 55 O-ring lubricant (or equivalent), and install onto the threaded stem of valve as shown. Use caution not to damage or twist the O-ring. Ensure the O-ring is fully installed and seated.



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**OMB Lyra CV valve with O-ring placement cap and lubricated O-ring ready to be installed, white snap ring already installed**



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**Guiding O-ring down over cap to flat surface**

6. Press the lubricated O-ring down over the cap until it sits flat on the surface as illustrated.



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OMB Lyra CV valve with O-ring successfully seated



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**Removing the O-ring placement cap**

7. Remove the O-ring placement cap from the valve.

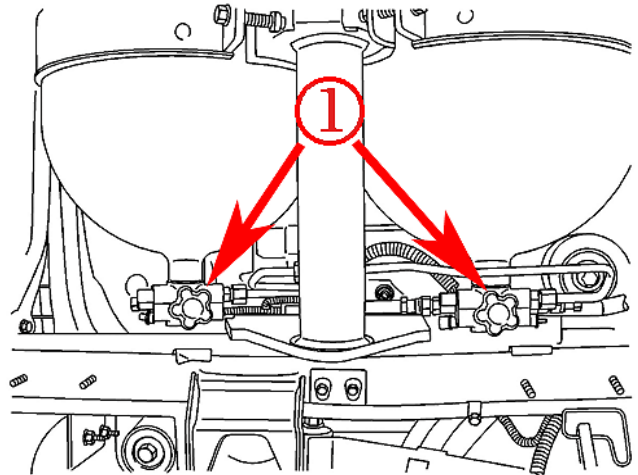
**CNG Tank Valve Replacement - Aft Tanks**

**Danger: To reduce the risk of explosion and fire, or asphyxiation from compressed natural gas (CNG), which if not avoided will result in death or serious injury and property damage:**

- Always reject valves or fuel tanks with damaged threads and/or damaged O-rings.
- Reject fuel tanks with O-ring groove damage since these damages prevent a safe and effective seal.

**Failure to follow the procedures exactly as written may result in serious injury or death.**

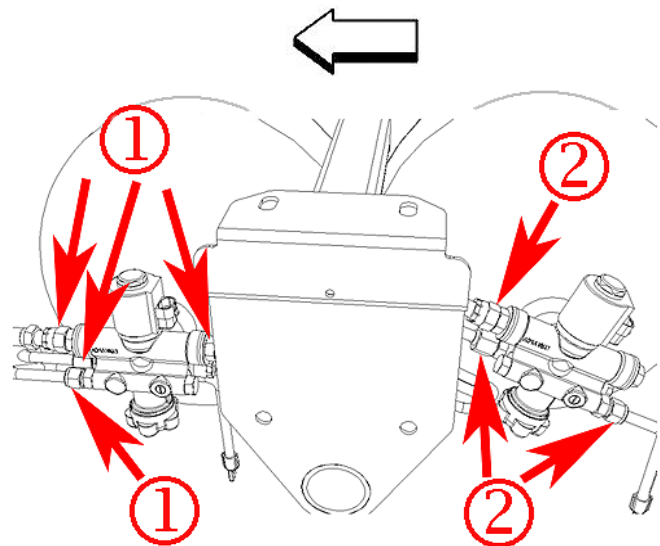
1. Vent all CNG fuel tanks. Refer to *CNG Tank Venting* in SI.
2. Remove the Aft Tank Cover. Refer to *CNG Tank Cover Replacement - Aft Tank* in SI.



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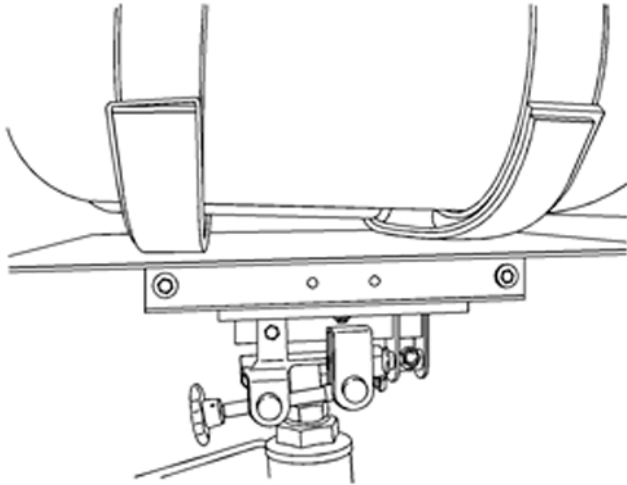
3. Close the manual tank valves (1).
4. Remove the trailer hitch. Refer to *Trailer Hitch Platform Replacement* in SI.
5. Disconnect the high pressure shutoff valve solenoid electrical connection.
6. Disconnect the rear fuel line fitting at the tee assembly.

