

Introduction

Adam GOSLING leads a small team of dedicated tyre professionals at TyreSafe Australia. Adam has more than three (3) decades of experience in the tyre industry including several years of international work. As a consultant, operations in South America, West Africa, China, Laos, Singapore and recently mining operations in the Pacific for a European based organisation have been undertaken. There is a broad scope of experience and knowledge available to draw upon.

Adam is currently vice chair of Transafe WA and also a state committee member of Heavy Vehicle Industry Association (HVIA) and has advocated for tyre safety for many years now including writing for international industry journals. He successfully lobbied the Australian Trucking Association (ATA) in 2016 to produce a Technical Advisory Procedure (TAP) for Tyres and Tyre Operations. Adam joined the Australian Road Transport Suppliers Association (ARTSA) Tyre Working Group on formation and has lobbied for a formal industry code of practise for tyres.

Over many years Adam has provided feedback to the National Transport Commission (NTC) and National Heavy Vehicle Regulator (NHVR) as well as making many presentations in public industry meetings.

This submission relates to the adoption of “new” technologies to improve the safety and efficiencies of the heavy vehicle fleet operating on Australian roads.

Recital;

Tyres are the foundation of the modern motor vehicle.

The tyre transmits all the steering efforts, all the braking forces and the traction required for drive. As such they are absolutely a critical link and deeply influence the performance of the vehicle.

This aspect can be judged by the statement from page 84 of the Performance Based Standards (PBS) Rules as published by the NHVR where it is stated

“Section E

all the forces needed to both support and guide a vehicle ultimately arise in the area of contact between the tyre and the roadway. These forces are generated at the road surface in response to the deformation of the tyre structure.”

UQ

Tyre deformation is governed by the applied loads (mass) and inflation pressure. Tyres are absolutely a safety critical item on the modern heavy vehicle.

How does the current Australian legislation and regulation(s) comply with what has been stated within the HVNL Review? Simply answered it does not.

Detail;

It is a well-established fact that appropriately inflated tyres are required to ensure safety for road going vehicles of all sizes. Simply put everyone knows a flat tyre does not support any load and is unsafe. What is less well accepted is that unless a tyre is appropriately inflated safety and efficiencies will be compromised.

New Zealand legislators recognised this in 2001 when the following legislation was introduced

Land Transport Rule Tyres and Wheels 2001 Rule 32013

2.4 Tyre inflation requirements

2.4(1) Except if 2.4(3) applies, a tyre fitted to a vehicle must be maintained at a safe inflation pressure that:

- (a) takes into account the recommendation of the manufacturer of the tyre or vehicle, the speed at which the vehicle is being used, and any loading;
- and
- (b) if fitted to a heavy motor vehicle, is not greater than the maximum cold inflation pressure for heavy motor vehicle tyres in 2.4(2).

The insurance organisation National Transport Insurance (NTI) (Australia's largest heavy transport insurer) have recently published their 2020 report (National Transport Accident Research Centre, NTARC), a copy as attached. The report evidenced an increase of steer tyre failures as well as vehicle fires that originated at the wheel end within the last reporting period.

<https://ntarc.nationaltransportinsurance.com.au/#introduction>

Tyre failure is not an uncommon event and may result in a total loss of control so compromising the safety of other road users. A single steer axle heavy vehicle that has suffered a steer tyre failure is in a total loss of control event, anything could happen, the driver is simply a passenger.

Under-inflation of tyres is not an uncommon occurrence. Surveys conducted by TyreSafe Australia have revealed that in excess of 60% of the vehicles surveyed coming into a major service chain had tyres that were underinflated. Underinflation of tyres is not an uncommon issue. This phenomenon is also widely reported in the EU, USA and UK.

