

IMPRINT

WINTER 2006

Helping our customers lower tyre costs

Bridgestone Earthmover Tyres has two specialist engineers, Akitomo Takahashi and Takeshi Yamada, to assist customers in improved tyre management, to achieve longer tyre life, reduce early failures and cut tyre operating costs.

Akitomo Takahashi, director engineering services, has been with Bridgestone Earthmover Tyres in Australia since April 2006, and plays a key role in the company in analysing and assessing tyre usage and wear.

Together with other Bridgestone Earthmover Tyres engineers, he visits customer sites throughout Australia and Papua New Guinea, looking at and inspecting tyres and providing recommendations to achieve longer life and lower operating costs.

"This process is helping us to build up a database of how Bridgestone tyres will perform under a given set of circumstances, something that is very useful and helpful, and which we could not work without," Akitomo said.

"That allows us to go back to customers with recommendations on ways in which they can increase tyre life, usually on a case-by-case basis."

"We recognise that accurate and detailed tyre life data is essential for estimating tyre consumption. This also allows us to forecast tyre demand more precisely.

"In addition, this database gives us the opportunity to compare the performance of Bridgestone tyres in this country with performances in other countries and regions, and to understand if there are any regional-specific changes or recommendations we should be making," he said.

Takeshi Yamada spends a lot of his time gaining a better understanding of how operational and environmental factors affect tyre life, with a view to improving tyre performance and increasing tyre competitiveness.

He also monitors wear rates on new tyre patterns as they are released into the market, or during the market testing stage.

"Much of the data we are collecting may not have an immediate impact on tyre life for a specific mine or application, but in the long term it gives us a much better understanding of tyre performance for a given set of circumstances," he said.

"Increasingly, customers are recognising that taking notice of data relating to speed, load, route and TKPH (tonne-kilometres per hour) can be used as a basis to extend tyre life.

"Our engineering department is playing a major role in helping customers become more aware of these factors in reducing their tyre operating costs..

"There has been a number of instances where we have worked with customers in making specific recommendations, which have paid off in terms of longer tyre life than was achieved previously," Takeshi said.



Bridgestone Earthmover Tyres engineers Akitomo Takahashi and Takeshi Yamada.

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Managing your tyres on mid-size equipment

Paul Comminos, Bridgestone Earthmover Tyres' Head Office Engineering Manager, provides some advice to contractors and quarry operators on tyre management for mid-size equipment (trucks, scrapers, wheel loaders, etc) during the tyre supply shortage – which could last for at least the next two years.



Most contractors and quarry operators in Australia would now be aware of the tyre supply crisis, which is having a dramatic effect on the supply of tyres for both OEMs and end users; this issue has been outlined in considerable detail over the past two years.

Recognising that it is a global problem which is not going to go away until early 2008, it is essential that contractors take steps to manage their tyre use and quickly develop processes to maximise tyre life.

The alternative will be standing down equipment or missing out on jobs if no replacement tyres can be sourced.

At a minimum, all contractors and quarry operators running mid to large sized wheeled machines (scrapers, trucks, loaders, graders, etc) should understand standard tyre maintenance practices – for example, correct pressure maintenance and tyre rotations.

However, it's now critically important to understand daily production practices, which can have a far greater effect on the consumption of tyres.

To maximise returns on tyre investment, and thus minimise the impact of tyre shortage, the mindset of tyre preservation now needs to permeate all levels of a contracting or quarrying operation, from top management to site foremen or quarry managers, to truck and loader operators.

There are two key approaches to increasing tyre life:

- 1. Using Existing Potential:** Ensuring you fully utilise the potential of your tyres, by doing everything possible within your existing operations to reduce cut-damaged scrap and increase the number of worn out tyres.
- 2. Increasing Potential Life:** Upgrading and improving your existing operation or tyre specification to further improve tyre life and tread utilisation. For example, many late life tyres are removed for localised chunking where almost 20% of the tread remains on the rest of the tyre; aim to remove this type of damage and larger utilisation of the tread is possible.

Combining these two approaches will give you maximum tyre life. Let's look at each in more detail.

