




GATX

DO'S AND DON'TS OF GENERAL SERVICE TANK CAR HANDLING

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NOTICE: This poster is offered as a guide to encourage safe operating procedures and should not be construed as a complete maintenance manual or operating instructions. These guidelines are contingent on following established safety rules and practicing proper maintenance. They assume a basic understanding of railcar operation and are not intended to replace existing company standards and procedures.

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KEY

- GATX HEADQUARTERS
- GATX REGIONAL RAIL OFFICES
- ◆ RAILCAR MAINTENANCE NETWORK

Do's and Dont's of General Service Tank Car Handling

To ensure safe operating procedures, follow safety rules, practice proper maintenance and use common sense.

General service tank cars are equipped with various top and bottom fittings to allow loading, unloading, gauging and testing operations. For additional information, read AAR BOE Pamphlet 34, your company's instructions, applicable government regulations, and AAR's NAR web site at nar.aar.com.

SAFETY VALVES & VENTS

The purpose of a safety valve or vent is to prevent the tank pressure from exceeding a specified limit. A SAFETY VALVE re-closes after this limit is exceeded and excess tank pressure has been relieved. A SAFETY VENT does not re-close and requires that a frangible disk (rupture disk) be replaced every time a pressure relief event occurs. The pressure setting on general service safety valves and vents is 165 psi maximum.

Safety valves and vents are typically mounted on the fittings nozzle cover plate or on a separate tank nozzle specifically for the safety valve. Safety vents may be mounted on the manway cover plate as well.

MANWAY AND FILL HOLE NOZZLES

A manway consists of a flanged nozzle located at the top of the tank. It is equipped with either a bolted cover or a hinged and bolted cover with a gasket to provide a seal in the closed position. Hinged manway covers are typically sealed with eye-bolts that rotate into position for tightening.

A fill hole is configured similar to a manway. However, it is typically much smaller and is used exclusively as a loading nozzle for some commodities.

A gauge bar is typically located on the inner edge of the manway nozzle. It serves as one means of verifying the required outage space in the tank. It consists of a scale that indicates the fill level of the tank.

FITTINGS NOZZLE AND ATTACHMENTS

A fittings nozzle consists of a flanged nozzle with a bolted cover plate and gasket. A number of devices are mounted to the coverplate. Mounting connections to the cover plate may be either flanged and bolted or screwed.

The liquid valve is typically a ball type valve that is used for both loading and top unloading of the tank. For top unloading, it is connected to a pipe mounted to the fittings nozzle coverplate that extends to within 2" of the inside bottom of the tank. These pipes are called eduction pipes. Eduction pipes may be of the stiff or flexible type.

For bottom unloading, a bottom operated ball valve (BOV) is mounted to a saddle at the bottom of the tank and operated at ground level (See Figure 2). Some cars of older vintage are equipped with a "Parks Positive" or top-operated BOV (See Figure 1) for

bottom unloading. This is essentially a plug type valve mounted to a saddle on the bottom of the tank that is controlled at the top of the tank via a rod attachment. When the valve cover is removed, it may be inverted and used as a tool to operate the valve.

The vapor valve is typically a ball type valve. It is usually attached to the top of the fittings coverplate using flanged or screwed connections. Since it does not extend into the liquid, it will only expel vapor when opened.

During a top unloading process, the unloading line is attached to the liquid valve, and an air or gas line is attached to the vapor valve. Pressure is applied to the tank by forcing air or an inert gas into the vapor space of the tank through the vapor valve such that the tank contents are forced through the eduction tube.

During a bottom unloading process, the manway cover or vapor valve is opened to vent the tank. The pipe plug on the BOV cap is removed to ensure the valve is not leaking. The cap is then removed, and the unloading hose is attached to the outlet nozzle of the BOV. When the BOV is opened, gravity allows product to flow to a pump which then moves the commodity to its destination.

Most valves have self-lubricating Teflon packings and Teflon seats. Therefore, no special maintenance is necessary. They are designed to be closed only hand tight. Wrenches pry-bars or other mechanical devices may potentially damage these valves.

THERMOMETER WELL

A thermowell is a long tube mounted to the fittings coverplate that extends into the tank and is typically filled with antifreeze. A screwed cap is removed from the top of the thermowell, and a long thermometer is inserted into the thermowell to measure the temperature of the antifreeze. The temperature of the antifreeze is representative of the temperature of the tank contents.

VACUUM RELIEF VALVES

Vacuum relief valves are typically located on the fittings arrangement nozzle. Their purpose is to prevent implosion of a sealed tank in the event that residual vapor cools and condenses into a liquid, thereby resulting in negative pressure inside the tank.

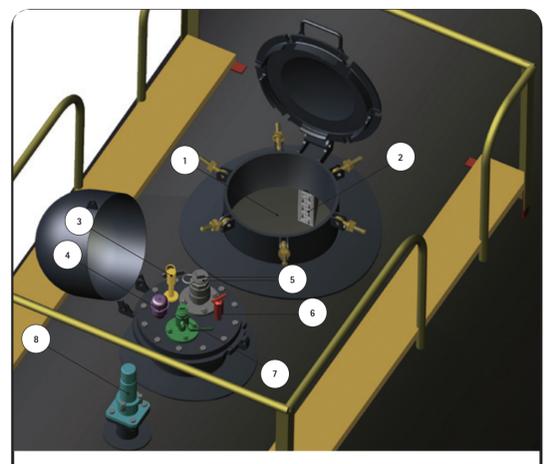
HEATER COILS

Some tank cars are equipped with heater coil systems for the purpose of heating the tank contents to facilitate unloading. Heater coils may be located on the interior or exterior of the tank. Steam is the typical heating medium, although hot oil is sometimes used to achieve higher heating temperatures. In some cases, auxiliary heating systems are fed by the heater coil system to allow localized heating of valves and fittings.