Evidence from the USA tabled by The National Highway Traffic Safety Administration (NHTSA) is published a detailed study titled

DOT HS 811 086 April 2009

Tire Pressure Maintenance - A Statistical Investigation

where within the introduction the following statement is made

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In order for a vehicle to handle safely and use fuel economically, proper tire inflation, as recommended by the vehicle manufacturer, needs to be maintained in a vehicle's tires. Pressure below the recommended pressure (i.e., underinflation) can cause high heat generation that in turn can cause rapid tire wear, tire blowout, and loss of vehicle control that may cause a crash.

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The intent is quite clear and the same intent resonates throughout the tyre industry globally yet the Australian regulatory sphere has managed to avoid taking any position for heavy vehicles.

The fact that under the Australian Design Rules (ADR) tyres on light vehicles (<4.5t) are required to display a minimum tyre pressure on the tyre placard indicating the minimum tyre pressure required for the vehicle's safe and efficient operation whilst for vehicles weighing in excess of 4.5t there is no such requirement for tyres to be even inflated let alone a tyre placard nominating a minimum tyre pressure seems incongruous. Why is there discrimination between vehicle types? Pneumatic tyres operate in the same manner regardless of size.

The ADRs reference the Australian Tyre and Rim Association (AT&RA) Standards Manual to determine the required inflation levels for different loads, speeds, size and type of tyres. This requirement is not translated into any legislation or regulation for heavy vehicles in Australia but it is applied to light vehicles. The AT&RA Standards Manual aligns with all the international tyre organisations. The Standards Manual is the overarching document in regards tyres used on Australian roads but appears to have been ignored by the Australian regulators.

Tyre Pressure Monitoring Systems (TPMS) were mandated in the USA (2004) for all light vehicles on road in the USA from 2008. Australia is yet to consider TPMS as a worthwhile addition regardless of the fact that the EU and many other jurisdictions have mandated it's use for passenger vehicles. The Holden HSV vehicles exported to the USA were fitted with TPMS but this equipment is deemed unwarranted by the Australia regulators. Why?

The Federal Transport bureaucracy is holding back progress with a retrograde approach. This is also demonstrated in the current review of Tyres within the Performance Based Standard (PBS) regime.

The current document HVNL Review (June 25 2020) states in the Executive Summary

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The Heavy Vehicle National Law (HVNL) regulates the use of heavy vehicles on roads in a way that promotes public safety, industry productivity and efficiency and encourages efficient, innovative and safe business practices. Amongst other things, it focuses on ensuring that heavy vehicles and their drivers are safe and that they are operating on suitable routes to minimise public safety risks.

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There are numerous points of contention in regards tyres as dealt with by the various Australian Federal bureaucracy.

How is the operation (or structure) of the vehicle "safe" if the tyre's (the foundation) inflation pressures are ignored?

- The current approach to managing tyre inflation is haphazard and mainly involves visual checks by drivers. This is not effective, totally subjective and does not provide any evidence to support or confirm the vehicle was "safe to operate"
- It is a basic engineering premise that you can't manage what you don't measure. How are tyre pressures measured in real time? What is the standard to measure against?
- Advances in technology have made the real time monitoring of tyre pressures both practical and affordable which is readily available. It is a mature technology with large scale adoption in other jurisdictions
- The value of this technology has been recognised by many other jurisdictions and has been mandated in numerous other countries
- Australian regulators have not acknowledged the importance of tyre inflation and appear to have been reluctant to embrace this technology

Appropriately inflated tyres also contribute to a major reduction in fuel consumption as well as emission reductions. Detailed studies have been conducted in the EU by the TNO organisation.

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TNO, the Netherlands Organisation for applied scientific research, was founded by law in 1932 to enable business and government to apply knowledge. As an organisation regulated by public law, we are independent: not part of any government, university or company.

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The EU based TNO organisation conducted a deep study into heavy vehicle tyres and published a highly detailed report titled as follows

TNO 2013 R10986 | final report

Study on Tyre Pressure Monitoring Systems (TPMS) as a means to reduce Light- Commercial and Heavy-Duty Vehicles fuel consumption and CO₂ emissions

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This report has assessed the feasibility, potential and cost-effectiveness of applying tyre pressure monitoring systems (TPMS) in light commercial vehicles (LCVs) and heavy-duty vehicles (HDVs) for the purpose of reducing fuel consumption and CO₂ emissions. In addition, also potential safety benefits have been estimated as well as a range of other impacts that may affect cost-effectiveness from the end-user as well as the societal perspective.

