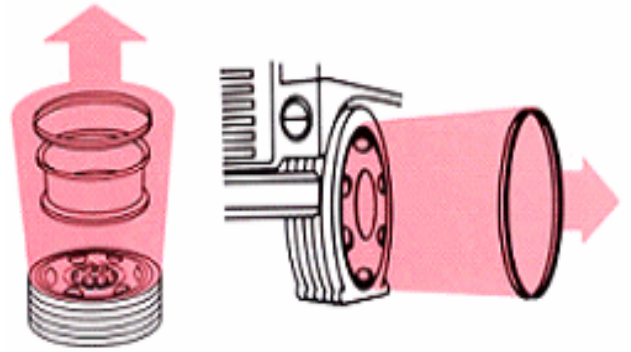




Worker Killed While Inflating a Tire Mounted on a Multi-Piece Rim - Massachusetts

Incident: A 42-year-old male laborer was fatally injured while using an air line with a faulty pressure gauge to inflate a tire mounted on a multi-piece rim on a front end loader. The victim sat in a chair positioned directly in front of the flat tire's sidewall and in the trajectory of the multi-piece rim parts. While he was inflating the tire, the increased air pressure caused the tire's tube to explode. The explosion knocked the victim backward with the chair, fatally injuring him.



Recommendations

All employees should be cautioned about the potential hazards of multi-piece rim wheels. Only employees who are assigned to service multi-piece rim wheels and have been trained on the proper methods of working with these wheels should be allowed to service them, including inflating tires.

To prevent similar incidents, employers should:

- **Ensure that tires mounted on multi-piece rims that are flat or underinflated (the tire has less than 80% of recommended pressure) are never re-inflated while the wheel is on the vehicle. Once the wheel is off of the vehicle, the rim should be disassembled, inspected, reassembled, re-inflated and placed back on the vehicle.**

Completely deflate the tire by removing the valve core. Then, remove the wheel from the vehicle, demount and inspect the tire, and disassemble and inspect the rim. If no problems are found, reassemble the rim, remount the tire on the rim, and reinflate the tire prior to placing the wheel back onto the vehicle. When reinflating the tire, employees should use a restraining device for the tire, such as a safety cage or cable restraints.¹

- **Ensure that employees never position themselves in front of or over tires mounted on multi-piece rims during inflation.**

A tire mounted on a multi-piece rim that is underinflated but has more than 80% of the recommended pressure can be inflated without demounting and disassembling the wheel (the wheel can remain on the vehicle). Employees should inflate tires from a distance, standing behind the tire tread, out of the trajectory of the rim parts, using a long air line with a clip-on chuck and in-line valve with a pressure gauge.¹ If the same underinflated tire is not mounted on a vehicle, the tire can still be inflated without disassembling and inspecting the wheel, but a restraining device must be used on the tire.^{1,2}

- **Implement safe operating procedures for servicing multi-piece rim wheels and provide training on these procedures.**

OSHA has outlined safe operating procedures in their 29 CFR 1910.177 standard, *Servicing multi-piece and single piece rim wheels*. In addition to the above two recommendations, other required procedures for servicing multi-piece rim wheels are listed below. The full text of this standard can be found at: www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9825

After inflation, the tire and rim components should be inspected while still within the restraining device to ensure that all components are properly seated and locked. If further adjustments to the tire or rim components are needed, the tire shall be deflated before these adjustments are made.

- Never attempt to correct the seating of side and lock rings by hammering, striking, or forcing the components while the tire is pressurized.
- Cracked, broken, bent, or damaged rim components should not be reworked, welded, brazed, or otherwise heated.
- No heat shall be applied to any multi-piece rim components.

- **Develop, implement and enforce equipment maintenance programs.**

Equipment maintenance programs should include both scheduled preventive and emergency maintenance. The victim was inflating a tire that routinely lost air using an air compressor that had a faulty pressure gauge. The air compressor should have been taken out of service until the pressure gauge was replaced. In addition, when the tire on the front end loader first started losing air, a trained worker should have addressed the problem.

References:

1. Code of Federal Regulations, 29 CFR 1910.177, Servicing multi-piece and single piece rim wheels, Motor vehicles, U.S. Government Printing Office
2. Equipment Manufacturers Institute, 1991, Wheel loader / tractor, Form # WLT70-1



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Multi-Piece Rim Wheels



A safety cage/tire inflation cage is one method of containing rim components in the event of an explosive separation.

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