Michelin Techtalk-Truck
Edition 1

Ask The Michelin Man

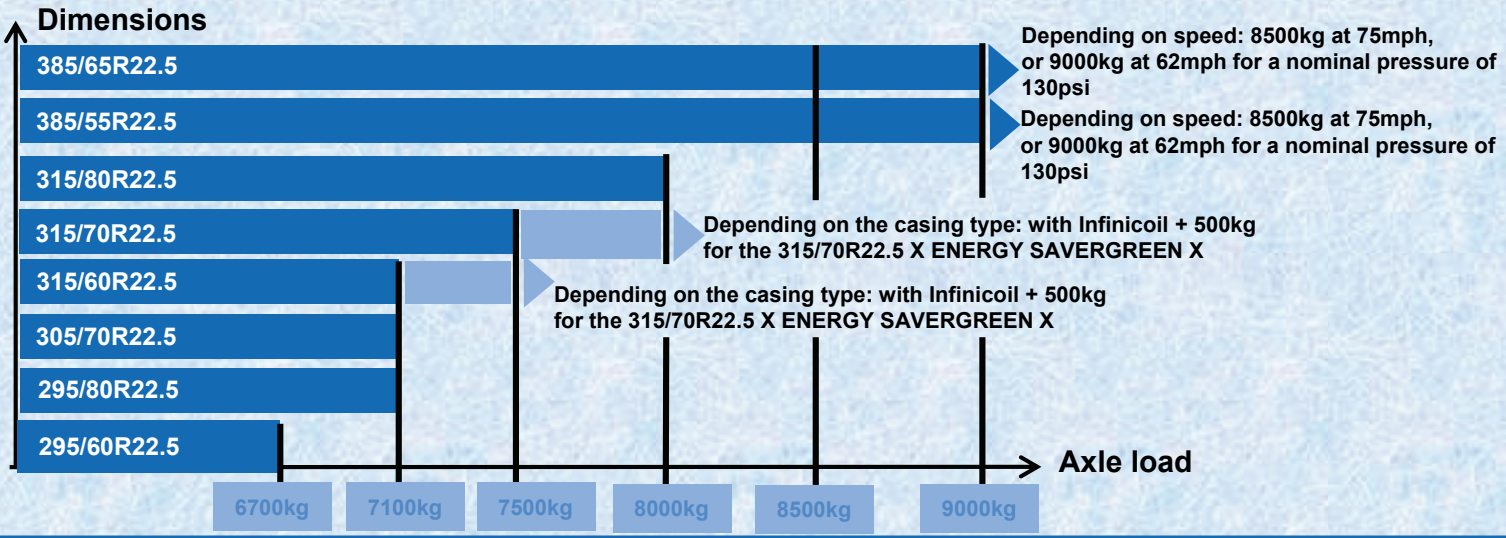
Guide for the selection and proper usage of steering axle truck tyres.

There are three main categories of axle on trucks. The steering axle, the drive axle and the load-bearing axle. To maximise safety and to optimize profitability, it is important to equip vehicles with the appropriate tyres, respecting certain choice criteria, in particular, for the steering axle. **3 steps are to be followed!**

Step 1 → Define the proper use of the tyre

The load on the axle is the first variable to be taken into consideration **when choosing a truck steering axle tyre.** In association with the available space on the vehicle, it allows the tyre dimension that is to be fitted to the vehicle to be defined and provides an accurate and reliable indication as to the choice of tyres.

Histogram of axle load with respect to dimensions



Please note

- The maximum axle load is provided by the vehicle manufacturer in accordance with local regulations in force. Equipping this axle with tyres that can bear a greater load does not allow the load authorised by the manufacturer to be exceeded.
- Fitting a tyre on a non-standard wheel rim may lead to: deterioration of the wheel and/or the tyre, a non-optimised footprint, which reduces tyre safety, behaviour, grip and lifetime
- Use ETRTO or manufacturers recommendations to determine the appropriate wheel rim for each tyre and use only that rim.

Step 2 → Define the proper use of the tyre

The Michelin truck tyre range is made up of **7 types of tyres**, each meeting the various requirements and applications of user customers. Therefore, in order to choose the right tyre for the steering axle of a truck, the major benefits and application must be taken in account.

A

MICHELIN X ENERGY™

Intended for long distance journeys, motorways and main roads.

A
E
N

MICHELIN X Coach

Intended for long and short distance on all types of roads.

A
E
N

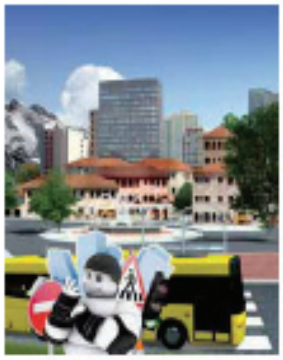
MICHELIN X MultiWay, MICHELIN X MaxiTrailer

Intended for long and short distance on all types of roads

N

MICHELIN X Grip

Intended for particularly difficult driving in winter.



U

MICHELIN X InCity

Intended for driving in urban and suburban areas.

Y
H

MICHELIN Sitework

Intended for multipurpose driving on roads, worksites and quarries.

L

MICHELIN Off road

Intended for special vehicles, civil or military, mainly driving on unsurfaced roads.

