



# FORS Tyre Management Guide for Operators



Understanding your tyres and staying safe

## Introduction

Tyres are an essential part of driving safely as they are the only points of contact your vehicle has with the road. Ensuring that each tyre on the vehicle is in good working condition will give drivers better control and it is crucial for their safety and that of all road users.

This guide is for operators of heavy goods vehicles (HGVs), passenger carrying vehicles (PCVs), vans and car fleets. It has been developed to help operators meet FORS Standard version 5 Bronze requirement 'V7 Tyre management'.

It provides practical advice to help implement robust policies, as well as management systems and training that will reduce tyre-related costs, adverse environmental impacts and safety-related issues.

Visit <https://www.fors-online.org.uk/cms/toolboxtalks/> to download the FORS 'V7 Tyre management' toolbox talk for drivers



## The legal requirements for tyres

A responsible operator will ensure that their tyres are always well above the legal minimum requirements. The following information outlines the minimum legal standards for vehicles and the sanctions that can be placed against a driver and fleet operator if these standards are not met.

### Tread depths

- 🌀 **HGVs and PCVs:** The tread depth legislation requires that HGV, PCV and vehicles with a maximum authorised mass (MAM) of over 3.5 tonnes must have a minimum of one millimetre (mm) of tread in a continuous band throughout the central three-quarters of the tread width and over the whole circumference of the tyre
- 🌀 **Vans and cars:** The legal tread depth for vehicles with a MAM of 3.5 tonnes is 1.6mm of tread in a continuous band across the central three-quarters of the tyre around its entire circumference

### Unroadworthy tyres

Unroadworthy vehicles can be immediately detained by the police or the Driver and Vehicle Standards Agency (DVSA) until defects are rectified. Each bald or defective tyre carries a fine of up to £2,500 and three penalty points for a driver. The operator also faces changes or restrictions to their operator's licence or, in some cases, the revocation of their operator's licence by the Traffic Commissioner.



#### List of sanctions for unroadworthy tyres

- Immediate detention of vehicle where tyres have:
  - A cut of more than 25mm on any part of the tyre or 10 per cent on the width of tyre
  - Incorrect air pressures (depending on load and running speed)
  - Lumps, bumps, bulges or tears
  - Any ply or cord showing
- Delayed detention of vehicle (where a seven day grace period is granted to rectify the fault) where there is a slash in tyre where cord or ply is not showing

#### Tyre age

The DVSA 'Guide to maintaining roadworthiness'<sup>1</sup> advises that tyre age is monitored and that tyres more than 10 years old should not be used except on a rear axle as part of a twin wheel arrangement. The Government has decided to proceed with a ban for tyres aged 10 years or older in order to improve road safety. The new legislation is scheduled to come out in late 2020, followed by an implementation period of 3 months.

This means that tyres aged 10 years or older will be banned from being used on the front axle. This ban will apply to tyres fitted to the front axle of heavy goods vehicles, buses and coaches and to the tyres on all axles of minibuses when fitted in single configuration. Re-treaded tyres will be subject to the same restrictions as first-life tyres, where the date of re-treading will be used to determine the age of the tyre. Where tyres aged 10 years or older are used on a non-front axle, their age should be recorded and a risk assessment completed that considers the speed and loading conditions that the vehicle will operate under (for example, operating only in urban areas).



<sup>1</sup> <https://www.gov.uk/government/publications/guide-to-maintaining-roadworthiness>

# How to reduce tyre failures and reduce costs

## Tyre pressure

Correctly inflated tyres are paramount for maintaining a safe, fuel efficient fleet.

Over-inflated tyres present a safety issue as the amount of tread touching the surface is decreased. This affects the braking of the vehicle, the handling and overall comfort of the ride. This is particularly evident on wet roads where the decrease in contact area with the road means an increase in the risk of aquaplaning.

Any under inflation will see an increase in fuel consumption and tyre wear.