**Note:** Take note of all fitting and plugs on each valve and transfer to the new valve as necessary ensuring they are transferred to the same, correct location on the new valves.



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7. Carefully disconnect all lines and hoses from tank valve being replaced, noting location and positioning of lines prior to removing. There are 4 connections (1) on the forward aft tank valve, and 3 connections (2) on the rear aft tank valve.

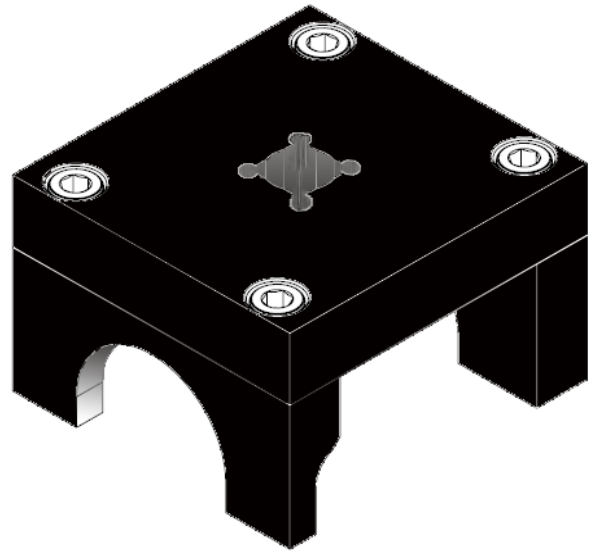


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8. Support the appropriate tank with a suitable jack. (Place jack supports to allow tank straps to move freely.)
9. Secure tank to jack with non-marring webbing or straps.
10. Loosen vehicle tank strap fasteners.
11. Reposition/shift tank toward passenger side to allow clearance for valve removal tool.

**Note:** Take note of the clocked position of the valve, the location of all fittings, and plugs. The new valve must be in the same clocked position, as well as transferring all fittings and plugs to the same correct location on the new valve.

**Warning:** A large release of gas would require you tighten valve and follow venting procedures again. It is however NOT uncommon to have a short 30 second vent of residual gasses release, this is normal and will cause no harm. If there is no gaseous release, proceed to unscrew the tank valve by hand until free from the CNG tank. Failure to follow these precautions may cause personal injury or death, and/or damage to the vehicle or its components.



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#### Valve removal/installation tool for LYRA CV type valve

12. Use the ½" drive special tool to remove the valve from the tank. (Tool is indexed to the valve to fit one way.) Break the valve free, and loosen slowly, listening for high pressure release.
13. Remove the valve, and inspect valve port threads for damage or debris. Clean if necessary.

**Caution:** Refer to *Fastener Caution* in SI.

14. Install the prepared valve onto the tank using the special tool. Torque to 128–133 N•m (94–98 lb-ft.).
15. Reposition the tank and valve assembly. Rotate the tank to the desired orientation for line attachments to valve. Torque strap fasteners to 40 N•m (30 lb ft).
16. Install PRD vent lines to the new valve. Replace all O-rings with new seals. Lubricate new O-rings with petroleum jelly or equivalent before installation. Tighten fittings to 35 N•m (26 lb-ft).
17. Connect the rear fuel flex line fitting at the tank valve using a new O-ring. Lubricate the O-ring with petroleum jelly or equivalent. Tighten the fitting to 35 N•m (26 lb-ft).
18. Install the trailer hitch to the vehicle. Refer to *Trailer Hitch Platform Replacement* in SI. Tighten mounting nuts and bolts to 88 N•m (65 lb-ft).
19. Connect the rear fuel line fitting at the tee assembly using a new O-ring. Lubricate the O-ring with petroleum jelly or equivalent. Tighten the fitting to 35 N•m (26 lb-ft).
20. Connect the high pressure shutoff valve solenoid electrical connector.
21. Open all manual tank valves.
22. Refill CNG system and perform leak check. Refer to *CNG Tank Venting* in SI.
23. Perform leak check at ALL CNG line and tank connections using a commercially available combustible gas detector. If a leak is found, verify with a leak detection fluid such as Swagelok Snoop® or equivalent liquid leak detector.

