LPG and anhydrous ammonia tank cars are sealed pressure containers. Several fittings are mounted on the manway cover plate to facilitate loading, unloading, gauging and testing operations. All of these fittings are designed to perform efficiently and safely, even under adverse conditions. But there is a right way and a wrong way to use any piece of mechanical equipment. Manway valves and fittings on pressure tank cars are no exception.

Always follow your company’s written policies and procedures. Refer to AAR Pamphlet 34 for additional information on proper handling.

### Do's and Don’ts of LPG and Anhydrous Ammonia Pressure Tank Car Handling

**LPG and Anhydrous Ammonia**

**Tank Car Handling**

1. **NEVER POSITION YOURSELF DIRECTLY OVER ANY PRESSURE CAR FITTINGS, WHEN OPERATING, TO MINIMIZE RISK OF SERIOUS INJURY.**

**Main Valves – Liquid and Vapor**

Manway cover plates are equipped with three main valves – either angle ball valves or angle-type rising-stem valves.

- The two valves on the longitudinal axis of the tank are the liquid valves.
- The one to the side of the longitudinal axis is the vapor valve.

The two liquid valves are connected to pipes that extend from the underside of the manway cover plate to within 1/2” of the bottom of the tank. These pipes are called suction pipes. They make it possible to unload the commodity in liquid form from the top of the tank. The two liquid valves are connected to pipes that extend from the underside of the manway cover plate to within 1/2” of the bottom of the tank. These pipes are called suction pipes. They make it possible to unload the commodity in liquid form from the top of the tank.

- The vapor valve is a ball or angle valve located on the manway cover plate, usually under a protective housing. The older cars, the angle-type design of gauging devices is common. In accordance with recent AAR requirements, open devices are to be replaced and all new open valves on existing cars must be removed at the next tank qualification event. No new cars a magnetic ball/float type of device is standard.

- For magnetic ball-type gauging devices, a rigid, calibrated rod, with a magnet at its top, is positioned inside a sealed well. On the underside of the sealed well, inside the tank car, is a float ball which moves up or down in the liquid as it enters or leaves the tank. The magnetic linkage between the float and the gauge rod gives a reading. When not in use, the rod is pushed down to rest on the bottom of the well, and a protective cap is threaded over the well opening.

Instructions for using a magnetic ball-type gauging device:

1. Slowly remove cap from gauging device.
2. Firmly grasp the cap and carefully pull the cap back on and report as defective.
3. If gauge rod does not move easily, carefully loosen packing gland nut slightly.
4. Depress gauge rod and free it from gauge rod valve.
5. Depress gauge rod and free it from gauge rod valve.
6. Read outage indicated on gauge rod opposite top surface of gauging pointer.
7. Read scale on the gauge tube across the top of the choke ball or protective device.
8. To prevent damage to gauge tube, push it back in and replace cap immediately after aggressive reading to valves.

**Excess Flow Valves**

Both the liquid and vapor valves are protected by excess flow valves. Located inside the tank directly under the manway cover plate, excess flow valves are intended to stop product loss if a valve is sheared off. These valves are sized according to the valves they serve. For example, a three inch tank car valve would have a three inch excess flow valve.

For safety’s sake, the loading/unloading point should not be an internal excess flow valve sized according to the plant loading/unloading line size. The excess flow valve should be attached directly to the car valve and if a line is accidentally ruptured or breaks this valve clamps immediately, preventing the release of hazardous product.

**Safety Valve**

The safety valve may be mounted in the center of the manway cover plate or opposite the vapor valve. This valve will open if the internal pressure of the tank is over the maximum allowable working pressure of the tank. This valve is a safety relief device. It is not intended to replace any other company written policies and procedures. Refer to AAR Pamphlet 34 for additional information on proper handling.

**Gauging Devices**

To measure the amount of liquid contained in the tank car, a gauging device is mounted on the manway cover plate, usually under a protective housing. The older cars, the angle-type design of gauging devices is common. In accordance with recent AAR requirements, open devices are to be replaced and all new open valves on existing cars must be removed at the next tank qualification event. No new cars a magnetic ball/float type of device is standard.

For magnetic ball-type gauging devices, a rigid, calibrated rod, with a magnet at its top, is positioned inside a sealed well. On the underside of the sealed well, inside the tank car, is a float ball which moves up or down in the liquid as it enters or leaves the tank. The magnetic linkage between the float and the gauge rod gives a reading. When not in use, the rod is pushed down to rest on the bottom of the well, and a protective cap is threaded over the well opening.

Instructions for using a magnetic ball-type gauging device:

1. Slowly remove cap from gauging device.
2. Firmly grasp the cap and carefully pull the cap back on and report as defective.
3. If gauge rod does not move easily, carefully loosen packing gland nut slightly.
4. Depress gauge rod and free it from gauge rod valve.
5. Depress gauge rod and free it from gauge rod valve.
6. Read outage indicated on gauge rod opposite top surface of gauging pointer.
7. Read scale on the gauge tube across the top of the choke ball or protective device.
8. To prevent damage to gauge tube, push it back in and replace cap immediately after aggressive reading to valves.

**Thermometer Well**

The thermometer well is a three-quarter inch hole, 90 degrees off the horizontal and in the center of a square plate, usually under a protective housing. The older cars, the angle-type design of gauging devices is common. In accordance with recent AAR requirements, open devices are to be replaced and all new open valves on existing cars must be removed at the next tank qualification event. No new cars a magnetic ball/float type of device is standard.

The safety valve may be mounted in the center of the manway cover plate or opposite the vapor valve. This valve will open if the internal pressure of the tank is over the maximum allowable working pressure of the tank. This valve is a safety relief device. It is not intended to replace any other company written policies and procedures. Refer to AAR Pamphlet 34 for additional information on proper handling.

**Sampling Line**

The sampling line consists of a one-quarter inch angle valve, a stainless steel nozzle, an excess flow valve and a one-quarter inch pipe, which extends down to the bottom of the tank. Its purpose is to obtain samples of the commodity.

**Plugs**

All openings in car valves are equipped with solid plugs which must be attached by the company valves. These are back-up or secondary seals to ensure leak proof fittings. On a male thread, especially on the plugs, use of Teflon tape is recommended to maximum the sealing ability of the metal-to-metal threaded connections.