## Did you know?

For every 10 per cent decrease in tyre pressure, fuel consumption increases by two per cent. For instance if five tyres are running two per cent under-inflated that equates to a 10 per cent increase in fuel consumption

Under-inflated tyres contribute to increases in emissions of carbon dioxide (CO<sub>2</sub>) and nitrogen oxide (NO<sub>x</sub>). Any increase in fuel consumption will lead to more vehicle emissions

Tyres wear more quickly when under-inflated, adding to costs. Many of the tyre manufacturers claim if a tyre is under-inflated by 20 per cent it will wear 25 per cent quicker

Visit <https://www.fors-online.org.uk/cms/fors-fuel-management-guide/> for more useful hints and tips on how to save fuel



## Wheels

The management of wheels goes hand-in-hand with tyres. When a tyre has been changed, or an existing wheel or an entire wheelset has been replaced, you must consider the following:

- 🔧 **Wheel nut re-torquing:** The wheel fixing should be re-tightened to the recommended torque after 30 minutes if the vehicle is stationary, or within 40 kilometres (25 miles) to 80 kilometres (50 miles) if the vehicle is in use
- 🔧 **Wheel alignment:** Not only will an incorrect wheel alignment affect the vehicle's handling, it will cause uneven wear of the vehicle's tyres meaning they will need to be replaced sooner
- 🔧 **Fitting of the tyre:** Ensure that the tyre is correctly fitted and seated on the wheel's rim

## Tyre damage and what to look out for

- 🔧 **Irregular wear:** Often due to poor wheel alignment which itself may be due to over-inflation, under-inflation, harsh braking, poor fitting on the wheel hub or a mechanical fault with the braking system
- 🔧 **Impact damage:** Normally resulting in a bulge in the tyre
- 🔧 **Cuts and slashes:** These tend to occur when pieces of metal or debris hit the tyre's sidewall
- 🔧 **Punctures:** When an object pierces the tyre and drives its way into its carcass

If any of these issues are identified, then the tyre must be repaired or replaced before the vehicle is used again.

## Tyre pressure monitoring systems (TPMS)

Tyres can sometimes look normal even though they are under-inflated. A TPMS is an in-vehicle electronic system that warns the driver when tyre pressure drops. There are two types of TPMS available:



**Direct TPMS** – sensors within each tyre monitor actual pressure levels and report any anomalies directly to the driver via the dashboard



**Indirect TPMS** – the antilock braking system (ABS) uses wheel speed sensors to measure the rate of revolutions for each wheel. When the system detects that a wheel is spinning faster than expected due to it being under-inflated, it sends an alert to the driver

Although now mandated for cars, it is not currently required for other vehicle types but it can be purchased as an extra from most vehicle manufacturers.

Although TPMS is useful, it must not replace tyre checks as part of a driver's daily walkaround check.



### Other tyre checking technology

There is other technology that can help operators and drivers better manage their tyres. This includes:

- 🌀 **Drive-over technology:** Tyre pressure and vehicle weight are measured using a number of sensors, which are embedded in the road surface. The vehicle simply drives over the sensors and the driver receives a text message or print out of the result
- 🌀 **Valve mounted technology:** A retrofitted system, which consists of an in-cab monitor and sensors that are embedded in tyre valve caps

Using the FORS FMS Mobile App (for Android) will help drivers complete their daily walkaround checks. The app is aligned to FORS requirements and gives operational staff a wide range of live information including data on fuel and tyres. It also allows photos of defects to be taken and uploaded, which is an ideal way of communicating problems. For more information please visit <http://www.fors-online.org.uk/cms/fms/>

## Tyre selection

Things to consider when selecting a suitable tyre:

