



Think Safety!

A Publication Of The West Virginia Propane Gas Association

Summer 2009

Properly Evacuating An ASME Tank

In the last issue of *Think Safety*, we covered the transportation of tanks from the customer location to the plant. We focused on tanks covered under a special permit that were more than five percent full.

Of course, once those tanks are moved back to the plant, something must be done with the propane in the tank. The permit does not allow for the tank to be transported to another customer location.

This means the propane in the tank must be evacuated into another storage con-

tainer. In this issue, we will describe safe procedures for evacuating propane. We will primarily center our attention on the use of a compressor to move the propane.

We understand that many of you may be using the pump on your bobtail or a plant pump, however, we do not have enough space in this newsletter to cover all three methods. We chose to stress the use of a compressor because the other two methods involve the use of equipment that is not truly designed for this purpose.

Using a bobtail or a plant pump could promote excessive wear that will lead to a premature breakdown or complete replacement of

the equipment.

As always, refer to your company policy as to which procedure you should use to perform this task.



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Articles in this publication are for information only. Nothing in this publication is to be construed as setting standards or requirements. Please consult with appropriate regulatory and rulemaking bodies for all legal requirements.

Identifying Transfer Components:

Of course, it is imperative that you use the right equipment during the transfer process. When making the transfer at the plant, equipment should include a compressor, a liquid transfer hose, vapor hoses, the proper adapters and valves, and actuated liquid withdrawal excess flow valves, and PPE such as gloves, protective glasses and heavy shoes or boots.

The liquid withdrawal hose should be as short as possible and at least 3/4 inch in diameter and preferably one inch. Other hose criteria include:

- It should be listed and approved for liquid propane gas service (350 psig operating pressure, 1750 psig bursting pressure).

- Manual shutoff valves

such as snap-action globe valves, hand wheel-operated globe valves, or ball valves should be installed on both ends of the hose. All valves should be rated for liquid or high pressure service 600 WOG.

- A hydrostatic relief valve should be installed in the liquid assembly. The relief valve prevents the hose from bursting due to liquid expansion when liquid propane gas is trapped between the two shut-off valves.

- Fittings must be selected that will connect the liquid supply line to the two tanks. The outlet of the liquid supply line will be connected to either the pump-off adapter or directly to the fill connection on the plant storage tank (when a

compressor is used).

- All threaded connections in the liquid line should be sealed with thread sealing compound (except POL and ACME threads).

The liquid propane can be removed through the filler valve with the use of a special unloading adapter. Each of the adapters employs an operating stem that extends through the bottom of each operator stem. The stem pushes open the back checks in the filler valve so the liquid can be removed from the tank. There are several unloading adapters on the market. Always follow the manufacturer's instructions.

Most of these valves sold today are not intended to be used as a normal liquid outlet. Consult the Manufacturer's instructions to determine whether the valve you are using is approved for use as a liquid outlet.

Most of the liquid withdrawal valves in the field today have metal-to-metal seats and product loss will take place when making a connection to the units.

In some cases, a damaged seat may allow an excessive

amount of liquid to be discharged when the closing cap is loosened. A bleed hole in the closing cap has been provided to vent the liquid before the cap is completely unscrewed. If a significant amount of liquid continues to be blown from under the closing cap for more than 30 seconds, it can be assumed that the internal seat will not prevent a dangerous amount of gas from escaping. **IF IN DOUBT, DO NOT REMOVE THE CLOSING CAP.** Should only vapor be leaking from under the cap, the connection to the liquid withdrawal valve can usually be made.

A transfer valve with a machined adapter must be used to evacuate a tank through a liquid evacuation valve. When the transfer valve and adapter are screwed into the evacuation valve, the machined adapter forces the operator shaft down and moves the valve disc off of its seat. Install a transfer valve with a 3/4" NPT inlet and a 1 3/4" ACME

hose connector in the outlet. Use the machined adapter supplied by the evacuation valve manufacturer.



UNLOADING ADAPTER



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Transfer Safety Guidelines:

Before you start the transfer process, it is important that you make sure you are working in a safe environment and that you are fully protected.

Make sure you are totally aware of safe transfer procedures as well as all the tank valves and transfer equipment to be used. Be aware of the manufacturer's instructions for all equipment to be used.

Special care is required with angle valves to ensure that they do not direct liquid toward people or ignition sources.

