NEW FLYER

INSTRUCTION TO SERVICE

ITS: 6385	
SECTION:	241 Fuel System
WRITTEN BY:	Dwayne Peters
SUBJECT:	Replace Fuel Vent Lines and Pressure Relief Devices

ITS6385

PROCEDURE:

1. Turn the main battery disconnect switch to the “OFF” position.
2. Vent the CNG fuel from all tanks per the instructions in the “Fuel Section” section of the New Flyer Service Manual.

⚠ **WARNING: DO NOT perform any corrective action or other maintenance on a pressurized system. Perform component servicing or maintenance only after the affected zone has been isolated and depressurized. Refer to the “CNG Venting Procedure” section of the Service Manual.**

⚠ **WARNING: After the engine has been allowed to stall from fuel starvation it is extremely important to check that the all solenoid valves are in the manually open position on all tanks and that the main shut off valve is in the open position. The purge valve must then be opened slowly to allow the tanks to completely depressurize, as indicated by a “zero” reading on the pressure gauge and no further flow through the vent line.**

⚠ **WARNING: Caution must be exercised to avoid damaging the outer surface of the composite fuel tanks. Take care to avoid contacting the tank when removing fuel lines and using wrenches and other tools. Walking on the tanks is not recommended and should be avoided. If walking on tanks is required, personnel must check their footwear for presence of any objects which might damage the tanks before walking on them and lay down drop cloths or wear protective footwear coverings.**

3. Replace affected lines and Pressure Relief Devices (PRD) as outlined in Section 1 and Section 2:
   a. Section 1 beginning on Page 3: Replace the old vent line (NF # 628588) with a new vent line (NF # 650777). Replace Pressure Relief Device (PRD) (NF # 650176).
   b. Section 2 beginning on Page 9: Replace the old vent line (NF # 628589) with a new vent line (NF # 650778).
4. With all affected lines and PRDs replaced, fill system to 500 psi and check for leaks. Vent and isolate affected tanks as outlined in the New Flyer Service Manual before repairing leaks. Repair leaks where necessary.

☞ **NOTE: Check for leaking connections and fittings using a liquid solution such as SNOOP®. Do not use make-shift soapy water solutions.**

5. Fill system to 1500 psi and check for leaks. Vent and isolate affected tanks as outlined in the New Flyer Service Manual before repairing leaks. Repair leaks where necessary.
6. Fill system to service pressure (temperature compensated) and check for leaks. Vent and isolate affected tanks as outlined in the New Flyer Service Manual before repairing leaks. Repair leaks where necessary.
7. Turn the main battery disconnect switch to the “ON” position.

SECTION 1: REPLACE THE OLD VENT LINE (NF # 628588) WITH A NEW VENT LINE (NF # 650777) AND REPLACE PRD (NF # 650176)

Figure 1 shows the vent line that must be replaced in this section.

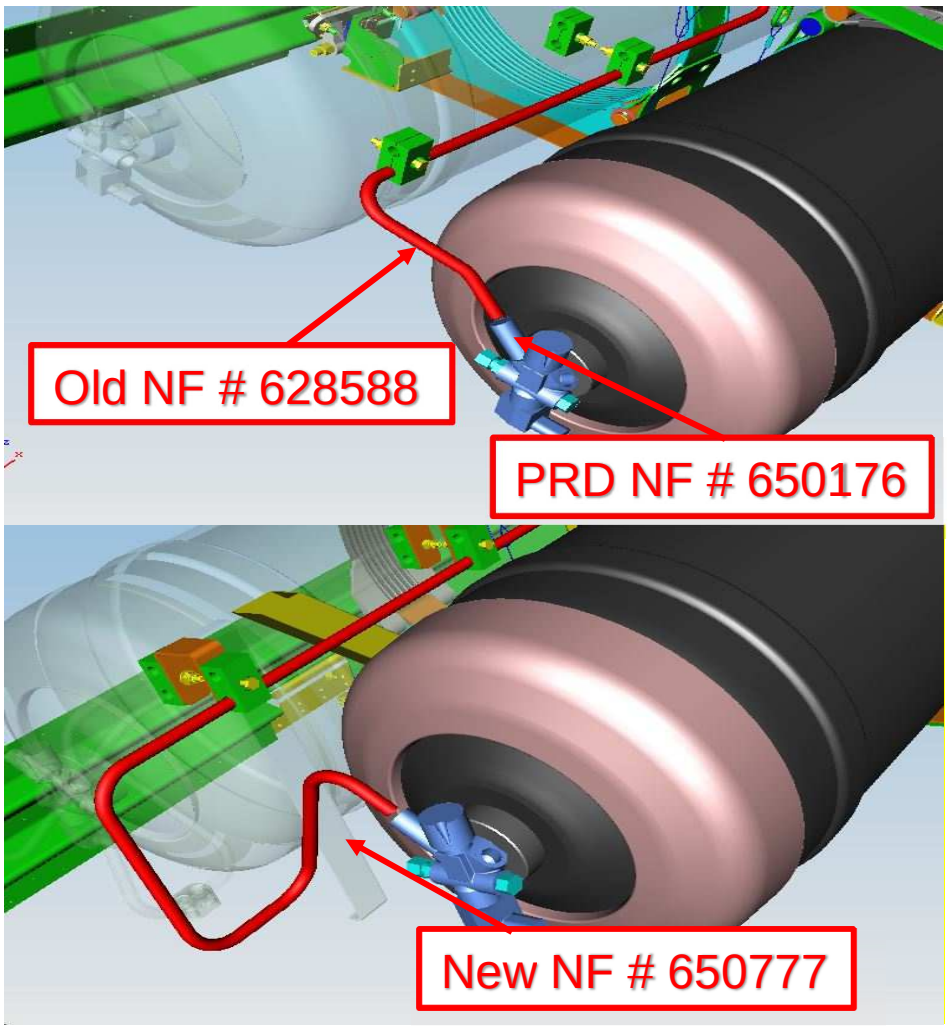


Figure 1: Vent lines affected in Section 1

Replace the vent line and PRD as follows:

1. Open the CNG doors and locate the old vent line to be replaced (NF # 628588). Reference the tank layout on Page 13. It may be necessary to replace 2, 3, or 4 vent lines and PRDs depending on bus configuration.
2. Remove the 4 screws securing each of the cross braces, as shown in Fig. 2.

