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Risk control
Wheel Security



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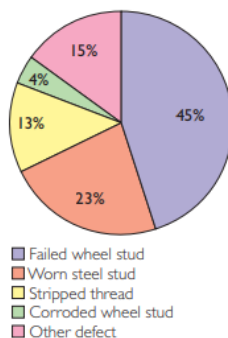
Wheel Security

Introduction

With a typical professional driver, driving around 125,000 miles a year which equates to 2,500 miles a week¹, it is relatively rare to witness a Large Goods Vehicle wheel detachment. However when it does occur it can lead to serious consequences. This could be injuries or loss of life, damage to vehicles or street furniture, legal implications, risks to the Operator and damage to company reputations.

TRL research² found that annually there are typically between 7,500 and 11,000 wheel fixing defects, between 150 and 400 wheel detachments, between 10 to 27 which result in injury accidents and sadly leading to up to 7 fatal collisions. The most common reasons behind these statistics are shown below:

Wheel stud defects – breakdown of causes associated with defective wheel security (TRL report)



Vehicle Checks

Typically, an LGV wheel can have up to 10 studs and nuts and are wholly reliant upon the nuts having enough torque to hold the wheel in place. Wheel nut indicators fit over these and will become misaligned if the nut becomes loose. They are however reliant on the driver completing robust pre-use checks before driving. As the wheel turns it is subjected to thermal expansion, vibration and axial forces. A driver subsequently travelling at speed may not be aware until the wheel becomes detached. It is estimated that the detached wheel can accelerate with velocity at up to 150km/h and have an equivalent force on impact of 10 tonnes³.

Reasons for a wheel loss

The science behind how wheels become unattached is through the loss of clamping forces which can be attributed to a large number of reasons which can include:

- Over or under tightening
- Failure to complete regular checks
- Fitting of incompatible wheels
- Incorrect lubrication causing high friction loss
- Severe corrosion
- Not following the correct torque and re-torque procedures
- Fractured wheel nut washers
- Torque wrench not calibrated correctly
- Incorrect use of air tools causing over or under torquing
- Excess road vibration causing the nut to work loose
- Change in temperature affecting the components.

Driver responsibility

According to the Road Traffic Act 1988⁴ it is an offence: *“to use, or cause or permit another to use a motor vehicle or trailer on a road which might for whatever reason, involve a danger of injury to any person”*.

The driver first use check is the obvious place to start to identify failed or worn studs, as the driver will initially be held accountable should the vehicle becomes unsafe due to a detached wheel. Both the Police and the DVSA have the power to issue a graduated fixed penalty should defects be identified alongside a potential prohibition notice preventing vehicle use on the road.

The advice on the government website⁵ states that the driver checks that *‘all wheel nuts are tight enough - you can check if wheel nut indicators (if fitted) have moved to do this’* and for most drivers the visual check conducted meets this requirement. Drivers should be looking for a number of defects, which include:

- Cracked wheels, nuts or rims
- Bright metal indicating wear
- Signs of rust in the vicinity of the wheel nuts
- Misaligned wheel nut markers
- Missing components
- Signs of damage to the wheel nuts and distorted rims

However, human error cannot be eradicated, and therefore operators need to expect this and therefore look for a range of proactive solutions.

Solutions

On-going driver education can help provide drivers with the knowledge they need, change attitudes and improve road safety. The Health & Safety Executive ⁶ states '*drivers should be given clear instruction or training on carrying out appropriate daily checks, as they may not be deemed as a competent person*'. It is therefore unlikely that a driver may have the knowledge or experience to identify 'false torque'.

Many organisations are moving away from the traditional 'tick sheet' to smart phone technology, enhancing the quality of driver walk round checks and allowing managers monitor the checks are performed correctly.

These electronic vehicle checks can record the time taken to conduct a walk round check and even the distance travelled around the vehicle using GPS, ensuring the drivers actually completes a comprehensive walk round check rather than just a quick cursory glance.

Some Organisations will not ask drivers to torque the wheels due to being impractical and not having the required skills in which to do so. It is therefore important that workshops are aware of any defects, and additional checks are made at the PMI whether maintenance is conducted in house or by a third party provider. This will help to ensure the vehicle does not fail the annual inspection affecting the OCRS score.

Wheel nut indicators have also increased in popularity across many of the UK's fleets providing a simple low-cost solution for drivers to quickly detect if wheel nuts have moved and become loose. Once fitted, the recognisable fluorescent yellow pattern of the wheel nut indicators makes them highly visible. The added benefits of the specific melt point of the material used also provides drivers with a visible indication of overheated wheels.

Summary

The potentially catastrophic event of a detached wheel can lead to an innocent motorist being involved in a fatality, the driver facing possible prosecution and imprisonment, the operator facing the Traffic Commissioner which will no doubt directly affect their Operator Compliance Risk Score (OCRS) and potentially a charge of Corporate Manslaughter.

At a time when organisations scrutinise every penny, money spent upon safety checks should never be the deciding factor, as road safety should always be the overriding factor. Tyre debris can lead to the closure of major roads and it is estimated that the cost to the economy can be £135,360 for a 2 hour delay with 2 lanes closed and rising to £1,488,960 for a 3 lane closure ⁷. It is important, that senior managers

clearly communicate and implement control measures to reduce the risk of this needless incident happening.

References

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5. <https://www.gov.uk/guidance/carry-out-daily-heavy-goods-vehicle-hgv-walkaround-checks>
6. <https://www.hse.gov.uk/workplacetransport/checklist/section7.htm>
7. <https://www.gov.uk/government/news/tyre-related-deaths-and-injuries-preventable-say-highways-england-and-bridgestone>

Further information

For access to further RMP Resources you may find helpful in reducing your organisation's cost of risk, please access the RMP Resources or RMP Articles pages on our website. To join the debate follow us on our LinkedIn page.

Get in touch

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