BIG TIRES BIG TROUBLES

Instead of disposing of damaged large truck and equipment tires, owners can save money with the Ultra Repair program by Kal Tire

By Lee Toop, Associate Editor

Tires being used in off-road jobs like mining and aggregates take a beating every day of their lives. They're designed to take the rough ride and challenging terrain, but at some point many of them simply can't handle it anymore and suffer significant damage.

Small repairs are fairly easy to manage, but in many cases the obstacle that causes the damage is, just like the tire, big – and the tire suffers a puncture or cut that requires it to be removed from the equipment. When that occurs, the tire is generally disposed of – often by dumping into a landfill or use as a berm on jobsites, among other methods.

The problem with disposing of these tires is that, other than the portion of the tire damaged by the injury, the technology that makes up that tire is still in good condition and would otherwise be able to continue in service for some time. However, repairing large injuries in a safe and functional manner has often proven too difficult.

Kal Tire, however, has taken up the challenge to extend the lifespan of large off-the-road tires through a process that rebuilds the internal structure of the tire and sends it off in good working order once again.

The Ultra Repair process Kal Tire offers was developed over more than a decade, according to Bert Jameus, Retread Plant Manager.

"In the days of old, when you got a repair that was too large on a tire, the only materials around were nylon – and that was it. If you were to take that nylon repair and put it on a repair that was too large, you'd see a lot of bulging on it, and nine times out of ten the repair fails," Jameus said. "We've developed what is called our Ultra Repair process."

The construction of tires is similar no matter the size. Steel cords form the core of the tire and provide much of the strength that allows it to hold air pressure and absorb the impacts that are faced in daily use. However, in mines and on rugged jobsites where large equipment operates, the terrain is rough and often can cause significant harm to even the best large tires.

"It's generally caused by rocks. A truck could be backing in to a shovel, and they can't see out the right side of their truck as they're all left-hand drive – a lot of damage happens on the right rear tires," Jameus said. "They may back up and if there's a big rock there, they drive over it, and the next thing you know they load the truck, there's 400 tons sitting on it, and it impacts the rock through the tire."

In other cases, rocks can be driven between dual tires, or otherwise find ways of causing damage. It becomes worse in the fall and spring when the roads and rocks are wet; wet rubber can be damaged more easily, Jameus noted.

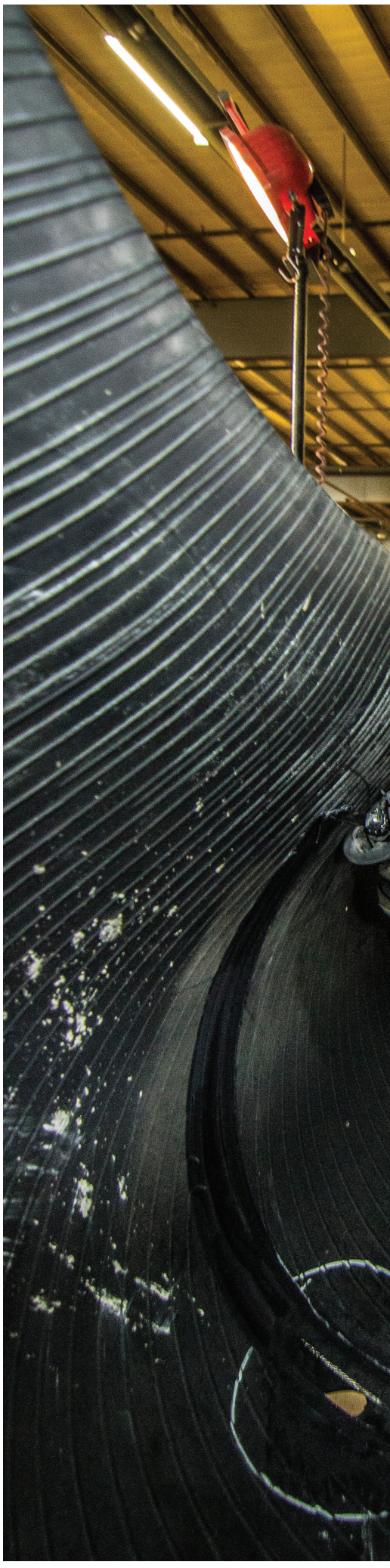
Damaged ultra-class tires – which can cost up to $75,000 per tire – are generally write-offs if the injury has broken the internal steel cables. There have been some methods of repair available previously, but those methods can not completely restore the strength of the tire and ensure that the rubber and steel are properly restored – and under the pressures that large truck and equipment tires face, that can be a hazard on the jobsite.