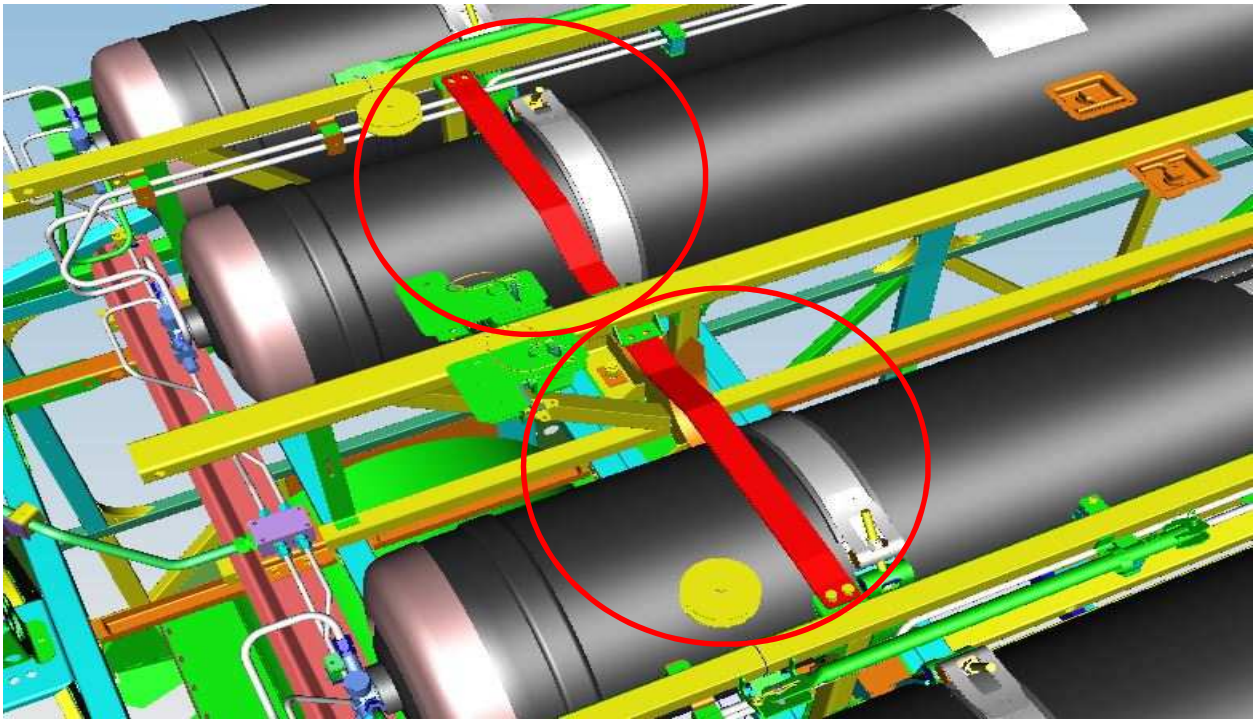


Figure 2: Cross braces and securing screws

3. Using a backing wrench to hold the adaptor body hex, disconnect the vent line from the remote PRD. The adaptor on the remote PRD will remain in place. Refer to Fig. 3.

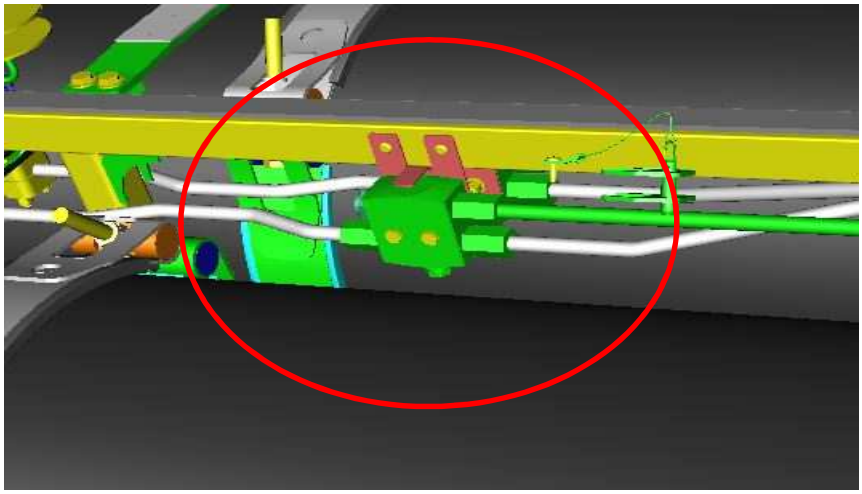


Figure 3: Remote PRD

4. Using a backing wrench to hold the adaptor body hex, disconnect the vent line from the tank-mounted PRD. Refer to Fig. 4.

