OSHA® FactSheet

Servicing Multi-Piece and Single-Piece Rim Wheels in Marine Terminals

Requirements for servicing multi-piece and single-piece rim wheels in marine terminals can be found in 29 CFR 1917.44(o) (tube-type wheels), and 29 CFR 1910.177. This fact sheet is for employers and workers, to demonstrate the hazards associated with handling multi-piece and single-piece rim wheels. It also highlights the OSHA regulations which protect workers.

Hazards

The air pressure contained in a tire is very dangerous. When fully inflated, a truck tire can exert more than 40,000 pounds of pressure against the rim flange. The most common hazards found during servicing rim wheels occur during inflation. The seating rings should be properly set or seated during inflation. If the rings are not set properly, the rings or the removable flanges can violently separate from the assembly, causing an explosion and forcefully propelling components of the assembly up to 130 mph. Similarly, another hazard found during the servicing of single-piece rim wheels is that the pressurized air contained in the tire may suddenly be released, either by the bead breaking, the bead slipping over the rim flange, or a zipper rupture.

Servicing

Marine terminal workers may service various types of vehicles equipped with multi-piece or single-piece rim wheels. Workers servicing these types of wheels must have the proper training and be aware of the requirements outlined in §1917.44(o), and §1910.177. The most common vehicles with these types of wheels include: cranes, top-handlers, side-picks, yard hustlers, chassis, trucks, tractors and trailers.

Failure to follow proper procedures when servicing rim wheels can result in serious injury or death. Prior to servicing any rim wheel assembly, workers should always:

- Completely deflate the tire (or both tires of a dual assembly) by taking out the valve core(s) before loosening any nuts or clamps that attach a tube-type tire/rim assembly of a vehicle;
- Use a non-flammable vegetable or soap-based rubber lubricant on the rim surfaces to make tire demounting and mounting easier;
- Use proper tools to demount or mount tires and rims;
- Use a steel duck bill hammer only as a wedge to unseat the beads of tube-type tires;
- Wear adequate protective eyewear (or a face shield), protective footwear and ear protection;
- Use soft-faced hammers to drive the tire irons or assemble components;
- Keep tools clean and inspect them frequently;
- Demount inspect and match all tire and rim components, before reinflating them in a restraining device with the valve core removed; and
- Always stay out of the possible air pressure explosion path (trajectory) area, see §1910.177(f)(10) and §1910.177(g)(8).

Workers should NEVER:

- Use a steel hammer to seat rim components;
- Strike a rim/wheel assembly with a hard-faced hammer (can damage the components and endanger the installer), and never use a rubber mallet or plastic dead-blow hammer;
- Reinflate any tire that has been operated in a run-flat or underinflated condition;
- Use a tire tool for anything except demounting and mounting tires;
- Use an extension or "cheater" bar with tire irons;
- Use a hammer with a loose or cracked handle;
- Use a bent, cracked, chipped, dented or mushroomed tool; and
- Modify or apply heat to any tire service tool.

Training

Employers must train workers on how to service multi-piece and single-piece rim wheels §1910.177(c)(1). Employers must ensure that workers understand, demonstrate and maintain the ability to safely service multi-piece and single-piece rim wheels. Employers must supply the required charts and/or manuals on servicing multi-piece and single-piece rim wheels as required in §1917.44(o)(5)(i)[1], and §1910.177(d)(5). OSHA will allow the use of any other manual or poster that provides at least the same instructions, safety precautions, and other information contained in these charts/manuals, which apply to the types of wheels the employer is servicing. Employers should provide a copy of the §1910.177 regulations to each worker who services rim wheels and should review the regulations for servicing multi-piece and single-piece rim wheels with each of these workers.

Safety Talk

Employers may use this fact sheet as the basis for tool box safety talks to ensure workers are aware of all hazards associated with servicing multi-piece or single-piece rim wheels.