When transferring liquid propane between containers the following criteria should be observed:

- All sources of ignition within 25 feet of the point of transfer must be removed, extinguished, or turned

off for the duration of the operation.

- Internal combustion engines within 15 feet of the point of transfer must be shut down while transfer operations are in progress, except for engines on transfer equipment and others as listed in NFPA 58.
- At least one recently

inspected fire extinguisher, having a minimum capacity of 18 lb. dry chemical with a B:C or A:B:C rating must be within easy reach during the entire operation.

- A qualified individual must be present at the operation during the entire evacuation procedure.

Tank Evacuation Procedures:

The following procedures for evacuating propane from a tank are designed as a guide when using a compressor. On most LP-gas containers larger than 125 water gallon capacity and manufactured prior to July 1, 1961, a liquid withdrawal (evacuation) internal dip tube was attached to the bottom of the filler valve by the manufacturer and extended to the bottom of the container.

Since 1961, container manufacturers have installed a separate valve called an actuated liquid withdrawal excess flow valve for liquid evacuation of domestic containers. An internal withdrawal tube extends to a point near the bottom of the container and connects to the valve.

Propane should never be vented into the atmosphere through these valves except as required during installation and removal of the transfer valve. Note the

procedures described below are limited to the following tanks and equipment:

- _ Any tank with a liquid withdrawal valve.
- _ Liquid will be withdrawn through a liquid withdrawal valve with a transfer valve installed.
- _ The tank used to receive the liquid from the tank being evacuated is a bulk plant storage tank, or other appropriate tank.
- _ A compressor will be used to evacuate the liquid in the tank.

(a) Determine the quantity of propane to be transferred. Check to see that the liquid level in the storage tank is low enough to handle the entire water capacity of the tank to be evacuated.

(c) Using the Compressor Transfer Method.

Step 1: Connect a transfer valve to the inlet of the withdrawal valve on the tank.

_ Begin by screwing a machined unloading adapter

into the inlet of the transfer valve.

_ When removing the plug or cap from the liquid withdrawal valve, be sure only the plug is loosened and removed.

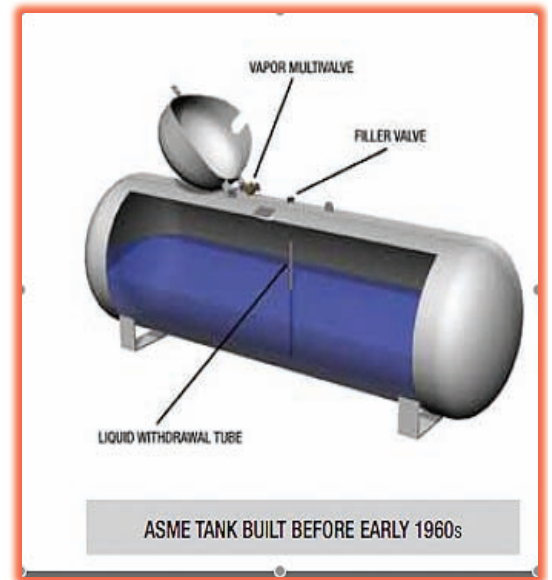
_ While removing the plug, if an excessive volume of propane leaks from the valve, reinstall the plug and follow manufacturer's instructions.

_ Install the transfer valve according to manufacturer's instructions making sure the transfer valve is completely open.

_ Once installed, close the transfer valve.

Step 2: Close all valves in the liquid transfer line.

Step 3: Lay out the liquid transfer hose between the



stationary tank and the cargo tank.

_ Ensure the liquid transfer hose-end valve is protected from foreign matter (rock, dirt, etc.)

_ Hoses should be capped when not in use.

Step 4: Connect one end of the liquid transfer hose to the outlet of the transfer valve and the other end to the fill connection located on the plant storage tank.

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Tank Evacuation Procedures:

Step 5: Connect the vapor hoses between the compressor and tanks. Connect the discharge hose between the discharge side of the compressor and the vapor equalizing valve (or purging adapter) on the tank.

– Connect the suction hose between the suction side of the compressor and the equalizing connection on the plant storage tank.

Step 6: Pressure Test the Vapor and Liquid Hoses. Slowly open one valve at a time, starting with the transfer valve in the stationary tank, to pressure test the liquid supply line.

Check all connections downstream to the next closed valve for leakage once a valve is opened.

