

## Andrew Chapman: Driving Bridgestone's OTR repair business

Bridgestone Earthmover Tyres' National Tyre Repair Manager Andrew Chapman has been with the company since 2001 and has been a driving force behind the development of its tyre repair business.

He was involved in establishing the company's first repair workshop expansion and now supervises around 20 repairers working in six facilities nationwide.

"I joined Bridgestone in 2001, and following some training in Perth, I was given the task of setting up the first tyre repair facility in Kalgoorlie where I worked for nearly six years," said Andrew.

"I was subsequently promoted to OTR Repair Specialist which meant a move back to Perth, then earlier this year I was promoted to National Repair Manager – a role I am really enjoying.

"Being a national role and having repair plants in Perth, Kalgoorlie, Mt Isa, the Hunter Valley and Melbourne, means I get to travel a fair amount, but that's all part of it," he said.

"My main role is to ensure all our tyre technicians are trained to the highest levels ensuring our stringent quality levels are maintained.

"The BSEM repair management system is designed to conform with ISO 9001 (International Standard for quality assurance) and our repairer training program is Australia's only nationally accredited and recognised OTR tyre repair course," said Andrew.

According to Andrew, serious safety issues can arise when poorly trained tyre repairers either carry out poor repairs – or even attempt to repair tyres that are too badly damaged to be repaired safely.

"We encourage our customers' tyre managers and personnel to become familiar with the new Australian Standard for tyre repair – and then to demand that all repairs fully comply in order to ensure safety in their operations.

"We're also finding a growing percentage of our business involves fixing repairs that have been performed by less-skilled competitors," he said.

Andrew is also responsible for the research and development for Bridgestone's Tyre Repair System, with the company constantly examining ways to make repairs safer and more durable, to provide extended tyre life.



*Andrew Chapman, Bridgestone's National Tyre Repair Manager, sees continued demand for the company's OTR tyre repair business.*

"The growth in Bridgestone Earthmover Tyres' repair business has been phenomenal in recent years, with the supply issue being a major factor – although we see the opportunity for continued growth, it is unlikely this will be maintained at current levels," said Andrew.



Damage to this tyre resulting from under-inflation meant it had to be discarded.

## Correct tyre inflation: the single best thing you can do for your tyres

**Under-inflation on heavy equipment off-the-road tyres is the single biggest cause of premature tyre failure.** Denis Clark, Bridgestone Earthmover Tyres' Manager, Engineering Services, Queensland, explains why. Note that all these comments apply to radial tyres. While there's a whole host of factors that affect mining equipment tyre life, including TKPH (tonne-kilometres per hour), haul road conditions, gradients and operator techniques, ensuring correct tyre inflation pressures are maintained is one of the most critical maintenance activities you can do for your tyres.

Over-inflation is rarely a problem under most operating conditions but under-inflation, due to gradual loss of tyre pressure, is something that is very quick and simple to check – and prevent.

There are a number of factors that can cause tyre air loss, including casing damage, inner liner fatigue and leaks, through the valve spuds, extensions, housings and the valves themselves.

In fact, if you want your operators to do just one thing to improve operating safety and increase tyre life, get them to check the valve caps and report any that are missing. Valves without caps will leak.

The valve is designed to allow the inflation pressure of the assembly to be checked, while the valve cap is designed to be the primary inflation pressure seal.

Checking inflation pressure on a tyre is equivalent to checking your own blood pressure: it's a very quick and efficient snapshot of a tyre's general health – just as blood pressure is for humans.

So, why is tyre pressure so important?

The volume and concentration of inflation pressure inside a tyre plays a vital role in supporting the tyre casing. As you can imagine, overloading is one cause of tyre failure (by increasing the casing deflection) – but low tyre pressure has exactly the same effect on the structure of a tyre: it overloads the tyre and leads to fatigue and premature tyre failure.

An incorrectly inflated tyre is far more vulnerable to damage if other issues come into play, such as excessive speed, overloading, poor haul road conditions and road design.