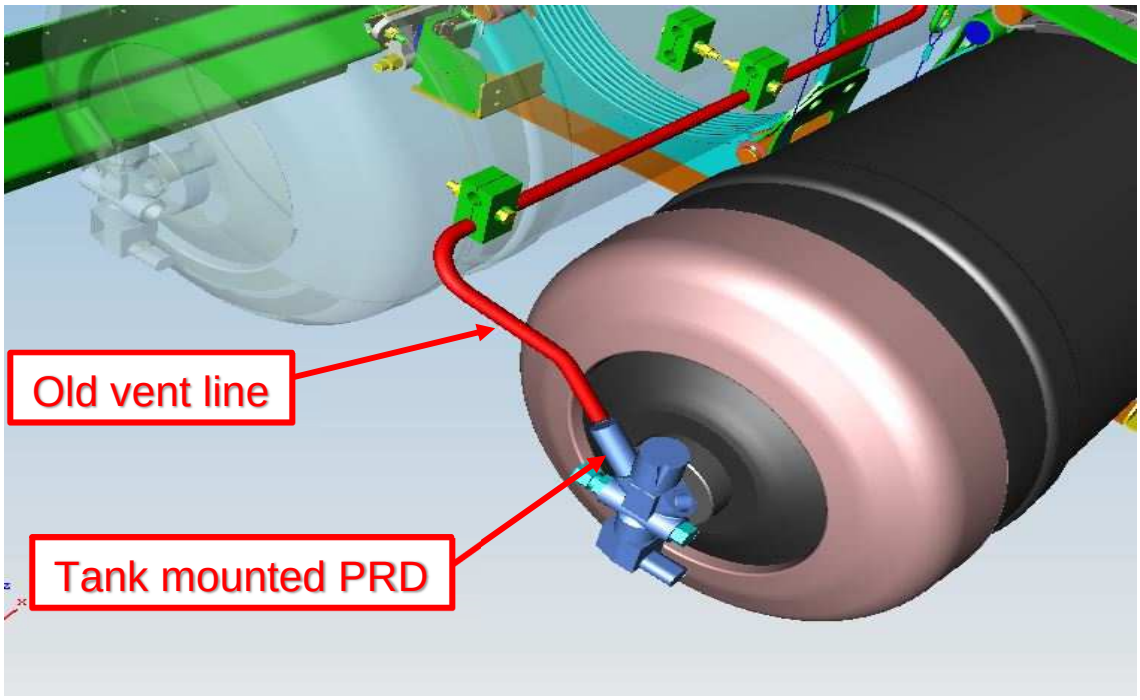


Figure 4: Tank-mounted PRD and old vent line

5. Disconnect the 4 mounting blocks that secure the fuel lines to the bus. On mounting blocks used with weld plates, as shown in Fig. 5, remove the two outboard bolts first and slide the block back to expose the socket head bolts. Remove the two socket head bolts. Remove the bolts on the remaining mounting blocks. Keep all hardware for reuse.

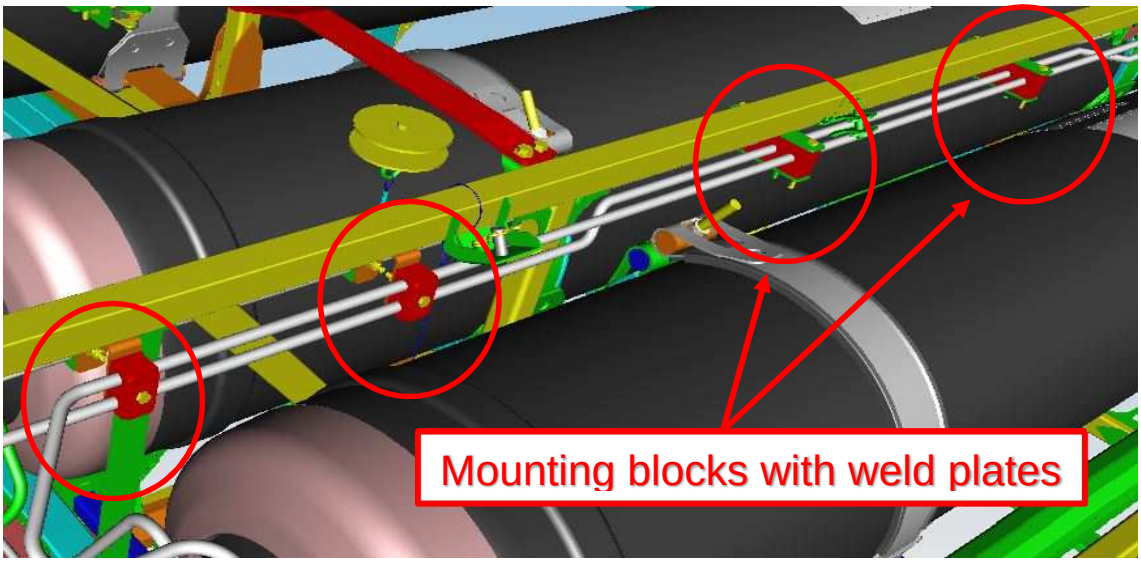


Figure 5: Mounting blocks to be disconnected

6. Remove and discard the affected vent line.
7. Remove and retain the tank-mounted PRD adaptor shown in Fig. 6. Discard the adaptor O-ring.
8. Remove, mark, disable, and discard the tank mounted PRD as described in the following note.

