

TECHNICAL INFORMATION

MICHELIN: TRUCK AND BUS TYRES

EDITION 24



Michelin tyres are designed for a specific use as detailed in this catalogue. Any other use constitutes an abnormal usage.

However, in some cases, Michelin may waive the specific use conditions and limits and allow for a derogation.

Michelin disclaims any liability for any abnormal use of our tyres in the absence of any specific express and written permission.

Michelin products are manufactured from high quality materials to high tolerances, ensuring a uniform and consistent performance. Correct application, fitting, inflation and regular inspection of the product are essential to its safe and efficient operation. Remix and the tyre designations mentioned are trademarks of Michelin. For further information about any of the products in this document, contact your local Michelin representative or Technical helpline on 0845 366 1535.

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FITTING NEW TYRES

In general, the Road Vehicles Construction and Use Regulations 1986 require that tyres of the same construction should be fitted on the same axle. Fitting tyres with different tread patterns is tolerated provided they:

- have sufficient load capacity for the plated weights of the vehicle axle
- are the same size
- are the same structure (radial or diagonal)
- have sufficient speed capacity.

X® LINE™ Energy™ D



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3D XDE**



However, for optimised tyre performance Michelin recommends mounting tyres with the same tread pattern on the same axle. If this is not possible, Michelin advises mounting twinned tyres of the same type. For certain tyres, Michelin issues Technical Bulletins indicating in what configurations they can be mixed and fitted.

FITTING REGROOVED TYRES

The UK Construction and Use Regulations permit the fitting of regrooved tyres on axles of commercial vehicles weighing more than 2540kg unladen weight, including for the transport of persons or hazardous materials, provided certain other criteria are met in relation to the dimension of the tyre and the regrooving pattern and method. See regrooving section on page 13 to 44 for more detail.



FITTING RETREADED TYRES

There are no specific requirements in the UK Construction and Use Regulations in relation to the fitment of retreaded tyres. However it is generally accepted in the UK and Ireland that retreaded tyres should not be fitted to front steer axles.

UNIFORM FITMENT (RETREAD - RETREAD) ON THE AXLE

- The technical characteristics of the retreaded tyres fitted to a vehicle must be the same:
 - retread brand
 - tyre size
 - tyre structure
 - speed rating and tyre load indexes
 - tyre tread type
- It is **NOT ADVISED** to mount retreaded tyres from different retreaders on the same axle, regardless of the make of the casing.

MIXED FITMENT (NEW - RETREAD) ON THE AXLE

Michelin recommend that its tyres should only be mixed on the same axle if:

- The retreaded and new tyres are MICHELIN
- The makes of the casings are the same (new and retread).
- The following technical characteristics of the retreaded and new tyres on the same axle are identical:
 - tyre dimensions,
 - structure (radial or diagonal),
 - speed rating and load indexes,
 - tread type (road, all-terrain, snow – M+S marking).

Axle layout for uniform retread mounts

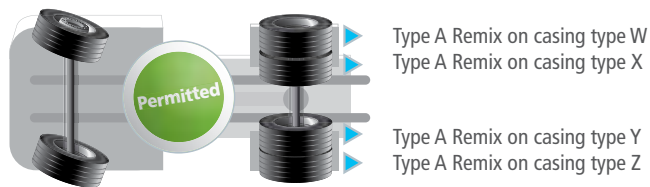
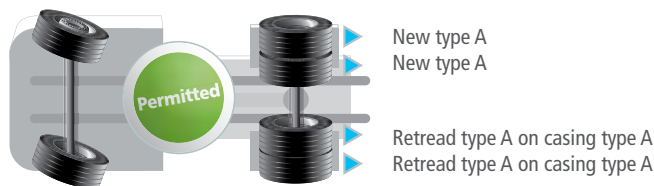


Diagram of axles for new/retreaded combination

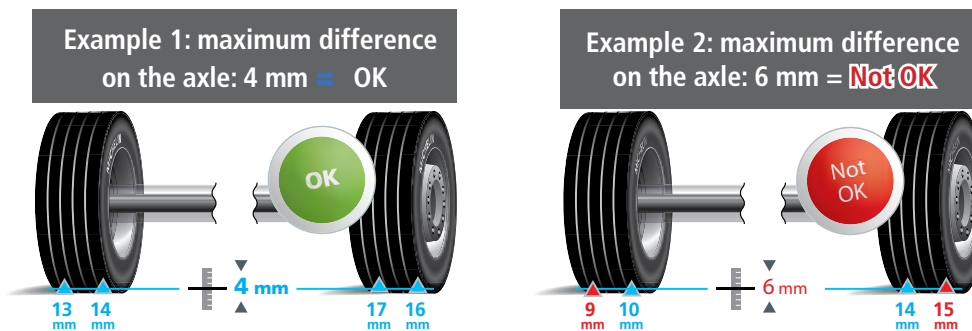


MICHELIN RECOMMENDATION

Michelin Remix tyres are designed and manufactured to be used on drive axles and trailer axles. Michelin does not recommend mounting retreaded tyres on the front steer axle of motor vehicles.

DEPTHS OF TREAD PATTERN ACROSS THE SAME AXLE

Michelin advise that the difference between the depths of the main grooves on two tyres fitted on the same axle must not exceed 5mm at the same phase of life (regrooved/non regrooved).



For a regrooved tyre, the depth of the regroove should be taken away from the remaining tread pattern depth before making this comparison.

PRODUCT LIFE

Tyres are constructed using various types of material and rubber compounds, having performance properties essential to the proper functioning of the tyre itself. These component properties evolve over time. For each tyre, this evolution depends upon many elements such as weather, storage conditions and conditions of use (load, speed, inflation pressure, maintenance, etc.) to which the tyre is subjected throughout its life. This service related evolution varies widely so that accurately predicting the serviceable life of any specific tyre in advance is not possible.

That is why, in addition to regular inspections and inflation pressure maintenance by operators, Michelin recommend that tyres, including spare tyres, should be inspected regularly by a qualified tyre specialist, such as a tyre dealer, who will assess the tyre's suitability for continued service. Tyres which are in use for 5 years or more from their date of manufacture should continue to be inspected by a specialist at least annually. It is recommended that tyres 10 years or older should be fitted only on Drive or Tag/Trailer axles.

Operators are strongly encouraged to be aware not only of their tyres' visual condition and inflation pressure but also of any change in dynamic performance such as increased air loss, noise or vibration, which could be an indication that the tyres need to be removed from service.

The date when a tyre was manufactured is located on the sidewall of each tyre. Operators should locate the code on the tyre which begins with the letters DOT and ends with the week and year of manufacture. For example a DOT code ending in "2204" indicates a tyre made in the 22nd week (May) of 2004.



Failure to follow these recommendations may lead to a reduction in the performance of your vehicle and cause it to respond abnormally and/or a tyre malfunction could pose a safety risk to drivers and others.

Michelin shall not be responsible under any circumstances for damage that occurs as a result of and/or during use that does not comply with its guidelines.

TYRE CONDITION

The information regarding tyre condition and remaining tread pattern depth is contained within the Construction and Use Regulations, Regulation 27G, Part 2.

If the minimum wear limit has been reached, the tyres must be removed and replaced.

A tyre industry professional should be consulted if abnormal wear is observed or if there is a difference in wear rates or patterns between tyres on the same axle.

TYRE REPAIRS

It is dangerous to ignore a damaged tyre.

MICHELIN truck tyres can be repaired under certain conditions; this possibility is planned in at the design stage.
However, not all kinds of damage can be repaired.

Repairing a tyre is a job for trained and qualified professionals. The tyre repairer always has sole responsibility for the accuracy and quality of the work done on the tyre.

Further advice on tyre repair can be found in British Standard BS AU 159.

Repair must always be preceded by removal of the tyre and a thorough inspection both internal and external, by the professional.

If any damage is found which cannot be repaired, such as over flexing of the reinforcing structure owing to deflated or severely under inflated running, the tyre must not be repaired.





REGROOVING

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PRINCIPLES AND PERFORMANCE GAINS

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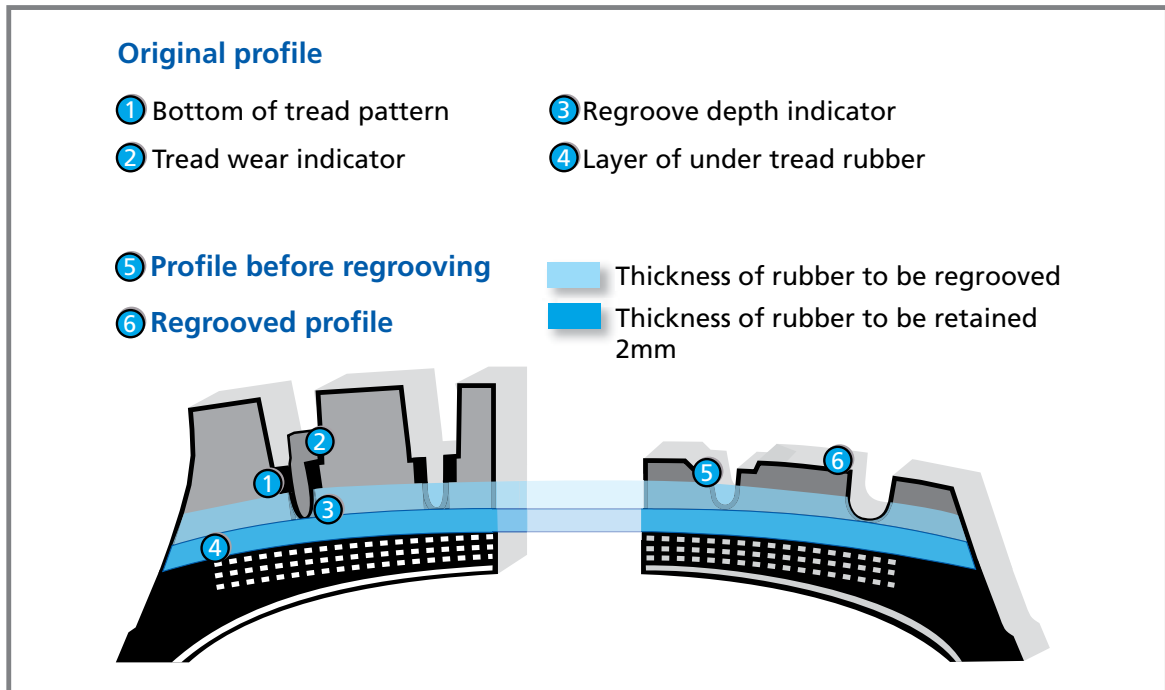
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TYRE PATTERN AND REGROOVING INFORMATION

PRINCIPLES AND PERFORMANCE GAINS

Regrooving entails removing rubber from the layer of existing rubber to restore tread pattern depth. The technique is recommended by ETRTO^{**}. Right from the design stage, Michelin provides a sufficient thickness of rubber to allow quality regrooving without adversely affecting the tyre's strength or robustness.




WHY REGROOVE?

■ Advantages of regrooving:

- Mileage potential increased by up to 25%
- saves up to 2 litres of fuel every 100 km
- significantly and safely extends the tyre's traction potential
- reduces your impact on the environment

^{**} European Tyre and Rim Technical Organisation.

LONGER LIFE

By raising up the tyre's tread pattern again, regrooving extends the mileage potential of the tyre by up to 25 % – for both new and retreaded MICHELIN tyres **MICHELIN**  **Remix**



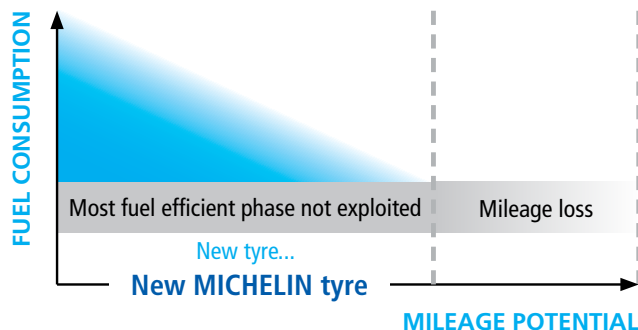
MORE FUEL SAVINGS

■ Save up to 2 litres every 100 km*

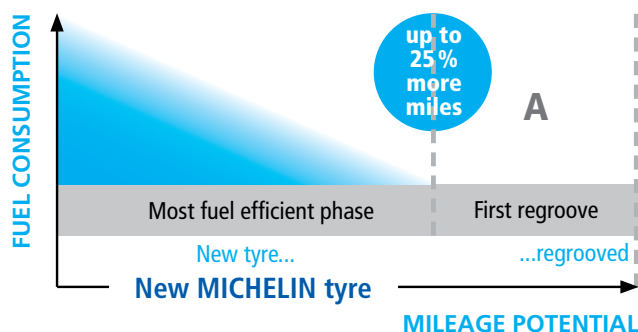
Regrooving is carried out when the tyre has its lowest rolling resistance. Regrooving enables the use of the tyre for longer in its most fuel efficient condition.

The potential 25% extra mileage provided by regrooving is obtained in period A (indicated below with user 2) when fuel consumption is at its lowest.

User 1: without regrooving



User 2: with regrooving



* 1.94 litre/100 km independently witnessed and certified in June 2007 on a unit equipped with regrooved MICHELIN ENERGY™ tyres and a unit equipped with non-regrooved MICHELIN ENERGY™ tyres.

IMPROVED TRACTION

■ Better road grip to help improve the safety of your vehicle

Regrooving creates a deeper tyre tread pattern depth, which improves your road grip and safety.

On wet roads, regrooved tyres offer improved transversal grip and approximately 10% higher traction than similarly worn tyres that have not been regrooved*.

REDUCES YOUR IMPACT ON THE ENVIRONMENT



Lower CO₂
emissions



Less waste



Fewer materials

■ By reducing your fuel consumption and extending mileage potential, regrooving is good for the environment.

Regrooving extends the life of your tyres when they are using the least amount of fuel. This helps reduce your CO₂ emissions by up to 1.1kg/100 km per axle*.

■ By extending the life of new and retreaded MICHELIN ↻ Remix Michelin tyres by up to 25%, you could save one tread for every four tyres you regroove.

Regrooving does not affect MICHELIN ↻ Remix retreading; carried out in accordance with our recommendations it has no adverse effect on the product regarding the strength of the crown block or casing.

The acceptance rate for MICHELIN ↻ Remix retreading is similar for regrooved or non-regrooved Michelin tyres: 90 %**

* Internal Michelin source: test conducted on polished concrete.

** Michelin study conducted on 1 million tyres provided for Michelin Remix retreading in 2008 and 2009. The difference in the approval rate between retreaded regrooved tyres and retreaded non-regrooved tyres is below 0.2 %.

REGROOVING: IN PRACTICE

It is the operators responsibility to ensure that regrooving is carried out in accordance with the tyre manufacturers' recommendations (pattern, depth, blade, etc.).

■ Regrooving when there is 2 to 4 mm of tread left makes it possible to:

- Reproduce the tread pattern.
- Adjust the depth of regrooving to ensure that there is always a 2 mm depth of undertread rubber when the tyre no longer has a regroove depth indicator showing.

■ Regrooving that is too deep

- Can cause damage to the tyre resulting in premature removal from service and compromising retreading; exposing the plies beneath the tread is prohibited in UK legislation.



■ Do not regroove if

- The tread pattern shows signs of significant accidental damage: perforations, scratches, cuts, tearing, etc. In this condition there is a risk of oxidisation of the metallic reinforcing plies: damage of this nature could lead to rapid deterioration of the tyre whilst in service, possibly leading to rapid deflation.

USING REGROOVED TYRES

To minimise vehicle down time, due to the action of regrooving, we advise that you have a stock of built up regrooved tyres.

Regrooving can optimise workshop time management.

DEFINITION OF TERMS

Legislation specifying a minimum requirement for the tread depth of tyres first came into force in Great Britain in April 1968. Since that time, the practice of re-cutting truck tyres has become increasingly popular, first, in order to restore a reasonable tread pattern as the original pattern becomes worn and second to increase overall tyre life. In this book, and in all Michelin literature, the term 'Regrooving' is used when referring to this process.

The regrooving process is where the original tread depth is increased by cutting into the base rubber between the lowest point of the original grooves and the bracing plies of the casing, usually following the original grooves. This is the process that is used to extend the life of your tyres. The term REGROOVING is used to refer to this process.

To suit regulations in some other countries, certain (but not all) of these tyres may be marked 'Regroovable'.

Descriptions of the methods of applying this process to Michelin truck tyres are given in the following pages.

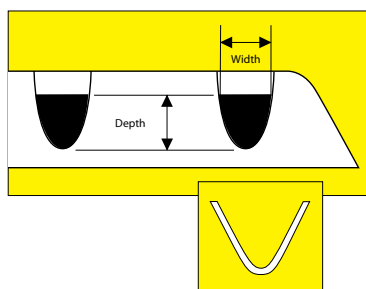
NOTES

The fitment of regrooved first life tyres is advised for steer axles. Fitment of Remix® and regrooved Remix® tyres, as in the case of any remould, should be for rear or trailer axles.

TECHNICAL REQUIREMENTS

1. Regrooving should only be carried out in a well-ventilated place with a tool which has an electrically heated blade and conforms to current British Standard regulations.

2. The width and depth of the regrooving is given for each tyre size and type of tread pattern. We suggest that a rounded blade be used. It should be noted that because of the rounded profile of the blade the regroove width will reduce slightly as the tyre wears further after regroove.



3. Before regrooving, the tyre should be examined to ensure that it is in good condition. Any damage or unsatisfactory repair should be repaired correctly. If the tread shows evidence of hacking, multiple cuts or tearing of the tread blocks, then regrooving is not recommended.

4. Tread depths should be taken at several places around the tyre. The depth of cut on the regrooving blade must be related to the minimum tread depth found.

5. On no account must a tyre be regrooved when there is any tread area which is devoid of the original tread patterns (i.e., major grooves).