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The adoption of new technologies is not a cherry picking exercise for Australian regulators with the jurisdictions in manufacturing hubs where the vehicles and tyres are produced (i.e. not in Australia) having large programs generating technologies useful for increased levels of safety, efficiencies and more crucially reduced emissions. It appears to the writer that the reluctance and reticence of the Australian Federal Bureaucracy to examine and utilise such projects conducted by other jurisdictions is counter-productive and does not align with the UN Road Safety program.

A question that could be posed is “What makes Australian regulators think they know better than bodies such as the National Highway Traffic Safety Administration (NHTSA) from the USA?” when such bodies have much more substantial resources available to them than the Australian system is able to dedicate.

It is acknowledged that the NHVR, has in the near term, engaged a New Zealand domiciled consultant, Dr John De Pont, to review the PBS Tyre “program”. It has been interesting to follow the discussions (the writer sat in by phone on the Sydney airport workshop event. It seemed poorly run and badly equipped) and papers surrounding this topic. There has been no resolution reached as yet.

At no point in time has the requirement for tyres to be appropriately inflated for the high performance PBS approved trucks ever been discussed in an open forum except for the very last speaker at the Sydney event. The “assumption” that tyres are appropriately inflated was approved by the NHVR by means of what appears to be deliberate omission. This aligns with the perspectives outlined by Mr Geoff Casey, Executive Director of Operations NHVR and Mr Sal Petrocchio CEO of NHVR in both personal discussions and written communications.

ISSUES:

The issue at hand is the general lack of knowledge and experience within the regulators and bureaucrats involved in the administration of tyres for heavy vehicles in Australia.

The unwillingness of the regulatory bodies (NHVR & NTC) to engage with mature technologies used in the transport industry (for instance TPMS is in excess of 25 years old) is counter-productive and damaging not only to the general public's safety on road but also the economics of the road transport industry in Australia, not to mention emission control. As is detailed within the NTI report, what costs are imposed upon the industry and society by ignoring or ASSuMing [sic] tyres are "ok"?

The reticence of the NHVR to engage in a study of real time tyre inflation pressures on Australian heavy transport is puzzling. How can the performance of a heavy vehicle be determined if there are no measurements taken or available? Within the PBS scheme there are software simulations conducted on the vehicle model using tyre data prior to the vehicle being approved under the PBS scheme and are without any follow up in the real world. Vehicle dimensions and mass are checked by NHVR (and others) inspectors but the very foundation of the vehicle, the humble tyre, is kicked and often just ignored particularly from the most critical aspect, inflation pressures.

This reticence is further evidenced within the NHVR Procedure for Roller Brake Testing where a substantial volume of discussion was made in regards the pneumatic system on the truck yet tyres were mentioned in passing as being "required to be inflated". When questioned about the formal RBT procedure, a NHVR team member stated in a public meeting (HVIA) that the reference to tyre inflation within the published procedure was colloquial only. Colloquial; informal, idiomatic, conversational and slang are all synonyms of colloquial. A formal procedure, published by the peak heavy vehicle regulator in Australia used in legal prosecutions has a slang reference referring to inflate a tyre where a tyre could be deemed inflated at 20 psi whereas the working pressure for most steer tyres is 120 psi.

The attitude of the relevant "authorities" such as the NTC and NHVR towards tyres has been a stance of "there is nothing to see here, move on". It seems that inflation pressures are not necessary to contemplate as a critical item despite the fact that august bodies such as the NHTSA, TNO and NZ parliament deem inflation pressures to be safety critical not to mention the economics and emissions.

