1 PRELOADING REQUIREMENTS – Securing Cars, Tracks and Car Inspection

1.1 Spot the car at the load out station.

Figure 1 - Sulfuric Acid Railcar Loadout

1.2 Apply handbrake and chock the wheels. Keep one handbrake applied to the string of cars at all times. Secure track mobile.

Note: If you can see contrast color on the handbrake chain links, the brake is NOT applied.

Chock the wheels	Apply handbrake
	

Figure 2 - Secure car

1.3 Securely block access to the track by use of derails, aligned and locked switches.

1.4 While a car is connected for loading a blue caution sign (blue flag) and caution signs must be placed on the tracks, access gate and roads that lead to loadout station.

Figure 3 - Blue flag and caution signs

1.5 Safety equipment such as safety showers and eye wash stations should be verified to be present and operational before conducting loading activities.

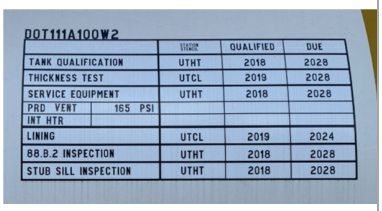
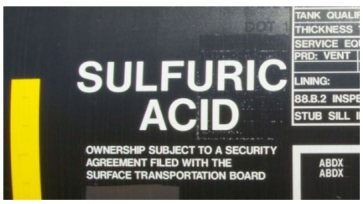
Inspect Test Dates	Inspect Placards	Inspect Product Stencil
		
Inspect Safety Appliances		
		

Figure 4 – Railcar Visual Inspection

1.6 Before loading inspect railcar for integrity, visible damage and signs of leak.

1.7 Inspect the tank ends and sides (shell) for obvious damage such as abrasions, corrosion, cracks, dents, distortions.

1.8 Inspect safety appliances such as handrails, ladders, steps and platform. Make sure these are not missing or have loose bolts or nuts.

1.9 Sulfuric Acid railcars must have Double Shelf Couplers on both ends

Figure 5 - No shelf coupler

Figure 6 - Bottom Shelf Coupler

Figure 7 -Double Shelf Coupler

1.10 Inspect the tank paint and document. No graffiti or bare metal over large areas.

1.11 Check the defect card holder to make sure no defect card is present.

1.12 If the car is equipped with a bottom washout, check the bolted blind flange, plug and chains for signs of corrosion, sulfate buildup, loose or missing parts such as chains. Newer construction sulfuric acid railcars, do not have a bottom washout.

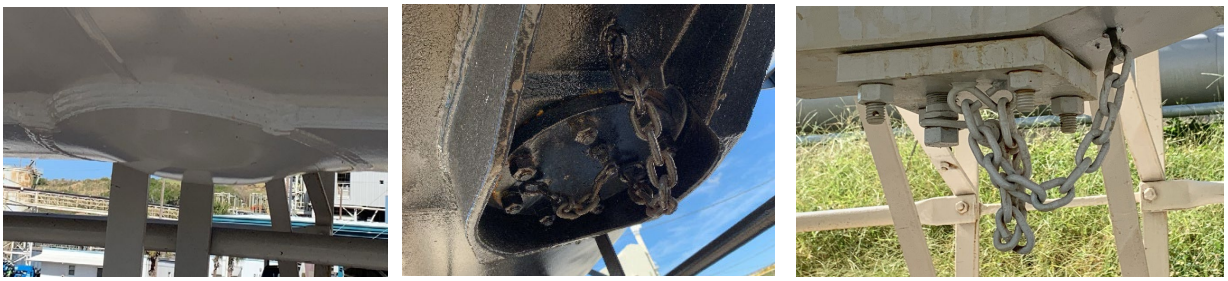


Figure 8 - Railcar bottom washout

Note: Per DOT regulations, 49CFR 172.102 Special Provision B83. Bottom outlets are prohibited on tank cars transporting sulfuric acid in concentrations over 62.5 percent.

1.13 Inspect commodity stencil (SULFURIC ACID) and reporting mark (Car Number) should be legible on both sides.

1.14 Car must have all four placards CORROSIVE UN1830. Replace damage or faded placards with new ones.

1.15 Qualification stencils should be reviewed to confirm that the car is not overdue for any test, qualification or inspection.

Note: Do NOT load a car with overdue tests, qualification or inspections.

2 CAR LOADING

2.1 Disconnect the shuttle wagon from the first car in the string prior to loading. On cars 2 thru 5 you must separate each car from the car that is being loaded and re-chock the wheels.