6. When regrooving Remix® tyres (i.e., those retreaded or rebuilt by Michelin) the regroove depth quoted for first tread tyres should be used (see note). No recommendation can be given for regrooving tyres remoulded by any other concern as the amount of base rubber remaining is not known and extreme care must be taken to avoid damage to the tyre casing in such circumstances.

7. Where a tyre has worn abnormally it is technically acceptable to regroove that part of the worn tread provided sufficient of the original pattern is visible prior to regrooving.

NOTES

a) Remix® tyres are to be regrooved in the same pattern as the corresponding first life regrooved pattern unless otherwise stated.

b) All regrooving widths given are approximate.

c) In cases where severe lateral scrubbing is encountered, particularly on multi-axle operation, it may be found that accidental damage to the tread rubber could be aggravated by regrooving.

d) To regroove any Michelin tyre not shown in this booklet please contact Michelin Technical Division on - Tel: 0845 3661535.

LEGAL REQUIREMENTS

The Motor Vehicles (Construction and Use) Regulation define a re-cut (regrooved) pneumatic tyre in the following terms.

"A pneumatic tyre in which all or part of its original tread pattern has been cut deeper or burnt deeper or a different tread pattern has been cut deeper or burnt deeper than the original tread pattern."

Broadly speaking, most trucks and PSV's over 2.5 tons unladen weight, all electrically propelled goods vehicles and all but the smallest trailers, can be fitted with regrooved tyres, provided that the tyres themselves are suitable for regrooving.

However, the law forbids the use of regrooved tyres on the following:

1. Passenger cars and dual-purpose 4x4 vehicles (e.g., Land Rovers).
2. Goods vehicles of less than 2540kg (approx 2.5 ton) unladen weight, or less than 3050kg (approx 3 ton) if their wheel diameter is less than 405mm (16 inches).
3. Passenger vehicles of less than 2540kg (approx 2.5 ton) unladen weight, or less than 3050kg (approx 3 ton) if designed to carry no more than 7 passengers, excluding the driver.

4. Trailers classed as 'living vans' not more than 2040kg (approx 2 ton) unladen weight.

5. Trailers not equipped to carry any load except for plant, or fixed equipment (e.g., air compressor trailers) whose laden weight is less than 2290kg (approx 2.25 ton).

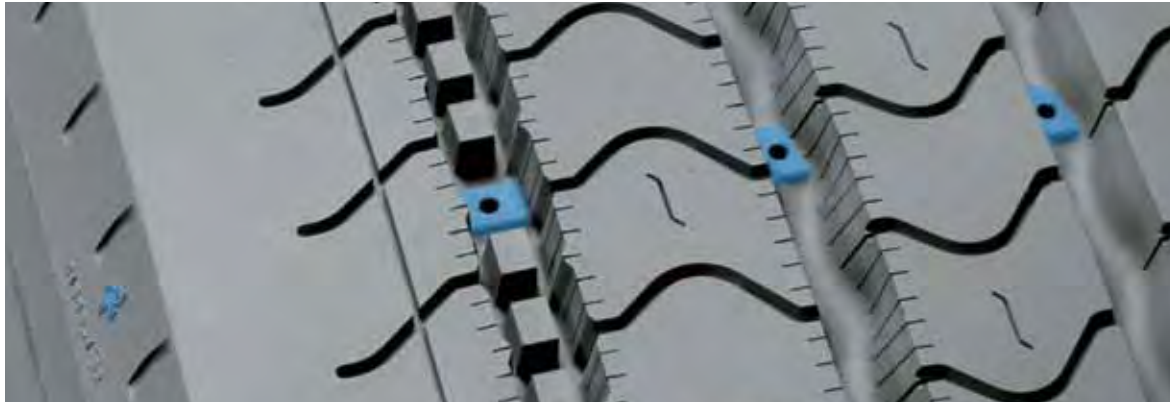
6. Any other trailers of less than 1020kg (approx 1 ton) unladen weight.

7. Vehicles classed as 'Motor Tractors' (i.e., designed to pull, but not carry their load) of less than 2540kg (approx 2.5 ton) unladen weight, unless their wheel diameter is at least 405mm (16 inches).

IMPORTANT

The law specifically demands regrooving to be carried out properly without damaging or exposing any part of the ply or cord structure of the tyre. It must be carried out in accordance with tyre manufacturers' recommendations and to the tyre manufacturers' regroove pattern.

REGROOVING DIMENSIONS

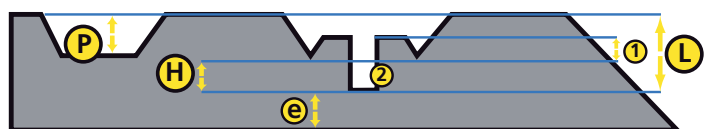


The regrooving dimensions that we indicate are theoretical values covering most cases. We recommend measuring the tread band in the most worn zone to assess the thickness of rubber remaining above the crown plies. On recent tread patterns, a depth-indicator located in the tread wear indicator enables the blade to be set at the optimum height.

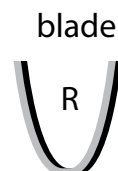


The depth of the blade can also be adjusted using a special gauge.

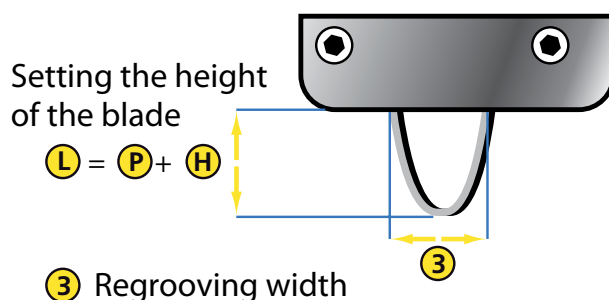
CROSS-SECTION OF A TYRE



- P** Depth remaining before regroove
- H** Theoretical height of regrooving
- L** Blade setting: $L = P + H$
We recommend that you measure L with a depth gauge
- e** Thickness of rubber to be kept after regrooving: 2mm
- 1** Height of the wear indicator
- 2** Recess indicating the regrooving depth



REGROOVING BLADE



MAIN EUROPEAN REGULATIONS ON REGROOVING

| Country | Restrictions on mounting regrooved tyres | Shrinkage of truck tyre units depending on wear (excluding winter uses) | |
|--|--|---|--|
| | | Minimum depth | Observations |
|  GERMANY | Prohibited on front axles of coaches reaching speeds of 100 kph | 1.6 mm | |
|  AUSTRIA | Prohibited on all front axles of all trucks | 2 mm | |
|  BELGIUM | None | 1.6 mm | |
|  BULGARIA | Prohibited on all front axles of all trucks | 1.6 mm | |
|  CROATIA | None | 1.6 mm | |
|  DENMARK | None | 1 mm | |
|  SPAIN | None | none | |
|  ESTONIA | None | 1.6 mm | |
|  FINLAND | None | 1.6 mm | |
|  FRANCE | None | 1 mm | |
|  GREECE | None | 2 mm | |
|  HUNGARY | Prohibited on front axles of coaches | 1.6 mm for tyres with a diameter ≤ 750 mm 3 mm for tyres with a diameter > 750 mm | |
|  ITALY | None | 1.6 mm | |
|  LATVIA | None | 1.6 mm | |
|  LITHUANIA | None | 2 mm for coaches and buses carrying more than 8 passengers | |
|  LUXEMBOURG | None | 1 mm for towed vehicles 1.6 mm for motor vehicles | |
|  NORWAY | None | 1.6 mm | |
|  NETHERLANDS | None | none | |
|  POLAND | Prohibited on single axles on coaches reaching speeds of 100 km/hr | 3 mm for coaches reaching speeds of 100 kph 1.6 mm for other vehicles | |
|  PORTUGAL | None | 1 mm | |
|  ROMANIA | None | 1.6 mm | |
|  RUSSIA | Prohibited on all front axles of all trucks | 2 mm for coaches and buses 1 mm for other trucks | |
|  SERBIA | None | 2 mm | |
|  SLOVAKIA | None | 1.6 mm | |
|  SLOVENIA | None | 1.6 mm | |
|  SWEDEN | None | 1.6 mm | Outer tyres in dual configuration. No min. depth unless in winter. |
|  SWITZERLAND | None | 1.6 mm | |
|  CZECH REPUBLIC | Prohibited on front axles of coaches and buses | 1.6 mm | |
|  TURKEY | None | 1.6 mm | |
|  UNITED KINGDOM | None | 1 mm | |
|  UKRAINE | Prohibited on all front axles of all trucks | 2 mm for coaches and buses 1 mm for other trucks | |

Provided for informational purposes only, may be subject to changes in local regulations.

TYRE PATTERN AND REGROOVING INFORMATION

The UK Road Vehicle (Constructions and use) Regulations 1986 permit the use of regrooved tyres on trucks, buses and coaches.

For guidelines as to their use, please see section "Legal Requirements" found on page 19.

Regrooveable tyres bear the symbol "U" on the sidewall or are marked "REGROOVABLE".

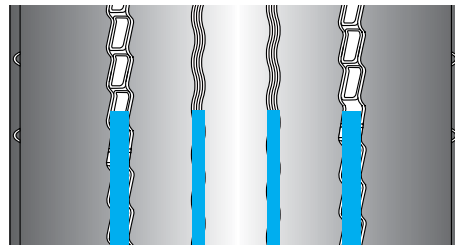


Only regroove the zones indicated in blue on the diagrams shown overleaf.



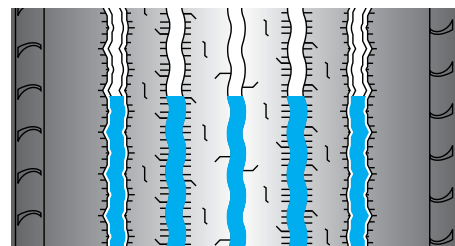
Long distance, high average speed,
international journeys, constant speed.

X[®] LINE[™] ENERGY[™] Z



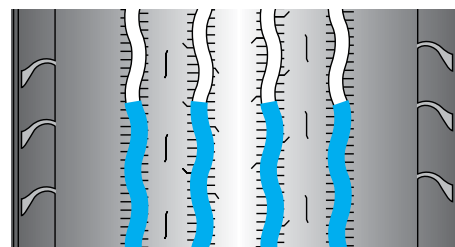
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|---------------------------|------------------------------|-----------------|
| 315/70 R 22.5 = 4 grooves | | |
| H = 3 mm | 6 to 8 mm | R3 |
| 315/80 R 22.5 = 4 grooves | | |
| H = 3 mm | 8 to 10 mm | R3 |

X[®] ENERGY[™] SAVERGREEN XF AND XZ



| Regrooving depth* | Approximate regrooving width | Suggested blade |
|---------------------------|------------------------------|-----------------|
| 315/70 R 22.5 = 5 grooves | | |
| H = 3 mm | 6 to 8 mm | R3 |
| 315/80 R 22.5 = 4 grooves | | |
| H = 3 mm | 8 to 10 mm | R3 |

X[®] ENERGY[™] XF



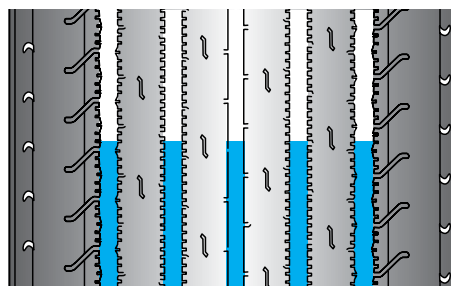
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-----------------------|------------------------------|-----------------|
| 60 series = 5 grooves | | |
| H = 3 mm | 6 to 8 mm | R3 |

*The depth of the regroove should always be checked before regrooving, see details on page 20



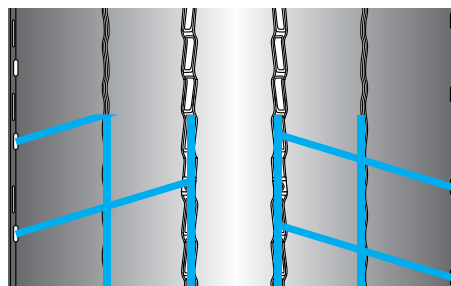
Long distance, high average speed,
international journeys, constant speed.

XFA2 ENERGY™ ANTISPLASH



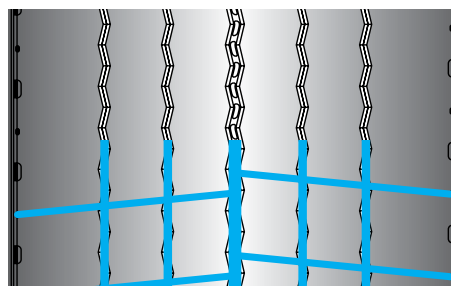
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| H = 3 mm | 8 to 10 mm | R3 |

X® LINE™ ENERGY™ D



| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| 315/70 R 22.5 | | |
| H = 3 mm | 7 to 8 mm | R3 |
| 315/80 R 22.5 | | |
| H = 3 mm | 7 to 8 mm | R3 |

X® ENERGY™ SAVERGREEN XD



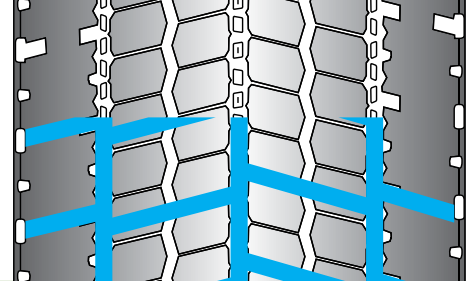
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| H = 3 mm | 7 to 8 mm | R3 |

*The depth of the regroove should always be checked before regrooving, see details on page 20



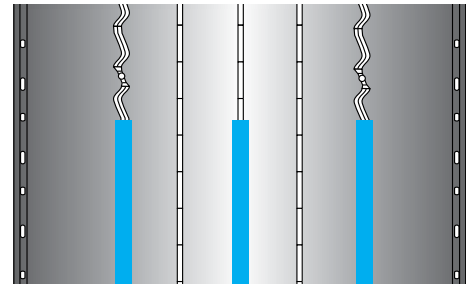
Long distance, high average speed,
international journeys, constant speed.

XDA2 + ENERGY™



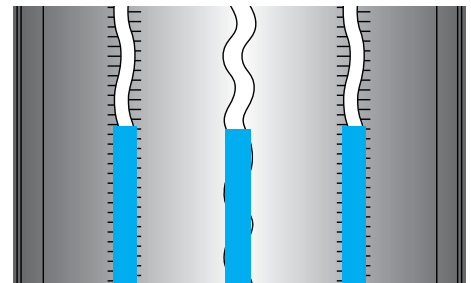
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| 70 and 80 series | | |
| H = 4 mm | 7 to 8 mm | R3 |
| 60 series | | |
| H = 3 mm | 7 to 8 mm | R3 |

X® Line™ ENERGY™ T



| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| 385/55 R 22.5 | | |
| H = 3 mm | 8 to 10 mm | R3 |

X® Line™ ENERGY™ T



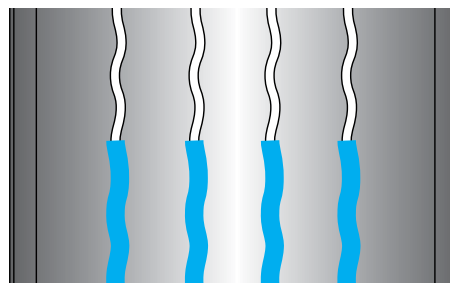
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| 17.5 and 19.5 | | |
| H = 3 mm | 6 to 8 mm | R3 |

*The depth of the regroove should always be checked before regrooving, see details on page 20



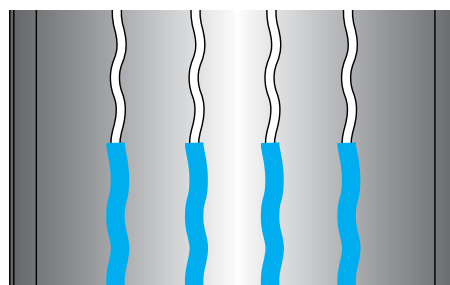
Long distance, high average speed,
international journeys, constant speed.

X[®] ENERGY[™] SAVERGREEN XT



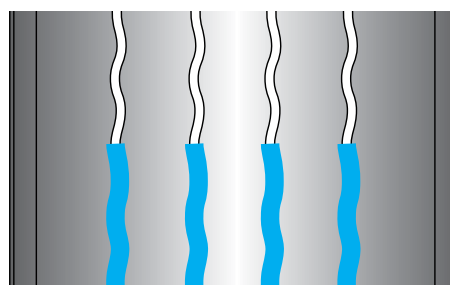
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| H = 3 mm | 8 to 10 mm | R3 |

XTA2 + ENERGY[™]



| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| 385/65 R 22.5 | | |
| H = 3 mm | 8 to 10 mm | R3 |

XTA2 ENERGY[™]



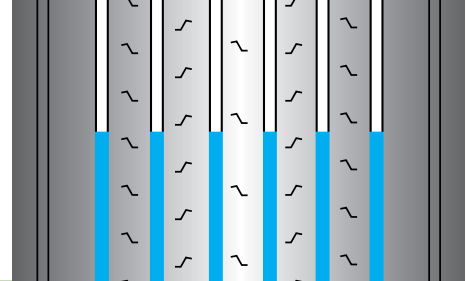
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| 385/55 R 22.5 | | |
| H = 3 mm | 9 to 10 mm | R4 |
| 275/70 R 22.5 | | |
| H = 3 mm | 6 to 8 mm | R3 |

*The depth of the regroove should always be checked before regrooving, see details on page 20



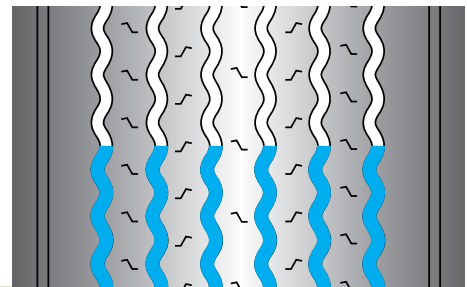
Long distance, high average speed,
international journeys, constant speed.