☞ **NOTE: Paint the old PRD with orange paint and then destroy/damage the old PRD in such a way that it cannot be reused.**

☞ **NOTE: The solenoid valve and tank serial number must be recorded for each tank that has a new PRD installed on it. Record the solenoid valve and tank serial number on the sheet in Appendix B. Provide the completed sheet to New Flyer Technical Services.**

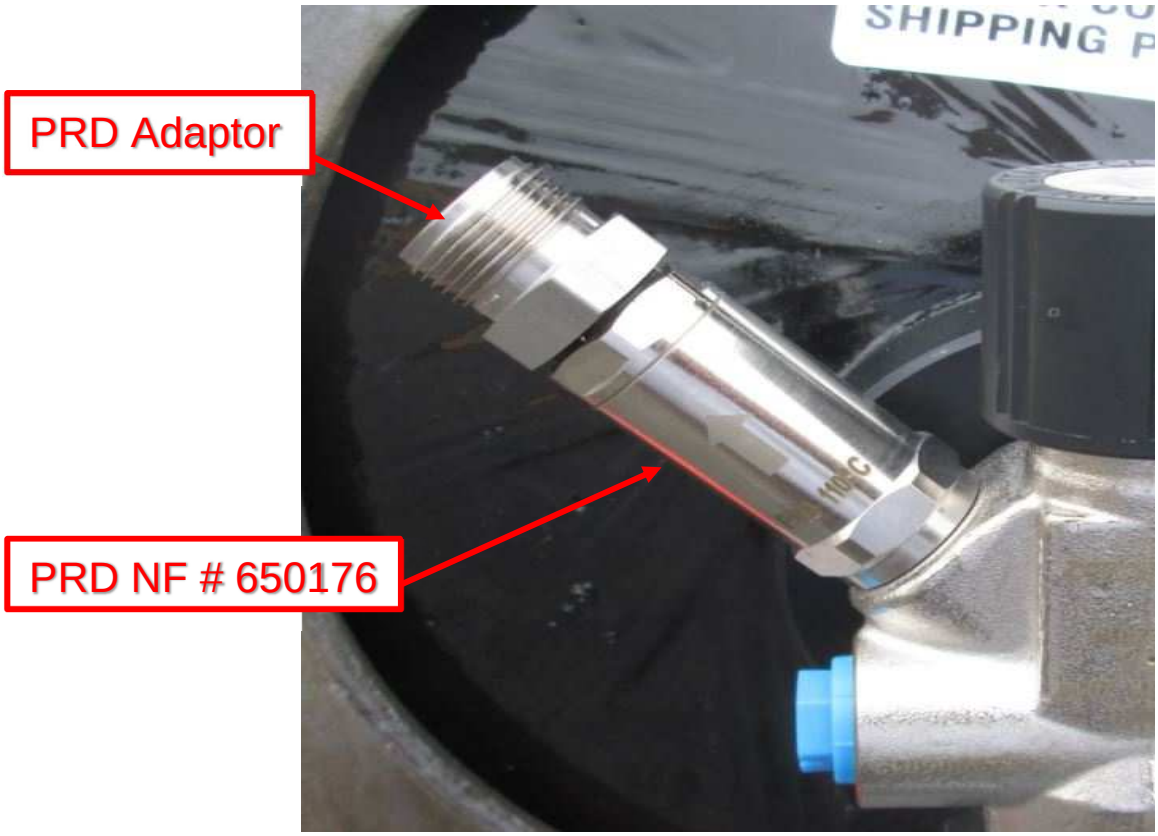


Figure 6: PRD with adaptor

9. Apply grease sparingly (NF # 5945362) to the O-ring of the new PRD (NF # 650176) shown in Fig. 7. Do not apply any grease to the PRD threads. If any grease is on the threads, wipe off before installation.

☞ **NOTE: The new PRD has a new O-ring installed. Under no circumstances should the old O-ring be reused from the old PRD.**

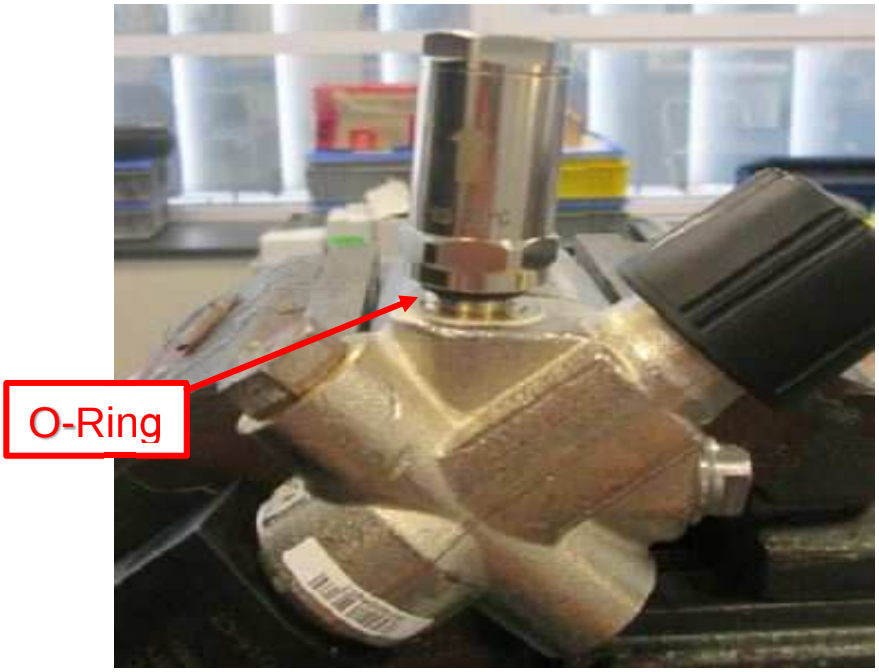


Figure 7: PRD O-ring

10. Install the new PRD and torque the top hex (3/4") to 26 FT-LBS. Refer to Fig. 8.

Figure 8: Torque PRD to 26 FT-LBS

11. Install a new O-ring (NF # 116719) on the adapter fitting. Apply grease (NF #5945362) sparingly to O-ring. Do not apply grease to the threads. Wipe off any grease on the threads before installation.
12. Using a 13/16” backing wrench on the bottom hex of the PRD, torque the Swagelok adaptor fitting 30 to 37 FT-LBS. Refer to Fig. 9.