Figure 9 - Disconnect shuttle wagon and chock the wheels

2.2 Lower the platform at load out station. Make sure it aligns properly with the platform of the car. Then secure the adjustable walkway. You are no ready to prepare for loading.

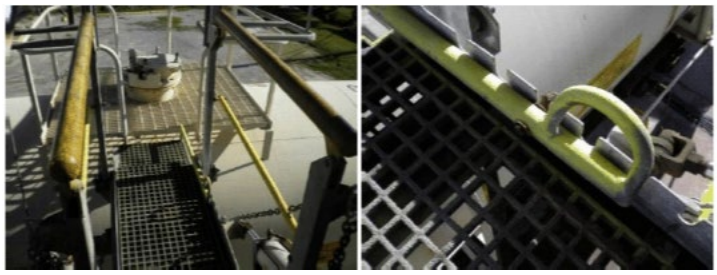


Figure 10 - Lower platform

2.3 Suit up with your acid safety gear. See section 8 for list of recommended Personal Protective Equipment.

⚠ **Warning:** Sulfuric acid is extremely corrosive, and several precautions should be taken to ensure the acid does not come in contact with skin and eye. Skin contact can cause pain, redness, burns and blistering. Permanent scarring can result. A severe exposure can even cause death. If acid comes in contact with the eye it can cause severe burns and redness, swelling, pain and blurred vision. Permanent eye damage including blindness can result.

Sulfuric acid railcars fittings and arrangements.

Figure 11 – Top fittings inside a protective housing

Figure 12 – Top fittings with partial protection

Figure 13 – Top fittings with no protective housing

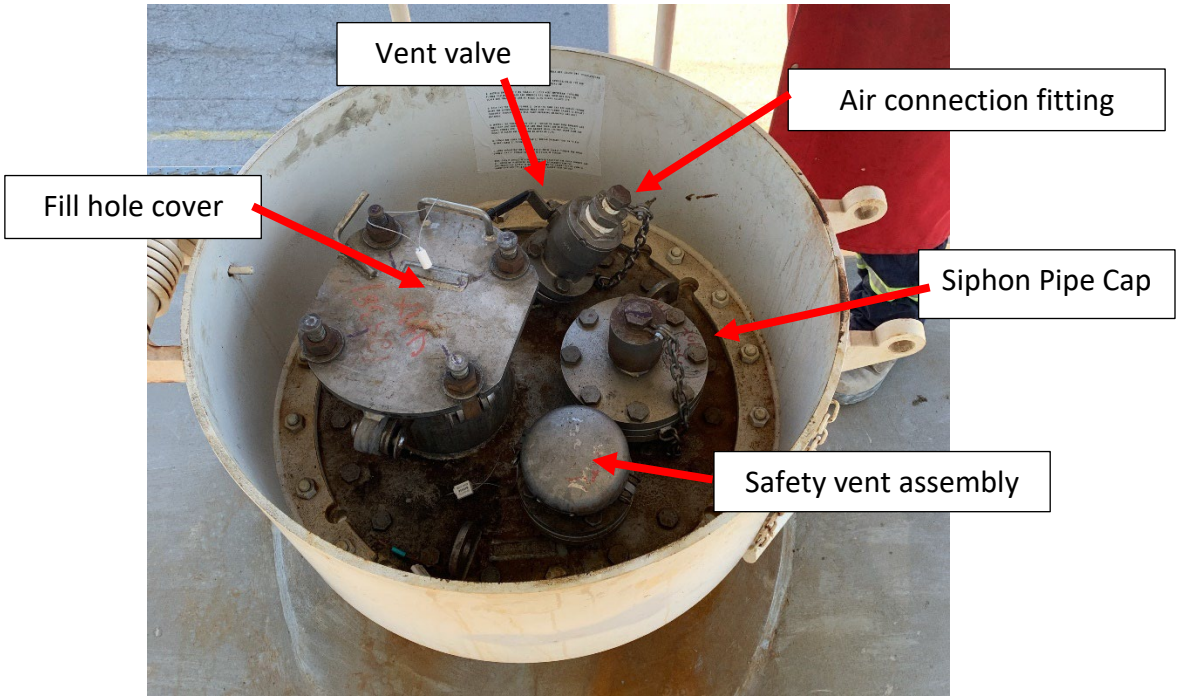


Figure 14 - Fitting arrangement for Sulfuric Acid Tank Car

2.4 Inspect rupture disc assembly. Check for the rupture disk cap pin. Once verified, remove it along with the rupture disc cap and proceed with inspection of the disc. If damaged Bad Order the car.