24. If any leaks are found, correct as necessary, and repeat leak check.
25. Install the Aft Tank Cover. Refer to *CNG Tank Cover Replacement - Aft Tank* in SI.

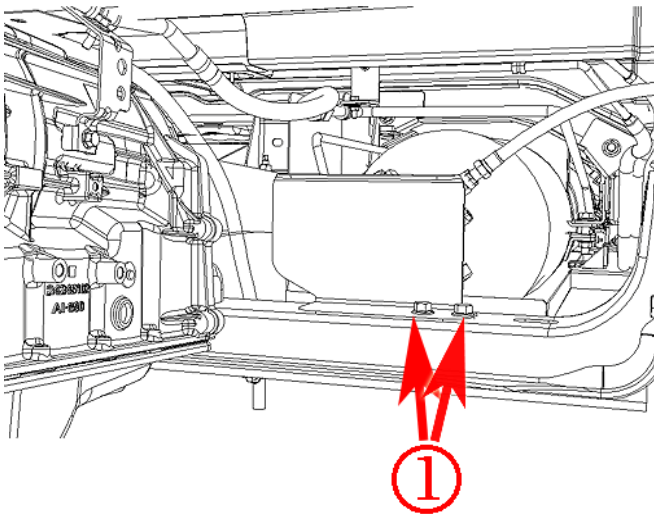
### CNG Tank Valve Replacement - Midship Tank

**Danger:** To reduce the risk of explosion and fire, or asphyxiation from compressed natural gas (CNG), which if not avoided will result in death or serious injury and property damage:

- Always reject valves or fuel tanks with damaged threads and/or damaged O-rings.
- Reject fuel tanks with O-ring groove damage since these damages prevent a safe and effective seal.

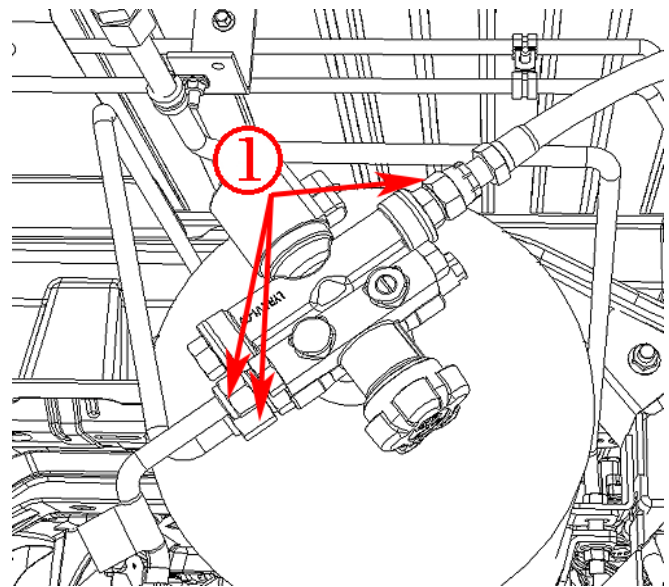
**Failure to follow the procedures exactly as written may result in serious injury or death.**

1. Vent all CNG fuel tanks. Refer to *CNG Tank Venting* in SI.
2. Remove the midship tank cover. Refer to *CNG Tank Cover Replacement - Midship Tank* in SI. While an assistant holds the shield in place, remove the tank shield bolts only. Lower the shield from the vehicle.



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3. Remove the 2 nuts, bolts (1), and shield from the cross member located forward of the midship tank.
4. Disconnect the electrical connector from the high pressure shutoff valve solenoid.
5. Close the manual tank valve.