XTA2 + ENERGY™



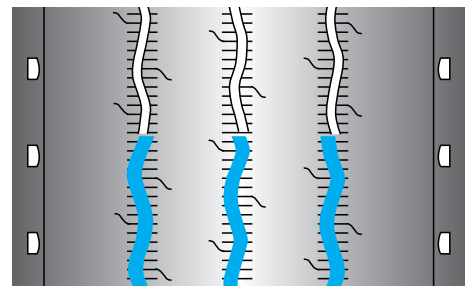
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| 445/45 R 19.5 | | |
| H = 3 mm | 8 to 10 mm | R3 |

XTA2 ENERGY™



| Regrooving depth* | Approximate regrooving width | Suggested blade |
|---------------------------------|------------------------------|-----------------|
| 425/55 R 19.5 and 445/45 R 19.5 | | |
| H = 3 mm | 8 to 10 mm | R3 |

XTA2 + ENERGY™ and XTA 2 ENERGY™



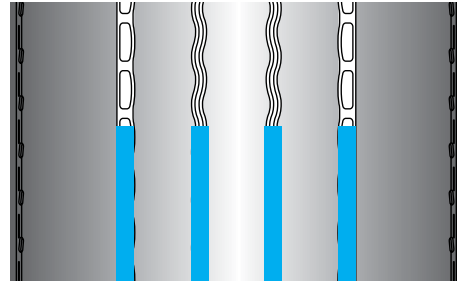
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|---|------------------------------|-----------------|
| seat 17.5 XTA2 + ENERGY™ and 245/70 R 19.5 XTA2 ENERGY™ = 3 grooves 265/70 R 19.5 and 285/70 R 19.5 XTA2 ENERGY™ = 4 grooves | | |
| H = 3 mm | 6 to 8 mm | R3 |

*The depth of the regroove should always be checked before regrooving, see details on page 20



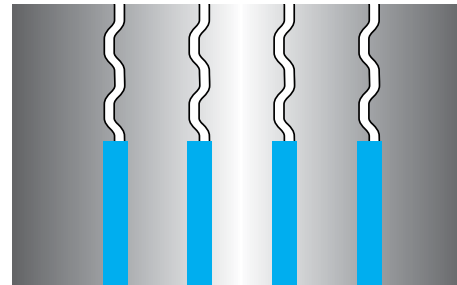
Intended for long and short distance
on all types of road.

X® MULTIWAY™ 3D XZE



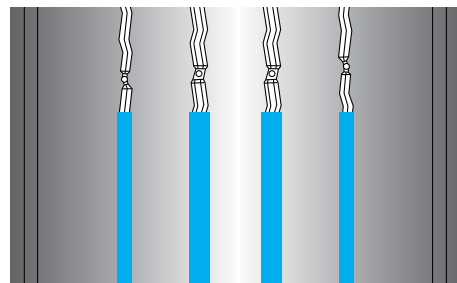
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| H = 3 mm | 8 to 10 mm | R3 |

X® MULTI™ F



| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| H = 3 mm | 8 to 10 mm | R3 |

X® MULTIWAY™ HD XZE



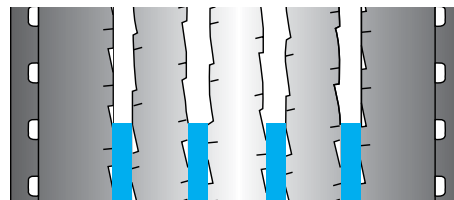
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| H = 3 mm | 8 to 10 mm | R3 |

*The depth of the regroove should always be checked before regrooving, see details on page 20



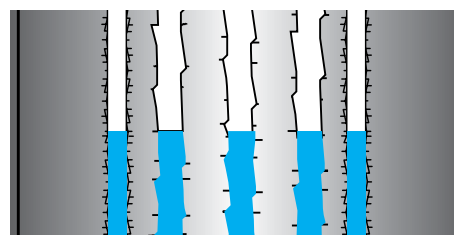
Intended for long and short distance
on all types of road.

XZE2 and XZE2 +



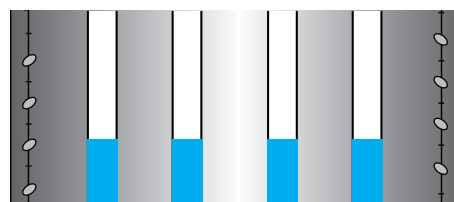
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|---------------------------------|------------------------------|-----------------|
| 245/70 - 265/70 - 305/70 R 19.5 | | |
| H = 3 mm | 7 to 8 mm | R3 |
| 285/70 R 19.5 | | |
| H = 3 mm | 8 to 10 mm | R3 |
| 11 R 22.5 | | |
| H = 3 mm | 7 to 8 mm | R4 |
| 12, 13 - 305/70 R 22.5 | | |
| H = 4 mm | 8 to 10 mm | R4 |
| 275/70 - 275/80 - 295/80 R 22.5 | | |
| H = 4 mm | 7 to 8 mm | R4 |
| 315/80 R 22.5 | | |
| H = 4 mm | 7 to 10 mm | R4 |

XF2 and XF2 ANTISPLASH



| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| H = 4 mm | 8 to 10 mm | R3 |

XZE2



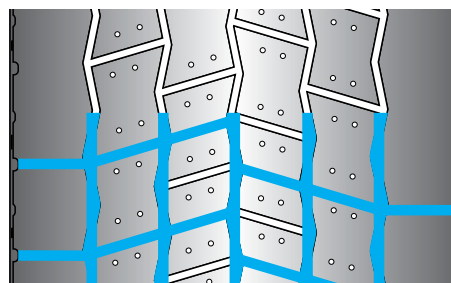
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| 17.5 | | |
| H = 3 mm | 6 to 8 mm | R3 |

*The depth of the regroove should always be checked before regrooving, see details on page 20



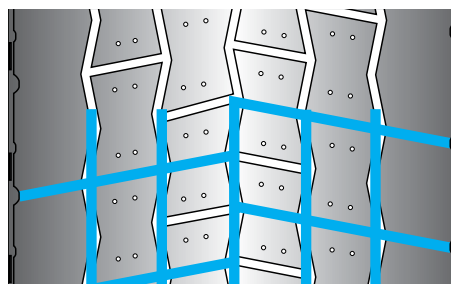
Intended for long and short distance
on all types of road.

X® MULTIWAY™ 3D XDE



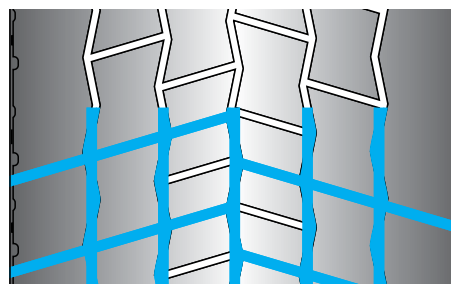
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| 315/70 R 22.5 | | |
| H = 3 mm | 6 to 8 mm | R3 |

X® MULTIWAY™ 3D XDE



| Regrooving depth* | Approximate regrooving width | Suggested blade |
|---------------------------------|------------------------------|-----------------|
| 295/80 R 22.5 and 315/80 R 22.5 | | |
| H = 3 mm | 8 to 10 mm | R3 |

X® MULTIWAY™ XD



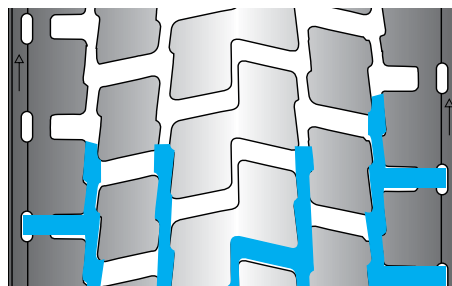
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| H = 3 mm | 6 to 8 mm | R3 |

*The depth of the regroove should always be checked before regrooving, see details on page 20



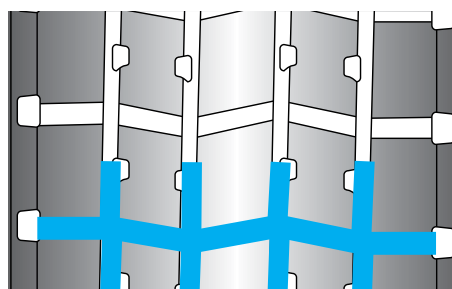
Intended for long and short distance
on all types of road.

XDE2 and XDE2 +



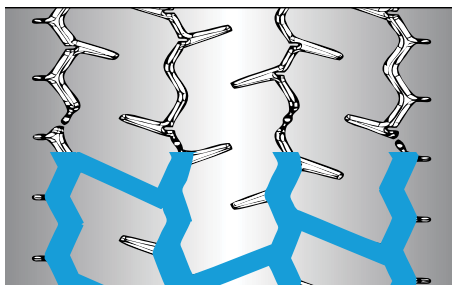
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|--|------------------------------|-----------------|
| 245/70 - 265/70 R 19.5 | | |
| H = 3 | 7 to 8 mm | R3 |
| 285/70 - 305/70 R 19.5 | | |
| H = 3 mm | 8 to 10 mm | R4 |
| 11- 275/70 - 305/70 - 295/80 - 315/80 - 13R 22.5 | | |
| H = 4 mm | 7 to 8 mm | R3 |
| 12 R 22.5 | | |
| H = 4 mm | 11 to 12 mm | R4 |

XDE2



| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| seat 17.5 | | |
| H = 3 mm | 7 to 8 mm | R3 |

X[®] MULTI D[™]



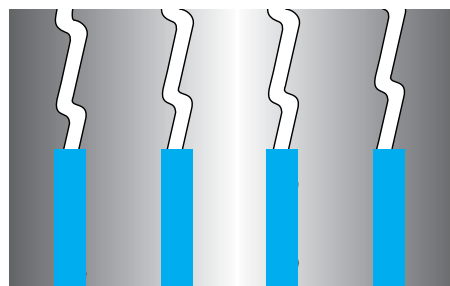
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|--|------------------------------|-----------------|
| 215/75 - 225/75 - 235/75 - 245/70 R 17.5 | | |
| H = 2 mm | 7 to 8 mm | R3 |

*The depth of the regroove should always be checked before regrooving, see details on page 20



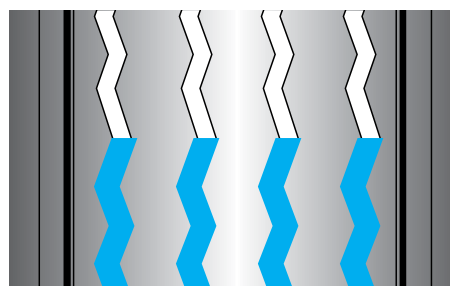
Intended for long and short distance
on all types of road.

X® MULTI T™



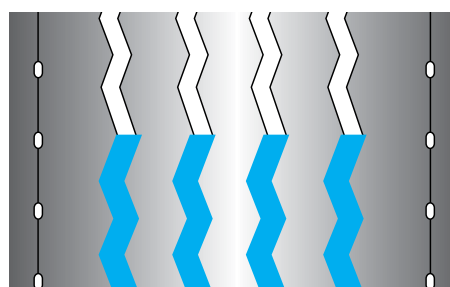
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| 385/55 R 22.5 | | |
| H = 3 mm | 8 to 10 mm | R3 |
| 385/65 R 22.5 | | |
| H = 3 mm | 8 to 10 mm | R3 |

XTE3



| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| H = 3 mm | 8 to 10 mm | R3 |

XTE2



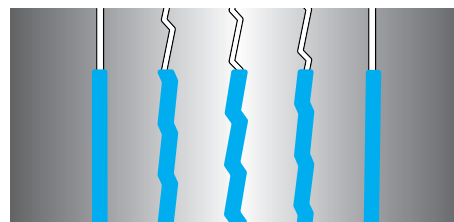
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|---------------------------|------------------------------|-----------------|
| 385/55 R 22.5 = 4 grooves | | |
| H = 3 mm | 8 to 10 mm | R3 |
| 425 and 445/65 R 22.5 | | |
| H = 4 mm | 8 to 10 mm | R3 |

*The depth of the regroove should always be checked before regrooving, see details on page 20



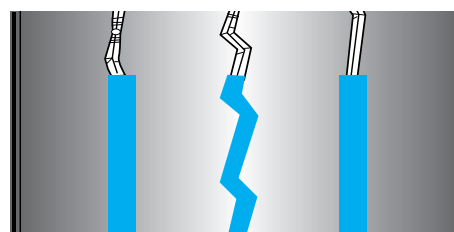
Intended for long and short distance
on all types of road.

X[®] One™ MaxiTrailer +



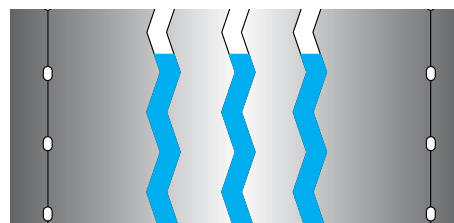
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| H = 3 mm | 8 to 10 mm | R3 |

X[®] MaxiTrailer



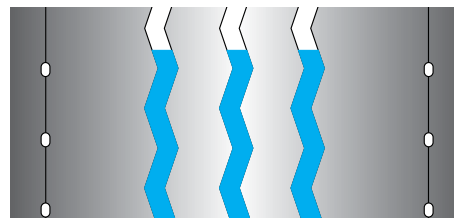
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|--------------------|------------------------------|-----------------|
| seat 17.5 and 19.5 | | |
| H = 3 mm | 6 to 8 mm | R3 |

X[®] SpecialTrailer and X[®] MULTI T™



| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| 245/70 R 17.5 | | |
| H = 3 mm | 6 to 8 mm | R3 |

XTE2 and XTE2 +



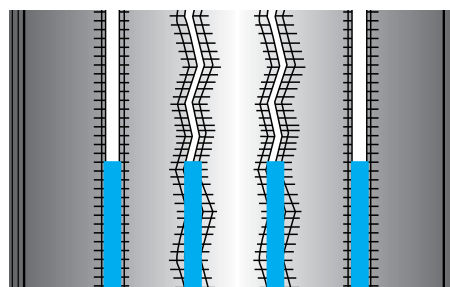
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|---|------------------------------|-----------------|
| seat 17.5 XTE2 +, 245/70 R 19.5 XTE2 and 11 R 22.5 XTE2 = 3 grooves 265/70 R 19.5 and 285/70 R 19.5 XTE2 = 4 grooves | | |
| H = 3 mm | 6 to 8 mm | R3 |

*The depth of the regroove should always be checked before regrooving, see details on page 20



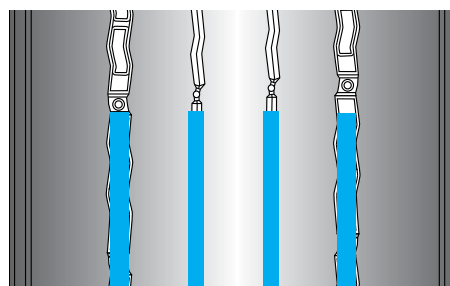
Intended for long and short distance
on all types of road.

X® COACH™ XZ



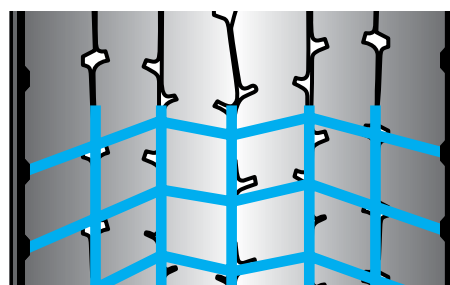
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| H = 3 mm | 8 to 10 mm | R4 |

X® COACH™ HL Z



| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| H = 3 mm | 8 to 10 mm | R3 |

X® COACH™ XD



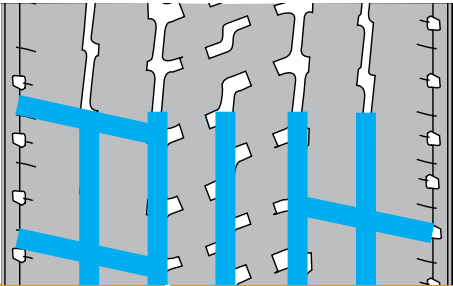
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| H = 3 mm | 6 to 8 mm | R3 |

*The depth of the regroove should always be checked before regrooving, see details on page 20



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

XDA4



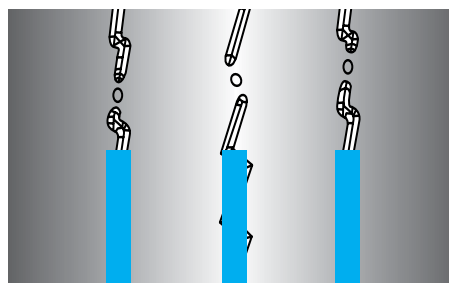
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| H = 4 mm | 7 to 8 mm | R3 |

*The depth of the regroove should always be checked before regrooving, see details on page 20



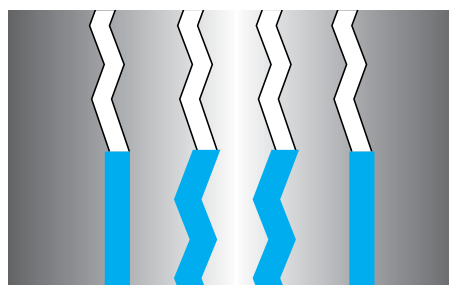
Intended for journeys in urban and suburban driving.

