Why you're an idiot if you don't wear the belt

I recently rode as a passenger in a B-double prime mover in a tipper application. It was a 2007 model truck in good condition. I checked it out for damage after the lead tipping trailer had 'collapsed' suddenly whilst tipping due to a hydraulic fault. Believe it or not, the only damage to the truck was some creases in the rear panel of the cabin. The shock wave had pushed the cabin up at the centre-back. The weight of the mufflers had weighed down the sides and creases resulted.

Now, back to the road trip. When I tried to buckle the seat belt I realised that the clasp had been removed. A box of electronics that is part of the load management system had been mounted onto the seat belt lap anchor hole! I had to wear a vest and safety glasses in the workshop but no one cared about wearing the seatbelt.

Recently I did a report about heavy-vehicle safety innovations for a road-agency. I came across an interesting statistic from Europe about serious heavy truck crashes. It showed that when considering serious injuries and fatalities, 6% occurred in the truck cabin, 54% occurred in a light vehicle cabin and 40% were unprotected road users (such as motorcyclists, bicyclists and pedestrians).

So how does Australia compare? Periodically, federal government agency BTRE issues an analysis of serious road crash performance. For 2008, the split of fatalities in which a heavy truck was involved was as follows: 25% occurred in the truck cabin, 61% were driving a light vehicle (including a motorcycle or bicycle) and 15% were pedestrians. The startling disparity between Australia and Europe is that proportionately, four times more Australian truck drivers die than European truck drivers in crashes involving a heavy truck! But why?

Here are three possible reasons:

- Australia has a very high incidence of heavy trucks running off the road and a high proportion of crashes do not involve another vehicle. The latest National Transport Insurers report states that ~ 70% of its claims are in fact single truck crashes.
- Seat-belt wearing rates are low, therefore the occupants of a serious heavy-truck crash will get thrown about during a crash.
- Europeans have cabin strength standards that Australia has not had (until very recently). Maybe the European cabins give better crash protection.

(visit: http://www.bitre.gov.au/publications/69/Files/Ann_Road_Deaths.pdf)

Dr Soames Job of the NSW RTA recently gave a presentation about truck safety. He showed a series of slides reporting a number of facts. Firstly, the slides showed that seat belt wearing rates for heavy vehicle drivers are probably in the range of 20 to 30%. Secondly, they demonstrated that seat belt wearing reduces the severity of the crash outcome. The ratio of fatalities to injuries in NSW crashes involving a heavy vehicle is 1:4 when the belt is not worn and 1:60 when it is worn – if this assessment is correct, then the easiest improvement is for truck occupants is to wear seatbelts. So why don't they?

I think that the aversion by truck drivers to wearing a seat belt has three causes. Firstly, it is not macho to wear the belt. Secondly, the driver might want to take an evasive movement inside the cabin when a crash seems inevitable. Thirdly, a retractor seat belt can lock-up and become uncomfortable. Now let's consider each of these.

Peer-group pressure to not wear a seat belt can be strong. Changing this requires even stronger management and better knowledge about the potential safety benefits that are being wasted.

The argument that a driver might need to take evasive action (i.e. move out of the seat) is an unsafe strategy. It's like saying a motorcyclist has the advantage of being able to jump off to avoid being hit! It is nearly always better to let the cabin do the protecting and this is only possible if the occupant is belted in.

The problem of seat belts locking up due to road bumps is real. It occurs when the sash anchor is on the B-pillar and one of the lap anchors is on the suspension seat. The belt gets worked by road bumps – but, there are now solutions to this problem.

Suspension seats with integral seatbelts have become available over the past five or so years. All the seatbelt anchors including the retractor are on the seat, so the belt doesn't get worked. The seat is strengthened to take the forces specified in Australian Design Rule 5/05. These are 460kg force on the sash segment, 460kg force on the lap segment, and 6.6 x the weight of the seat applied through its centre of mass. So the seat must remain attached to the truck when it is pulled with about 1.2 tonne force.

The truck manufacturer may have designed the floor to take the suspension seat test load. The rule requires that the test be done on a representative part of the floor. Another common approach is to tether the two lap anchors on the seat back to anchor points at the back of the cabin. Two short adjustable tether belts are used.

Tethering solves the problem of the truck floor not being strong enough to withstand the test forces. The added anchor points for the tether belts can be put into a strong point where they are integrated with the cabin structure. This is usually the only practical approach when a suspension seat is retrofitted.

It is important that the tether belts are adjusted to allow the seat to move, but are not too slack.

The comfort of a latest generation suspension seat will be appreciated by the driver. The belt will not lock up over bumps and the belt won't restrict the full range of seat adjustments. Hopefully drivers can be convinced to wear the belt.

It is nearly always better to let the cabin do the protecting and this is only possible if the occupant is belted in.

By Peter Hart
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The right tyre changes everything

Heavy rain, damaged asphalt, slippery or snow-covered surfaces – the road is full of unexpected dangers. And as tyres are the only part of a truck linking the vehicle to the road, a tyre that assists in responding to the unexpected is essential.

In addition, fitting reliable tyres to a truck will also improve the braking distance. Therefore, the right tyre choice can make the difference between a near miss and a serious or life threatening accident, making it one of the most important decisions a truck operator has to face. In fact, it is a decision that can have an impact on every aspect of the business, not only safety, but also productivity, profitability, operating cost and fuel consumption.

To improve the life and efficiency of a tyre, there are many simple steps a truck owner can take, but it all starts with choosing the right model. The next step is just as crucial – correct tyre management. In combination, correct tyre choice, carefully maintained tyre pressure and regular wheel alignment have a well-proven effect on economic performance and fuel consumption.

Therefore it is paramount to inflate all tyres to the correct pressure in line with the load per axle, and ensure that they are fitted with valve caps to reduce air loss. Tyres that are balanced with lead weights can reduce vibration notably and ensure optimum performance in the long term. Also, it is a well proven measure to regularly monitor the condition of the tyres including wear and tread depth, sidewalls, wheels, and inflation pressure.

A well maintained, quality tyre will provide a return of investment in no time. Making the right tyre choice can reduce your fuel consumption. Studies have shown that rolling resistance can contribute to as much as 30% of fuel consumption for a long combination – this is the equivalent of one full tank for every three used.

The most significant advancement in reducing the rolling resistance of tyres was made in 1992 when the industry began adding silica to the rubber compound. This maintained tyre grip and tread life. The new "Low Hysteresis" rubber compounds reduced the energy absorbed & heat generated, while reducing heat loss, thereby reducing the energy required to move the vehicle. As a result, choosing a fuel saving or low rolling resistance tyre does not mean sacrificing the performance or safety characteristics of a tyre anymore. A modern, fuel efficient tyre has tread patterns and contains rubber compounds specifically designed to improve rolling resistance to reduce the energy required to move the truck and reduce emissions at the one time.

In fact, modern tyres have more than one life. Multi life tyres are based on a well-engineered case specifically designed with durability in mind, providing a solid base that allows the tyre to remain strong and safe throughout all stages of life, including both regrooving and retreading.

At the end of its first life, a quality tyre can be regrooved and retreaded a number of times (twice on average), delivering up to four lives per case. This can contribute to increasing the mileage by more than 300 percent while reducing the impact on the environment. Regrooving, for instance, restores the tyre's grip. At about five percent of the initial cost, it can expand the tyre life by 25 percent. Retreading can add another 90 percent, or almost one entire life, to the original product life at the cost of 35 percent of the original price. And saving valuable resources such as natural rubber is a welcome side effect. Therefore, utilizing a multi life strategy can significantly reduce cost of ownership and improve safety.

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