

TyreAsia

TRACKING THE TYRE WORLD

SPECIAL SUPPLEMENT:
TYRE RETREADING



Harvey Brodsky

**RETREADING WORLD
MISSES HARVEY**



Tony Robinson

**TIRE TECHNOLOGY
EXPO 2018**

*Wang Zhongjiang,
Chairman, Fengyuan Tire*

Fengyuan Tire: Winner From The Start

Retreading Pays Dividends

Belt end separation is one of the most common causes of rejection during the retreading process. Having removed the tyre from service before all of the tread is consumed specifically for retreading the tyre is now rendered scrap value only. The investment has not returned the economic benefits that retreading provides

By Adam Gosling*

Retreading, life extension, maximising return from your tyre investment, reducing pollution and environmental design - there are many reasons why retreading pays dividends.

In order to prepare a tyre for retreading it must be treated properly in its first life in order to achieve a second, a third or even a fourth. There is one factor that must be consistent over a virgin tyre's life, the inflation pressure.

Adam Gosling



A tyre supports the load applied by containing the air within its structure. A tyre knows no difference between an over load or under inflation, it is all the same to a tyre. Given enough of either the tyre may well suffer a catastrophic failure.

A tyre's work is determined by the rate of deformation, that is how much the tyre deforms under the load and the frequency of deformation, how many times the tyre is deformed.

Think about a speed hump as used in traffic calming scenarios. At 5 km/hr the hump is just that, a slow rise and fall, the tyre doesn't deform very much. Now hit that speed hump at 50 km/hr and the deformation is much greater, now hit it 100 km/hr and the tyre is shocked, not to mention the passengers in the vehicle. So the same obstacle encountered at different speeds will result in a differing rate of deformation of the tyre. The frequency, is about the rotational speed of the tyre. Rubber absorbs energy then releases it, the difference between the input and output remains within the tyre's structure as heat.

Overload

When a tyre is over worked the rubber within the tyre's structure is "cooked." It is like baking a cake, if you apply too much heat the cake overcooks and become less than edible at worst, not very good at best. For a steel radial the most susceptible area is at the steel belt end. The belts become detached from the rubber as the tyre overheats. The rubber surrounding the belts loses the adhesion qualities it is chosen for. Belt end separation is one of the most common causes of rejection during the retreading process. Having removed the tyre from service before all of the tread is consumed specifically for retreading the tyre is now rendered scrap value only. The investment has not returned the

economic benefits that retreading provides.

How does a tyre user protect the investment made in the tyre? It really is quite simple. As previously mentioned, the tyre supports the load by containing the air we put into the tyre's air chamber, the air actually supports the load, the tyre "merely" contains the air. The higher the load the stronger the tyre has to be. Heat is generated within the tyres' structure in a process of physics known as hysteresis. The tyre will radiate the heat generated and under normal operations will achieve equilibrium where the heat generated is shed.

When the tyre is over loaded, either by too much mass being supported, or being deformed too frequently by over speeding the heat generated will exceed the heat that the tyre is able to shed. The heat builds and may reach the critical point where the rubber starts to revert, once reversion commences it cannot be reversed, it can be limited but it cannot be "healed."

Imagine a triangular girder bridge, remove one piece of the structural steel at a time, whilst traffic continues to pass over the bridge. As more elements are removed eventually the structure will failure, more than likely catastrophically. A tyre is no different, it will absorb the punishment and abuse until it fails.

Retreading potential

So how do we prevent the overloading of the tyre? There are two main factors that will assist a tyre's retreading potential.

Ensuring that the physical mass applied to the tyre does not exceed its load rating is the

The tyre supports the load by containing the air we put into the tyre's air chamber, the air actually supports the load, the tyre "merely" contains the air. The higher the load the stronger the tyre has to be. Heat is generated within the tyres' structure in a process of physics known as hysteresis. The tyre will radiate the heat generated and under normal operations will achieve equilibrium where the heat generated is shed

first step. Imagine a human lifting a weight, if the weight is too large the human body will be damaged, a tyre is no different.

Now, whilst lifting that weight I want you to run as fast as you can, yes you'll be exhausted very quickly, a tyre of no different to a human. Run whilst carrying a heavy load and you'll die, run with a light load and you'll survive. Why do we not think about what we ask from a tyre?

Tyre manufacturers provide charts of loads and inflation pressures at set speeds. Vary any one of those parameters and the tyre will not perform as it is expected to.



Photo courtesy: Tytec Retreading Perth Australia

I had a truck owner tell me his tyre shop told him he had to upsize his wheels and purchase the next tyre size up, at a cost of \$2000. The tyre was operating at 110 psi, it was rated at 120 psi. I asked the truck owner why he thought it was less preferable to simply put another 10 psi into the tyre rather than spend \$2,000? The tyre was capable as it was rated at a maximum of 120 psi.

By monitoring tyre pressures in real time the level of work a tyre experiences can be accurately gauged. A tyre retreader will always prefer a tyre that has been monitored by TPMS, tyre pressure monitoring than a tyre that has been ignored. If you are retreading your tyres and not using a quality TPMS then I have to ask "why are you throwing money away?"

Look after your tyres so that when you call upon them to look after you they will be in a fit state to do what you ask of them.

****Adam Gosling heads TyreSafe Australia (tyresafe.com.au) providing guidance and direction for mining and transport fleets around the globe. He is an executive committee member of TransafeWA (http://transafewa.com.au/about-us/) a not-for-profit group for heavy transport safety in Western Australia as well as contributing to Road Safety Alliances funded by the Road Safety Commission of Western Australia (https://www.rsc.wa.gov.au). Further, co-operation with the RAC WA (https://rac.com.au/about-rac) enables enhanced safety for the general community. ▲***