- 🌀 **Tyre structure:** There are different types of tyre structure - radial, cross-ply and bias belted. Cross-ply tyres have diagonally lapping plies whereas radial tyres have their plies arranged in the direction of rotation of the tyre. Bias belted tyres are similar in structure to cross-ply tyres but have additional steel belts to protect the carcass
- 🌀 **Pairing of tyres with different structures:** All tyres fitted on an axle must be of the same structure and nominal size. Tyres on an axle may be different structures and nominal sizes to those on another axle with the following exceptions:
  - 🌀 All tyres on all steered axles must have the same structure (with the exception of a temporary or spare use tyre)
  - 🌀 All tyres on all driven axles must have the same structure (with the exception of a temporary or spare use tyre)
  - 🌀 All tyres on a trailer axle must have the same structure (with the exception of a temporary or spare use tyre)
  - 🌀 On a two axle vehicle where each axle is fitted with single wheels, tyres must be fitted as follows:

Structure of tyre on axle 1	Structure of tyre on axle 2
Cross ply	Bias belted
Cross ply	Radial
Bias belted	Radial

- 🌀 **Super singles:** Super singles (normally found on HGVs and larger PCVs) are defined as having a road contact area of at least 300mm. They are commonly used on steer and trailer axles. They are a popular choice as they weigh less than twin (dual) tyres and have less rolling resistance resulting in better fuel economy
- 🌀 **Twin tyres:** Twin tyres (or dual tyres) are tyres that are doubled on each side of a given axle. Twin tyres are normally used on drive axles for larger vehicles as they offer better grip and stability. When fitted to the same axle, the tyres must be of the same construction and must not touch. The only exception being laden vehicles with radial tyres that have flexible side walls
- 🌀 **Size:** The tyre size must be suitable for the operational needs and the operator will need to consider the tyre's rim diameter, section width and aspect ratio
- 🌀 **Run-flat tyres:** Common on cars, run flat tyres have reinforced sidewalls capable of temporarily supporting the weight of the vehicle after a puncture
- 🌀 **Tyre speed rating:** This indicates the maximum speed a tyre is legally approved for. This is important for an operator to understand as it must be taken into consideration, together with the maximum load defined for the tyre, as they are dependent on one another
- 🌀 **Load ratings:** Each tyre has a maximum load rating which must not be exceeded. The DVSA's 'Heavy Goods Vehicle (HGV) Inspection Manual' provides detailed information about tyre load and speed rating. It can be accessed <https://www.gov.uk/government/publications/hgv-inspection-manual>



- 🌀 **Other types of tyres:** There are different types of tyres that are specifically suitable for different types of operation, for example:
  - 🌀 Off-road tyres
  - 🌀 Construction site tyres
  - 🌀 Urban tyres
  - 🌀 Winter tyres
  - 🌀 Mud and snow tyres

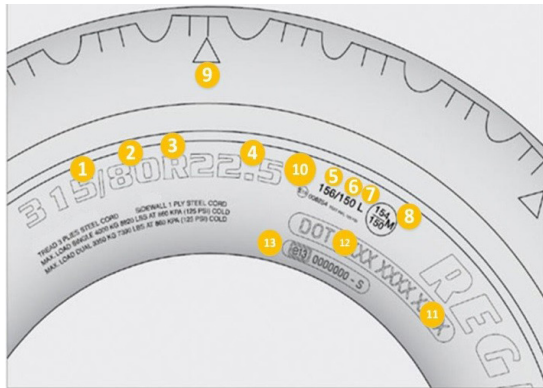
### Tyre markings

Understanding what the markings on the side of a tyre mean can help operators purchase the correct tyre for their vehicles and operation. The markings on the side of the tyre provide operators with the necessary information to keep their operation legal.

Selecting the correct tyre will minimise tyre wear, ensure the tyre will support the vehicle and its loads and ensure that the tyre does not fail at the speeds the vehicle will be driven at.

