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

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.

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 manway cover is connected to pipes that extend from the underside of the manway cover plate to within 1’ of the inside bottom of the tank. These pipes are called suction pipes. They make it possible to obtain the commodity in liquid form from the top of the tank, usually under a protective housing. The older cars, the open-type design of gauging devices in common. In accordance with recent AAR requirements, open devices are to be applied and ALL new devices on existing cars MUST BE REMOVED at the next tank qualification event. No manway cars have a magnetic ball/flat type of device is standard.

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 damaged. 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 it breaks this valve clean immediately, preventing the release of hazardous product.

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

It is important that both liquid and vapor line valves be fully opened during loading/unloading. It is also important that all valves be opened SLIGHTLY to ensure that excess flow valves do not act when starting to load or unload tank cars. Should these excess flow valves close, the tank car valves must be closed and kept closed until the excess flow valves are heard to “drop.” After the drop, the tank car valve should be opened slowly all the way and loading/unloading continued.

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 open-type design of gauging devices in common. In accordance with recent AAR requirements, open devices are to be applied and ALL new devices on existing cars MUST BE REMOVED at the next tank qualification event. No manway cars have a magnetic ball/flat type of device is standard.

For magnetic ball-type gauging devices, a rigid calibrated rod, with a magnet at its base, is positioned inside the car 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. Pull the gauge tube up until magnetic ball makes connection.
3. Read scale on the gauge tube across the top of the magnetic device.
4. To prevent damage to gauge tube, push it back in and replace cap immediately after reading gauge readings.

Instructions for using spew-type gauging device:

1. Unscrew and remove gauging device protective housing.
2. Depress gauge rod and free it from gauge rod lock.
3. Pull the gauge tube up until magnetic linkage between the float and the gauge rod gives a reading.
4. Push the gauge rod down to rest on the bottom of the well, and a protective cap is threaded over the well opening.

Magnetic ball-type gauging devices, a rigid calibrated rod, with a magnet on the end, is positioned inside 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 spew-type gauging device:

1. Unscrew and remove gauging device protective housing.
2. Depress gauge rod and free it from gauge rod lock.
3. Push the gauge rod down to rest on the bottom of the well, and a protective cap is threaded over the well opening.

Safety Valve

The safety valve may be mounted in the center of the manway cover plate or opposite the vapor valve. This valve will operate in order to prevent damage to the liquid or vapor line if excessive pressure is built up in the tank. Safety valves must meet Federal and AAR requirements. Contact car owner for specific information.

LPG and Anhydrous Ammonia Car Manway Arrangement

The top part of the thermometer well is equipped with a safety cap. This cap allows controlled escape of any internal pressure in the thermometer well. If commodity escapes from the thermometer when open, the well may be leaking and should be inspected and reported as defective.

Sampling Line

The sampling line consists of a one-quarter inch valve, a stainless steel nipple, an excess flow valve and a one-quarter inch pipe, which extends downward 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 bolts to the 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 maximize the sealing ability of the metal-to-metal threaded connections.

Safety Valve

The safety valve may be mounted in the center of the manway cover plate or opposite the vapor valve. This valve will operate in order to prevent damage to the liquid or vapor line if excessive pressure is built up in the tank. Safety valves must meet Federal and AAR requirements. Contact car owner for specific information.

LPG and Anhydrous Ammonia Pressure Tank Car Handling

The top part of the thermometer well is equipped with a safety cap. This cap allows controlled escape of any internal pressure in the thermometer well. If commodity escapes from the thermometer when open, the well may be leaking and should be inspected and reported as defective.

Sampling Line

The sampling line consists of a one-quarter inch valve, a stainless steel nipple, an excess flow valve and a one-quarter inch pipe, which extends downward 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 bolts to the 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 maximize the sealing ability of the metal-to-metal threaded connections.

Safety Valve

The safety valve may be mounted in the center of the manway cover plate or opposite the vapor valve. This valve will operate in order to prevent damage to the liquid or vapor line if excessive pressure is built up in the tank. Safety valves must meet Federal and AAR requirements. Contact car owner for specific information.

LPG and Anhydrous Ammonia Pressure Tank Car Handling

The top part of the thermometer well is equipped with a safety cap. This cap allows controlled escape of any internal pressure in the thermometer well. If commodity escapes from the thermometer when open, the well may be leaking and should be inspected and reported as defective.

Sampling Line

The sampling line consists of a one-quarter inch valve, a stainless steel nipple, an excess flow valve and a one-quarter inch pipe, which extends downward 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 bolts to the 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 maximize the sealing ability of the metal-to-metal threaded connections.

Safety Valve

The safety valve may be mounted in the center of the manway cover plate or opposite the vapor valve. This valve will operate in order to prevent damage to the liquid or vapor line if excessive pressure is built up in the tank. Safety valves must meet Federal and AAR requirements. Contact car owner for specific information.