Slowly open each valve downstream one at a time after each section of line is considered tight. Close all valves in the line and make repairs, if any leaks are detected.

Step 7: Transfer as much liquid as possible from the propane tank to the storage tank. Read and follow compressor manufacturer instructions. Typically, portable compressors are run only for short time periods of one or two minutes to create a pressure differential between the two tanks.

Step 8: Bleed down and disconnection all hoses. During this procedure, liquid propane gas trapped in the hose connections is bled off to the atmosphere. Any liquid propane gas trapped in the hose itself (between shut-off valves) must be bled off. The steps for bleeding down the transfer hose are as follows:

(a) Bleed down and disconnect the fitting of the liquid transfer hose connected to the closed transfer valve.

(b) Bleed down and disconnect the liquid transfer hose connection at the

pump-off adapter or fill connection.

(c) Fully open the transfer valve and allow liquid propane gas to flow through until the excess-flow check valve “slugs” shut.

CAUTION:

If the excess-flow valve does not “slug” shut, immediately close the transfer valve. Do not remove the transfer valve until the pressure in the tank has been reduced to 0 psig. Once the pressure has been reduced, the withdrawal valve must be serviced before the tank is returned to service.

(d) Remove the transfer valve, Teflon washer, and adapter from the tank after the excess-flow valve has been “slugged.”

(e) Reinstall the plug and Teflon washer into the liquid withdrawal valve.

CAUTION:

Do not cross thread the plug during installation. Also, avoid tightening or

moving the withdrawal valve when installing the plug.

(f) Bleed down and disconnect the vapor hose fitting from the tank (either at the vapor equalizing valve or the purging adapter

(g) Remove the purging adapter from the vapor service valve, if applicable.

(h) Install any dust caps on the hoses or stationary valves.

(i) Bleed down and disconnect the vapor hose fitting from the storage tank. Install any dust caps on the hose or the vapor connection.

(j) Bleed down and disconnect the suction and discharge hose fittings from the compressor, if applicable.

(k) Disconnect the hose from the fill connection on the bulk plant storage tank.

(l) Store all tools, supplies, hoses, and transfer equipment.

Training Quiz

Name _____ Social Security Number _____

1. The liquid withdrawal hose should be as short as possible and at least ___ inch in diameter and preferably ___ inch.
A. 1, 2 B. 3/4, 1 C. 2, 3 D. 1/2, 1
2. The transfer hose should be listed and approved for liquid propane gas service (350 psig operating pressure, 1750 psig bursting pressure).
A. True B. False
3. Manual shutoff valves such as snap-action globe valves, hand wheel-operated globe valves, or ball valves should be installed on both ends of the hose.
A. True B. False
4. A hydrostatic relief valve should be installed in the liquid assembly.
A. True B. False
5. All threaded connections in the liquid line should be sealed with thread sealing compound (except POL and ACME threads).
A. True B. False
6. If a significant amount of liquid continues to be blown from under the closing cap for more than ____ seconds, it can be assumed that the internal seat will not prevent a dangerous amount of gas from escaping.
A. 45 B. 15 C. 20 D. 30
7. All sources of ignition within ___ feet of the point of transfer must be removed, extinguished, or turned off for the duration of the operation.
A. 25 B. 15 C. 30 D. 1,000
8. Internal combustion engines within ___ feet of the point of transfer must be shut down while transfer operations are in progress, except for engines on transfer equipment and others as listed in NFPA 58.
A. 25 B. 15 C. 30 D. 1,000
9. A qualified individual must be present at the operation during the entire evacuation procedure.
A. True B. False
10. Propane should never be vented into the atmosphere through an actuated liquid withdrawal excess flow valve except as required during installation and removal of the transfer valve.
A. True B. False
11. When removing the plug or cap from the liquid withdrawal valve, be sure only the plug is loosened and removed.
A. True B. False
12. Any liquid propane gas trapped in the hose itself (between shut-off valves) must be bled off.
A. True B. False
13. If the excess-flow valve does not “slug” shut after opening the transfer valve and filling it with liquid propane, immediately close the transfer valve.
A. True B. False
14. At least one recently inspected fire extinguisher, having a minimum capacity of 18 lb. dry chemical with a B:C or A:B:C rating must be within easy reach during the entire operation.
A. True B. False

Training Quiz Answers

Name _____ Social Security Number _____

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