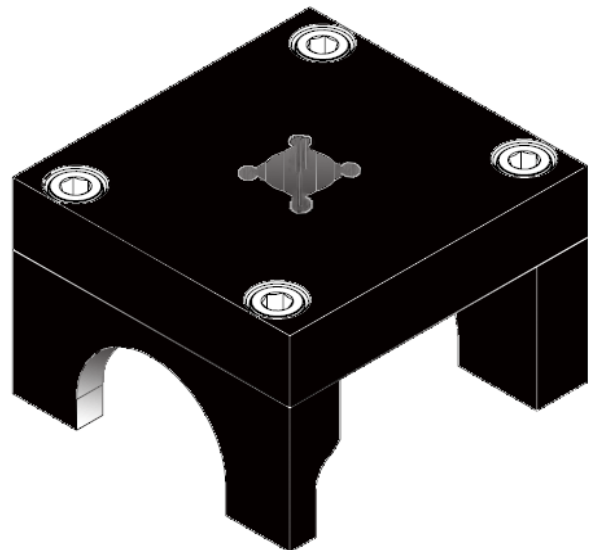


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6. Disconnect the 2 lines and 1 hose (1) at the midship tank valve.

**Note:** Take note of the clocked position of the valve, the location of all fittings, and plugs. The new valve must be in the same clocked position, as well as transferring all fittings and plugs to the same correct location on the new valve.

**Warning:** A large release of gas would require you tighten valve and follow venting procedures again. It is however NOT uncommon to have a short 30 second vent of residual gasses release, this is normal and will cause no harm. If there is no gaseous release, proceed to unscrew the tank valve by hand until free from the CNG tank. Failure to follow these precautions may cause personal injury or death, and/or damage to the vehicle or its components.



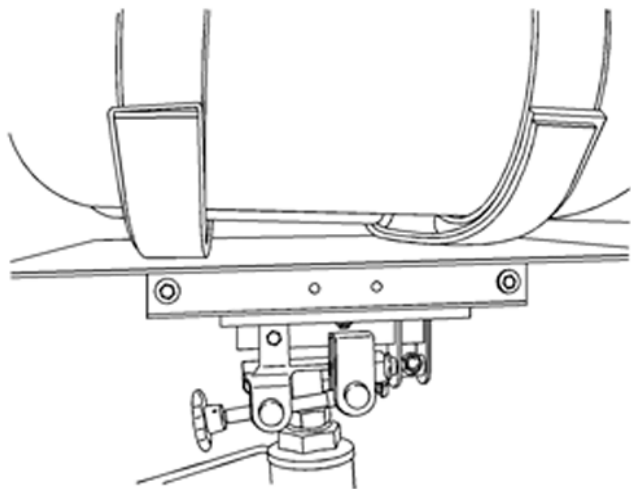
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**Valve removal/installation tool for LYRA CV type valve**

7. Use the ½" drive special tool to remove the valve from the tank. (Tool is indexed to the valve to fit one way.) Break the valve free, and loosen slowly, listening for high pressure release.
8. Remove the valve, and inspect valve port threads for damage or debris. Clean if necessary.

**Caution:** Refer to *Fastener Caution* in SI.

9. Install the prepared valve onto the tank using the special tool. Torque to 128–133 N•m (94 - 98 lb-ft.).



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10. If needed, index and align the new valve to the lines. Support the tank with a suitable jack. (Place jack supports to allow tank straps to move freely.)
11. Secure tank to jack with non-marring webbing or straps.
12. Loosen all 4 vehicle tank straps and rotate the tank to the desired orientation for line attachments to the valve.
  - Torque the main tank strap fasteners to 42 N•m (30 lb-ft).
  - Torque the PRD tank strap fasteners to 14 N•m (10 lb-ft).
13. Install PRD vent lines to the new valve.
  - Replace all O-rings with new seals.
  - Lubricate the new O-rings with petroleum jelly or equivalent before installation.
14. Tighten fittings to 35 N•m (26 lb-ft).
15. Connect the high pressure shutoff valve solenoid electrical connector.
16. Open all manual tank valves.
17. Refill CNG system and perform leak check. Refer to *CNG Tank Venting* in SI.
18. Perform leak check at ALL CNG line and tank connections using a commercially available combustible gas detector. If a leak is found, verify with a leak detection fluid such as Swagelok Snoop® or equivalent liquid leak detector.