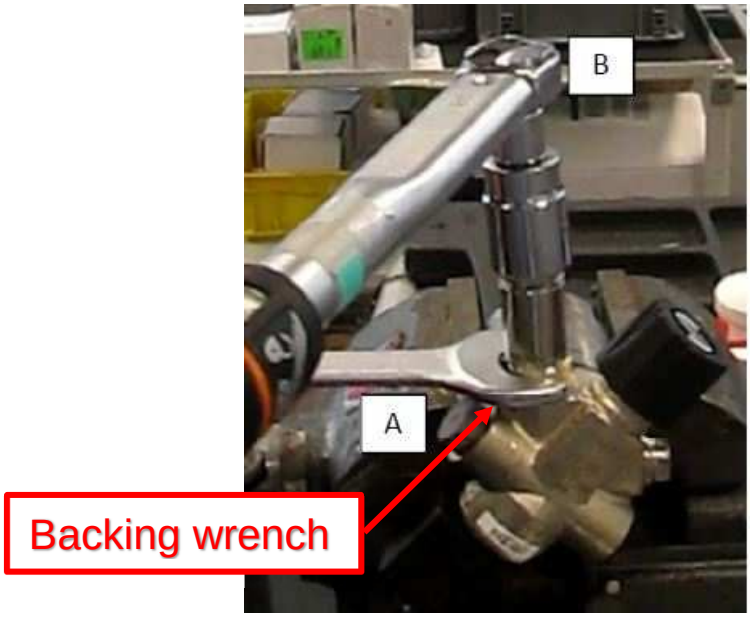


Figure 9: Torque adaptor while using a backing wrench

13. Install the new vent line (NF # 650777) and install the fittings on both ends of the tank-mounted and remote-mounted PRDs. Tighten to finger-tight.
14. Tighten the fittings using a backing wrench on the adapter body hex. Rotate the Swagelok nuts with a wrench until snug. At this point an increase of resistance will be encountered. Then tighten slightly with a wrench.
15. Reinstall all mounting blocks using existing hardware.
16. Reinstall the cross braces using existing hardware.

Section 2: Replace the old vent line (NF # 628589) with a new vent line (NF # 650778)

Figure 10 shows the vent line that must be replaced in this section.

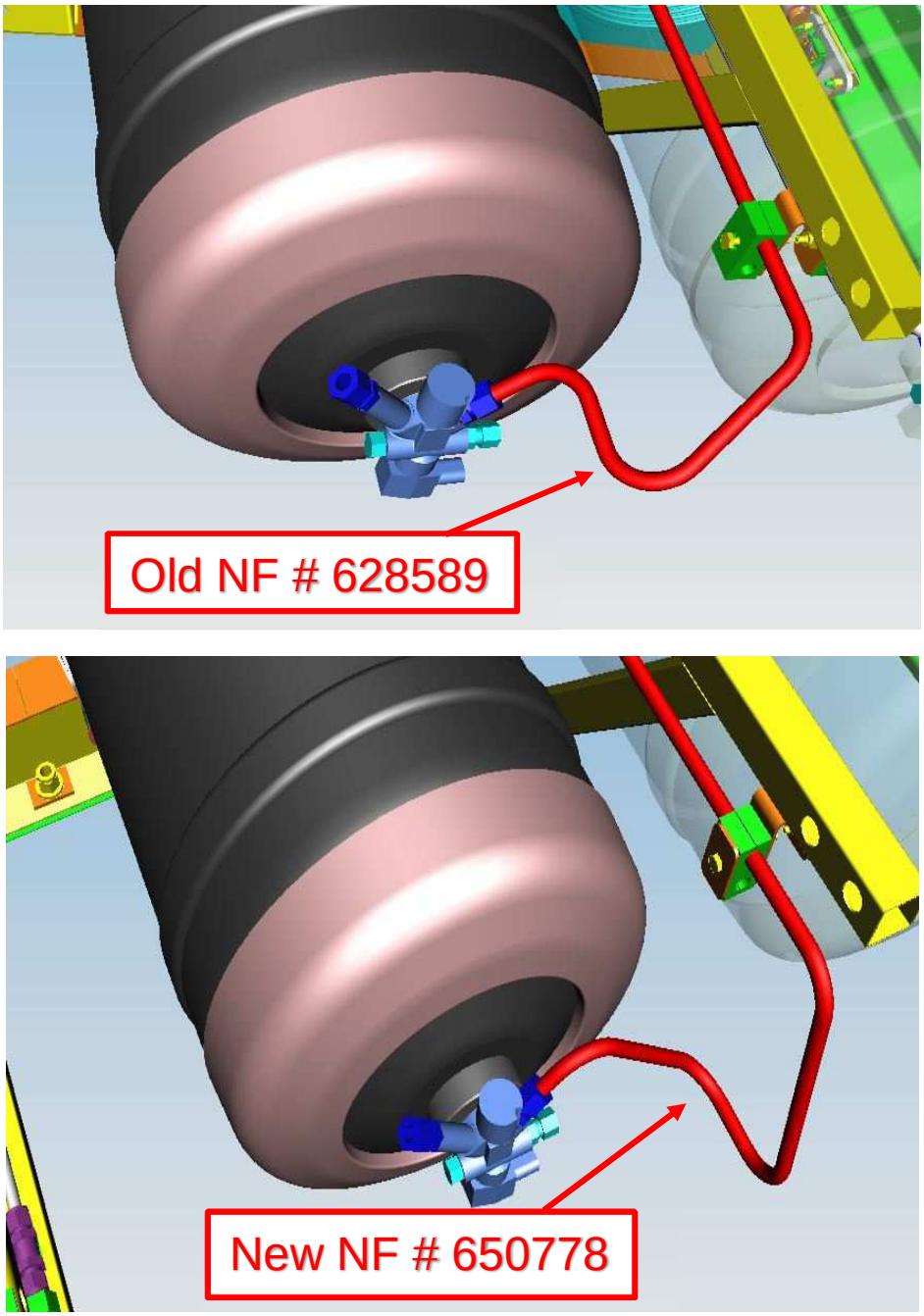


Figure 10: Vent lines affected in Section 2

Replace the affected vent lines as follows:

1. Open the CNG doors and locate the affected vent lines (NF # 628589). Reference the tank layout on Page 13. 4 vent lines will need to be replaced on each bus.
2. Remove the 4 screws securing each of the cross braces, as shown in Fig. 11.