To add insult to injury is the fact that Australia now has no tyre manufacturing left on shore. Any development work is undertaken remotely. Low cost tyre producers have flooded the Australian market place with many products of dubious quality with a matching price tag. The requirement that all tyres imported conform to a particular standard (DoT) is not policed nor even considered by the bureaucrats in charge of tyre operations. The external appearance of a tyre provides few indications of the performance of the tyre. Tyres are the most complex single item on the modern motor vehicle without a doubt. Regardless of origin all pneumatic tyres absolutely rely upon the contained inflation pressure to operate safely and efficiently to the best of the tyres capacity.

A simple change in legislative requirement aligning Australian legislation (ADR) and regulation with that of other like nations, such as New Zealand involves the addition of words into the existing legislation. Reference is made to the New Zealand document.

When injury and insult is not sufficient then consideration of the Australian Parliament, Tyre Safety, Report of the House of Representatives Standing Committee on Road Safety June 1980.

Forty (40) years ago these topics were discussed when Australia lead the field in heavy transport. To the writer it seems this leadership has been spent badly by the bureaucrats involved since that time.

Q (page 37)

11.4 Handling is adversely affected by underinflation of tyres all round and is favourably affected by over-inflation though comfort and resistance to impact fracture are reduced at high pressures. Evidence suggested that a tyre running with pressure in the range 70 to 100, kPa (about 10 – 15 psi) has a markedly different handling characteristics than a tyre with the recommended pressure considerable difficulty in controlling a vehicle

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The criticality of appropriate inflation pressures was recognised then, 40 years ago! Why are the agencies that are tasked with the regulation of heavy vehicles in Australia denying and ignoring what is ostensibly a well-known fact?

There is little other option but to consider these agencies as “not yet competent” where tyres are considered.

Resolutions;

As a conclusion to this submission the following topics are proposed for discussion and resolution

1. Standardise the manner in which tyres are considered (and regulated) for all on road vehicle types currently operating on Australian public roads. The current regulation is discriminatory one way or the other in that it requires light vehicles to carry a tyre placard with a minimum tyre inflation pressure and optional wheel sizes unlike heavy vehicles which have no such requirements for either inflation pressures or tyre / wheel sizes
2. Introduce or revise the relevant legislation (ADR) to be aligned with that of New Zealand where all road going tyres are required to be appropriately inflated according to load and speed. (There appears to be no justification for not acting upon this matter)
3. Can the Senate Committee determine why the regulators (NHVR & NTC) have not embraced tyre monitoring technology which is a mature and sound technology and readily available?
4. Introduce and mandate tyre pressure monitoring (TPMS) for all high performance PBS vehicles. Just as engine ECU data, dimensional and mass requirements are used to determine the “correct” operation of such vehicles whilst in operation so tyre pressures should be included to prove that the vehicle was “safe to operate”
5. There is substantial evidence from other jurisdictions that indicate and provide positive returns on investments for transport operators as well as asset managers (pavements) and the general society in the form of reduced costs and decreased emissions. If other jurisdictions can make these determinations why has Australia ignored such factors to this point in time?
6. The Federal Government should facilitate and support the formation of an industry working group comprised of tyre suppliers, road users, industry groups and regulators to promote an increased level of general awareness in regards tyre use and operations, particularly for heavy transport. The ramifications are manifold with not only road safety issues to hand but also reduced fuel consumption and the associated reduction in vehicle based emissions which effect the entire community providing positive outcomes on many levels.

The writer would be happy to make a personal presentation to the Senate Standing Committee when it meets in Perth Western Australia. Such presentation would include video footage, other media content outlining why and how tyres are a safety critical item on the modern motor vehicle and how the appropriate operation of tyres can reduce emissions at the same time providing positive returns for our society.

Adam Gosling
TyreSafe Australia Pty Ltd

Attachments

- NTI 2020 Report
- TNO 2013 R10986 | final report
- DOT HS 811 086 April 2009
- Tyres and Wheels 2001 Rule 32013
- Australian Parliament, Tyre Safety, Report of the House of Representatives Standing Committee on Road Safety June 1980.