19. If any leaks are found, correct as necessary, and repeat leak check.
20. Install the midship tank cover. Refer to *CNG Tank Cover Replacement - Midship Tank* in SI.

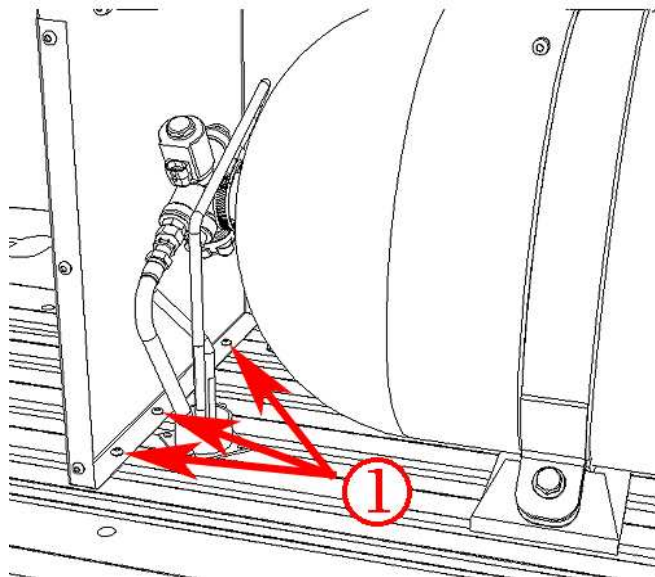
**CNG Tank Valve Replacement - Cargo Tank**

**Danger:** To reduce the risk of explosion and fire, or asphyxiation from compressed natural gas (CNG), which if not avoided will result in death or serious injury and property damage:

- Always reject valves or fuel tanks with damaged threads and/or damaged O-rings.
- Reject fuel tanks with O-ring groove damage since these damages prevent a safe and effective seal.

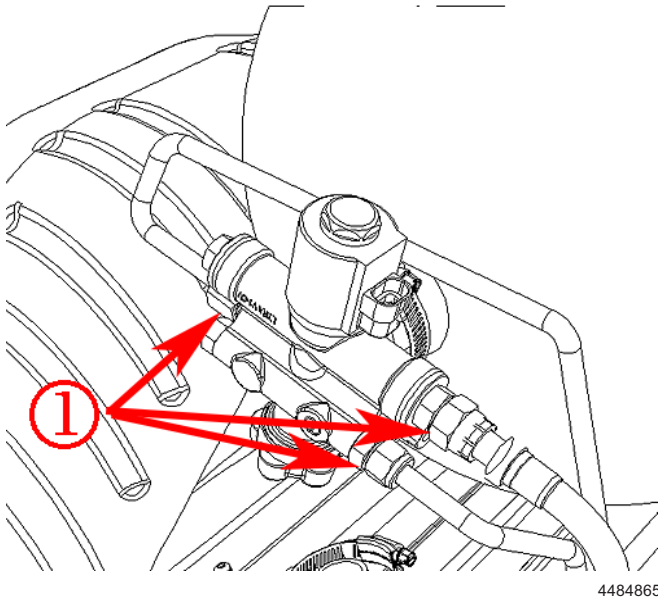
**Failure to follow the procedures exactly as written may result in serious injury or death.**

1. Vent all CNG fuel tanks. Refer to *CNG Tank Venting* in SI.
2. Remove the Aft Tank Cover. Refer to *CNG Tank Cover Replacement - Aft Tank* in SI.
3. Remove the cargo tank cover. Refer to *CNG Tank Cover Replacement - Cargo Tank* in SI.



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4. Remove the 3 fasteners (1) securing the rear part of cover to the floor.
5. Gently pry/pull away and secure the rear part of the cover to gain access to the cargo tank valve. Use caution not to bend the front plane of cover.
6. Loosen the hose clamps securing the vapor bag to the tank and underbody pass-through.
7. Disconnect the electrical connector from the high pressure shutoff valve solenoid.
8. Disconnect the line at the 9 O' Clock position on the cargo tank valve.
9. Remove the vapor bag from the valve assembly.
10. Close the manual tank valve.

