

Heavy Vehicle Fires – Causes and prevention

A recognised project under the NHVR's *Heavy Vehicle Safety Initiatives* program

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Detecting Wheel Fires

Heavy vehicle fires - Causes & prevention

ARTSA Conference
15th August 2019

LSM
TECHNOLOGIES



Causes of Wheel Well / Tyre Fires / Thermal Events

- Wheel Bearing Failures.
- Dragging (Drum) Brakes.
- Under- Pressurised / Flat Tyres.
- Dual Set / Tyre Rubbing- low Air Pressure.
- Exceeding Tyre Specifications- Speed / Load / Pressure (pyrolysis's).

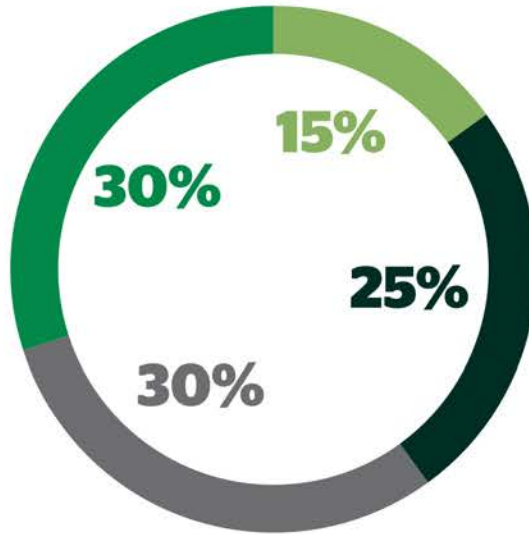


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33% of Heavy Vehicle Fires start at the Wheel-End- NTARC (NTI)



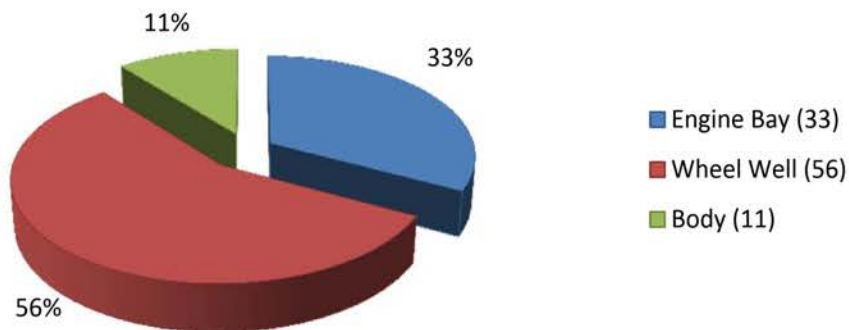
WHEEL END FIRES BY SUB-CAUSE

- Wheel end fire Brake
- Wheel end fire Bearing
- Wheel end fire Tyre
- Wheel end fire Other/Unknown

Source: [NTARC 2019 Major Accident Investigation Report](#)

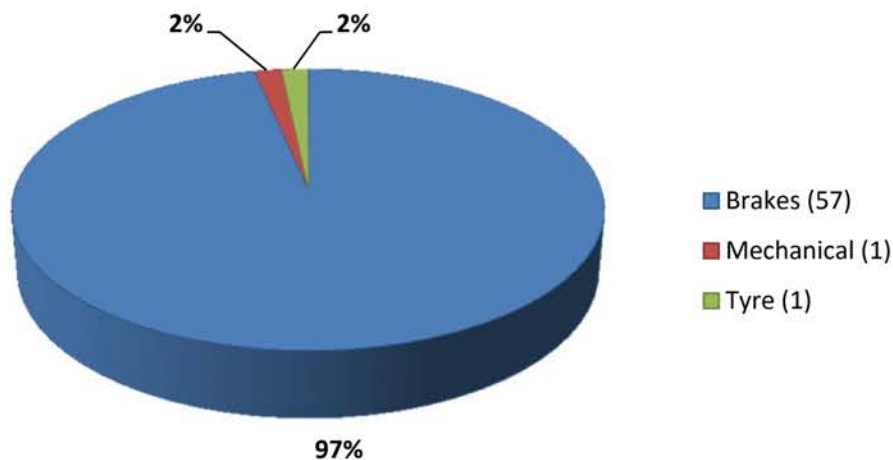
Wheel Well Fires / Thermal Incidents- OTSI- 2018 Bus Report

Origin of Event



56% Wheel Well

Causes of Event



97% Brakes

Source: OTSI – Bus Fire Summary Report NSW 2018.