Using existing potential

Again, we can break down this approach to a number of critical factors, which include:

1. Reducing cut damage
2. Repairing cut-damaged tyres
3. Operating tyres within their capabilities.
4. Tyre Maintenance

Reducing cut damage

There are a number of key steps you can take to minimise cut damage to your tyres – usually the single biggest cause of early tyre failure. These include:

- 1 Clear loading surfaces:** A clear loading surface in a quarry or load-



Consider make it part of your loading area procedures that operators clean up between trucks, and spread fine crushed rock to minimise the risk of tyre damage.

and-haul operation means no rocks, stones or other sharp objects in your loading area, where trucks and loaders are manoeuvring and there are added stresses and shock loads on tyres.

- 2 Eliminate spillage on haul roads:** high speed contact with rocks is a major cause of tyre failure. The haul road is one of the key areas where this contact may be eliminated by avoiding and clearing spillage.
- 3 Control your dump area:** High speed manoeuvring at the dump area leads to spillage. Slow down fully loaded trucks in this area to limit spillage and ensure that any spillage is reported and cleared away.
- 4 Minimise operation in wet conditions:** Wet conditions pose an extremely high risk of tyre cut damage. Water acts as a lubricant making it easier to cut tyres. Also, puddles can hide rocks that an operator might otherwise avoid.
- 5 Check underfoot conditions:** Especially if you are working on a redeveloped site, ensure everyone on site keeps a good eye out for anything on or in the ground that could cut or puncture tyres. This includes old demolition material, such as concrete, reo, steel, glass, etc. For example, rather than just running your articulated trucks through a new area, run through it with a dozer first to clear the way and uncover any buried items.

Repairing cut-damaged tyres

Repair of cut-damaged tyres is another option for extending tyre life. While a repair can never return the tyre to its original level of structural integrity, it can improve the opportunity for you to safely wear out a damaged tyre.

While it is possible to effectively repair tyres that have been quite badly damaged, timely removal of cut-damaged tyres for repair is essential to keep repair costs to a minimum, and to ensure the viability of repair. If left too long separation commences and repair is not possible.

In the case of damage to the *tread area*, a tyre should be removed for repair when separation on the top belt occurs, or when the belts have been penetrated.

Damage to the *sidewall area* requires removal for repair once the steel ply is visible.

Bridgestone Earthmover Tyres offers the most sophisticated tyre repair facilities in Australia, with operations in Queensland, New South Wales, Victoria and Western Australia.

Operating tyres within their capabilities

Ensuring your tyres are operated within their capabilities is critical to

ensuring maximum tyre life.

Apart from cut damage caused by sharp rocks and other foreign objects, heat is the great enemy of tyres. When tyres are operated too fast or overloaded, excessive heat is generated. Tyres that are consistently overheated could break down and may fail well before their maximum life due to heat separation.

In the past, many construction and quarrying operations have chosen to overwork their tyres, happy to trade off shortened tyre life in return for higher productivity.

However, today, with the likelihood of tyre shortages requiring equipment to be stood down, this philosophy needs to be reconsidered.

The prime indicator of a tyre's heat capability is the TKPH (Tonne Kilometre Per Hour) rating. Each earthmover tyre has a TKPH rating; if it is operated consistently above or even close to this, premature failure could result.

Another important area of concern is load carrying capability of the tyre. Tyres are designed to carry a certain load at a given speed and inflation pressure. If the tyre travels faster, with higher load or under inflated then it is being overloaded. Overloading may cause tyre fatigue and makes it easier to cut the tyre. Lower tyre life is the most likely result.

Increasing potential life

In the previous section, we discussed ways of working within your current operations to maximise tyre life.

However, introducing some wider-ranging changes, including the overall set up of your operation, offers the potential to increase tyre life even further.

There are four main factors here:

1. Improving your operating surfaces
2. Better road design
3. Imposing speed limits according to conditions
4. Optimising tyre selection

Improving your operating surfaces

Previously, we mentioned the importance of maintaining clean, rock-free loading, hauling and dumping areas for a quarrying or large construction project.

Consider going a step further, and properly sheeting with road base your haul roads, dump access areas and loading areas (ideally to a minimum of 20 mm).

That will give you a safer, more stable road surface and reduce tyre wear and tear resulting from rough or poorly finished roads.

Improve your dewatering and drainage, particularly in high-risk areas such as load and dump areas, and in low-lying haul roads. In addition, ensure your water carts do not over-water to the extent that puddles remain lying around or roads remain slick and slippery.