But even if all these other factors are addressed, failure to maintain the recommended tyre pressures for the machine, conditions and application will have an adverse effect on tyre life.

And even in the best maintained and run operations, spillage on haul roads can still occur – and an incorrectly inflated tyre is far more likely to sustain damage.

- Insufficient tyre pressure can result in one or more of the following:
- Distortion of the sidewall, causing casing fatigue or carcass breakup
- High stress between piles, causing ply separation

- Excessive tread movement, causing abnormal abrasion and irregular wear
- Bead slippage, causing rim friction and bead separation
- Distortion of the bead area, causing rim chafing and erosion of the rubber
- High stress at the belt edge, causing belt-edge separation
- Higher levels of heat, causing heat separation.
- Results of excessive tyre pressure include:
- High cord tension, increasing the likelihood of casing damage
- Reduced enveloping power, making the tyre more susceptible to cut impact breaks
- Belt separation resulting from stress concentration.

For high-severity tyre applications, tyre pressures need to be checked on a daily basis; ensure they are on the list of daily checks carried out by operators or maintenance crews.

The latest tyre safety standards AS4457:1 2007 and AS4457:2 2008 now specify that if a tyre on a piece of heavy earthmoving equipment has less than 70% of its cold inflation pressure – and the reason is unknown for this inflation loss – the tyre must be removed and properly inspected before it can be put back on the machine.

In the case of dual-mounted tyres, if there is more than a 10% difference in pressure between the tyres, it is essential to investigate the reasons for this and take action to correct this.

The sidebar outlines the correct procedures for checking OTR mining tyre inflation pressure.

Ideally, tyre pressures should be taken at "cold pressure", when the tyre is at ambient air temperatures. A large earthmoving tyre will take a minimum of eight hours to cool down after a shift.

However, hot tyre pressures are a good indication of the severity of the operation. Tyres which reach an inflation pressure of 25% compared with the cold inflation pressure may start to suffer bonding problems. And at temperatures of just over 100° C, the bonding in a tyre starts to break down and can result in separation.

In conclusion, as stated at the beginning of this article, correct tyre pressure is critical to ensure optimum tyre operating safety, performance and maximum tyre life.

Constant attention to ensuring all tyres are correctly inflated will contribute to longer tyre life, reduced operating costs, less machine downtime and higher productivity.

And it's such a simple step to take.



Valve caps are simple way to maintain tyre pressures. Valves without caps will leak.

### Checking inflation pressure

- Inflation pressure should be checked daily prior to operation, ideally at the start of each working shift
- Check the inflation pressure, and be sure that the pressures are at specified values; when internal air temperature is the same as the ambient temperature, the pressure reading obtained is called "cold pressure"
- ALWAYS wear safety glasses, gloves, long-sleeve shirts and hearing protection while inspecting tyres
- When a vehicle is used for more than 24 hours continuously and the cold inflation pressure cannot be checked daily, monitor the hot pressure. This is how to monitor hot pressure:
  - Determine the correct inflation pressure before beginning vehicle operation
  - After a full day of vehicle operation, check the inflation pressure to confirm operating inflation pressure
  - Each subsequent inflation pressure checks should be within a similar inflation pressure range, taking into consideration changes in the operation of the equipment or changes to ambient conditions
  - If hot tyre pressures are 25% over cold inflation pressure, either slow the trucks down or park them up until pressure drops below 20% over cold inflation pressure.
- Record the tyre-pressure readings; reference to these records is an effective method for early detection of tyre problems – for example, if one tyre loses pressure more rapidly than the others, the tyre should be dismantled and inspected
- Always use an accurate pressure gauge
- Check the gauges in use against a master pressure gauge, and have the master gauge calibrated frequently by the manufacturer
- After conducting the tyre inflation pressure check pay careful attention to the appearance of each tyre and wheel; all cuts should be investigated for casing damage. Demount the tyre and wheel, inspect as required.

