

# SAFETY ALERT



## QUEENSLAND FATALITY DURING WHEEL REMOVAL

### INCIDENT

In February 2004, one person died and another was injured at a mine in Queensland. The two were changing wheels on a truck when a split rim became dislodged and caused the tyre to move uncontrollably. It struck one person who sustained a broken jaw. The second person, who was pinned under the tyre assembly, suffered fatal injuries.

### CIRCUMSTANCES

Two contractors were changing wheels on a 170-tonne truck around midnight when the split ring on the inner rear wheel became dislodged and caused the tyre to move uncontrollably, projecting the tyre assembly about 15 metres.

### INVESTIGATION

Queensland Police and Department of Mines Inspectors from Mt Isa are conducting the investigation.

### RECOMMENDATIONS

Numerous tyre burst/explosion incidents have occurred at NSW Mines and elsewhere. The following is a summary of the recommendations from these incidents:

- Conduct a risk assessment to identify and control all hazards associated with wheel rims and tyres.
- Major hazards should include at least:-
  - (a) Tyre and rim components violently bursting from the wheel.
  - (b) Tyre exploding violently.
- **Risk Controls to prevent violent bursting of components should include at least:**

Compliance with Australian Standard - AS4457 Earth-moving machinery—Off-highway rims and wheels—Maintenance and repairs. This specifically includes the following **before removal of the wheel assembly**:

- (a) Visual examination to ensure no immediate threat is posed by the wheel assembly.
- (b) Deflation to a maximum pressure of 35Kpa (5psi). For dual wheels, both tyres are to be deflated before any wheel nuts are loosened. For demountable rims it is recommended that the tyre be fully deflated.
- (c) Use of competent persons.
- (d) Development and use of documented safe operating procedures.

**Report No:** SA 04 01

**Date:** 23/02/04

**Prepared by:** R Regan 02 9901 8591

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## Queensland Fatality During Wheel Removal /2

This standard also covers demounting, inspection, repair and mounting procedures and compliance with the written procedures of both the tyre and rim manufacturers.

Risk controls should also cover the **Fatalities and serious injuries** that have occurred due to violent bursting of both small and larger tyres and the resultant movement of the tyre assembly components. This includes catering for or controlling:

- (a) Corrosion, wear, metal fatigue, impact damage, over inflation, under inflation and incorrect assembly which can result in dislodgment of the locking ring from split rim assemblies whilst the tyre is being inflated, hit, transported, removed, replaced or in service. These issues can also result in violent bursting of tyres from other types of wheel rims not fitted with locking rings.
- (b) Damage to tyres.
- (c) Reduction in the diameter of the rim in the tyre bead area (particularly for one-piece aluminium wheels) which has resulted in violent bursting of the tyre from the wheel.
- (d) Preventing accidental removal of the assembly bolts of two-piece rims which are held together by bolts, ensuring the design has sufficient barriers to prevent this.
- (e) Sections of aluminium being broken from wheel rims due to impact and then being projected over 30 m, as has occurred at a mine site.

- **Risk Controls to prevent tyre explosions include:-**

Preventing: vehicles being struck by lightning; contact with overhead power lines; tyres becoming abnormally hot for any reason including, being too heavily loaded; travelling too fast or far for the load being carried; overheated brakes; constant rubbing on a stationary item; under-inflation; exposure to a fire; welding or any acetylene cutting in the vicinity of the wheel assembly without removal of the tyre; leaving something solid in the tyre during assembly such as a piece of timber; and use of highly flammable liquids to aid in fitting the tyre.

- **AN EMERGENCY RESPONSE PLAN** should be used if the tyre has been subject to conditions that may cause an explosion.



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## EMERGENCY RESPONSE IF THERE IS POTENTIAL FOR TYRES TO EXPLODE

### 1. IF TYRES ARE STILL INFLATED

- Drive the minimum distance to a safe clear area
- Remain in the vehicle
- Commence emergency procedures
- Ensure no one comes within 300 m of vehicle except for the rescue vehicle driver
- Evacuate driver by using a similar vehicle, approaching radiator to radiator to allow the driver to step across
- Rescue vehicle leaves by driving directly in reverse
- Wait for 24 hours before approaching within 300 metres of vehicle

### 2. IF TYRES BEGIN TO EXPLODE

- Operator immediately institutes emergency procedures
- Evacuate area within 300 metres
- If there is no residual fire, evacuate operator as above
- If a residual fire occurs, the operator should leave the vehicle by moving **FORWARD** and proceed away from the vehicle at least 300 metres
- Wait for 24 hours before approaching within 300 metres of vehicle

### 3. IN GENERAL - IF THERE IS POTENTIAL FOR TYRES TO EXPLODE

- Always avoid the sides of the tyres/rims
- Fire fighting should only be carried out using remote control monitors from water carts positioned forward or directly behind the vehicle
- The risk of fighting the fire should be carefully assessed.

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- A competent person should internally inspect all tyres before normal use

**NOTE! FLAT TYRES CAN STILL EXPLODE**

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