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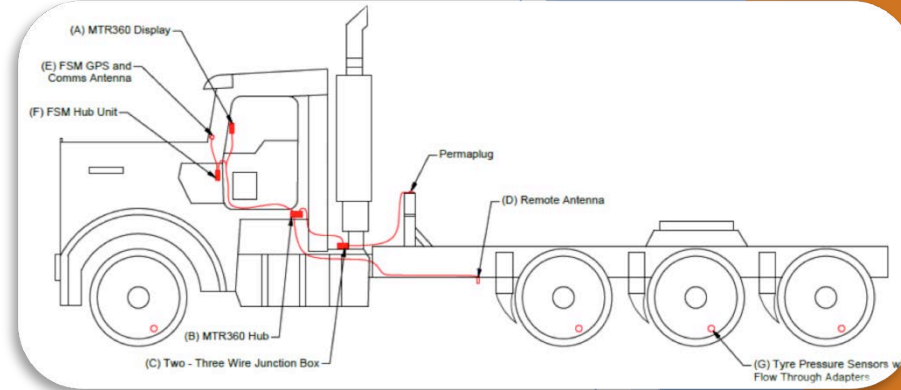
Tour Bus Sydney Harbour Bridge 2018
Passengers **TOLD** the driver to stop as the Bus was on fire!

A Better way of Detecting / Mitigate Wheel Fires Tyre Monitoring System Technology

Source: 7News report – December 2018

Tyre Monitoring Systems- Primary Functions / Alerts

- ❑ Wheel Temperature Alert >80DegC.
- ❑ High Pressure Alert (25% Over).
- ❑ Low Pressure Alerts (12% or 25% Under).
- ❑ Fast leak Alerts- Rapid Air Loss- Blow- Outs.
- ❑ 14.7 Kpa / 1.0 DegC Deviation- Setpoint= Alert.



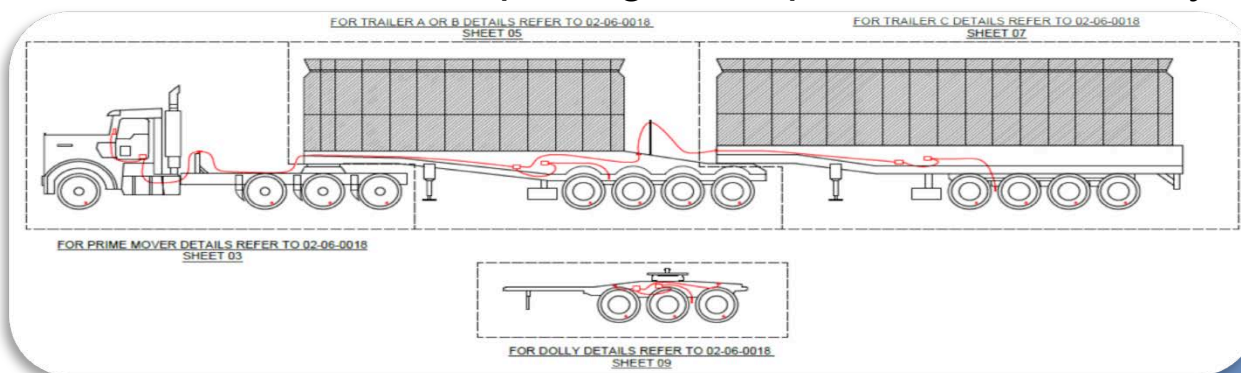
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In Cabin Display (+Remote)

- Visual / Audible Alerts to Driver / Operator.
- Provides for Pre- Start Checks / Alerts.
- Monitoring / Displays upto 180 Tyre Sensors.
- Multi- combinations of Truck (Prime mover) / Trailers / Dollies.
- Full “Drop & Hook” Capability.
- Robust against Temperature / Vibration / Dust.
- Allow for quick / ease of Programming Sensors.
- Telematics Integration: Back- to- base Reporting / Compliance / Data Analysis.