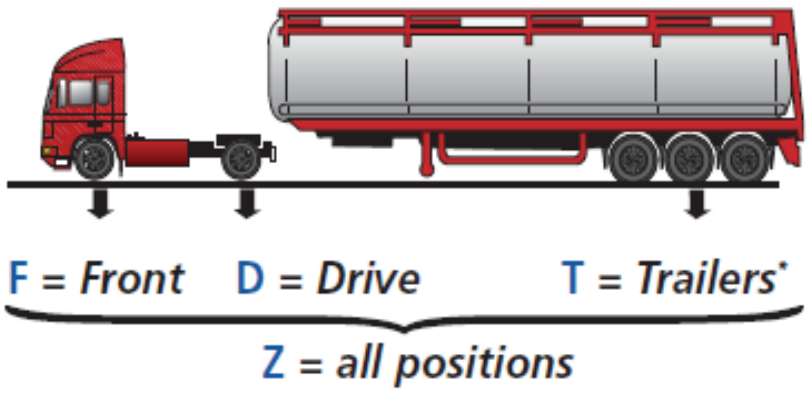
Please consult our technical documentation and our range brochure for details on our products' technical specifications and on the benefits of each range, or visit our website:
www.michelintransport.com

MICHELIN
A better way forward

Step 3 → Choose the right tread

Certain rules must be followed when choosing a suitable tyre type or the steering axles of a commercial vehicle.

Tyre position code diagram



Examples:

XF2 = F for *Front*

XDN2 Grip = D for *Drive*

XTE3 = T for *Trailer*

XZY2 = Z for *all positions including the Front*

*** These casings are specifically designed for use on load-bearing axles and are not designed, nor intended, for commercial vehicle steering axles. Michelin shall not be held liable for any consequences due to driving outside its recommendations.**

To equip steering axle, you must:

Exclusively use 'F' or 'Z' tread patterns

These are tread patterns designed and manufactured to meet the specific driving constraints of motor vehicle steering axles; varying load, angle geometry of axles, high mileage…

Never use 'T' tread patterns on Steering axles

The 385/55 R 22.5 and 385/65 R 22.5 XT casings… (e.g. XTA2 ENERGY, XTA2 + ENERGY, XTE2, XTE3…) with the additional labelling FRT (Free Rolling Tyre) in compliance with ETRTO standards are, for usage in Europe, especially designed to use on load bearing axles mainly on trailers and semi trailers.**

** The definition of FRT (Free Rolling Tyre) is provided by ETRTO: "Tyres for commercial vehicles reserved for non-drive axle equipment, excluding car front steering axles"

Legislation

The FRT marking is also defined in Regulation 54: "Section 3.1.15". The "FRT" marking for tyres specifically designed for load bearing axles (tyres for trailer axles).

This regulation is applicable to all new tyres used within the European territory: this means that FRT-marked tyres are only approved to be fitted to load bearing axles and cannot be used on other types of axles.

Risks associated with not following the 3 steps for choosing a steer axle tyre

Steer tyre functions		Associated risks
Bears the loads	Defined by vehicle specifications (axle load)	An undersized tyre with respect to load may overheat in service. This can lead to rapid tyre deterioration when driving, to the extent that a sudden rapid tyre deflation may occur. The tyre footprint will not be optimised, which will affect tyre behaviour and grip (steering and breaking). Retreading can be affected. Lifespan or mileage potential will be reduced.
Supports the speed	Defined by vehicle specifications (maximum speed of the vehicle)	An undersized tyre with respect to speed may overheat in service. This can lead to rapid tyre deterioration when driving, to the extent that a sudden tyre deflation may occur. Retreading can be affected Lifespan or mileage potential will be reduced.
Driving on different surfaces	With regard to profession and usage	A tyre that is not suitable for a given application can for example: - overheat: the case of a multipurpose tyre that is used for long distance motorway driving. - will deteriorate: the case of the tyre tread of a tyre designed for long-distance roads used on un-surfaced roads. A tyre showing such accidental damage must be examined by a specialist in order to determine whether it can continue to be used, must be repaired or removed. It must be noted that exposure of the reinforcing structure can lead to oxidisation. A tyre with such damage may contravene tyre related legislation. This type of damage can lead to rapid tyre deterioration in service, to the extent that a sudden rapid tyre deflation may occur. Retreading can be affected Lifespan or mileage potential will be reduced.
Steers the vehicle	With regards to the profession and usage	A tyre that is not suitable for the position or a given application, depending on the condition of road surfaces and speed, may have affect on the vehicle stability and performance.
Provides driving comfort	Specific characteristic of front tyres (uniformity)	The Front axle is particularly sensitive to tyre uniformity: link with the steer wheel, position close to the driver… Front axle tyres are specifically designed to meet this criterion.
Provides part of the braking of the vehicle	Very important for emergency braking	A tyre not intended for the Front axle can have lower braking performance when it is fitted in this position. During emergency braking, a heavy load bears down on this axle. It therefore plays an essential role in a vehicle's braking distance. Front axle tyres are designed with this requirement in mind.
Influences fuel consumption	Represent up to 50% of the tyres fitted to the vehicle	The choice of range and tread pattern will have an impact on fuel consumption. For certain conditions, it is possible to optimise fuel consumption by using low rolling resistance tyres. Tyre maintenance can also significantly affect vehicle fuel consumption.
Informs the driver about the road surface condition	It is the first axle that comes into contact with the surface that the vehicle is going to drive on	A tyre not intended for Front axles may filter information regarding behaviour when it is fitted in this position. Due to their characteristics, Front tyres enable feedback on changes in road surface conditions to be provided to the driver progressively: such as a temporary reduction in adherence for instance.

The information within this document is included in the Technical Brochure 2010