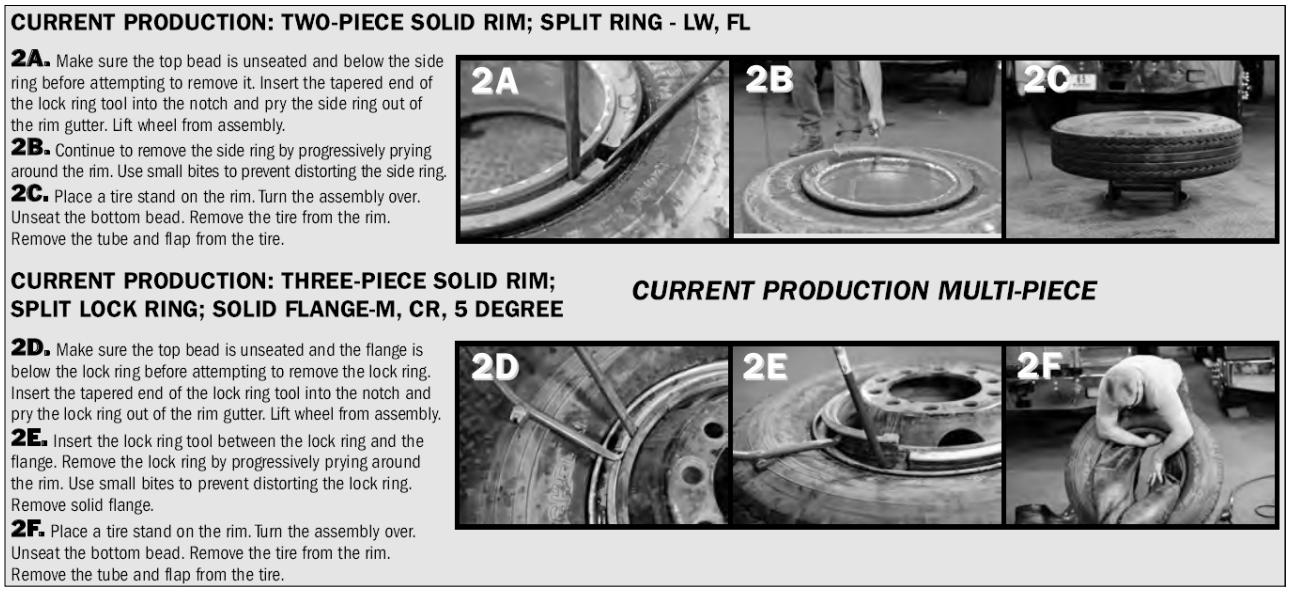
Demounting

Always remove the valve core from the tire stem and insert wire into the tire assembly to ensure complete deflation before demounting (§1917.44(o)(4)(i), and §1910.177(f)(1)). Tires must be inspected prior to removing the valve core. Sometimes a split rim wheel will be mounted on the inside of a single-piece rim wheel. Therefore, workers must fully inspect rim wheels prior to servicing in order to understand the scope of the work and the potential hazards involved.

Mounting/Inflation

Pre-inspect rim wheel for improperly matched, damaged, or corroded components as required in §1917.44(o)(4)(ix), §1910.177(e)(2).

There must be an in-line valve with a pressure gauge or a pre-settable regulator §1910.177(d)(4)(ii). Always use a clip-on chuck with a sufficient length of hose between the chuck and the in-line valve to ensure that workers can stand outside the trajectory zone (§1910.177(d)(4)(iii)). When seating the tire bead, do not exceed 3 psi before placing assembly in an OSHA compliant restraining device 29 CFR 1917.44(o)(4)(v). Workers servicing rim wheels must always use a restraining device during tire



Mounting tire on rim/wheel assembly tube type; multi-piece

1. On December 27, 2011 (76 FR 80735) OSHA amended §1910.177 by updating the provisions regarding the tire charts. Section 1917.44(o)(5)(i) will be revised via a technical amendment in the future to refer to the updated charts. Meanwhile the charts to be referred to are on the OSHA webpage at www.osha.gov/pls/publications/publication.athruz?pType=Industry&pID=319.

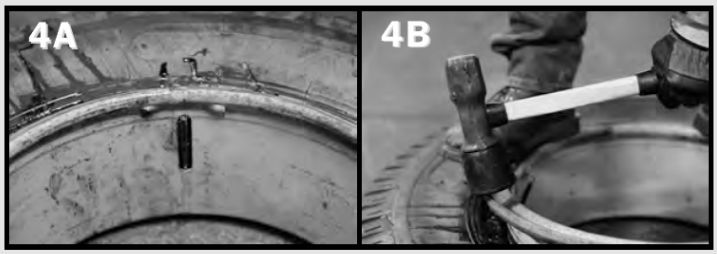
inflation §1910.177(d)(1), (d)(2), and (f)(7). Before removing the tire, inspect the ring to see if it is properly seated and locked (1917.44(o)(4)(viii) and §1910.177(f)(7)).

Workers servicing rim wheels must instructed on the safe operating procedures for servicing rim wheels as outlined in (§1917.44(o)(4), and §1910.177(f) and (g)).

CURRENT PRODUCTION: TWO-PIECE SOLID RIM; SPLIT RING - LW, FL

4A. Lay the rim on the floor and align the valve stem with the slot in the rim. Lift the tire at the valve stem to work it onto the rim. For rims with bead humps, make sure the top bead is below the bead hump before attempting to install the side ring.

4B. Insert one end of the side ring into the rim gutter and use a rubber mallet or dead-blow hammer to progressively seat the remainder of the side ring in the rim gutter.

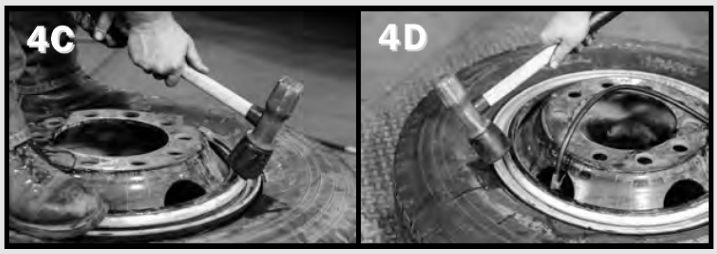


CURRENT PRODUCTION: THREE-PIECE SOLID RIM; SPLIT LOCK RING; SOLID FLANGE-M, CR, 5 DEGREE

4C. Lay the rim on the floor and align the valve stem with the slot in the rim. Lift the tire at the valve stem to work it onto the rim. For rims with bead humps, make sure the top bead is below the bead hump before attempting to install the side ring. Install the flange making sure it is below the rim gutter.

4D. Insert the end of the lock ring in the rim gutter and use a rubber mallet or dead-blow hammer to progressively seat the remainder of the lock ring in the rim gutter.

4E. Ensure the lock ring is completely seated in the rim gutter by using the rubber mallet or dead-blow hammer before attempting to inflate the tire.



Deflating and Demounting tire from rim/wheel assembly — tube type; multi-piece

This is one in a series of informational fact sheets highlighting OSHA programs, policies or standards. It does not impose any new compliance requirements. For a comprehensive list of compliance requirements of OSHA standards or regulations, refer to Title 29 of the Code of Federal Regulations. This information will be made available to sensory-impaired individuals upon request. The voice phone is (202) 693-1999; teletypewriter (TTY) number: (877) 889-5627.

For assistance, contact us. We can help. It's confidential.

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