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Wireless Tyre (External) Sensors

- ❑ Report Air Pressure & Temperature to In- Cabin Display.
- ❑ External Mount- fitted direct to Air- Valve Stems (Steel).
- ❑ Easily removed / replaced / programmed by Driver / Maintenance Personnel.
- ❑ Fully Sealed- 100% Waterproof- Encapsulated (eg battery not replaceable).
- ❑ Proven Heavy Duty & Reliable Technology.
- ❑ Robust- Impact / Vibration Proof.
- ❑ Tested / Certified for Dangerous Goods Transport Vehicles.
- ❑ Tested / Certified to SAE J2848/1 Standards.
- ❑ Service Life 4-5 years before replacement.



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A Few- TMSystems Recommendations / Standards / Guidelines / Mandates

- ❑ 2008- 2018- Mandated for Passenger Cars Manufacture- Globally.
- ❑ 2017- TfNSW- “Safety Technologies for Heavy Vehicles & Combinations”.
- ❑ 2017- Mandated by TfNSW BC17 18562 Standard for all Buses.
- ❑ 2015- WA Mining “Tyre Safety- Earth-moving machinery”.
- ❑ 2016- QLD Mining “Recognised Standard 13- Wheel, Tyre, Rim Management”.
- ❑ 2006- ISO 21750 “Road Vehicles- Safety enhancement ...Tyre Monitoring”.
- ❑ 2010- SAE J2848/1 Standard- “TMSystems- Medium / Heavy H’way Vehicles.”
- ❑ 2012- UNECE-R64r1e- EU TMSystem Specifications.
- ❑ 2016- NHVR “TMSystems Technical Working Group”.
- ❑ Many more Recommendations, Specifications, Guidelines are being amended / developed in Australia & Globally.



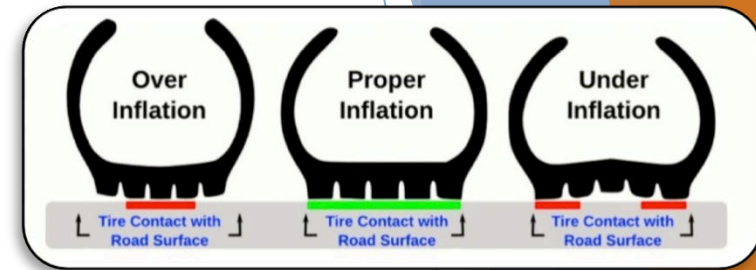
Other Benefits of TMSystems Technology

Safety:

- Avoid Catastrophic Tyre Failure- Blow Outs / Roll- Overs.
- Wheel-Off's.
- Dangerous Goods Transport– Explosions.
- Enhanced Braking / Traction / Vehicle Control.
- Negate Fatalities / Injuries of Occupants & Public.

Cost Savings:

- Reduces Fuel Consumption.
- Tyre Service Life.
- Labor- check Tyres & Re- pressurise (2-3 mins / Tyre- calculate).
- Reduce Insurance Costs.
- Vehicle Damage / Replacement.
- Loss of Business / Contracts.
- COR- Civil Litigation
- Insurances.
- Emergency Services / Road Recovery.
- Other consequential damage- houses / buildings, traffic congestion, emergency services costs, site shut- downs, equipment damage (Goods), etc.



60% Inflation



100% Inflation

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QUESTIONS?



Source: Fire & Rescue NSW Station 392 - Muswellbrook Chronical report