X[®] INCITY™ XZU



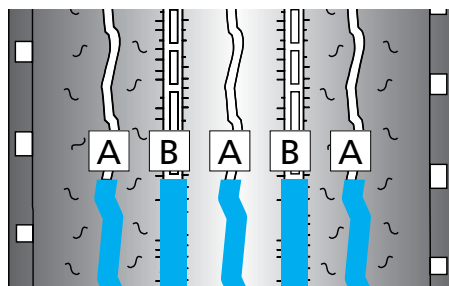
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| 275/70 R 22.5 | | |
| H = 4 mm | 8 to 10 mm | R3 or R4 |

X[®] INCITY™ XZU3



| Regrooving depth* | Approximate regrooving width | Suggested blade |
|---------------------------------|------------------------------|-----------------|
| 275/70 R 22.5 and 295/80 R 22.5 | | |
| H = 4 mm | 7 to 8 mm | R3 |

XZU +



| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|---------------------------------|-----------------|
| 275/70 R 22.5 | | |
| H = 4 mm | A = 7 to 8 mm B = 9 to 10 mm | R3 |

*The depth of the regroove should always be checked before regrooving, see details on page 20

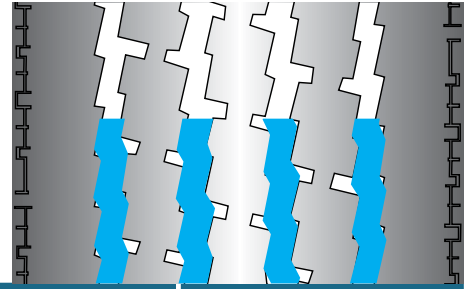
SPECIAL FOR WINTER



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

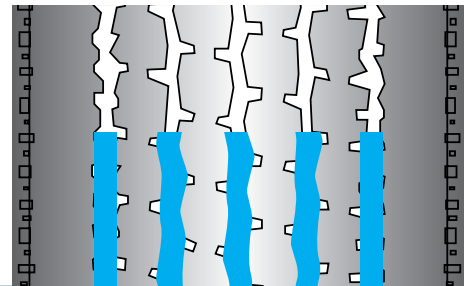
XFN2 +

| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| H = 3 mm | 6 to 8 mm | R3 |



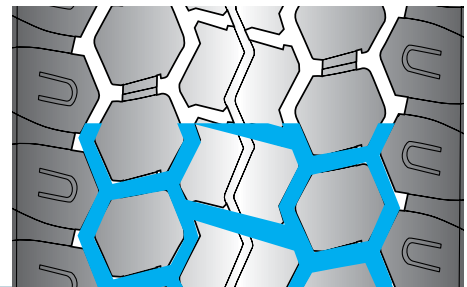
XFN2 ANTISPLASH

| Regrooving depth* | Approximate regrooving width | Suggested blade |
|---------------------------|------------------------------|-----------------|
| 315/70 R 22.5 = 4 grooves | | |
| H = 3 mm | 7 to 8 mm | R3 |
| 385/55 R 22.5 = 5 grooves | | |
| H = 3 mm | 8 to 10 mm | R3 |
| 385/65 R 22.5 = 5 grooves | | |
| H = 4 mm | 8 to 10 mm | R3 |



XJW4+

| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| 19.5 | | |
| H = 3 mm | 6 to 7 mm | R3 |
| 22.5 | | |
| H = 4 mm | 6 to 8 mm | R3 |



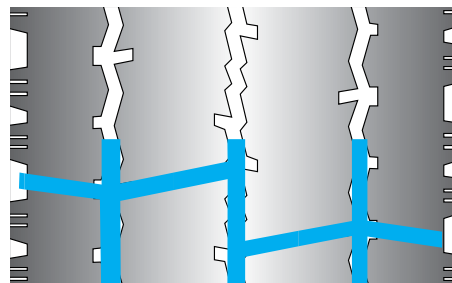
*The depth of the regroove should always be checked before regrooving, see details on page 20

SPECIAL FOR WINTER



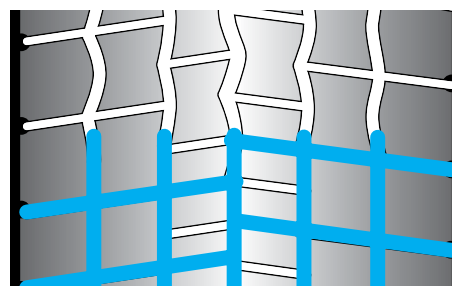
Intended for long and short distance
on all types of road.

XDW ICE GRIP



| Regrooving depth* | Approximate regrooving width | Suggested blade |
|---|------------------------------|-----------------|
| seat 19.5, 11 R 22.5, 275/70 R 22.5 and 315/70 R 22.5 | | |
| H = 3 mm | 6 to 8 mm | R3 |
| 295/80 R 22.5 and 315/80 R 22.5 | | |
| H = 4 mm | 6 to 8 mm | R3 |

XDN2 GRIP



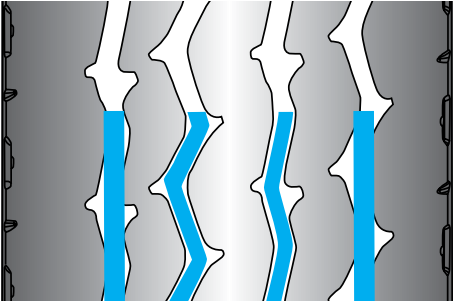
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| H = 3 mm | 6 to 8 mm | R3 |

*The depth of the regroove should always be checked before regrooving, see details on page 20



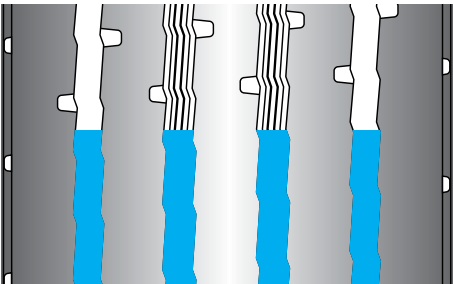
On roads, in and around worksites
and quarries.

X® WORKS™ XZY



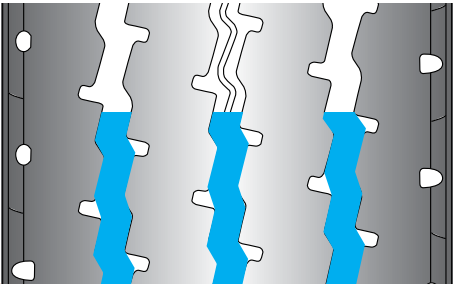
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| 315/80 R 22.5 | | |
| H = 4 mm | 8 to 10 mm | R3 |

XZY2



| Regrooving depth* | Approximate regrooving width | Suggested blade |
|---------------------------------|------------------------------|-----------------|
| 295/80 R 22.5 and 315/80 R 22.5 | | |
| H = 4 mm | 8 to 10 mm | R3 or R4 |

XZY2



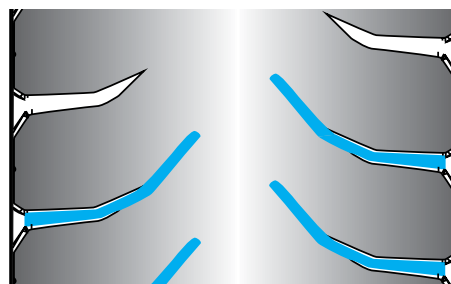
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------------|------------------------------|-----------------|
| 11 R 22.5 and 12 R 22.5 | | |
| H = 4 mm | 8 to 10 mm | R4 |
| 13 R 22.5 | | |
| H = 4 mm | 8 to 10 mm | R3 |

*The depth of the regroove should always be checked before regrooving, see details on page 20



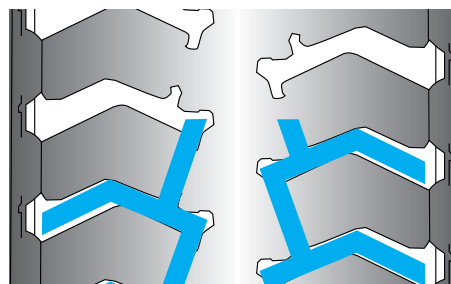
On roads, in and around worksites
and quarries.

X® WORKS™ XDY



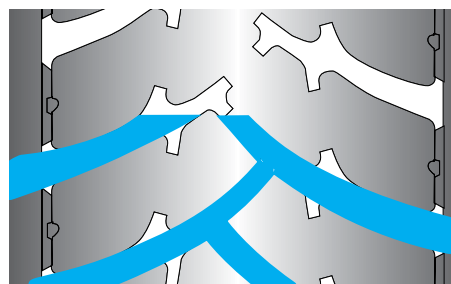
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| 315/80 R 22.5 | | |
| H = 4 mm | 6 to 8 mm | R3 |
| 13 R 22.5 | | |
| H = 3 mm | 6 to 8 mm | R3 |

XDY +



| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| H = 4 mm | 6 to 8 mm | R3 |

XDY3



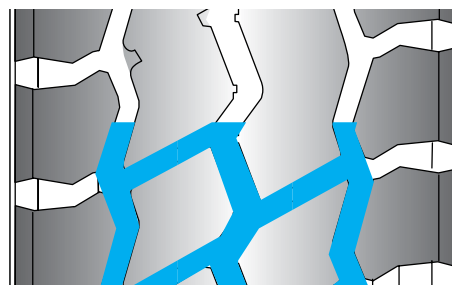
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| H = 4 mm | 6 to 8 mm | R3 |

*The depth of the regroove should always be checked before regrooving, see details on page 20



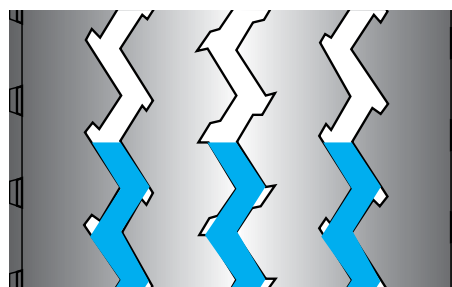
On roads, in and around worksites
and quarries.

XZY3



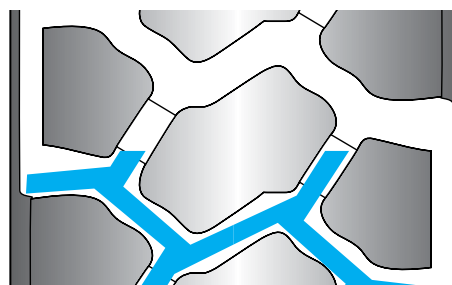
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| H = 4 mm | 10 to 12 mm | R4 |

XTY2



| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| seat 19.5 | | |
| H = 3 mm | 8 to 10 mm | R3 |
| seat 22.5 | | |
| H = 4 mm | 8 to 10 mm | R3 |

XZH2 R



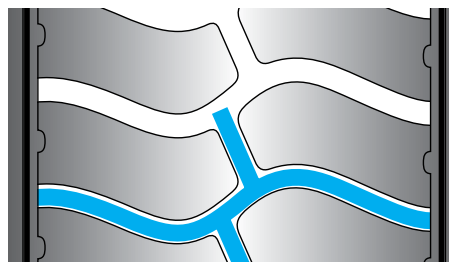
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| H = 4 mm | 12 to 14 mm | R4 |

*The depth of the regroove should always be checked before regrooving, see details on page 20



Specialised, civil or military vehicles
mostly driven on off-road surfaces.

XZL2



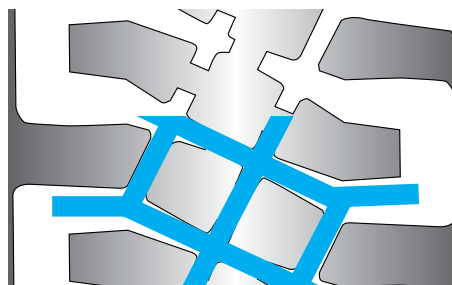
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| H = 3 mm | 8 to 10 mm | R3 |

XZL + and XZL



| Regrooving depth* | Approximate regrooving width | Suggested blade |
|--|------------------------------|-----------------|
| Note: some tyres with XZL treads are not regroovable | | |
| 1400 R 20 XZL + | | |
| H = 3 mm | 10 to 12 mm | R4 |
| 365/85 R 20, 365/80 R 20, 16.00 R 20 | | |
| H = 4 mm | 10 to 12 mm | R4 |
| 395/85 R 20 | | |
| H = 4 mm | 18 to 20 mm | R4 |

XML



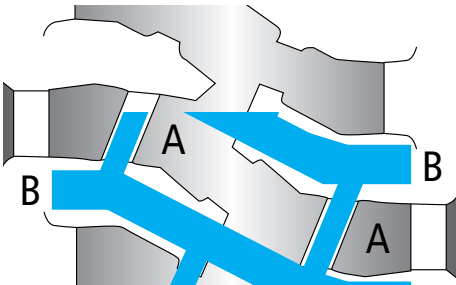
| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| 325/85 R 16 | | |
| H = 4 mm | 10 mm | R4 |

*The depth of the regroove should always be checked before regrooving, see details on page 20



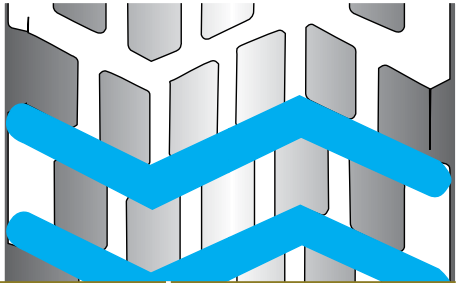
Specialised, civil or military vehicles
mostly driven on off-road surfaces.

XML



| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| 395/90 R 560 | | |
| H = 4 mm | A = 20 mm B = 10 to 12 mm | R4 |

XS



| Regrooving depth* | Approximate regrooving width | Suggested blade |
|-------------------|------------------------------|-----------------|
| 24 R 20.5 | | |
| H = 4 mm | 8 to 10 mm | R3 |

*The depth of the regroove should always be checked before regrooving, see details on page 20



OPERATING INSTRUCTIONS

48 INTRODUCTION TO HOW COMMERCIAL VEHICLE TYRES ARE USED

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INTRODUCTION TO HOW COMMERCIAL VEHICLE TYRES ARE USED

The choice of tyre must comply with local legislation and be in line with the tyre specification recommended by the vehicle manufacturer, the tyre manufacturer (size, load and speed ratings, construction etc.)

- **The tyre's conditions of use have to be taken into consideration to ensure that its performance meets the expectations of the vehicle operator.**
- **In the case of a modification to the original tyre specification,** it is advisable to make sure that the solution proposed complies with the current legislation, the technical constraints of the vehicle, the conditions of use and the manufacturer's recommendations (refer to the regulations in force in the country operations). In some countries, vehicles modified in this way need to obtain official authorisation.
- **Any second-hand or part-used tyre or one which has been involved in an accident** must be checked very carefully by a professional before being fitted in order to guarantee the user's safety and compliance with the regulations in force (see monitoring and maintenance, page 78).
- **Incorrect use or the wrong choice of tyre** may also contribute to premature demise of certain mechanical components.

CHOOSING THE MOST SUITABLE TYRE

To ensure optimum safety, reliability and business efficiency it's important to fit the correct tyre specification. This can be done by observing certain selection criteria.

STEP 1: DETERMINE THE CORRECT TYRE SIZE

- **The maximum permitted** axle load given by the vehicle manufacturer in relation to the regulations in force. Fitting this axle with tyres which can support a greater load does not mean that a load homologated by the vehicle manufacturer can be exceeded.
- For each tyre size there are one or more corresponding approved wheel rim sizes: consult the ETRTO "Standard Manual" and/or the vehicle manufacturer's recommendations.
- Fitting a tyre on a non-approved wheel rim can lead to damage to the wheel and/or the tyre, a footprint which is less than optimum and abnormal working of the casing which can be prejudicial to safety, handling, grip and tyre service life.

STEP 2: DEFINE THE CORRECT USE OF THE TYRE

The MICHELIN commercial vehicle tyre offer comprises of six tyre ranges designed and adapted to each business application and ready to help you optimise your operating costs.

To select the right tyre, we have to take into account the type of use and the benefits of each range.



Long distance, high average speed, international journeys, constant speed.



Specialised, civil or military vehicles mostly driven on off-road surfaces.



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



Intended for journeys in urban and suburban driving.



On roads, in and around worksites and quarries.



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

STEP 3: IDENTIFY THE RIGHT BENEFIT

MICHELIN tyres offer different benefits depending on the operators specific needs.

STEP 4 SELECT THE RIGHT TREAD PATTERN

There are rules which HAVE TO BE followed when selecting the tread patterns of your tyres.

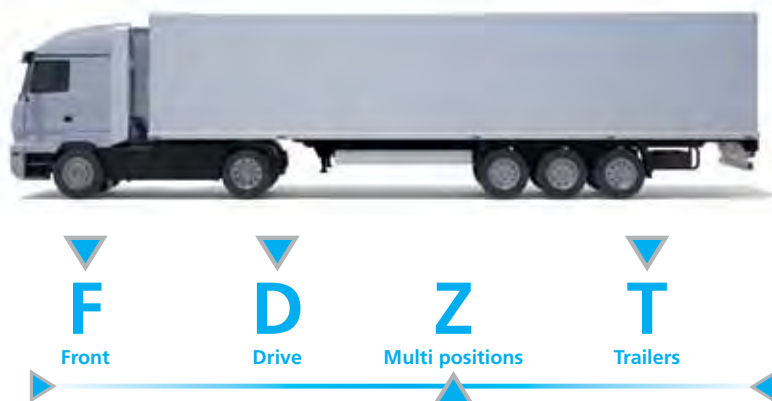


Diagram of tyre position code

Examples

X[®] MULTI™ F = **F** for Front
 X[®] LINE ENERGY™ D or
 X[®] COACH™ XD = **D** for Drive
 X[®] MULTI™ T = **T** for Trailer
 X[®] INCITY™ XZU = **Z** for Multi positions

■ For fitments on a steering axle we must:

Use "F" or "Z" tread patterns only. These tread patterns are designed and manufactured to cope with the specific stresses and strains imposed on the steering axles of motor vehicles: dynamic load, axle geometry, high mileage, etc. (See advice page 7).

