Work environment **– Rural safety**

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Single-piece and multi-piece rim wheels >

This bulletin outlines some simple safety guidelines for those working in the rural industry and is one of a series on Rural Industry safety.

General

Servicing tyres on single-piece and multiple-piece rim wheels involves a number of hazards associated with handling a pressurised system.

Inflated tyres on rims can explode. They can blow pieces of tyre, rim, sometimes whole wheels and people up or sideways, often large distances.

Look at the side wall of a tyre. Estimate how many square inches and multiply by the tyre pressure. That gives the force which can be released.

Typically the side wall area of a truck tyre is nearly two-thirds of a square metre in area (approximately 1000 square inches) making available a force of 35 tonnes @ 517 kPa (75 p.s.i.).

When servicing tyres on single-piece and multiple-piece rim wheels, this explosive force must be controlled.

Plan now about how to control this explosive force with equipment on your property.

Ask yourself:

- When is this release of force most likely to occur?
- What equipment will be needed to control this force?
- Who will operate this equipment?
- Who needs to know the safety procedure for controlling this force?
- How often will I check that the necessary equipment, knowledge and willingness are there?

People are most frequently damaged when removing, dismantling or reinflating tyres, particularly with high pressure tyres on multi-piece (split) rims.

Single-piece rim wheels

These are used on virtually all types of motor vehicles. The tyre and rim seal very effectively allowing the use of tubeless tyres which offer less rolling resistance and hence increased mileage. Tubeless tyres have physical limitations when operated under more severe environmental conditions. In general they offer a much lower level of injury risk when servicing.

Multi-piece rim wheels

Heavy vehicles, off-road vehicles and rubber tyred plant, continue to rely on tube-type tyres on multi-piece rim wheels. The wheel assembly has one or more side rings which support the tyres' bead and serve as a flange and locking system to keep the inflated tyre on the rim. The rim base, side/lock rings and inflated tyre assembly make up the wheel. It is an inherently unsafe design. Factors which result in misfit of the side/lock rings to the wheel base and result in explosion include:

- mismatched, distorted, worn or corroded components resulting in physical misalignment on the rim; and
- external factors resulting in sudden deflation or operation with under-inflated or flat tyres causing rim assembly failure.

Dangers

- If all air pressure is not released in the tyre before servicing, the valve core may be ejected during its removal;
- Any tyre under pressure presents a potential hazard. The volume of air that can be released suddenly can cause a worker in close proximity to be thrown against walls, ceilings or other hard unyielding objects;
- If the air blast is directed against a floor or wall, the unrestrained wheel rim may be hurled across the workplace; or
- Multiple piece rim wheels pose the added risk of components separating in the air blast and becoming missiles.

Precautions

- Always deflate and inflate tyres in a safety cage or other portable restraint device. Belting restraints are available. Never reach into the cage during inflation or deflation and always position the body to one side of it.
- Never position the head or body in front of the rim during deflation or inflation.
- Use recommended tyre mounting tools and equipment to avoid rim damage.
- Wear protective goggles or face shields when working on wheels or tyres.
- Have a regular tyre maintenance schedule which checks tyres for condition, matching,
- pressure, tread depth and wear patterns as well as rims for corrosion or cracking;

Always follow the recommended tyre servicing procedures and ensure all workers undertaking these procedures are trained and follow them, eg the side or lock ring split should be installed directly opposite (180 degrees) the valve stem slot.

NT WorkSafe >

GPO Box 1722
Darwin NT 0801

Telephone: 1800 019 115
Facsimile: (08) 8999 5141
Email: ntworksafe@nt.gov.au
Website: worksafe.nt.gov.au