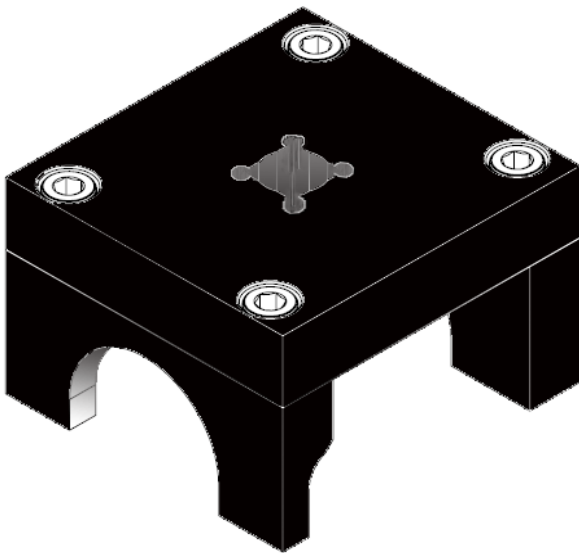


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11. Disconnect the remaining 2 lines (1) at the Cargo tank valve.

**Note:** Take note of the clocked position of the valve, the location of all fittings, and plugs. The new valve must be in the same clocked position, as well as transferring all fittings and plugs to the same correct location on the new valve.

**Warning:** A large release of gas would require you tighten valve and follow venting procedures again. It is however NOT uncommon to have a short 30 second vent of residual gasses release, this is normal and will cause no harm. If there is no gaseous release, proceed to unscrew the tank valve by hand until free from the CNG tank. Failure to follow these precautions may cause personal injury or death, and/or damage to the vehicle or its components.



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#### Valve removal/installation tool for LYRA CV type valve

12. Use the ½" drive special tool to remove the valve from the tank. (Tool is indexed to the valve to fit one way.) Break the valve free, and loosen slowly, listening for high pressure release.
13. Remove the valve, and inspect valve port threads for damage or debris. Clean if necessary.

**Caution:** Refer to *Fastener Caution* in SI.

14. Install the prepared valve onto the tank using the special tool. Torque to 128–133 N•m (94–98 lb-ft.).
15. Install the new vapor bag and secure the lower hose clamp.
16. Install the prepared valve onto the tank using the special tool. Torque to 128–133 N•m (94–98 lb-ft.).
17. If needed, loosen tank straps and rotate the tank to the desired orientation for line attachments to the valve.
  - Torque the main tank strap fasteners to 42 N•m (30 lb-ft).
18. Install PRD vent lines to the new valve.
  - Replace all O-rings with new seals.
  - Lubricate the new O-rings with petroleum jelly or equivalent before installation.
19. Install the high pressure fuel supply hose.
  - Replace all O-rings with new seals.
  - Lubricate the new O-rings with petroleum jelly or equivalent before installation.
20. Tighten fittings to 35 N•m (26 lb-ft).
21. Connect the high pressure shutoff valve solenoid electrical connector.
22. Open all manual tank valves.
23. Refill CNG system and perform leak check. Refer to *CNG Tank Venting* in SI.
24. Perform leak check at ALL CNG line and tank connections using a commercially available combustible gas detector. If a leak is found, verify with a leak detection fluid such as Swagelok Snoop® or equivalent liquid leak detector.
25. If any leaks are found, correct as necessary, and repeat leak check.
26. Once it has been verified there are no leaks, complete installation of the vapor bag, and all tank covers and shields. Refer to *CNG Tank Cover Replacement - Cargo Tank* and *CNG Tank Cover Replacement - Aft Tank* in SI.

#### Parts Information

Description
Replacement Valve Kit includes valve and components needed. Valve removal/installation tool on loaner program, to be returned.



### Warranty Information

Version	1
Modified	

Labor Operation	Description	Labor Time
4081188	Prep New Valve	0.2 hr
Add	Replace Aft Tank Valve	2.0 hrs
Add	Replace 2nd Aft Tank Valve	0.9 hr
Add	Replace Cargo Tank Valve	1.7 hrs
Add	Replace Midship Tank Valve	1.4 hrs
Add	CNG Tank Venting	0.8 hr

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