	VT-0046	001	05/29	BP/BK
CHART®	R110 RH Tanks EFV and Liquid Tube Install			

Purpose

This document will outline the steps necessary to upgrade the plumbing on certain LNG vehicle tanks designed and manufactured by Chart under R110 standards.

Overview

Certain R110 coded LNG vehicle tanks can have the tanks plumbing supply lines upgraded. The upgrade only affects a small number of tanks. The owner of tanks requiring this upgrade procedure will be contacted directly by Chart LNG personnel to schedule the repairs. Scope of repair items includes installation of a secondary flow restriction device, installation of new fuel supply line between the tank liquid shut off valve and heat exchanger inlet. Installation of new fuel supply lines between the heat exchanger outlet and shut off solenoid inlet, as well as new fuel supply line between the shut off solenoid outlet and tank internal bulkhead connector. The optional fuel inlet check valve and bulkhead connector will also be removed and the hole plugged off.

Parts Needed

Qty.	Part Number	Description
1	20732476	Plastic Plug for Bulkhead Connector Hole
1	20910164	RH Liquid Tube Assembly
1	11751555	3/8” Flaretite Seal
2	11751571	3/4” Flaretite Seal
1	1210482	3/8” NPT street elbow
1	20909776	Excess flow valve

Tools Needed

- 1/2” Combination Wrench or Hex Socket Adapted to Drill or Ratchet
- 9/16” Combination Wrench
- 11/16” Combination Wrench
- 3/4” Combination Wrench
- 7/8” Combination Wrench
- 1-1/8” Combination Wrench
- 1-1/4” Combination Wrench
- 1-3/8” Combination Wrench

This procedure is intended for use by trained technicians with experience on systems using LNG. Review all applicable safety documents before beginning this procedure.

- Internal wire brush
- Adjustable wrench

Other Supplies

- Nickel Impregnated Thread Sealant Tape (PN: 11811511)
- Anti-Seize Lubricant for Stainless Steel

Safety

Ensure the servicing technician has read this procedure in its entirety prior to beginning. They will follow the procedure in a step by step process. Ensure all appropriate personal protective equipment is worn as required. Any special safety considerations will be highlighted in red and should be paid special attention.

Upgrade Steps

1. Remove the 4 shroud plumbing protective cover attaching bolts. Use a ½" hex socket or ½" combination wrench. Retain the cover and bolts to reinstall.
2. Turn off Fuel Shutoff Valve (Red Hand wheel shown in photo below) by rotating it clockwise until it is fully closed.

3. Turn on the ignition switch and start the engine to depressurize fuel line downstream of the Fuel Shutoff Valve.
4. Once the engine stops, turn the ignition off, remove and secure the key.

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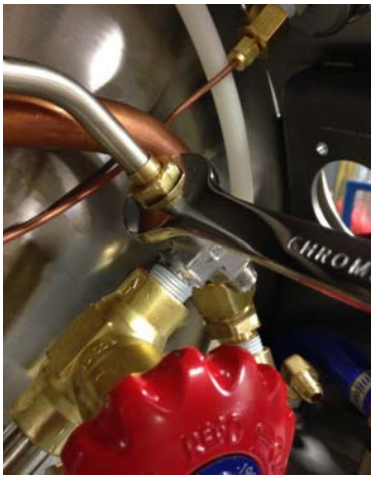
5. Using an 11/16” combination wrench, loosen the flare nuts of 3/8” tube in between tee and heat exchanger. Loosen the nuts two full turns and wiggle the tube by hand to loosen it in its mating fitting, this will also allow any residual pressure to safely escape. (See photo below).

6. Once residual pressure has escaped it is safe to completely loosen and remove the two flare nuts from their connecting fittings and remove the tube.
7. Remove the Flaretite seals from the male flare fittings and discard.
8. Using an 11/16” combination wrench, loosen the flare nuts of 3/8” tube in between tee and check valve.



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9. Using 1-1/4" combination wrench, remove jam nut from bulkhead connector of 'AUX LIQUID IN' port.

10. Remove the check valve, bulkhead connector, and 45° elbow fittings.

11. Insert plastic plug into hole. See below photo.

12. Using 1-1/4" combination wrench, slowly loosen the flare nuts of 'AUX FILL' line. Only loosen them 1 to 2 full turns maximum to allow pressure to escape from the lines. See photos below.

Use Caution when performing Step 12. The line to be loosened will have natural gas under pressure inside it, but will begin to bleed out when the flare nuts are loosened. The tube should bleed to 0 bar within one minute, if it continues to leak pressure after 2 minutes the fill check valve may need to be replaced as a separate repair procedure.

13. Once all pressure has escaped it is safe to fully loosen the flare nuts and remove the tube. Keep the tube to reinstall in a later step.
14. Remove the Flaretite seals from both flared fittings and discard.
15. Remove the stainless steel flare tee from Fuel Shutoff Valve body using a 3/4" combination wrench. See photo below.

16. Remove any remaining thread sealant tape from the shut off valve female pipe threads using a wire tube brush. Open the valve for a few seconds to purge out any remaining debris then close it.

17. Apply thread sealant tape to the male threads of 3/8" NPT 90° street elbow and install in Fuel Shutoff Valve. Refer to Chart procedure VT-0030 for thread tape installation requirements. Tighten the tee with a 7/8" combination wrench as oriented in the photo below.

18. Reinstall 'AUX FILL' line using new ¾" Flaretite seals (remove old ones first). Tighten flare nuts with 1-1/4" combination wrench. If necessary, loosen jam nut of 'AUX FILL' bulkhead connector with 1-3/8" combination wrench to allow the tee going into the bulkhead connector to move to obtain proper alignment between tubes and fitting. Tighten flare nuts first and the jam nut of the bulkhead connector last.

19. Apply thread sealant tape to male threads of the excess flow valve and install it into the 3/8" NPT 90° street elbow. Tighten the excess flow valve with 1-1/8" combination wrench on the flats closes to the pipe thread end.

20. Insert the non-flared end of the RH Liquid Tube Assembly (PN: 20910164) into the outlet of the EFV. The excess flow valve should have a nut and ferrules already installed.
21. Install a new 3/8" Flaretite seal onto the heat exchanger fuel inlet elbows, male flare fitting.
22. Thread the other end of the tube (with the flare nut installed on the tube) to the male flare fitting elbow on the heat exchanger inlet fuel port. See photo below.

23. Using 11/16” combination wrench, tighten the flare nut on the heat exchanger end.

24. Using 11/16” combination wrench, tighten the nut of compression fitting end on the Excess Flow Valve.

25. Apply anti-seize lubricant to the four screws that mount the shroud cover to the shroud and install shroud cover
26. Fully open the Fuel Shutoff Valve by turning the handle counter-clockwise.
27. Turn on ignition switch to power (open) the fuel shut off solenoid.
28. Leak test all fittings and connections.