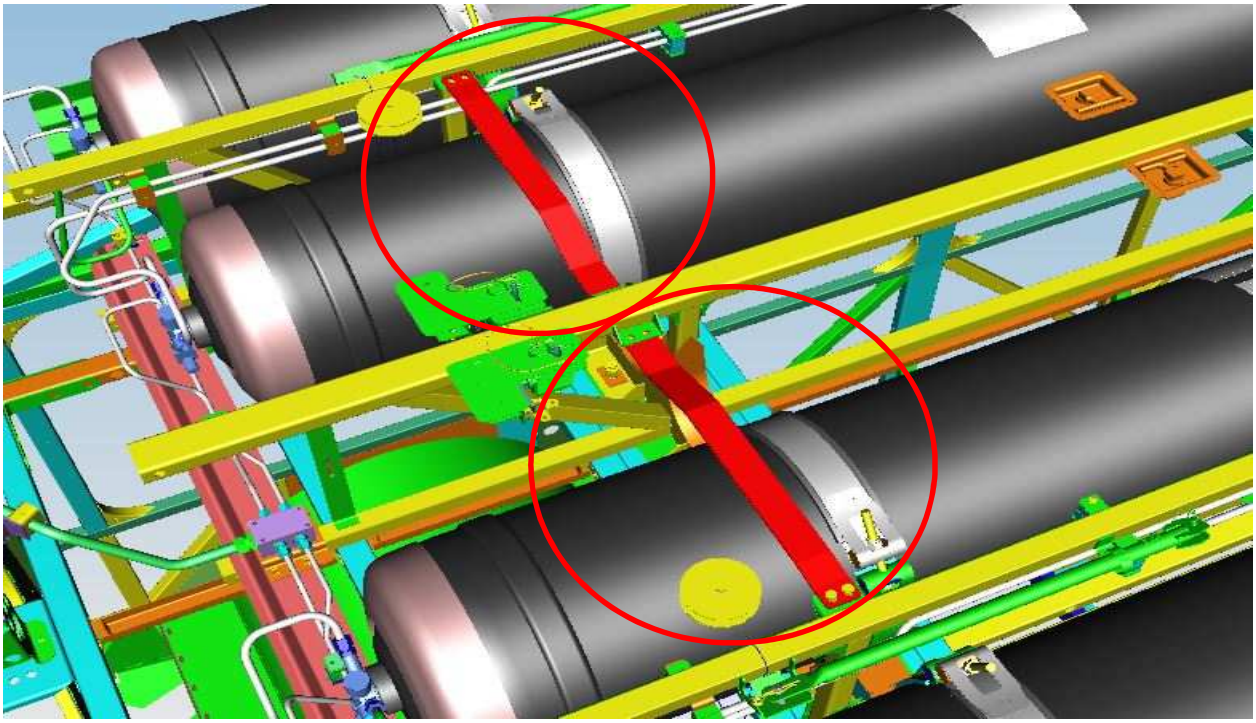


Figure 11: Cross braces

3. Using a backing wrench to hold the adaptor body hex, disconnect the vent line from the remote PRD. The adaptor on the remote PRD will remain in place. Refer to Fig. 12.

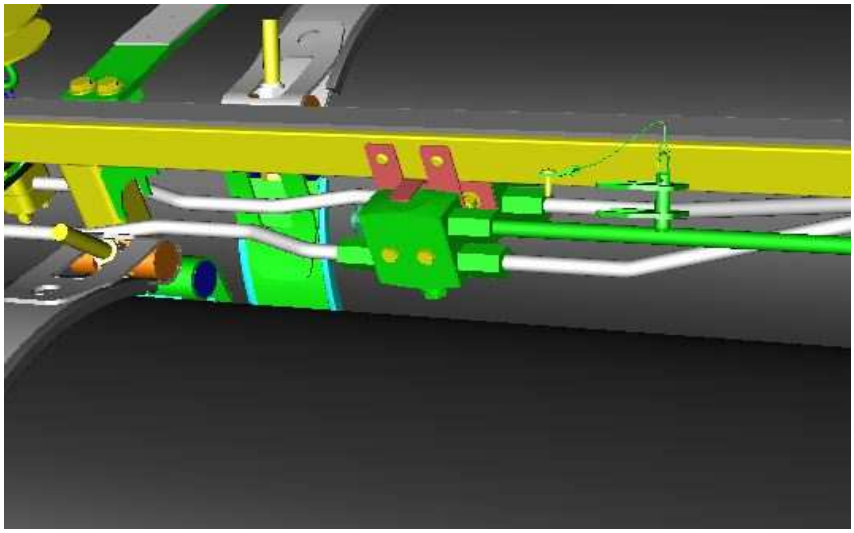


Figure 12: Remote PRD

4. Using a backing wrench to hold the adaptor, disconnect the vent line from the tank solenoid valve. The adaptor on the solenoid valve will remain in place. Refer to Fig. 13.