Figure 15 - Inspect Rupture Disc

2.5 De-pressurize car though vent/air valve. When venting, the operator should be positioned out of the line of flow and ensure no personnel is present in the area to prevent exposure to possible trace amounts of acid spray. When removing the plug from the vent valve ensure the valve is in the closed position. Once the plug is removed, slowly open the vent valve to release pressure form the car. Inspect plug for corrosion and any thread defects, replace if needed.

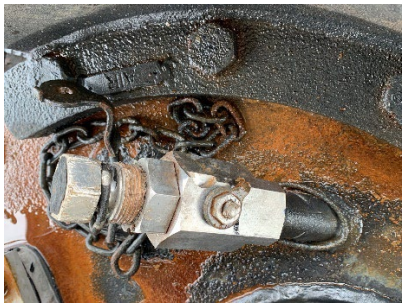


Figure 16 – Vent/air valve with threaded plug

2.6 Once the car is vented through vent valve, open fill hole cover. Carefully loosen all fill hole cover bolts and swing safety bolts to the down position and open cover slowly for any remaining pressure to release. Before opening the manway cover (dome lid), release any existing air pressure from the car. Open the air valve for displacement of any pressure.

2.7 Visually inspect the tank car interior prior to loading to ensure the tank car is free of product or foreign objects.

2.8 Inspect the manway cover gasket. Look for damage such as tears, dry rot or any other indication that a seal may not be obtained when closing the car. If any of these conditions is identified, replace it.

Figure 17 - Inspect manway gasket

2.9 Inspect the eyebolts, nuts and washers for corrosion, damaged threads, excess paint and to ensure they are in good condition. All eyebolts nuts on a given car must have same configuration (all heavy square or heavy hex).

2.10 If the car dome has a safety eyebolt, make sure the safety collar engages with the manway lid. If safety eyebolt collar was properly installed, the collar should not turn. It should be set in place (Tack welded or secured with locking compound Loctite). If the collar is loose bad order the car.

2.11 Inspect safety eyebolts to ensure the cover cannot be opened while the tank is under pressure.

⚠ **Warning:** This is a crucial step for your safety.

Figure 18 - Safety eyebolt properly engaged with lid. OK to ship

Figure 19 - Safety eyebolt out of adjustment. Bad order car, do not ship

2.12 Open the siphon cap slowly and inspect the threads for wear. Never remove siphon cap before venting the tank car. Inspect the gasket inside the cap for defects. If the gasket is damaged or missing bad order the railcar. Teflon tape is not acceptable. If the threads are wrapped with tape it means, there is an issue with the threads, contact your supervisor. If you find no issues with the threads, then retighten the cap with a wrench and continue the process.

Figure 20 - Inspect Product Siphon Cap and Gasket

2.13 Swing the loading arm (spout) into position. Test your high-level alarm by lowering the spout into a bucket of water. If alarm doesn't work, call your supervisor. This is done before every car is loaded. Lower the spout into the dome lid opening and attach both safety chains.

⚠ **Warning:** This is a crucial step for your safety.

Figure 21 – Inset loading spout and secure loading arm

2.14 Enter the loadout control room and complete the paperwork for the startup procedure. Railcar load out report.

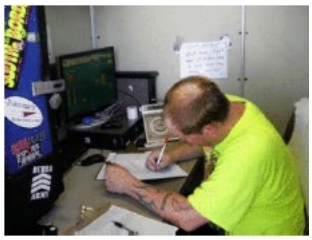


Figure 22 - Complete preloading checklist

2.15 Being loading and continuously monitor the car for signs of leakage.

Figure 23 - Monitor car loading

2.16 Ensure adequate outage (unfilled portion of the tank) space remains in the car when loading is completed to prevent overloading by volume or by weight and to allow expansion in transit. Refer to applicable regulations on Appendix G2 for correct outage, filling density and other weight restrictions applicable to sulfuric acid railcar loading.

2.17 Now that the car is loaded you are ready to move to the post load tank inspection

3 TANKCAR INSPECTION BEFORE SHIPPING

3.1 Remove loading arm safety chains from the car. Lift loading spout from dome lid opening. Be sure to attach the bucket to the bottom of the loading arm (spout) to insure there is no spillage.