The various markings on the sidewall of a tyre are as follows:

1. Tyre section width (mm or inches)
2. Aspect ratio SH/SD radial construction (this is the ratio of the tyre's cross-section to its width, expressed as a percentage. An aspect ratio of 80 indicates that the tyre's height is 80 per cent of its width)
3. R = Radial
4. Rim diameter (inches)
5. Load index (max. load per tyre - single tyre)
6. Load index (max. load per tyre - dual mounted)
7. Speed symbol (the letter indicates the tyre's maximum safe running speed)
8. Alternative load indices when used with alternative speed
9. TWI = tread wear indicator
10. ECE homologation number (this is the manufacturing approval number)
11. Date code (the first two numbers indicate which week of the year the tyre was made, with the second two indicating the year the tyre was made)
12. DOT manufacturing code (tyre factory code and date)
13. Noise number (indicates that the tyre conforms to ECE noise regulations: between two and five decibels)



## Regrooving tyres

Tyre regrooving involves the re-cutting of grooves once the existing tread reaches a depth of roughly three millimeters. Regrooving tyres is a popular way for operators to improve safety and increase tyre life by up to 25 per cent. A regrooved tyre has the additional benefit of reducing rolling resistance when compared to a new tyre which means it lowers fuel consumption and is better for the environment. Regrooved tyres are only allowed on certain vehicles - they are not allowed for example on private cars and goods vehicles of less than 2,540kg unladen weight.

Selecting the correct tyre package for your business is another way you can save money for your operation, for example it is cheaper to purchase tyres on a contract basis

## Tyre retreads/remoulds

Retreading (sometimes referred to as remoulding) is the process of replacing the tyre's tread and in some cases the tyre's side wall. There are two processes for retreading the tyre which are:

- ❶ **Cold process:** The cold process is where the tyre's tread is removed from its casing and replaced by gluing a new tread
- ❷ **Hot process:** The hot process is where the tyre's casing is completely stripped of both the sidewalls and tread. The tyre is then built again using hot vulcanised rubber and cooked to give the impression of a nearly new tyre




If you buy a retreaded tyre, make sure that it has the E-mark on it, which confirms that a tyre meets minimum EU or International (UNECE) standards in relation to its dimensions, load and speed rating. All motor vehicles tyres in the EU must be E-marked, whether new or retreaded.

## Appointing a Tyre Champion

It is recommended to appoint a Tyre Champion or responsible person who will be accountable for tyre management and maintenance duties (however this is not a mandatory FORS requirement).

The responsibilities of the Tyre Champion or responsible person should include the following:

- 🌀 **Tyre selection:** Ensuring the selection of tyres considers vehicle types and operating conditions
  - 🌀 **Recording of problems:** Creating a spreadsheet or database of tyre-related issues such as:
    - 🌀 **Nature of tyre wear:** For example uneven tyre wear on a given vehicle suggesting an alignment problem
    - 🌀 **Tyre failure trends:** Common factors for tyre failures such as punctures, slashes or bulges
    - 🌀 **Location of tyre problems:** For example particular collection or delivery points that cause issues
  - 🌀 **Creation and updating of a maintenance schedule:** Covering planned periodic safety inspections of tyre condition, tread depth, pressures and recording of tyre age
  - 🌀 **Management of external tyre fitters:** Production of a formal written contract or other supporting documentation and monitoring of their performance
- 
- 🌀 **Management of in-house maintenance:** Ensuring that where safety inspections and maintenance are conducted in-house, the technical facilities and staff competence are adequate for the size of the fleet and type of vehicles operated
  - 🌀 **Recycling arrangements:** Implementing a procedure for disposing of tyres in accordance with local waste regulations
  - 🌀 **Training of drivers to undertake daily walkaround checks:** Ensuring that drivers are trained to conduct thorough walkaround checks by giving a practical demonstration of the tyre checking procedure

🔊 **Coordination of spot checks:** Ensuring supervisors and transport staff regularly spot check vehicles and trailers to help identify missed defects

🔊 **Overseeing tyre storage:** Ensuring that if tyres are stored onsite they are in a secure location to prevent them from being damaged or stolen

Tyres are non-biodegradable and when burned produce dangerous toxins and an oily substance that pollutes the air, ground and water sources. An operator's tyre management policy must state how the tyres are disposed of or recycled responsibly and in accordance with local waste regulations.