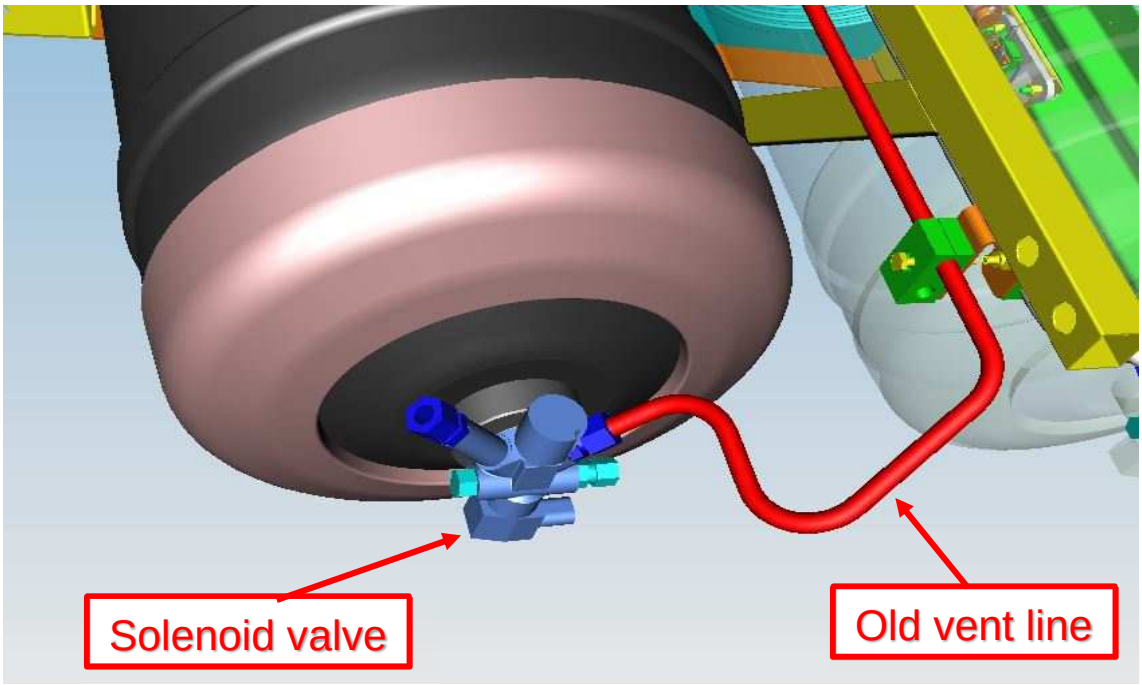


Figure 13: Disconnect vent line from the adaptor on the solenoid valve

5. Disconnect the 4 mounting blocks that secure the fuel lines to the bus. On mounting blocks used with weld plates, as shown in Fig. 14, remove the two outboard bolts first and slide the block back to expose the socket head bolts. Remove the two socket head bolts. Remove the bolts on the remaining mounting blocks. Keep all hardware for reuse.

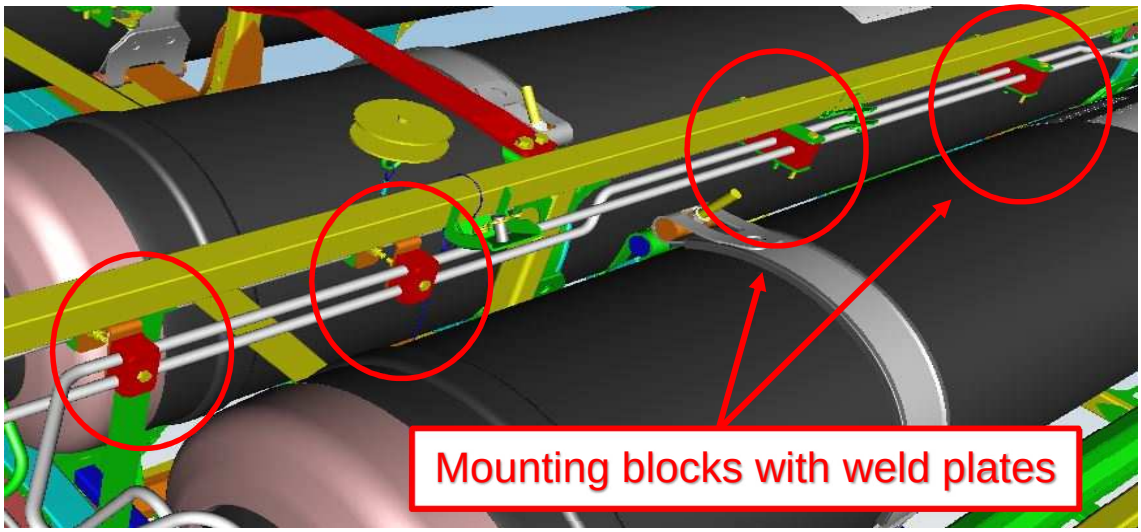
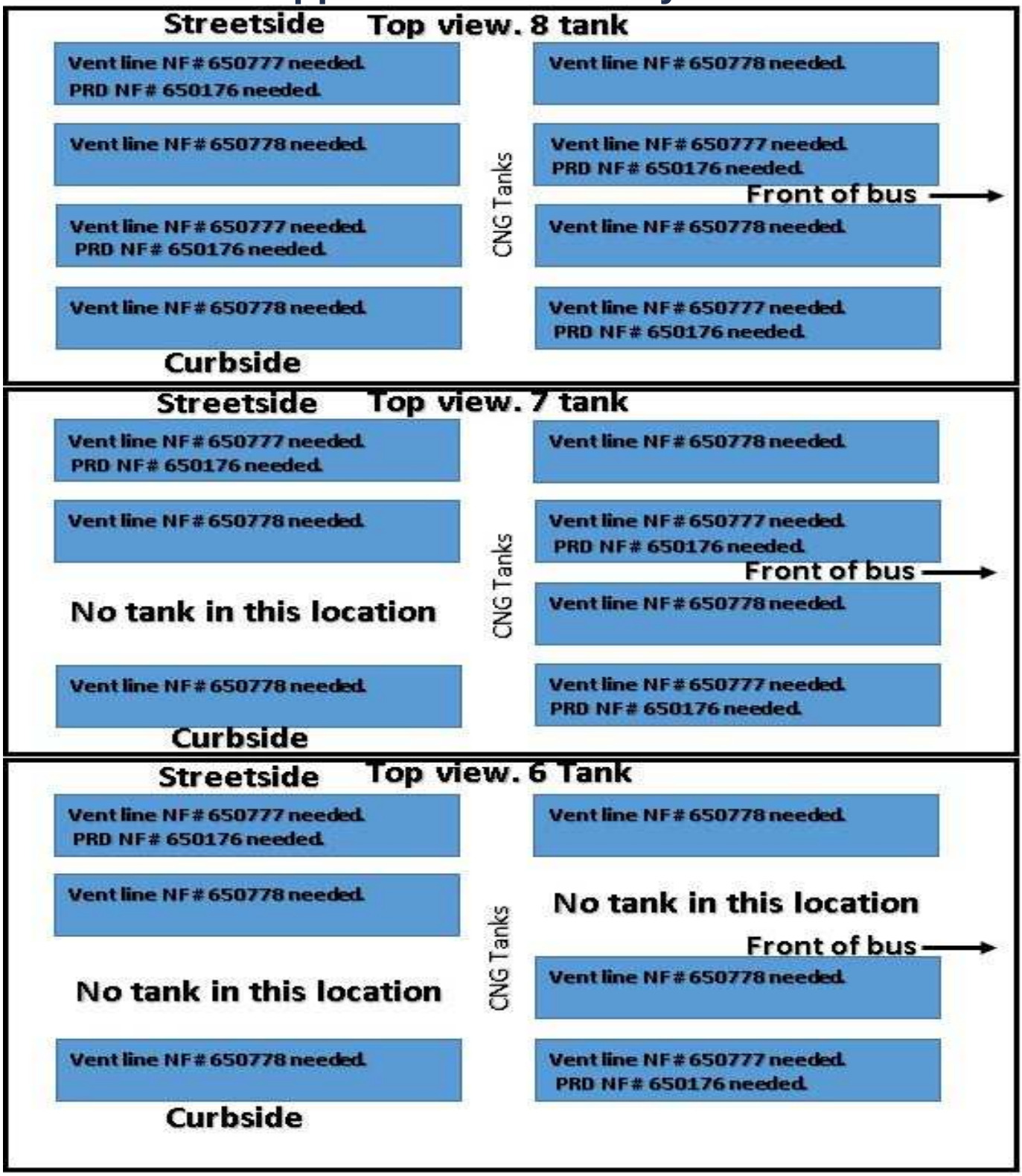


