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## MINING AND QUARRY OPERATIONS

# Over-inflation of jumbo tyre resulting in explosion

### What happened?

A trade assistant at a large underground metalliferous mine was injured when a Jumbo tyre was over-inflated to the point it exploded.

### How did it happen?

The over-inflation occurred because an electronic gauge used to measure the inflation pressure was wrongly set on Bar and not psi.

Front Jumbo tyres are required to be pressurised to 140 psi. Compressed air on site was only capable of supplying approximately 90 psi.

It is common practice in the mining industry to inflate Jumbo tyres to a working pressure of 140 psi, using pressurised nitrogen. This is inherently dangerous if there is no engineered pressure release control in the inflation process.

The worker is now back at work. However, the injuries could have been fatal.

The tyre cage was not certified for safe use by an engineer.

### Comments

Because some development drill rigs used in underground mining operations require tyre inflation pressures higher than what can be achieved by using an existing air source, consideration should be given to using inflation methods other than compressed nitrogen.

Gauges used for inflating tyres must be accurate and have an appropriate operating pressure range so inflation pressure can be read accurately, and not be interchangeable with other systems.



**FIGURE 1:** The nitrogen cylinder cage and where the worker was standing



**FIGURE 2:** Rim damage after explosion

Installation of an 'air compressor booster' should also be used where pressures need to be increased above normal compressed air being supplied. The maximum system pressure can be set at levels well below that of compressed nitrogen cylinders.

The use of solid-filled tyres should be considered to eliminate the risk.

Principal Hazard Management Plans and Principal Control Plans should be reviewed regularly to ensure the hazards are fully controlled.

## **What can be learned?**

Inflation systems must have built-in pressure release valves so in the event of system failure there is a pressure release control to prevent an explosion.

Certified tyre cages need to be used to ensure the design and fabrication of the cage can withstand forces generated from tyre explosions and prevent fragments being ejected from the cage.

Installation of blast walls is required to protect the person inflating tyre.

Valve stem adapters should not be installed on tyres as fittings on nitrogen cylinders are not compatible for tyre inflation.

Long air lines should also be used to remove people from the proximity of an explosion.

## **More information**

[NSW Trade & Investment Mine Safety - Tyre exploded during inflation Safety Alert](#)

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