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Safety Meeting

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Rimmed wheels can be deadly

Tire servicing can be extremely hazardous, especially when large rimmed wheels are involved. An inflated tire contains tremendous stored energy. Improper handling and assembly can cause components to explode, resulting in costly damage, serious injury or death.

There are two types of rimmed wheels: Single-piece and multi-piece (split). A single-piece wheel holds the tire, forms part of the air chamber (with tubeless tires) and provides the means of attachment of the assembly to the vehicle axle. A multi-piece wheel consists of two or more parts, one of which is a side or locking ring that holds the tire and other components on the rim wheel by interlocking them when the tire is inflated.

Single-piece rim wheel accidents occur when the pressurized air in the tire is released suddenly, either by the bead breaking or by the bead slipping over the rim flange. Once released, the pressurized air can either hurl a person across the workplace if he or she is close to the wheel or it can propel the wheel across the workplace and into another worker.

In a multi-piece rim wheel accident, the components separate and are released from the rim wheel with violent force.

Anyone who is required to work with different types of tires and wheel assemblies must be trained to recognize and understand the hazards associated with each type and to know the correct procedures to use. This work includes:

- Installing/removing tires and wheels.
- Handling wheels.
- Inspecting and repairing tires and wheels.
- Inflating and deflating tires.
- Assembling multi-piece wheels.
- Mounting and demounting tires on wheels.

The most horrific incidents often involve multi-piece rims.

When an assembly is being removed from the vehicle, the tire should be completely deflated before the wheel nuts are loosened. To ensure the valve stem is not blocked, the valve core is removed and a wire is inserted into the stem.

On dual wheels, both tires should be inspected before removal of the cap nuts on the outside wheel. If there is obvious or suspected damage to either the inside tire or wheel assembly components, both tires should be completely deflated.

Whenever wheel assemblies are removed from a vehicle or before they are remounted, the rim base and parts should be cleaned of dirt and rust, disassembled and carefully inspected.

Parts that are cracked, worn, bent, severely dented or pitted from corrosion must not be used. They have been weakened and they may not assemble properly. Replacement parts should be of the same size and type as specified by the manufacturer.

There should be no attempt to rework, weld, heat or braze any wheel assembly or component, because doing so could weaken a part to the extent that it will fail during inflation of the tire or while the vehicle is being operated.

Current manufacturer's information on the type of wheels being serviced such as tire charts or rim manuals must be available for the persons doing the work.

The tire must always be inflated in a safety cage that will contain flying parts or by using other protection as required for multi-piece wheels, such as a safety chain specifically made for this purpose. The protection must keep workers away from the trajectory of flying lock rings, rims, flanges or parts of the tire.

It is recommended that this practice be used for tires on single-piece wheels as well.

Here are some more basic safety procedures:

- Lubricate the tire beads and the mating rim surfaces with an approved rubber lubricant.
- Inflate tires slowly and carefully, using a clip-on air chuck with an in-line valve and gauge while standing outside the trajectory. If adjustments are necessary, first deflate the tire by removing the valve core .
- Never use flammable gases to "explode" a tire onto a rim.
- Never use a pressure higher than 40 psi to seat the beads or side rings, unless the manufacturer allows higher pressures.
- Never re-inflate a tire that is flat, has been run flat or run while at a pressure that is less than 80 percent of its recommended pressure.

Rimmed Wheels

The Quiz

These questions are meant to help you remember what was discussed today — not to test your patience or challenge your intelligence. The answers are at the bottom of the page. Cover them up, and complete the quiz as quickly as you can.

1. There are two types of rimmed wheels.
   TRUE ____ FALSE ____

2. Does a single-piece rim wheel have a locking ring ?
   YES ____ NO ____

3. When a multi-piece wheel assembly is removed from a vehicle, the tire must be :
   A. Free of rust and dirt.
   B. Lubricated.
   C. Completely deflated.
   D. Partially deflated.
   E. None of the above

4. On dual wheels, both tires should be inspected before removal of cap nuts on the outside wheel.
   TRUE ____ FALSE ____

5. Which of these should NOT be done:
   A. Replace defective parts with those of the same size and type recommended by the manufacturer.
   B. Inflate repaired tires in a safety cage.
   C. Weld, heat or braze a wheel assembly component.
   D. Make sure current manufacturer's tire charts and rim manuals are available.

6. Tires should be inflated as quickly as possible.
   TRUE ____ FALSE ____

7. Which of these are basic safety precautions when working with wheels and tires:
   A. Wear safety eyewear and other appropriate personal protective equipment.
   B. Only use approved products to lubricate tire beads and rim surfaces.
   C. Never re-inflate a tire that has been run flat.
   D. All of the above.

8. Does your workplace have all the necessary tools to repair multi-rim wheels safely?
   YES ____ NO ____ DON'T KNOW____

ANSWERS: 1. True, 2. No, 3. C., 4. True, 5. C., 6. False, 7. D., 8. Your answer

Hold These Thoughts

As with so many tasks, using the proper equipment and doing so correctly is essential for your safety.

For wheel and tire servicing, it starts with protective eyewear, footwear and hearing protection. A hard hat might also be necessary, depending on the work environment.

Be sure you:

- Never use a tire tool for anything except demounting and mounting tires.
- Never use an extension or 'cheater' bar with tire irons.
- Never use a hammer with a loose or cracked handle.
- Always use soft-faced hammers when driving tire irons or assembling components.
- Never use a bent, cracked, chipped, dented or mushroomed tool.
- Always keep tools clean and inspect them frequently.
- Never alter or apply heat to any tire service tool.

It's also important to realize that sudden release of pressurized air isn't the only cause of tire explosions. Electrical current from a power line contact, overheated brakes, a vehicle fire heating the brakes, welding on a wheel or even heating wheel nuts can cause a chemical reaction (pyrolysis) inside the tire and the build up of flammable gases. Explosions occur when the gas concentrations exceed a critical level and parts of the tire remain sufficiently hot.

Also, many aerosol tire inflators contain flammable propellants. These repair products seal punctures and leaks while inflating the tire. An explosion can occur under certain circumstances.

For the Record

Date of Meeting: _____ Topic: _____
Location: _____ Department:_____
Start Time: _____ Finish Time: _____ Meeting Leader: _____

In Attendance:

It really happened...

A worker was removing an inflated tire from a log stacker. The tire was mounted on a multi-piece rim. The inner and outer rims were held together by 16 smaller bolts and the entire rim was attached to the hub with 48 larger bolts. When the worker had removed most of the larger bolts, the smaller bolts could not withstand the internal air pressure. The outer rim and tire were blown off the hub and struck the worker.

Investigation found that the smaller rim-to-rim bolts had been weakened by improper torquing and/or unequal loading.

Such incidents are a reminder of these safe work practices:

- Always deflate the tire before loosening any nuts or bolts on a wheel.
- With multi-piece rims, use the correct grade of fasteners and apply the factory-specified torque.
- Inspect the wheel fasteners as part of preventive maintenance inspections. Other components of multi-rim wheel assemblies should also be inspected on a regular basis to detect cracks or other damage.
- Obtain current manufacturer's instructions for heavy equipment. If the equipment was not purchased new, the manual may not include important safety updates and service bulletins.