Interior heater coils are supported by brackets mounted to the bottom interior surface of the tank. Interior heater coils offer more efficient heating of the tank. However, the use of interior coils has diminished significantly due to the potential for product contamination and extensive maintenance.

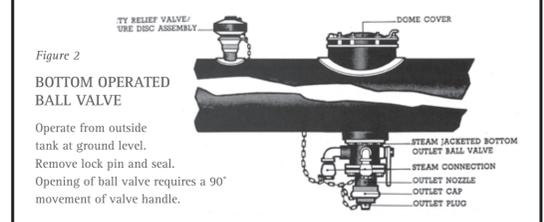
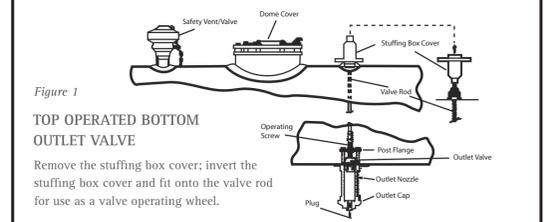
Exterior heater coils are located on the exterior surface of the tank in a serpentine pattern and utilize a low profile, oval shaped coil section. The heating medium is fed to the coil system via threaded coil nipples.

The design pressure of the coils is 200 psig, and the maximum recommended operating temperature is 150 psig. The maximum temperature of the heating medium is limited to 250 F for a foam insulated car and 450 F for a glass wool blanket insulation system.



1	MANWAY	5	2" or 3" EDUCTION VALVE / PIPE
2	GAUGE BAR	6	SAMPLE LINE
3	THERMOWELL	7	1" or 2" AIR CONNECTION VALVE
4	VACUUM RELIEF VALVE	8	SAFETY VALVE

Unloading Arrangements



WARNING

What to do if you think your product is frozen:

- ### UNLOADING: DO'S
1. Ready car for unloading.
 2. Open manway cover to prevent pressure build-up as product thaws.
 3. Connect steam hose to heater coils and apply steam gradually to prevent damage from sudden thermal shock.
 4. Regularly monitor lading temperature.
 5. Inspect outlet unloading connections for freezing damage. If no damage or cracks are evident, apply steam to outlet connections immediately prior to commencement of unloading.
 6. Commence unloading.
 7. Blow out heater coils with dry air to ensure no water is left in coils which could freeze and damage them. Leave coil caps off.

- ### UNLOADING: DON'TS
1. Don't apply steam to coils too quickly.
 2. Don't overpressure coils.
 3. Don't heat car without providing a means for venting tank pressure.
 4. Don't heat car without monitoring lading temperature.
 5. Don't apply steam to a lined car that is less than half full or when the commodity is below the top level of heater coils.
 6. Don't attempt to force open a frozen outlet valve.
 7. Don't leave coils full of condensate (i.e. water) after unloading.

DO'S

IT IS THE SHIPPER'S RESPONSIBILITY TO ENSURE THAT NO COMMODITY IS LEAKING FROM ANY COMPONENT OR THE TANK ITSELF BEFORE SHIPPING A CAR.

TANK QUALIFICATION	STATION
THICKNESS TEST	ABC
SERVICE EQUIPMENT	ABC
PRD-VALUE	75 PSI DEF
INT HTR	SPGR FGL
LINING	ABC

DO - verify car stencilling information such as car number, specification, HM201 qualification, dates, tank, contents, etc.



DO - vent the interior tank pressure before loosening manway cover bolts and hold down before loading/unloading the tank (except for pressure loadings).



DO - use the stuffing box cover or a square drive tool to operate the top operated bottom outlet valve rod.



DO - secure valves and fittings properly prior to release of a loaded or empty car.



DO - release the handbrake before moving a car.



DO - use steam to free a frozen outlet valve.



DO - use proper tools to unfasten/fasten the manway cover hold down bolts.



DON'T - poke ball of bottom outlet ball valve to free it when frozen, as this will damage the ball and cause it to leak.



DON'T - ship a car before removing spilled commodity from the exterior.

DON'TS



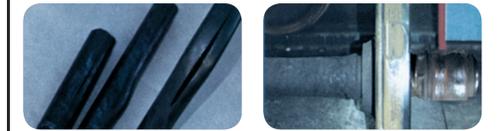
DON'T - ship a car before removing spilled commodity from the exterior.



DON'T - use a pipe wrench to operate stuffing-box bottom outlet valve rod, as this will damage the rod.



DON'T - use an extension tool cheater to try to force open a seized or frozen bottom outlet ball valve, as this will twist the valve stem and render.



DON'T - let foreign objects drop into the tank, as this will clog the bottom outlet valve or eduction pipe.



DON'T - use an extension tool to tighten cover hold down bolts, as this will bend the bolts and strip the threads.

DON'T - move car with handbrake applied, as this will damage the wheels and brakes.