



Distribution & Storage Division / Beverage Systems

Technical Service Bulletin

Preventive Maintenance

TSB-Y10-003

Date:

January 2005

Subject:

Liquid CO₂ Fill Circuit Preventive Maintenance Recommendations

Description:

Transfer of liquid CO₂ from delivery source to storage vessel is commonly accomplished through a fill circuit consisting of a (wall box) fill coupling, fill hose, vent tube, and fill valve on the bulk CO₂ storage vessel. The fill circuit is under pressure during the fill process and while the bulk CO₂ system is in operation. During its years of use the fill circuit may eventually exhibit the effects of exposure to wear and damage due to its environment. Chart recommends that a qualified service agent perform periodic inspection and maintenance on the components of the CO₂ fill circuit to keep it in proper and safe operating condition.

Recommendation:

With every CO₂ delivery check the fill box connection equipment.

- The wall box must be securely fastened and its door operating properly.
- The restraint clip or tab attachment for the fill gun must be secure.
- The fill coupling must be securely fastened within the wall box.
- The fill coupling threads must be clean and undamaged to allow fill gun to fully engage.
- The fill coupling valve must open and close properly.

At least once a year check the integrity of the fill and vent hose circuits.

- Verify that the vent hose is routed from the CO₂ storage vessel to an outdoor location.
- Inspect the fill hose and replace it if it contains cover cracks, blisters, kinks, abrasions (exposed reinforcement), leaks, damaged or corroded fittings, excessive build-up of dirt, grease or oils.
- The fill and vent hoses should be replaced every eight years because the accumulated effects of exposure to normal harsh use conditions may not always be obvious.
- The fill valve on the CO₂ storage vessel must be equipped with a self relieving isolation valve (Chart P/N 11082128) or piped away relief valve within the fill hose circuit.

If you have questions about liquid fill circuit preventive maintenance, please contact Chart Technical Service at 800-253-1769.



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TSB-Y10-004

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January 2005

Subject:

Liquid CO₂ Fill Valve Inspection

Description:

Bulk CO₂ storage vessels are equipped with a check valve or a self-venting shut-off valve (ball valve) at their fill port. The purpose of this valve is to prevent pressure or product loss from the vessel during times when the vessel may be disconnected from or isolated from the fill hose and fill box. As a feature of safety, the valve is designed to relieve excess and possibly dangerous pressure (from the fill hose) into the vessel when the valve is closed. The valve's relief function should be tested at least once a year.

Recommendation:

Verify that the vessel's fill port is equipped with a proper valve. If the valve cannot be confirmed to be one of the four versions of self-venting valves shown below, it should be replaced with Chart supplied ball valve P/N 11082128 shown in Figure 4. **Warning: A non-venting ball valve on the vessel's fill port could, if closed, entrap liquid CO₂ in the fill hose creating high pressure that could result in hose rupture and serious injury.**



(Check Valve)
Figure 1



(Parker Ball Valve)
Figure 2



(Dynaquip Ball Valve)
Figure 3



(Ball Valve, P/N 11082128)
Figure 4

At least once a year check the fill valve on a bulk CO₂ storage vessel for external leakage, cracks or other visible damage. Verify that the valve opens completely to ensure maximum fill speed.

The relief performance of a self-venting ball valve can be tested using the following procedure:

- With the vessel pressure at 150 psi or less and its fill valve closed, install a pressure gauge at either end of the fill hose between the fill valve and the wall box coupling. (The gauge on a "fill gun" will serve this purpose.)
- Using an external pressure source, slowly raise the fill hose pressure to 300 psig then shut off the pressure source. Note: If a CO₂ delivery vehicle is used to pressurize the fill hose through the wall box coupling, ensure that only CO₂ gas is being supplied. Avoid trapping liquid CO₂ in the fill line.
- The pressure in the fill hose should drop, indicating that the valve is venting excess fill hose pressure into the vessel. If the pressure does not drop, replace the valve with P/N 11082128 when the vessel is empty.

If you have questions about fill valve inspection please contact Chart Technical Service at 800-253-1769.