"That tire starts its day at 105 psi, and as the truck operates, it heats up and can go as high as 145 psi. If that tire blows driving by an office, every window is going to be blown out of that office," Jameus said. "If a man is standing beside it, that tire will catapult a man about three football fields away… a large OTR tire exploding is equivalent to about four sticks of dynamite."

The Ultra Repair process that Kal Tire has adopted keeps those hazards in mind, and aims to return tires up to 63 inches to full working order, even after significant damages.

Customers who have tires that are good candidates for repair send them to Kal Tire's Kamloops facility, where highly trained and experienced employees evaluate the damage and whether it can be repaired. Most can – one in ten tires brought in for repair is too badly damaged, Jameus said.

"Right now, we can do a break that has upwards of 12 cables broken, and we're testing in other areas where we have up to 14 cables broken and [are]



Above: Pressure and heat are applied to ensure that repairs are able to seal fully with the tire. Right: Damaged tires are carefully prepared by expert Kal Tire staff prior to repairs being installed.

Clockwise from top left: Damaged areas of the tire are cut out; damaged steel bands are repaired and replaced; rubber patches designed to match the contour of the tire are applied, and later heated for proper curing; damage to the face of tires is filled with new rubber, which is cut to match the existing tread pattern later.

successfully repairing those tires," he said. "In a lot of places, those tires are then running their lives out."

Once the tires are initially inspected and the feasibility of repair is confirmed, the damage is addressed. That requires removing rubber and trimming broken cables where necessary. Kal Tire's specialists cut out the damaged portion of the tire, and then place new steel components to replace what had been removed.

"We take the rubber right down to the steel, then we're laying steel back in over top of the original steel, minus the area that had to be cut out. We follow it up the same way the tire is built," Jameus described. "We have steel that is almost the exact copy of what had been put in that tire in the original manufacture… we lay the cable over the originals, then we fill that back up to the original level with a rubber that's compatible to the tire."

The cable sections are designed to taper and conform with the shape of the tire, which ensures that as the tire flexes under normal use, the repaired section flexes with it rather than trying to pull away, as might occur with a more rigid and less engineered patch job. After the rubber is replaced, that section of the tire is heated to ensure the new rubber is properly cured, resulting in a tire that is essentially as good as new.

Care has to be taken to do the repair right, Jameus noted.

"The rubber and steel have to be tight. If it's not, what happens as the tire moves and flexes is the damage starts to travel – and that damage, as it travels, is going to blow apart," he said. "There are a lot of issues that can be involved with a bad repair. That's why we ensure that we don't cut corners."

Kal Tire works closely with its customers in the mining sector and other heavy industries, a connection that ensures a speedy turnaround when it comes to tire repairs. If a truck tire is damaged, that means downtime – and downtime costs money, especially when that truck is normally carrying high-value loads like bitumen, rock, ore or other products.

"The most expensive piece of equipment that a customer owns is one that isn't working," Jameus said.

To ensure that customers are back up and running as quickly as possible, the plant aims to put tires through the repair process within days. For many mine sites that might not have spares handy – and thus need to put new tires straight onto the back of a truck, which reduces their service life – that's important.

"Once a tire gets into the plant, we can turn that out in about three days – that's all the repair work and curing done, ready to ship back to the customer," Jameus said. "If a mine phones us up and they have a situation, we can have a load of tires turned out of here in a week, complete."

Repairing, rather than disposing of, ultra-class tires makes Ultra Repair a benefit for customers and for the environment, Jameus noted.

"The ultra-class repair has taken us to a new level where, instead of lining the roads with old tires and building retaining walls, these tires are being put back into service," he said. **HEG**