■ When fitting tyres on a drive axle we must:

Use tyres with "D" or "Z" tread patterns exclusively. "D" tread patterns are designed to cope with the specific stresses of drive axles: transmission of engine and brake torque, twin fitment, the highest axle load of the whole vehicle combination. Tyres with a "Z" tread pattern can be fitted on drive axles, but the compromise likely in mileage performance needs to be considered carefully. "D" tread patterns offer optimised performance in the areas of traction and tyre longevity when compared to the "Z" tread patterns.

■ To equip a trailer axle we must:

Use tyres with "T" or "Z" tread patterns exclusively. These tread patterns are designed to cope with the specific stresses and strains of trailer axles: static and dynamic loads, scrubbing, high mileage on the centre axles, etc.

Tyres with "T" tread patterns bear load indices and speed ratings suited to trailers or semi-trailers. When fitting tyres with "Z" tread patterns check that the load and speed ratings comply with the needs of the axle.

Tyres with "T" tread patterns made by MICHELIN in Europe bear the "FRT" (Free Rolling Tyre) marking, standardised by the ETRTO so "T" tread patterns must never be used on front steer or drive axles.

The term FRT is defined in ECE Regulation 54 Revision 2 Corrigendum 1 dated 3 December 2004 (paragraph 3.1.15):

"The inscription "FRT" (Free Rolling Tyre) in case of tyres designed for the equipment of trailer axles and axles of motor vehicles other than front steering and drive axles."

All future MICHELIN Group documentation will reinforce this view.

MICHELIN does not recommend the fitment of any MICHELIN Group Trailer tyres (MICHELIN, Taurus, Kormoran, Riken) to the Front Steer axle and Drive axle positions.

Certain European countries have adopted the ETRTO definition within their national regulations and as such prohibit such use. Please see the local national regulations for more information.

This regulation is applicable to all new tyres which are used on European territory: this means that tyres marked FRT are only homologated for fitment to trailer axles and cannot be mounted on axles of other types. Michelin also apply the FRT marking to MICHELIN Remix tyres. Michelin shall not be held liable for the consequences of any damage or injury caused by the use of tyres contrary to their recommendations.

■ Associated risks if the four steps are not followed

| Tyre functions | | |
|--|---|--|
| Carry the load | Defined by the vehicle characteristics: axle load | |
| Ability to carry the load at maximum speed | Defined by the vehicle characteristics: maximum speed of vehicle | |
| Travel on different road surfaces | According to the conditions of use | |
| Steer the vehicle | According to the conditions of use By providing feedback to the driver about the conditions of use | |
| | Special feature of front axle: specially adapted tread pattern and uniformity | |
| Provide a comfortable ride | Special feature of front axle tyres: specially-designed tread and uniformity | |
| Transmit braking forces | Braking: related to the vehicle's braking system. The front axle is put under considerable strain during emergency braking. Braking with a retarder is carried out by the drive axle. | |
| | | |
| Long life for optimised business efficiency | In relation to mileage performance | |
| | In relation to the vehicle's fuel consumption | |

Associated risks of using inappropriate tyres

An under-sized tyre under load will overheat. This may lead to rapid deterioration of the tyre on the road which may even go so far as a sudden loss of inflation pressure. The tyre footprint will not be optimised, which can affect handling and grip: steering, traction and braking may be affected. Retreading may be compromised. Service life will be reduced.

An under-sized tyre travelling at speed will overheat. This may lead to rapid deterioration of the tyre on the road which can result in a sudden loss of inflation pressure. Retreading may be compromised. Service life will be reduced.

A tyre which is not suitable for the position or use may:

- overheat: as in the case of an urban tyre used on long motorway journeys.
- deteriorate: as with the tread of a long distance tyre which is used on unsurfaced roads.

In the latter case, a tyre showing deep-seated damage must be examined by a specialist to determine whether it can continue in use, can be repaired or needs to be withdrawn from service. Note that if the reinforcing plies are exposed they will deteriorate: a tyre with this kind of damage is considered unfit for use under the terms of the Construction and Use Regulations (1986). This damage may lead to rapid deterioration of the tyre on the road and can result in sudden total deflation. Retreading may be compromised. Service life will be reduced.

On the Steering axle, fitting a tyre which is not suitable for the position or use may result in less precise steering, depending on the state of the road surface and the speed. This may prejudice complete control of the vehicle.

The tyres on the Steering axle are the first ones in contact with the road surface ahead. Tyres designed for this axle must give a steady feedback of information on changes in the condition of the road surface, such as a fleeting reduction in grip, for example. A tyre not designed for this axle may be less progressive or filter out certain information on changes in the road surface.

The Steering axle is particularly sensitive to tyre uniformity: link with the steering wheel, position near the driver, etc. Tyres intended for this axle are specially designed to meet this criterion and also have tread patterns adapted to optimise this function. A tyre not designed for the Steering axle will have a poorer response to this function.

Under emergency braking, a major transfer of load is exerted on the Steering axle: the tyres on this axle therefore have a crucial role to play in the vehicle's stopping distance.

The braking performance of a tyre not designed for the Steering axle may not be as good when it is fitted in this position.

When braking with retarder systems, the tread and casing of Drive axle tyres are very much brought into play: an unsuitable tyre will be less effective in transmitting the torque and service life will also be reduced.

Vehicle acceleration is provided by the tyres on the Drive axle only: an unsuitable tyre will be less effective in transmitting torque and its service life will be reduced.

The tyres must be suited to the axle and the use of the vehicle: a tread pattern not suited to the axle or a range unsuitable for the use will not give the mileage performance corresponding to the tyre's potential.

The tyres on a commercial vehicle have a major impact on the vehicle's fuel consumption. The choice of range and tread pattern will have an effect on fuel consumption. For some uses, it is possible to optimise consumption by using tyres with low rolling resistance.

The rolling resistance of tyres reduces as the tyres become worn: replacing a tyre before it is completely worn* results in a loss of potential fuel savings.

*What is considered a completely worn tyre changes with local legislation. UK legislation must be adhered to in relation to completely worn tyres.

INTRODUCTION TO TYRE FITTING

Before commencing the tyre fitting process the conformity and compatibility of the tyre with the wheel and the vehicle must be established. Correct tyre fitting, carried out with the recommended methods of work and in line with the safety rules in force, helps to ensure that the tyre will be used to its full potential.

GENERAL PRECAUTIONS

Operators must always be equipped with their usual protective clothing (ear defenders, gloves, safety shoes, etc.)

- The operators must be correctly trained for the work they are carrying out.
- The vehicle must be stationary with its engine switched off and must be correctly stabilised (parking brake, chock, axle stands, etc.)

FITTING PRECAUTIONS

- Make sure that the wheel and its components are in good condition.
- Check the compatibility of tyre and wheel, tyre and vehicle and tyre and use.
- Respect the positions, fitting direction, direction of rotation and any relevant instructions when mentioned on the tyre sidewalls.
- After fitting the wheel on the vehicle, the wheel nuts must be tightened with a torque wrench to the torque setting defined by the vehicle manufacturer.
- We recommend fitting tyres on wheels with protected valves for vehicles equipped with disc brakes to prevent the risk of the valve being damaged by an object jammed between the brake and the wheel.

For more information contact a Michelin Technical Manager and refer to guidance provided by the Freight Transport Association on wheel security.

PRECAUTIONS FOR TYRE REMOVAL

■ When removing the wheel from the vehicle

If the tyre is part of a twin fitment or if the rim shows obvious damage, the tyres:

- Must be deflated by removing the valve core before the fitted unit is removed from the vehicle.
- Comply with the vehicle manufacturer's recommendations and instructions.

■ Removing the tyre with the wheel still fitted to the vehicle

Michelin does not recommend this practice which should only be used if it is not possible to remove the wheel. In this case, deflate the tyre completely by removing the valve mechanism.



Incorrect tyre and wheel fitting may lead to damage to tyres and vehicles and injury to persons (serious or even fatal injury).

It is therefore imperative that these operations are carried out by trained personnel using the appropriate equipment. In the case of an operation performed by an apprentice, he must never be allowed to work on his own.

In all cases, reference must be made to the technical instructions of the tyre manufacturer and/or vehicle manufacturer.

THE CORRECT WAY TO FIT AND INFLATE TYRES

Failure to follow precautions and safety instructions can pose a risk of serious accident or even death.

IMPORTANT INSTRUCTIONS FOR SAFE INFLATION

ADVICE BEFORE INFLATION

- 1** Weigh your vehicle and its load, axle by axle, to determine tyre pressure.
- 2** Measure the pressure when cold (when the vehicle has been stationary for several hours): pressures must be checked at regular intervals and during each service.
- 3** **Important safety instruction:** pressure increases when the vehicle is in motion, never reduce the pressure of a hot tyre.
- 4** **Pressure gauges:** must be accurate, handled with care and calibrated regularly, like all measurement devices.

For a certain load and work, and in well-defined conditions, there is only one correct pressure.

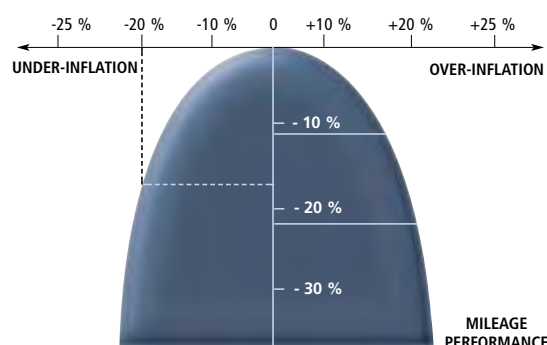
Over-inflation reduces:

- comfort,
- grip,
- tyre lifespan, particularly on drive axle tyres.

Under-inflation leads to:

- impact on vehicle handling and safety,
- a reduction in casing endurance, which limits the possibility of retreading,
- an increase of rolling resistance and consequently of fuel consumption.

Impact of tyre pressure



A tyre under-inflated by 20% leads to a mileage performance loss of approximately 18%.



CAUTION:

Driving with insufficient pressure can damage your tyres. After having driven with an under-inflated tyre, do not re-inflate: before having it fully checked over by an expert.

BE AWARE OF THE RISKS OF OVER- AND UNDER-INFLATION!

FITTING ON RIMS

- **Make sure that the inside of the tyre is clean, dry and free of foreign matter. For a tyre which has already been used on the road, check carefully that the inside of the tyre does not show any signs of having run under-inflated (mottling, dislocations).**

- **Always check that the rims are suitable, clean and in good condition.**

For rims with loose flanges or with several detachable components:

- Tubeless: fit the tyre with a new valve seal
- Tube Type: fit the tyre with a new inner tube and flap.

For Drop Center rims:

- Fit a new valve seal.

- **Make sure that the tyre is centred on the rim during the inflation operation.**

- **Inflate the tyre safely to the manufacturer's suggested operating pressure.**

Above all, make sure that all of the components are correctly in place. Never stand facing a fitted tyre. Stand in line with the tread, at least 3 metres away. Always use an inflation cage where possible.

- **All of these precautions must be used for both new tyres and tyres that have already been used on the road.**

INFLATION PRESSURE

- Tyres for commercial vehicles should be inflated to a pressure relevant to the load, speed and condition of use.
- Using the correct pressure is essential to the safe running of the tyre.
- Underinflation could result in the tyres running at abnormally high temperatures leading to thermal degradation of the tyres' components.
- This degradation is irreversible and can result in a rapid deflation of the tyre.
- The consequences of running underinflated are not necessarily immediately evident and may appear later after the underinflation has been corrected.
- Tyre pressures must be checked on cold tyres at least every two weeks or when the vehicle is serviced, using a calibrated pressure gauge.
- The spare tyre should also be checked.
- Never "bleed" a tyre when hot.
- The valve cap is the primary air seal and must always be fitted.
(Note: The valve core acts as a one way valve to allow the tyre to be inflated; it should not be treated as a seal).

FITTING AND REMOVAL OF MICHELIN TYRES

This must be carried out by trained competent personnel using the correct equipment. Incorrect fitting can result in damage to the tyre (may not be visible at the time of fitting), tube or wheel.

The inflation must be carried out in 2 stages :

- 1st stage:**
- pre-inflate to 1.5 bar, 22psi,
 - general inspection of the tyre.

The presence of blisters or deformations will necessitate the de-mounting of the tyre to be examined by a tyre specialist.

- 2nd stage:**
- inflate the tyre to the required pressure,
 - during inflation, the tyre must be placed vertically in an inflation cage, or a suitable secure area.

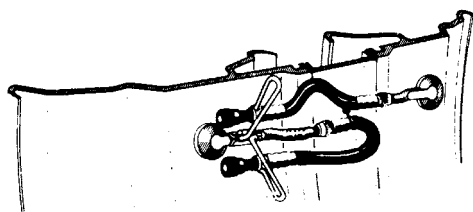
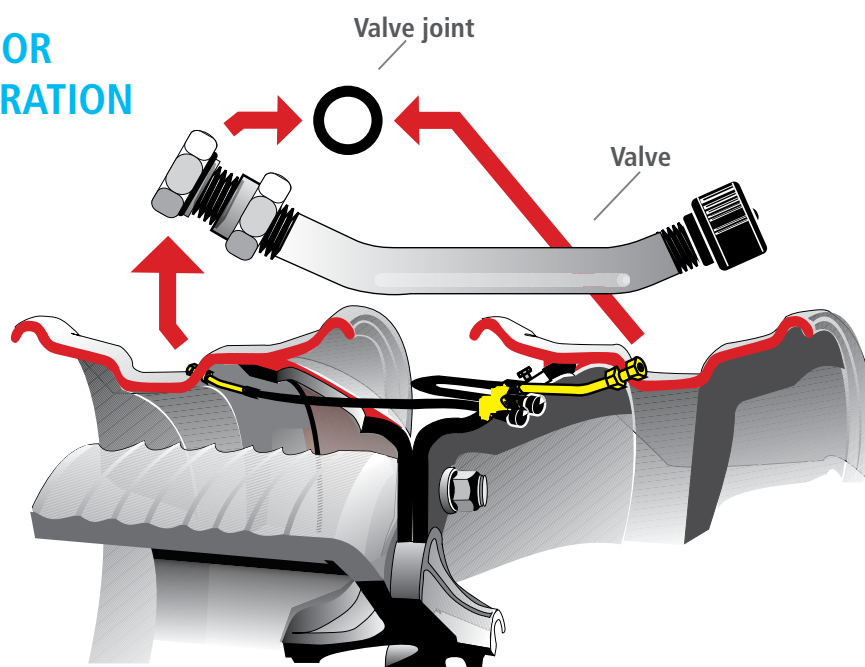
The operator must position himself in line with the tread band during inflation.

At all times whilst inflating, stand at least 3 metres from the fitted assembly in line with the tread band.

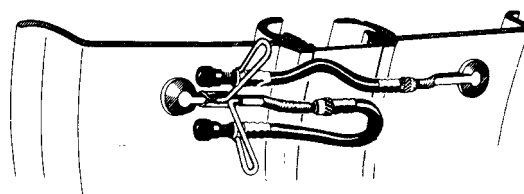
VERIFICATION OF VALVES

Because of ageing and the high temperature linked to brakes, valve seals and inflation extensions are to be replaced each time a tyre is changed. A valve cap in excellent condition is essential for maintaining an air-tight seal.

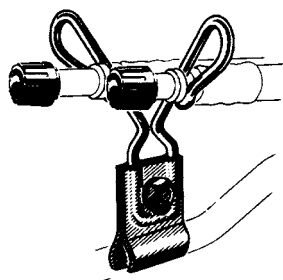
SEALING DIAGRAM FOR DUAL TYRE CONFIGURATION



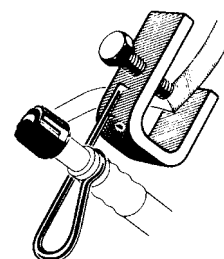
Truck tyre
valve
extensions



In these assemblies, always fit the valve facing each other.



Fixing clamps
for Truck tyre
valve
extensions



WHEEL TIGHTNESS

The correct wheel tightening process is essential to maintain wheel security, and along with it your safety.

WHEELS

- The condition of all wheels should be regularly checked.
Any cracked wheel or rim should be replaced.
- Wheels or rims should not be repaired by welding.
- If a welding operation has to be undertaken, the tyre must be removed from the rim. If this is not done, there is a serious risk of explosion.
- The tyre should only be refitted when all items have returned to ambient temperature.
- Before any welding on the vehicle chassis or in proximity of the tyres, the tyre and wheel assemblies should be removed from the vehicle.
- Before removing divided wheel assemblies from a vehicle, it is recommended that the tyres are deflated.

■ Before any tightening operation the following must be observed:

- **Clean:**
 - the support surfaces of the hub and wheel.
 - the wheel studs and nuts.
- **Check:**
 - the condition of the fixing holes (deformation, cracks, etc.)
 - the condition of the studs (deformation, state of threads, etc.)
 - the condition of the nuts (deformation, state of threads, etc.)
 - corrosion and any paint removing with a wire brush if necessary.
 - any burrs, loose or flaky surfaces, on the metal.
- **Lubricate:**
 - the threads of the wheel nuts with a drop of oil.
 - never lubricate the mating face of ball nuts or washers.

■ Final tightening torque:

- use a calibrated torque wrench
- the methods recommended by the vehicle manufacturer and their **recommended tightening torques**.
- remember to tighten the nuts alternately diagonally according to the number of nuts. Tightening to the correct torque with the torque wrench makes the wheel easier to remove in the event of a puncture, does not distort the studs and helps to ensure safe operation.

■ Over-tightening is often just as harmful as not tightening enough and can result in:

- deformation and/or cracking of wheel studs.
- distortion of wheel nut threads which may even lead to wheels loosening.
- ovalisation of drums, etc.