Figure 14: Mounting blocks

6. Remove and discard the old vent line
7. Install the new vent line (NF # 650778) and install the fittings on both ends of the tank solenoid and remote-mounted PRD. Tighten to finger-tight.
8. Tighten the fittings using a backing wrench on the adapter body hex. Rotate the Swagelok nuts with a wrench until snug. At this point an increase of resistance will be encountered. Then tighten slightly with a wrench.
9. Reinstall all mounting blocks using existing hardware.
10. Reinstall the cross braces using existing hardware.
11. Install 3 decals (NF # 064068) on each new vent line installed in Section 2 so that they are pointed up and visible. Use the old vent line as a reference for placement.

Appendix A: Tank Layout



Appendix B: Solenoid and Tank Data Collection Sheet

☞ **NOTE: Only record serial numbers for tanks and solenoid valves which receive new PRDs, as noted in Section 1 of the ITS.**

SR#	Bus #	Solenoid Serial #	Tank Serial #

NEW FLYER

LABOUR ESTIMATE

	Operation	Men	Hours	Labour Time M X HR
1	Remove and replace CNG vent lines and PRD.	1	8.0	8.0

PARTS REQUIRED - 6 Tank

Item	Part Number	Description	Qty. per Coach	Units	Notes
1	650777	ASSY - TUBE-0.50 DIA VENT CNG	2	EA	
2	650778	ASSY - TUBE-0.50 DIA VENT CNG	4	EA	
3	650176	PRD-OMB ESA VALVE TPRD	2	EA	
4	116719	O.RING BUNA 90D 9/16-18	2	EA	
5	064068	DECAL COMP. NAT. GAS	12	EA	
6	5945362	HOSE GREASE SILICONE	0.01	EA	Source Locally

PARTS REQUIRED - 7 Tank

Item	Part Number	Description	Qty. per Coach	Units	Notes
1	650777	ASSY - TUBE-0.50 DIA VENT CNG	3	EA	
2	650778	ASSY - TUBE-0.50 DIA VENT CNG	4	EA	
3	650176	PRD-OMB ESA VALVE TPRD	3	EA	
4	116719	O.RING BUNA 90D 9/16-18	3	EA	
5	064068	DECAL COMP. NAT. GAS	12	EA	
6	5945362	HOSE GREASE SILICONE	0.01	EA	Source Locally

PARTS REQUIRED - 8 Tank

Item	Part Number	Description	Qty. per Coach	Units	Notes
1	650777	ASSY - TUBE-0.50 DIA VENT CNG	4	EA	
2	650778	ASSY - TUBE-0.50 DIA VENT CNG	4	EA	
3	650176	PRD-OMB ESA VALVE TPRD	4	EA	
4	116719	O.RING BUNA 90D 9/16-18	4	EA	
5	064068	DECAL COMP. NAT. GAS	12	EA	
6	5945362	HOSE GREASE SILICONE	0.01	EA	Source Locally