Figure 24 - Remove loading arm

3.2 Swing spout back it its home position

3.3 Take your sample from the loaded car

3.4 Close the fill hole cover, place the swing bolts in the proper position and tighten. Note all nuts, bolts, valve plugs must be tool tight per DOT regulations.

Figure 25 - Close manway and tighten bolts

3.5 Tightening your manway lid bolts on a cross pattern. Railcar manufacturers recommendations for closing the manway lid with a torque wrench are provided on Appendix G3

3.6 Attach pipe to the air valve for pressure testing the car. Now connect the air hose to the pipe.

Figure 26 - Connect air supply for pressure test

3.7 Enter the control room and select the start pressure test option from the computer. This will turn on air supply to a minimum 25 psi; hold pressure for 10 minutes while checking for any acid leaks from any primary or secondary closures on the tank car. If any leaks are present, depressurize the car before any repairs are made to the tank car.

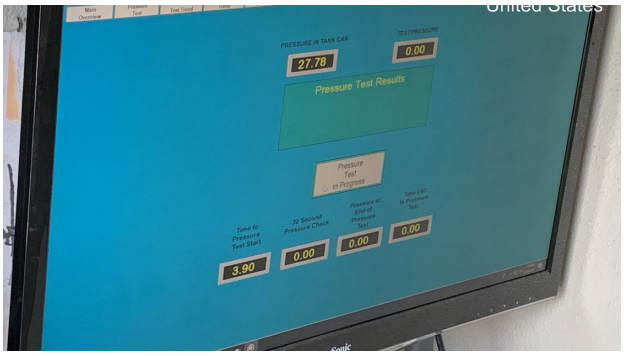


Figure 27 - Monitor pressure test

3.8 Relieve all air pressure from railcar by manually releasing the air check valve.

Figure 28 – Relieve air pressure before disconnecting air supply from car dome

3.9 Check air gauge to ensure that it reads read zero psi.

Figure 29 - Check pressure gauge

3.10 Remove air hose from the pipe and then remove the pipe.

Figure 30 - Remove air supply

3.11 Close the air valve on the car and if the railcar is <u>not</u> equipped with a protective housing remove the valve handle.

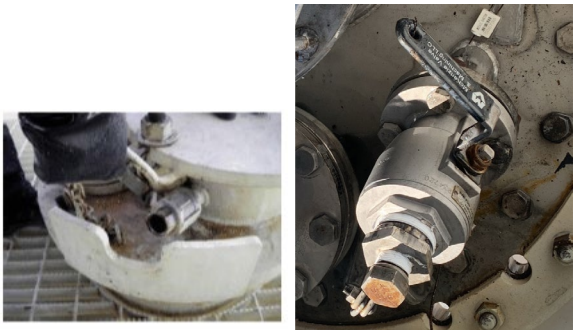


Figure 31 - Close air valve and apply plug

3.12 Reattach the air valve threaded plug to a tool tight condition. Make sure the valve plug and handle are attached to a chain.

Note: Sulfuric acid cars equipped with a protective housing can ship with air valve handle attached.

Figure 32 - Remove handle from air valve if car dome doesn't have a protective housing

3.13 Attach security seals (tamper proof seals) to the fill hole cover and the rupture disc pin.

Figure 33 - Apply seals

3.14 Wash off the top of the railcar, to remove any product spillage.

Figure 34 - Wash car dome

3.15 Raise the loadout platform and secure in the home position with the safety chain

Figure 35 - Raise platform

3.16 Remove the wheel chocks

Figure 36 - Remove wheel chocks

3.17 Complete post-loading checklist paperwork and prepare secured railcar for shipment.

Note: When a loading operator discovers an unacceptable condition on the tank car, the plant may not offer the car for transportation until the condition is corrected. The loading operator may correct certain conditions, such as replacing a worn or torn manway gasket. Other conditions, such as repairs to the rupture disc assembly, manway nozzle or cover, regular eyebolts and safety eyebolt collars will require repair by a properly certified mobile repair unit (MRU) or tank car facility (shop).

3.18 Records of examining the tank car such as inspection checklist and photographs will help dispute DOT/FRA presumption that a proper inspection was not performed before shipping. Each loaded tank car must have a written report (inspection checklist) that must be retained until successfully completing the next inspection and test of the same type.

3.19 Digital photographs with a date stamp shall be taken of all closed and secured openings to create a record of proof showing completion of the loading/unloading inspection process.

Note: *Digital photographs shall be stored within Livelink with a one-year retention.*

3.20 Repeat process on the next car.