For additional information refer to the Freight Transport Guidance document entitled "Wheel Security"

BALANCING

It is important to ensure that tyres are correctly balanced, as this:

- plays a part in high tyre mileage performance
- protects the mechanical parts from premature wear
- ensures a comfortable ride

If balancing is required, Michelin recommends dynamic balancing using weights applied to the wheel.

TYRE CARE

Tyres must be examined regularly. When doing this, make sure that the vehicle is stationary, the engine is switched off and it is completely immobilised before any inspection.

CARE OF TYRES

- Tyres on a vehicle must be checked regularly, taking particular care to check:
 - the tread, for signs of abnormal wear, cuts, load deformations and embedded foreign objects (stones, bolts, nails etc.),
 - the sidewalls for cuts, impact damage (caused by pot-holes, riding kerbs, etc.), rasping due to kerbing, and abnormal deformations.
- Causes of vehicle handling problems such as, steering wheel vibrations, pulling to left or right, etc. should also be investigated.
- If loss of pressure occurs, it is imperative to stop as quickly as possible, as running underinflated causes thermal degradation of the tyre components.
- The tyre should be removed from the rim, and the reason for the loss of pressure determined.
- Any damage must be examined by a tyre professional who is capable of determining if a repair is necessary or possible.
- Repairs must be undertaken by a tyre specialist, who will accept responsibility for the repair.
- Before any repair, the interior of the tyre must be examined to ensure that no degradation has occurred.

TYRE WEAR ON THE STEERING AXLES OF MOTOR VEHICLES



■ OBSERVATIONS:

- The front nearside tyre wears more quickly than the front offside tyre on a truck driving on the left.
- The front nearside tyre often has more pronounced wear on the outer fitted shoulder due to the camber of the road and the number of roundabouts.

■ SOLUTIONS:

To even out front tyre wear if necessary turn tyres on the rim when half worn and interchange left to right. Regroove at the appropriate time.

Michelin advise against fitting Retreaded tyres on the Front Steer axles of motor vehicles.

Note: For advice on Antisplash™ tyres see page 65.

TYRE WEAR ON THE DRIVE AXLE



■ OBSERVATIONS:

- As a general rule, both the inner tyres have more pronounced wear on the tread shoulder, on the inner side of the chassis.
- Several factors are involved: camber angle, type of suspension, use of the engine brake, the route conditions and the axle load.

■ SOLUTIONS:

To even out wear and take advantage of the full potential of the four tyres by integrating regrooving, follow the advice below:

- Switch the inner and outer tyres round (twin fitment)
- Turn the two inner tyres on their rims whilst observing direction of rotation
- Regroove with 3 to 4 mm of tread remaining

Fit retreaded tyres **MICHELIN**  **Remix** on drive axles in rear position.

For directional tyres see page 64.

WEAR ON TRAILER AXLE TYRES (SEMI-TRAILER WITH THREE FIXED AXLES)



■ OBSERVATIONS:

As a result of lateral scrubbing whilst cornering and manouvering, the wear rate of the tyres fitted on the 3 axles is not uniform:

- The 1st axle is moderately affected by scrubbing and will therefore have a level of wear mid-way between that of the 2nd and 3rd axles.
- The 2nd axle, with virtually no stresses, has a very low degree of wear.
- The 3rd axle has more rapid wear because it is most affected by scrubbing linked to the geometry of the vehicle.

■ SOLUTIONS:

To even out wear and take advantage of the full potential of both tyres by integrating regrooving, follow the advice below:

■ TYRE ROTATION:

- Turn the tyres on their rims on the 1st and 3rd axles when approximately 50% worn

■ REGROOVE (AT 3 - 4MM REMAINING TREAD PATTERN DEPTH)

- On 1st axle use of regrooved tyres is possible depending on use.
 - On 2nd axle use of regrooved tyres is usually recommended.
 - On 3rd axle use of regrooved tyres is not normally recommended.
- 3rd axle tyre may be regrooved and fitted to the 2nd axle.

For trailers and semi-trailers, **MICHELIN**  **Remix** tyres can be fitted in any position.

TYRE ROTATION AND TURNING ON THE RIM

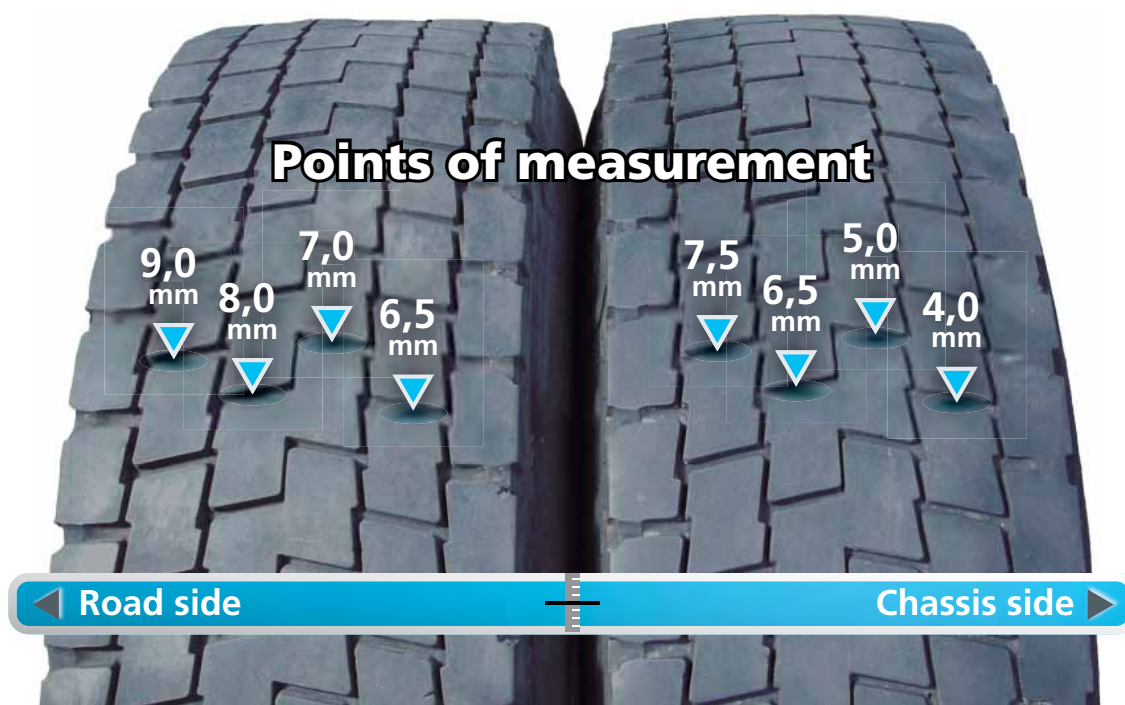
■ What is it?

Tyre rotation is an operation consisting of removing the tyre from one position on the vehicle and refitting it in another position.

Turning on the rim is an operation consisting of removing the tyre from the rim and refitting it the other way round.

These two operations can increase tyre longevity by about 20%*.

Example: wear on the drive axle tyres



Some truck tyres have a direction of rotation which should be complied with at the start of the tyre's life to optimise all round performance. In this case, when rotating tyres, it may be necessary to also turn on their rims to maintain the recommended direction of rotation.

* Internal Michelin source.

THE ANTISPLASH TYRE

The Antisplash™ system is designed to be effective on the outside of the vehicle. The words "Outer Side" are marked in several languages on the sidewall of 385/65 R 22.5 tyres with the Antisplash™ system.

■ 385/65 R 22.5 and 315/70 R 22.5 tyres

For reasons of space requirements, 385/65 R 22.5 Antisplash™ and 315/70 R 22.5 Antisplash™ tyres must not be turned on their rims.

■ 385/55 R 22.5 tyres

It is possible to turn these tyres on their rims. If it is required, it is essential to check that the Antisplash™ is not in contact with any mechanical parts. To do this, the clearances must be checked with the wheels in all steering positions (from full left lock to full right lock) taking account of the variations in geometry when the vehicle is in dynamic use. It would also be advisable to contact the vehicle manufacturer for their comments.

GEOMETRY

Correctly adjusted vehicle geometry helps to ensure that the tyre gives optimum mileage performance.

If the alignment is out by just 1 mm, it can reduce mileage performance by up to 3%*, and increases fuel consumption.

* Internal Michelin source.

STORAGE AND HANDLING

■ Conditions for good tyre storage:

- Clean, dry, temperate and well-ventilated premises, sheltered from direct sunlight and bad weather.
- Well away from any chemical substance, solvent or hydrocarbon likely to alter the nature of the rubber.
- Well away from any object which might penetrate the tyre (metal spike, wood, etc.).
- Well away from any source of heat, flame, incandescent bodies, equipment which might give off sparks or electrical discharges and any source of ozone (transformers, electric motors, welding sets, etc.).

When storing in stacks, make sure that the tyres are not deformed. If they are to be stored for a long time, rotate the tyres (reverse the order of the tyres in the stacks), so as to be able to extract the oldest tyres first. Avoid compressing the tyres under other objects.

■ When handling tyres and accessories, operators must:

- Apply the company's safety instructions.
- Be equipped with their usual protective equipment for handling,
- Use instruments and equipment which will not damage the tyres.

Instructions for the storage of tyres are contained in ETRTO (European Tyre and Rim Technical Organisation) Recommendations on Storage pages S5, S6, S7 and S8. That information is reproduced below together with additional information from Michelin. This Michelin information is for tyres which are fitted to rims but under no load, or for fitted tyres on a vehicle which is standing on the ground.

ETRTO RECOMMENDATIONS ON STORAGE

In view of the harmful influence of temperature, humidity and light, inside storage is essential. Whether fitted on rims or not, tyres must be stored in clean conditions free from exposure to sunlight or strong artificial light, heat, ozone (electrical machines) and hydrocarbons.

■ Humidity:

- The store room should be cool, dry and moderately ventilated. Moist conditions should be avoided. Care must be taken to ensure no condensation occurs.
- Tyres destined for retreading/repairing must be thoroughly dried out beforehand.
- If tyres are stored outdoors, they should be covered. An opaque, waterproof tarpaulin is a good cover. Water and moisture should be kept out of the tyre.
- If possible, mount on wheels and inflate to approximately 1 bar. Store vertically. Cover with a tarpaulin.

■ Light:

- There should be protection from sunlight and strong artificial light with a high ultraviolet content. Room lighting with ordinary incandescent lamps is preferable to fluorescent tubes.

■ Temperature:

- The storage temperature should be below 35°C and preferably below 25°C. At temperatures exceeding 50°C, particularly in the absence of proper rotation of stocks, certain forms of deterioration may be accelerated sufficiently to affect the ultimate service life. Direct contact with pipes and radiators must be avoided.
- The effects of low temperatures are not permanently deleterious, but can cause the products to stiffen. Care should be taken therefore to avoid distorting them during handling at that temperature. When they are taken from low temperature storage for immediate use, their temperature should be raised to approximately 20°C throughout before they are put into service.

STORAGE AND HANDLING

■ Oxygen, ozone and chemical agents:

- As ozone is particularly harmful, storage rooms should not contain any equipment generating ozone such as fluorescent lighting, mercury vapour lamps, electrical machines or other equipment which may produce sparks or other electrical discharges. Combustion gases and vapours which produce ozone via photochemical processes should be excluded.
- Solvents, fuels, lubricants, chemicals, acids, disinfectants and the like should not be kept in the store rooms. Rubber solutions should be stored in a separate room and the administrative regulations on the storage and handling of inflammable liquids must be observed.

■ Deformation:

- Products should be stored in a relaxed condition free from tension, compression or other deformation since these may cause cracking or permanent distortion.

■ Rotation of stocks:

- To avoid deterioration, storage time must be minimised. Stocks should be issued from the stores in rotation so that those remaining in storage are of the latest manufacture or delivery.

■ Short term storage:

- For short term storage (up to 4 weeks) tyres can be stacked horizontally, one on top of another, on wooden gratings but the height of the stacks should not exceed 1.2 metres. After 4 weeks, the tyres should be re-stacked, reversing the order of the tyres. When fitted on rims, tyres should be stored inflated in an upright position or in a single layer of shelf racks.

■ Long term storage:

- For long term storage, tyres should be stored upright in a single layer on shelf racks with at least 10cm clearance above the floor. To avoid deformation, it is advisable to rotate them once a month.

■ Tubes:

- Tyre tubes should either be slightly inflated, dusted with talcum and placed in the tyres or stored in a deflated condition in small stacks max. 50cm – in the compartments of shelf racks with a level bottom. Slatted palettes are not suitable since they might apply pressure at particular points.
- If tubes are supplied by the manufacturer in cartons or wrapped in film, they should be left in these because the packing provides some degree of protection against contamination, oxygen and the effects of light.

■ O ring seals:

- Store O ring seals in a cool, dry place. Lay flat. Do not stack other materials on O rings.

■ Valves:

- Store Valves in a clean, cool, dry place.

■ Flaps:

- Flaps should preferably be placed with the tubes inside tyres, but if stored separately, they should be laid flat on shelves free from contamination, from dust, grease and moisture. Never suspend them – this can cause deformation and elongation.

ADDITIONAL MICHELIN STORAGE INFORMATION:

- It is reasonable to expect that tyres stored following the instructions above should last for at least 10 years. However, in any case, stored tyres which reach ten years of age, should be examined by competent personnel to determine their suitability for further service.
- It is strongly recommended that fitted tyres which are to be stored should be inflated with Nitrogen. If air is used then it must be as dry as possible before it enters the tyre. Ensure that a valve cap is fitted to the valve.
- Tyres on vehicles resting on the ground should be at the normal pressure for the vehicle. Every six months, that pressure should be checked and corrected as necessary. Every four months, the tyres should be rotated ¼ turn. The tyres should be driven for a distance every year until any 'flat spotting' disappears.
- Tyres on vehicles suspended off the ground should be deflated to approximately half the normal pressure for the vehicle.
- Spare tyres in storage should also be deflated to approximately half the normal pressure for the vehicle.
- A procedure must be established to ensure that tyres which have been in storage at reduced pressure, are correctly re-inflated when they are returned to service.
- Any tyre which has been stored, should be visually inspected by competent personnel before entering or re-entering service.

Consult Michelin Technical Managers for further advice and information regarding the storage of tyres.



GUIDE TO WEAR AND DAMAGE

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INFLATION PRESSURE

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THE INFLUENCE OF INFLATION PRESSURE ON TYRE MILEAGE

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THE INFLUENCE OF INFLATION PRESSURE ON FUEL CONSUMPTION

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RECOGNITION OF TYRE WEAR AND DAMAGE

- CONSTRUCTION OF A TYRE
- TREAD
- SIDEWALLS
- BEAD
- INTERIOR
- MISCELLANEOUS

INFLATION PRESSURE

Choosing and maintaining the correct inflation pressure is an essential factor at the heart of performance.

■ **The tyre is the sole point of contact between the vehicle and the road surface.**

It is crucial to the safety both of users and goods transported.

For a given load and type of work, in clearly defined conditions, there is only one suitable inflation pressure.

The pressure of the air in the tyre is crucial to its correct operation: it is this pressure which both supports and moves loads or people:

- Safely
- Durably
- Economically
- Comfortably

However, in the surveys conducted by MICHELIN, pressure emerges as one of the maintenance points which is often not monitored and maintained as well as it should be.

■ **Pressure and safety**

Incorrect tyre pressure has a negative impact on certain basic aspects of safety performance such as:

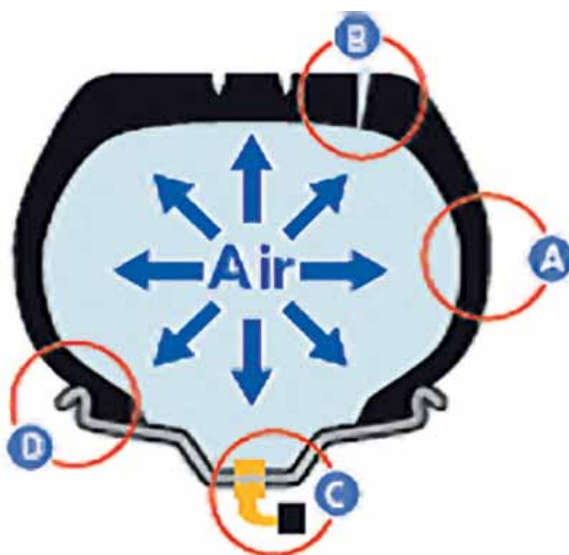
- Casing strength.
- Vehicle stability and handling.
- Levels of grip and traction
- Sensitivity to kerbing.

■ Variation in inflation pressure

A tyre may lose pressure in the course of use for various different reasons:

- Natural infiltration through the components (a).
- Perforation through the whole structure (B).
- Airtightness of the wheel rim (e.g. cracks or welds).
- Airtightness of the valve mechanism (C).
- Airtightness between the valve and rim (D).
- Airtightness between the rim and tyre beads.

Apart from on-board monitoring systems, regular visual checking of pressures with a pressure gauge is the most common method for detecting possible air leaks.



Standard suggested pressures are available from your Michelin commercial department, or you can visit www.trucks.michelin.co.uk

WHY YOU SHOULD CHECK INFLATION PRESSURE?

■ Pressure checks should be made on all the tyres on the vehicle (including the spare wheel).

- If the inflation pressure is too low, the result is an abnormal rise in running temperature which may lead to damage to the internal components.

This damage is irreversible and may cause the destruction of the tyre and rapid deflation.

The consequences of running with insufficient pressure in the tyres are not necessarily immediate and may even become apparent after the pressure has been corrected.

- Insufficient inflation pressure also greatly increases the risk of aquaplaning.
- Over-inflation can cause rapid and irregular wear and increased sensitivity to impact (tread damage, casing failure).
- Even if tyres are inflated with nitrogen, the pressure still needs to be checked regularly.