Better road design

Better road design throughout your operations will certainly contribute to longer tyre life. Areas to consider include:

Corners, where you should look at superelevation and increasing the

corner radius to minimise load shifting, skidding, sliding, tyre fatigue and rock spillage. If it is not possible to include these measures in your road design then speed limits may be introduced to minimise these problems.

Gradients, traction is significantly reduced when gradients exceed 8%. This leads to tyres spinning which means extra wear.

Drainage, where the camber should be adequate to achieve acceptable drainage, to a maximum of 3%. Excessive camber may cause uneven wear on tyres and load shifting to tyres running on the lower side of the road.

Road width, which should be based on the equipment with the widest operating track, with provision for debris clearing without interrupting haul cycles. A good rule of thumb is three times the width of the equipment for a two-way road.

Speed limits

Speed limits should be set according to conditions, signposted and strictly monitored. This will help ensure that the risk of damage to tyres in high risk areas is minimised. High-risk areas where speed limits should be imposed include:

- Downhill loaded
- Switchbacks
- Corners
- Dump areas
- Pit floors
- Intersections
- Abnormally long haul distances (outside TKPH capability of the tyre).

Rock damage is far less likely to occur when the equipment is travelling slowly through these high risk areas.

Optimising tyre selection

In view of the tyre supply crisis, today, more than ever, contractors and quarry managers must be aware of tyre limitations, and structure their operations to maximise tyre life.

Production planning must fall within the tyre capabilities; the days of trading off higher production for shorter tyre life are over.

Tyre selection today needs to be based on the bulk of your production requirements, not the longest haul distance. This allows the tyre company to provide you with a more cut and wear resistant tyre that will ultimately result in longer tyre life.

In this case if you continue with extreme operations, such as very long haul distances, it is necessary to restrict your haul speeds and cycle times to ensure you remain within your tyres' capabilities.

Bridgestone Earthmover Tyres provides in-house training seminars on tyre management programs for its customers. For more details phone (02) 9722 6111, email tyremanagement@bridgestone-earthmover.com.au.

Next edition of Imprint: Tyre management and operator training for quarry and earthmover equipment. Plus we'll cover the issue of compact and utility equipment, with tips and hints on managing your tyres on smaller wheel loaders, backhoe/loaders and skidsteers.



Drainage contractor gets more life at lower cost from Bridgestone track



Melbourne drainage contractor Anthony Veltmeyer has found the use of Bridgestone rubber track on his 4 tonne mini excavator gives him significantly longer life – and buying it through Bridgestone Earthmover Tyres has saved him nearly 50% on the purchase price.

“I’ve had the excavator for approximately four years and with the type of work I’m expected to do, I’ve given the track a fairly good work out,” he said.

“I’m often working in fairly tough conditions up and down kerbs, over tree roots and broken concrete on building sites, for example, so the machine and the rubber tracks really take a pounding.

“My machine is also my livelihood; it pays the bills, so I can’t afford any downtime,” Anthony said.

“Losing a track causes unnecessary hassle and costs plenty in terms of lost earnings.”

The excavator was originally delivered with Bridgestone rubber tracks fitted as standard and although they’ve been worked hard, it was four years and some 2500 hours before the first set needed replacing.

“I was really impressed with the performance of the original set and when the first needed replacing in late 2005, and being unable at the time to source a genuine Bridgestone rubber track from anywhere else, I purchased a cheaper Chinese-manufactured product,” he said.

“The replacement is OK, but it’s obviously not in the same league as the Bridgestone. It doesn’t fit as well and already after just a few months, I can see it’s starting to get a little loose,” he said.

When the second track needed replacing recently, he noticed that Bridgestone Earthmover Tyres was advertising replacement tracks, and called his local Bridgestone branch.

“Through the Bridgestone ‘Right Track’ system they could tell me that the track I needed was in Perth, but that it would be in Melbourne in a couple of days. And it was.”

The ‘Right Track’ on-line system has been developed by Bridgestone Earthmover Tyres to ensure the correct rubber track is quoted for the each excavator make and model.

Bridgestone manufactures over 1800 different track sizes and configurations, covering some 2300 makes and models, with most popular sizes stocked in Australia. Its “Right Track” system also identifies which branch is holding the stock and how quickly it can be delivered.

“In my opinion the Bridgestone rubber track is a top quality product – and from my experience, I can only say: if you’re in the market for a replacement track give your local Bridgestone branch a call. They’ll be able to help,” said Anthony.

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