## Tyre management policy and procedures

Creating a detailed tyre management policy will help you get to grips with all aspects of tyre management. The policy and procedures checklist on the following pages indicate what you must include to meet FORS Bronze requirement 'V7 Tyre management'. Each point will need either a written statement, documentation or planned action:

POLICY AND RESPONSIBILITIES				
Policy		Demonstration	Responsible for completion	Evidenced? Y/N
1	Purpose of the tyre management policy	Written statement about the aims and objectives of the tyre management policy and what each of the initiatives put in place are expected to achieve (eg reducing tyre failures to zero per cent)	Transport management and Tyre Champion (or responsible person)	
2	Company tyre safety statement	Written statement about what the company's expected standards are on tyre safety, tread depth, tyre selection, tyre pressures, tyre life and replacement (including stance on regrooved/ retreaded tyres), tyre inspection and how tyres are disposed of or recycled responsibly	Transport management and Tyre Champion (or responsible person)	
3	Who the tyre management policy applies to	Written statement on who the tyre management policy applies to (eg drivers, transport staff, tyre fitters, external tyre contractors, Tyre Champion, transport management, tyre procurement staff)	Transport management and Tyre Champion (or responsible person)	

Policy		Demonstration	Responsible for completion	Evidenced? Y/N
4	Review of policy	A timeline for periodic review of tyre management policy (minimum of every 12 months)	Transport management and Tyre Champion (or responsible person)	
5	Senior management sign-off	The tyre management policy being reviewed and signed off by senior management (minimum every 12 months or sooner if circumstances dictate)	Senior management, transport manager & Tyre Champion (or responsible person)	
6	Communication plan	Written documentation on how the tyre management policy and procedures are communicated to relevant staff	Tyre Champion (or responsible person)	
7	Standards for tyre fitters	Written agreement on what the company expects from either in-house or contracted tyre fitters	Tyre Champion (or responsible person)	
8	Disposal of tyres	Written statement and agreement setting out how tyres are disposed of in a responsible and environmentally friendly manner	Tyre Champion (or responsible person)	
9	Tyre maintenance schedule	A document containing information about tyre maintenance scheduling, which should include recordings of tyre failures, wear, defects, changes in condition (such as unusual tyre wear on certain routes), pressures and disposal/recycling	Tyre Champion(or responsible person), driver and in-house tyre fitter/contractor	

PROCEDURES AND RESPONSIBILITIES				
Procedures		Demonstration	Responsible for completion	Evidenced? Y/N
1	Analysis	The company having the means to review and analyse information about their fleet's tyres and evidence of how they have acted on the information	Transport management and Tyre Champion (or responsible person)	
2	Wheel nuts and alignment	A procedure for monitoring wheel nut torquing and wheel alignment, with the necessary reporting procedures put in place	Tyre Champion (or responsible person), driver and in-house tyre fitter/contractor	
3	Spot checks	A plan for periodic checks of tyres by transport operations staff	Tyre Champion (or responsible person) and transport staff	
4	Reporting of defects	A procedure for drivers to report tyre defects which should include actions needed, contact information for relevant parties and what to do in emergencies	Tyre Champion (or responsible person) and driver	
5	Daily walkaround checks	Drivers properly trained on how to inspect tyres as part of their daily walkaround checks	Tyre Champion (or responsible person) and driver	
6	Responsible disposal/recycling of tyres	A procedure that actions the disposal/recycling policy of the operation	Tyre Champion(or responsible person), driver and in-house tyre fitter/contractor	
7	Storage of tyres	A procedure to ensure that if tyres are stored at the operator's premises, it is done in a safe, secure and risk free manner	Transport management, Tyre Champion (or responsible person) and tyre fitter	



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