In terms of nominal inflation pressure of between 6 and 9 bar

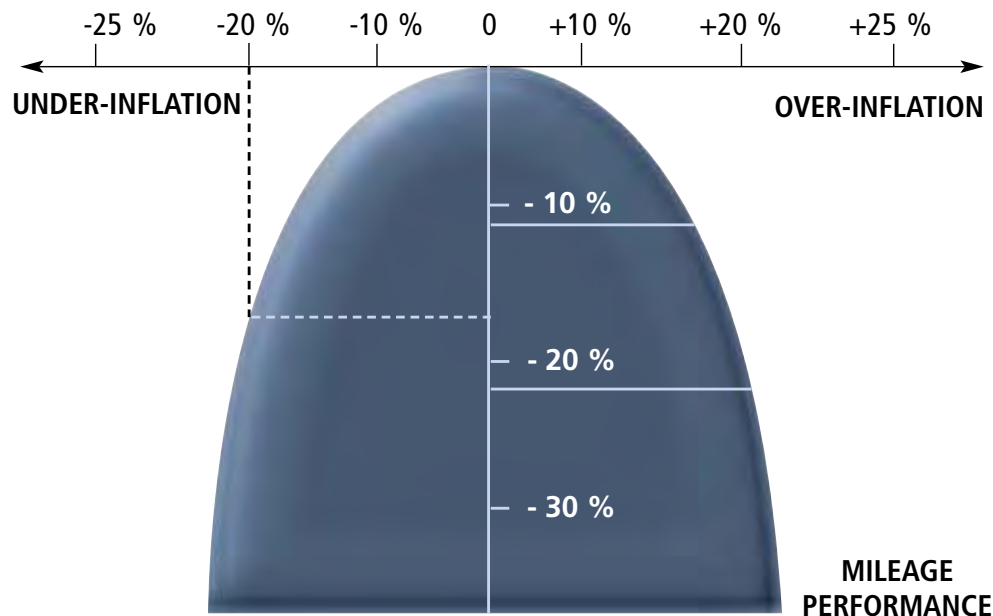
| | | |
|--|--|---|
| Under-inflation of up to 0.5 bar Over-inflation of up to + 0.5 bar (7psi) | Increased safety Greater longevity Reduce fuel consumption | ACCEPTABLE PRESSURE Correct as soon as possible to the suggested level. |
| Under-inflation between - 0.6 and - 1 bar (8 to 14.5psi) | Reduced longevity Increased irregular wear Increased fuel consumption | TEMPORARILY ACCEPTABLE PRESSURE Correct immediately and monitor |
| Under-inflation of more than - 1 bar (14.5psi) | Rapid deterioration in use with risk of rapid deflation, reduced stability and grip. Reduction in longevity. Increase in fuel consumption and irregular wear | UNACCEPTABLE PRESSURE Demount and inspect the interior for runflat damage. If mounted in dual configuration: demount and inspect adjacent mounted assembly. |

In all circumstances the pressures recommended by the manufacturer of the vehicle or tyre must be observed. Tyre inflation pressures must always be appropriate for the load and tyre use.

IMPORTANT PRECAUTIONS

- Check tyre pressures when the tyres are cold. The pressure increases in use: never reduce the pressure of a tyre while it is hot.
- Never re-inflate a tyre which has been running underinflated without a thorough inspection both inside and out.
- Under inflation could result in the tyres running at abnormally high temperatures, leading to thermal degradation of the tyres' components'. The degradation is irreversible and can result in a rapid deflation of the tyre.
- Inflation pressures on cold tyres which are more than 0.6 bar (8psi) below the suggested values must be corrected immediately.
- The regulations in force in the country of use are to be observed in all cases.
- Tyre pressures should be checked on cold tyres at least every two weeks or when the vehicle is serviced.
- Use an accurate, regularly calibrated pressure gauge and handle it with care.
- If the pressure in a tyre checked when hot is lower than the suggested pressure, the tyre must be removed and checked, complying with the safety instructions.
- If one tyre appears considerably hotter than the others, it must also be removed and checked complying with the safety instructions.
- The inflation pressures of the tyres on the same axle should normally be about the same.
- The pressure should be checked 24 hours after a tyre has been fitted and should not have dropped by more than 5 % of the original pressure.
- Tyres for commercial vehicles should be inflated to a pressure relevant to the load, speed and conditions of use.
- Suggested pressures are shown in the load/pressure tables.
- Using the correct pressure is essential to the safe operation of the tyre.
- The valve cap is the primary air seal and must always be fitted (NB. The valve core acts as a one way valve to allow the tyre to be inflated; it should not be treated as a seal).

THE INFLUENCE OF INFLATION PRESSURE ON TYRE MILEAGE



A tyre under-inflated by 20% leads to a mileage performance loss of approximately 18%.

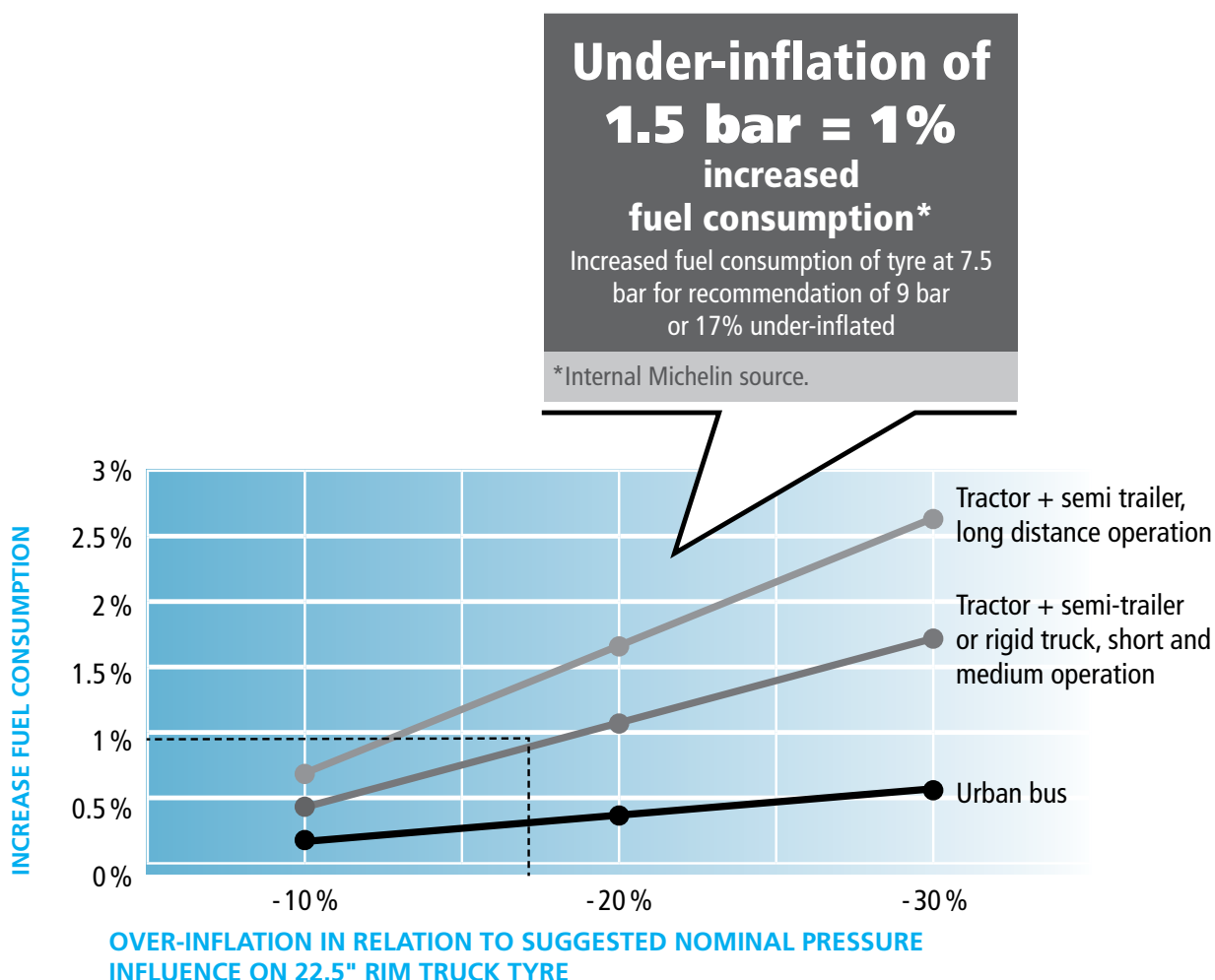
Under-inflation leads to:

- an impact on the handling of the vehicle and its safety,
- a reduction in casing resistance, which limits the possibility of retreading.

Over-inflation reduces:

- your safety and ride comfort,
- grip,
- the tyre's service life, particularly on drive axle tyres.

THE INFLUENCE OF INFLATION PRESSURE ON FUEL CONSUMPTION



Inflation pressure has a proven influence on fuel consumption!

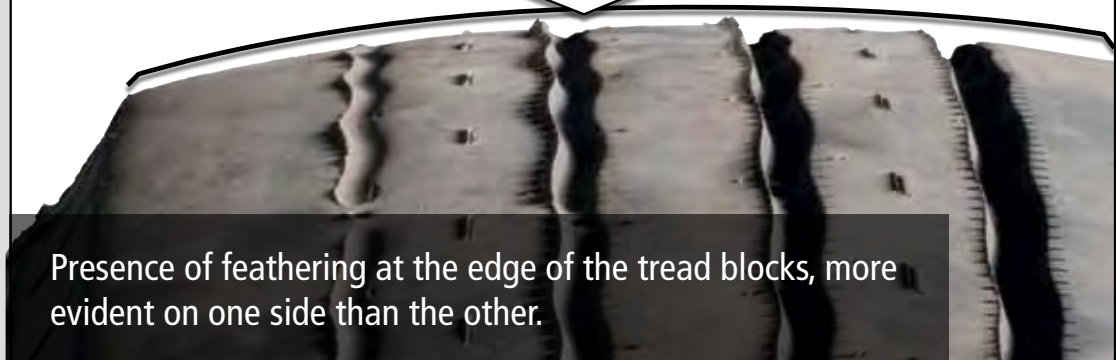
An unsuitable inflation pressure increases tyre rolling resistance and thus the vehicle's fuel consumption.

RECOGNITION OF TYRE WEAR AND DAMAGE

RAPID ABNORMAL WEAR



1/Observation



Presence of feathering at the edge of the tread blocks, more evident on one side than the other.

2/Probable cause(s)

Scuffing whilst running, caused by incorrect alignment of the wheels (toeing in or toeing out) or axle misalignment.

■ Alignment of the front axle

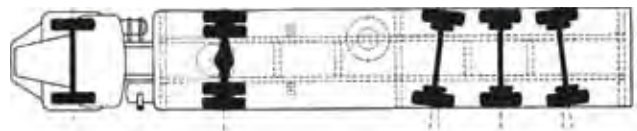


TOE-IN



TOE-OUT

■ INCORRECT AXLE ALIGNMENT



3/Tips

TYRE

Can be kept on the vehicle if it meets legal requirements.

VEHICLE

Adjust vehicle geometry (parallelism/alignment) according to vehicle manufacturer's specifications.

In some cases, such wear exposes rubber with a different colour and texture.

► Refer to page 101

HEEL AND TOE



1/Observation

Occurring mainly on tyres with block type treads. The leading edge of each block is sharply defined, with the trailing edge excessively worn.

2/Probable cause(s)

- The forces exerted on the tyre from increasingly powerful accelerating and braking torques. (Affected by application, frequent stopping and surface texture).
- Inappropriate inflation pressures for the load carried by the tyre.

3/Tips

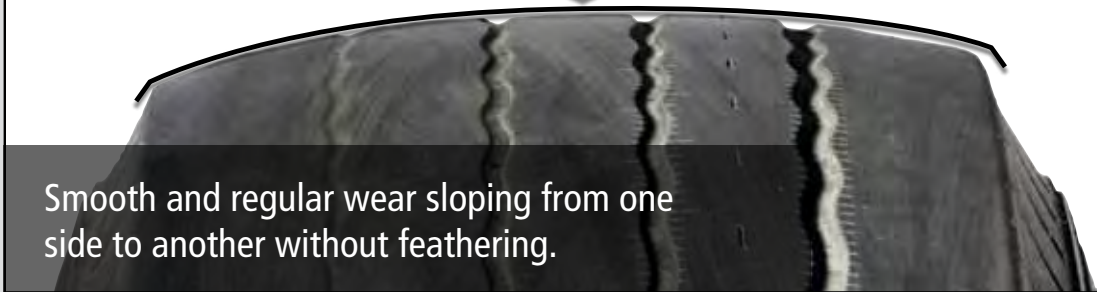
TYRE

Check the pressure when the tyre is cold and adjust it if necessary. It may be possible to keep the tyre on the vehicle if legal requirements are met. Permutate the tyres to even out wear.

SLOPED WEAR



1/Observation



Smooth and regular wear sloping from one side to another without feathering.

2/Probable cause(s)

Excessive wheel camber.
Flexing of the axle under the weight of the load.
(This may be more pronounced on the inner tyre of a twinned assembly).

3/Tips

TYRE

Turn on the rim.
Check pressures when tyre is cold and alter as necessary.

VEHICLE

Check the vehicle geometry.
Check the load is distributed evenly across the axle.

In some cases, such wear exposes rubber with a different colour and texture.

► Refer to page 101

CENTRE WEAR



1/ Observation

Wear more pronounced in the centre of the tread than on the shoulders.

2/ Probable cause(s)

Overinflation.

3/ Tips

TYRE

Check the inflation pressures when tyres are cold and re-establish according to conditions of use.

ROUNDED WEAR



1/Observation

Wear more pronounced on shoulders than in the centre of the tread.

2/Probable cause(s)

Tyre underinflated or overloaded.

3/Tips

TYRE

Find the cause of the underinflation and resolve it. (Start by checking for pressures, punctures, valve caps, valve stems etc.)

Weigh each axle of the loaded vehicle and adjust the pressures accordingly. It may be possible to keep the tyre on the vehicle if legal requirements are met.

In some cases, such wear exposes rubber with a different colour and texture.

► Refer to page 101

WAVY/LUMPY WEAR



1/Observation

Wavy wear affecting half or more of the tread.

2/Probable cause(s)

Wear or play in the suspension or steering systems. Imbalance, incorrect fitting. Incorrect twinning. Twins with different inflation pressures. Severe pitching of the vehicle.

Heavy loads and a high centre of gravity.

3/Tips

TYRE

Check fitting, concentricity and balance etc.

Check inflation pressure adjust for conditions of use, check twinned tyres.

VEHICLE

Check and if necessary repair the suspension and steering systems.

In some cases, such wear exposes rubber with a different colour and texture.

► Refer to page 101

SHOULDER WEAR



1/Observation

Circumferential wear to one shoulder, where shoulder is partially or completely worn away.

2/Probable cause(s)

Severe pitching of the vehicle, perhaps due to high centre of gravity. Prolonged running at a pressure which is inappropriate for the load or use.

3/Tips

TYRE

Check and adjust pressures according to the conditions of use.

In some cases, such wear exposes rubber with a different colour and texture.

► Refer to page 101

"TRAMLINE" WEAR



1/Observation

An area of more or less circumferential wear affecting only part of tread width.

2/Probable cause(s)

Undemanding usage on straight roads and motorways.
(Sign of slow wear rate).

3/Tips

TYRE

Ensure the appropriate tyre for the application is being used.
Tyre may be kept on the vehicle if legal requirements are met and handling is not affected.
Check pressures and permutate tyres if appropriate.

In some cases, such wear exposes rubber with a different colour and texture.

► Refer to page 101

DROPPED ELEMENT WEAR



1/Observation

Isolated circumferential wear of one rib of the tread pattern.



2/Probable cause(s)

Undemanding usage on straight roads and motorways. (Sign of slow wear)
Incorrect pressures.

3/Tips

TYRE

Check that the appropriate tyre for the application is being used. Tyre may be kept on the vehicle if legal requirements are met and handling is not affected. Check pressures and permutate if appropriate.

In some cases, such wear exposes rubber with a different colour and texture.

► Refer to page 101

ECCENTRIC WEAR



1/Observation

Diametrically opposed maximum and minimum tread wear rates. Severe scooped sidewall wear.

2/Probable cause(s)

Tyre eccentrically fitted to the rim. Rim eccentrically fitted to the hub.
Imbalance in rotating assemblies.

3/Tips

TYRE

Check concentricity of fitted tyre with rim.
Perform dynamic balancing.

VEHICLE

Check runout of rotating assemblies (rim, brake drum etc).

In some cases, such wear exposes rubber with a different colour and texture.

► Refer to page 101

BRAKE FLATTING



1/Observation

Very localised wear, the size and shape of which resembles that of the contact patch. Possible presence of circumferential scratches and cuts to the rubber.

2/Probable cause(s)

Locking of the wheel(s) caused by excessive braking or defects to the braking system.

3/Tips

TYRE

Remove from vehicle according to severity.

VEHICLE

Check the braking system if the localised wear is not attributable to excessive braking.

TEARS IN THE GROOVE



1/Observation

Tears in the base of the tread groove.



2/Probable cause(s)

Repetitive crossing or mounting of protruding objects (kerbs, rail tracks etc.) Frequent manoeuvring on the spot. Hot tyres are particularly sensitive to this type of damage.

3/Tips

TYRE

May be left on the vehicle if legal requirements are met.
Remove if damage is deep.
Check pressures.

VEHICLE

Avoid obstacles as much as possible and if not proceed with care. Avoid manoeuvring on the spot.

MULTIPLE CUTS



1/Observation

Multiple cuts all around the tread.

2/Probable cause(s)

Running on coarse surfaces, sites and quarries. Overinflation and damp surfaces exacerbate this type of damage.

3/Tips

TYRE

Use the correct tyre for the application.
Ensure correct pressures.

DETACHMENT OF THE CROWN



1/ Observation

Detachment of the crown plies which can eventually lead to complete disintegration of the structure of the tyre.

2/ Probable cause(s)

Prolonged use in an underinflated and/or overloaded condition causing abnormal heat build up in the crown area.

3/ Tips

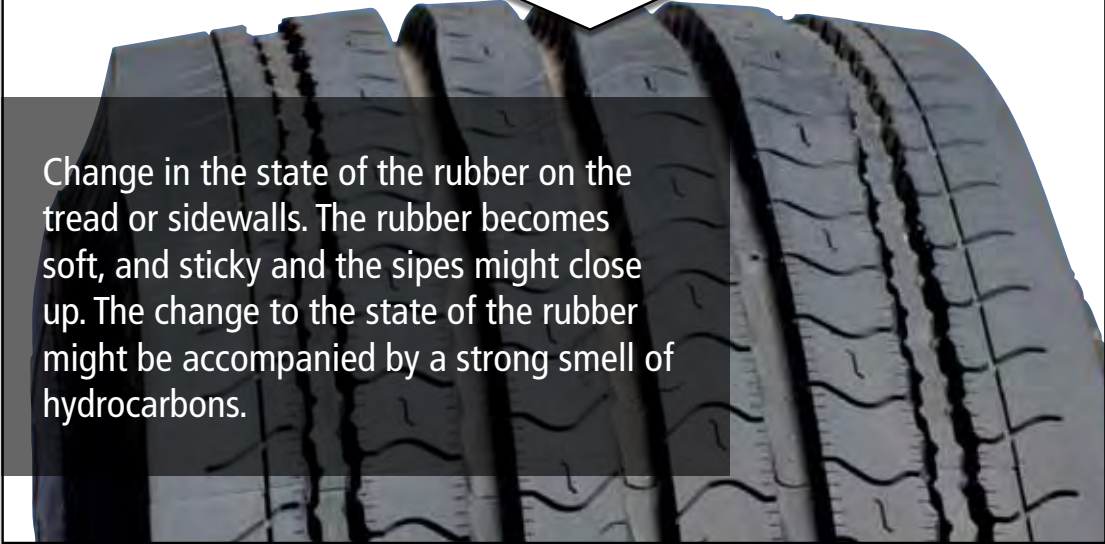
TYRE

Regularly check pressures. Avoid overloading.

DETERIORATION OF THE RUBBER



1/Observation



Change in the state of the rubber on the tread or sidewalls. The rubber becomes soft, and sticky and the sipes might close up. The change to the state of the rubber might be accompanied by a strong smell of hydrocarbons.

2/Probable cause(s)

Tyre stored in contact with a hydrocarbon.

3/Tips

TYRE

Remove from vehicle and dispose of it.
Check storage conditions.

VEHICLE

Check for and eliminate any leakage of hydrocarbons. Avoid parking in areas with hydrocarbon spillages.

APPEARANCE OF A DIFFERENT RUBBER ASPECT IN THE TREAD BAND



Different rubber aspect with no cut to tread rubber.

1/Observation

2/Probable cause(s)

Use beyond normal tread limits or abnormal wear.

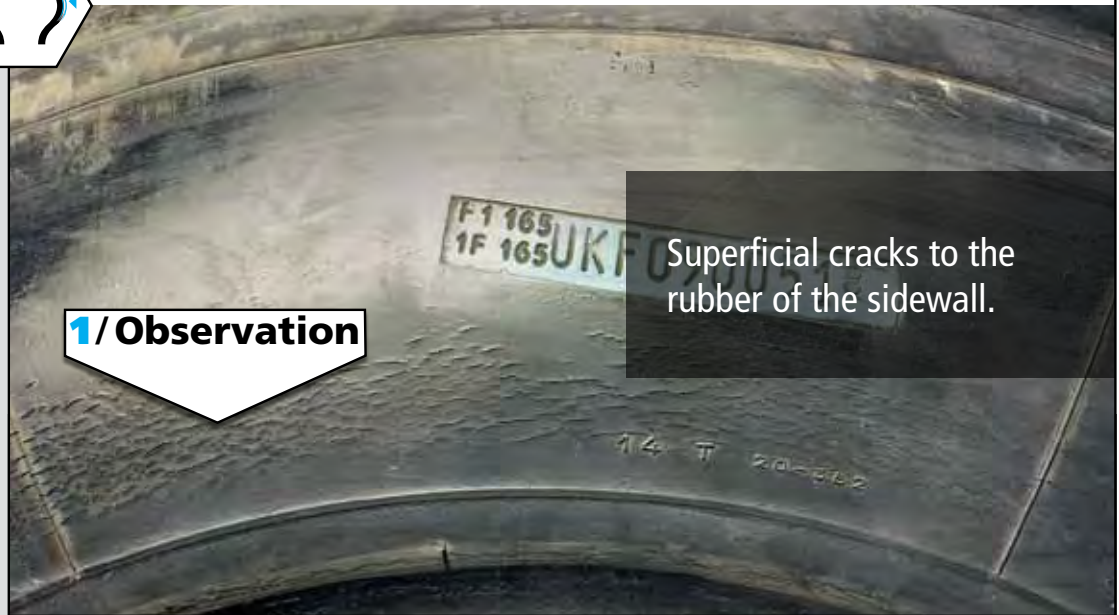
3/Tips

TYRE

Tyres should be replaced before this point is reached.

Manage tyre use to maintain best Remix potential and prevent potential structural damage by excessive wear.

RUBBER CRACKING



2/Probable cause(s)

Age, exposure to UV light (sunlight) close-up exposure (even for a couple of hours) to a source of ozone: an arc welding tool, electric motors etc.

3/Tips

TYRE

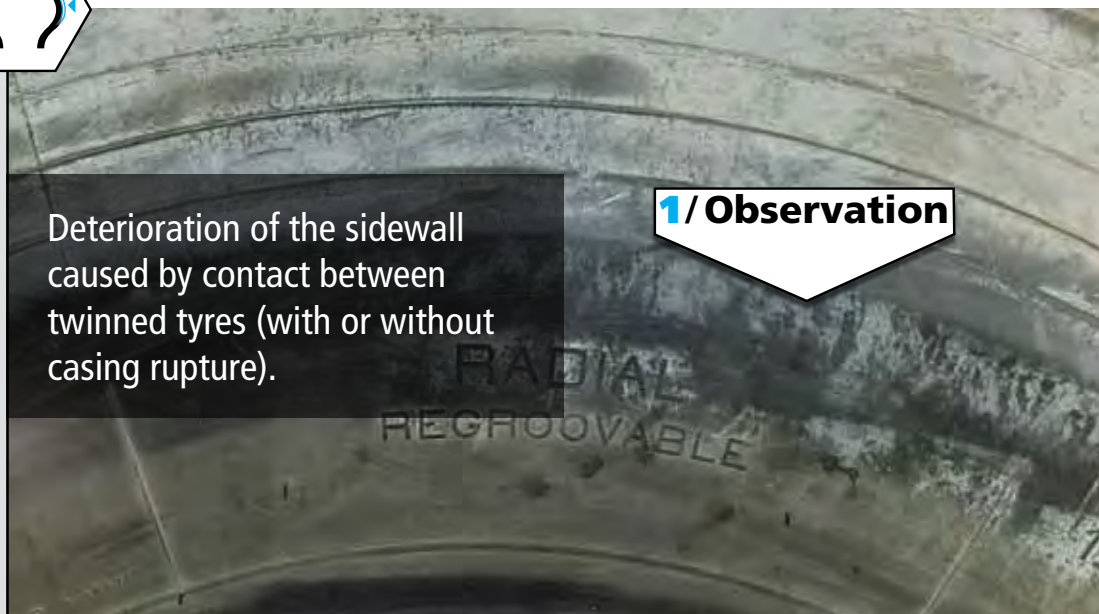
May be left on vehicle if legal requirements are met. Store tyres in an area protected from ozone emissions and UV light.

CONTACT BETWEEN TWINS



Deterioration of the sidewall caused by contact between twinned tyres (with or without casing rupture).

1/ Observation



2/ Probable cause(s)

Contact between two tyres causing circumferential wear to the sidewalls can lead to premature removal. Contact can result from underinflation, overloading, insufficient clearance between tyres when fitted.

3/ Tips

TYRE

Check the pressures and adjust them according to the load. Respect the minimum distance required between twinned tyres.

VEHICLE

Follow the wheel recommendations of the manufacturer.

RUBBER DETACHMENT



1/Observation



Detachment of rubber from the sidewall following infiltration of pressurised air.

2/Probable cause(s)

Accidental perforation of the airtight interior lining before fitting (e.g. staple etc) during fitment (e.g. by a tyre lever). Accidental perforation from the exterior with the perforating object staying in place.

3/Tips

TYRE

Remove from vehicle, do not repair or retread. Check method of fitting and labelling to avoid repeat.

VEHICLE

Check rims are clean and in a good condition.

RUPTURE OF THE CASING PLY



Regular circumferential rupture to the sidewall.

1/Observation



2/Probable cause(s)

Prolonged running with inadequate inflation pressure. Prolonged running overloaded. Running with different pressures on twins. Poor twinning.

3/Tips

TYRE

Inflate to the correct pressures, avoid overloading, check twinned tyres.

IMPACT/PINCHING



1/Observation



Rupture of the cables with cuts to sidewall rubber.

2/Probable cause(s)

Severe impact on an obstacle (kerb, stones, holes) causing the sidewall to be pinched between the rim and the obstacle. This type of damage is more likely when the tyre is underinflated or overloaded.

3/Tips

TYRE

Remove from the vehicle and hand over to a specialist for possible repair after thorough investigation.

BEAD DAMAGE



1/Observation



Damage to the bead point or the 'heel' caused during fitting, or removal.

2/Probable cause(s)

Poor use of fitting and removal tools, or tools in poor condition.

3/Tips

TYRE

Remove tyre from service and dispose of it.
Follow all fitting and removal instructions carefully.
Ensure all tools are in good condition.

DETERIORATION



Deterioration of the bead seat and/or the bead heel caused by foreign matter (rust, grit).

1/ Observation



2/ Probable cause(s)

Rim in poor condition (rusted). Lack of precautions taken on fitting (dirty fitting area etc).

3/ Tips

TYRE

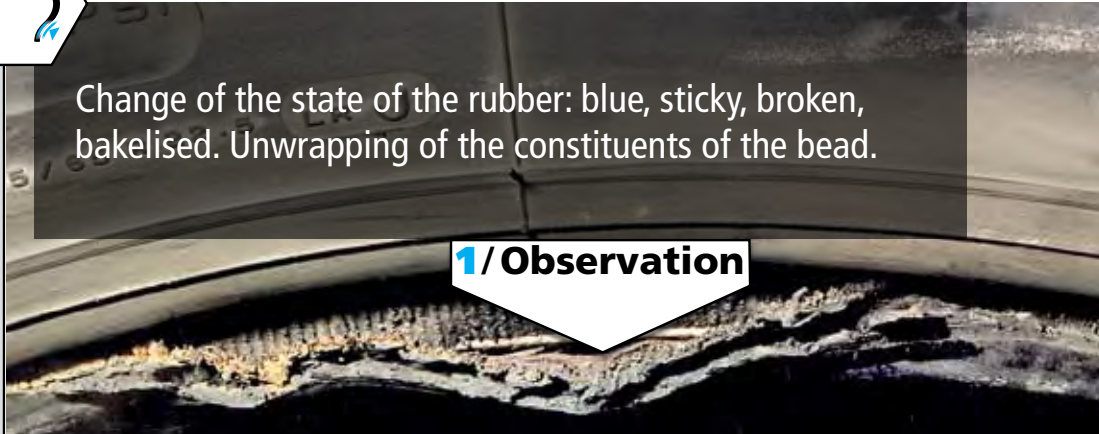
Clean the rim. If the rim is in poor condition replace it.
Maintain fitting areas properly.
Follow all fitting instructions correctly.

HEAT BUILD UP



Change of the state of the rubber: blue, sticky, broken, bakelised. Unwrapping of the constituents of the bead.

1/Observation



2/Probable cause(s)

Extreme increase in temperature in the bead area often caused by malfunction of the braking system or prolonged braking.

3/Tips

TYRE

Remove tyre from service and dispose of it.

VEHICLE

Check the braking system of the entire vehicle.
Avoid prolonged heavy braking in descent.
Follow driving and safety regulations.

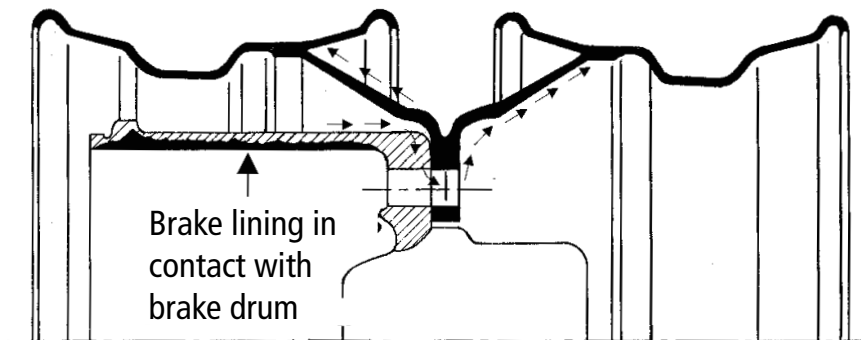


If the tyre is subjected to abnormally high temperatures, stop the vehicle in an open area, keep people far away from the vehicle – particularly the tyres – and then deflate after it has cooled down.

HEAT CONDUCTION

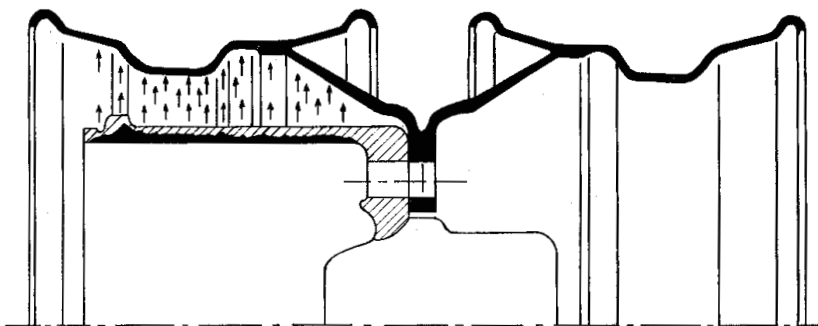
Example: a poker placed in a fire.

The heat of the coals passes from one end of the poker to the other, from the fire to the hand holding it. The longer the poker, there is more heat loss on the way and the part held in the hand heats up very little and slowly. Short distance: slight loss, significant and rapid heat build-up.



Short distance to travel
 - little loss high temperature and fast heating

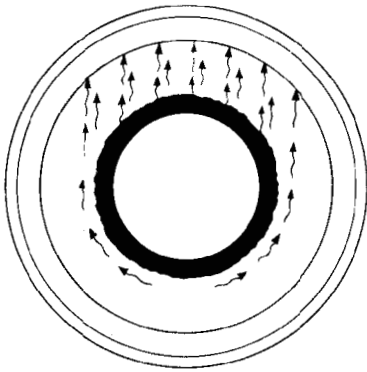
RADIATION



Example: a campfire.

Heat is transferred by radiation. Anything placed in front of the heat source screens off the radiated heat. The nearer the object is to the heat source the hotter it becomes.

CONVECTION



Example: a radiator.

A radiator first heats up the air close to it and, as hot air is lighter than cold air, the hot air rises and thus creates an upward current.



MARBLING



1/Observation



2/Probable cause(s)

Running underinflated or overloaded.

3/Tips

TYRE

Remove tyre from vehicle and dispose of it.

Important: Never reinflate a tyre that has been running underinflated without first removing it and examining the interior.

DISLOCATION



1/Observation

Dislocation and holes in the interior lining, even ending in complete dislocation and rupture of the casing.



2/Probable cause(s)

Prolonged running underinflated or overloaded.

3/Tips

TYRE

Remove tyre from vehicle and dispose of it. Inflate replacement tyres to correct pressure. Check the pressures regularly. Find out why the pressures were low (puncture, valve, rim etc).

DAMAGE CAUSED BY ELECTRICAL ARCHING



1/Observation

Electricity can cause localised burns to the rubber and in certain cases it can even cause damage to the cables, break the bead core and form small holes.

2/Probable cause(s)

The electricity arcs due to the proximity of the vehicle to a source of electricity or lightening.

3/Tips

TYRE

Remove all the tyres from the vehicle or the complete tractor and trailer assembly and send for analysis.



RETREADING **MICHELIN** *Remix*

110

PRINCIPLES OF MICHELIN REMIX RETREADING

PRINCIPLES OF RETREADING

MICHELIN *Remix*



A forerunner in the field, at MICHELIN we have been retreading tyres for almost a century, continuously developing our innovative technology. MICHELIN REMIX enjoys the advantages of the same industrial processes as used in the manufacture of our new tyres. Our experts use high technology methods (radiography and shearography) to ensure the reliability of MICHELIN REMIX retreading. A pledge of quality and safety. MICHELIN REMIX factories are all ISO 9001 and ISO 14001 certified, delivering optimised management of quality and environmental performance respectively.

WHY REMIX?

■ Reduce your running costs

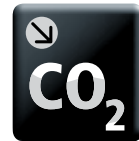
- Reduction in the cost per kilometre
- Regroovability is assured.
- Excellent retreadability.
 - Tyres retreaded by the MICHELIN REMIX process give levels of performance similar to new tyres, at approximately 60% of the cost.
 - Constant regrooving thickness.
 - Nearly 9 out of 10 MICHELIN casings are accepted for retreading, which reduces the number of scrap tyres.

■ Benefit from our pledge of quality and reliability.

- Performance similar to that of a new tyre.
- Same performance in relation to safety, qualities of grip, damage resistance, handling and road-holding.
 - MICHELIN REMIX retreading is carried out with the same materials used for the production of our new tyres.
 - MICHELIN REMIX tyres make use of all of the latest innovations, including MICHELIN DURABLE TECHNOLOGIES.

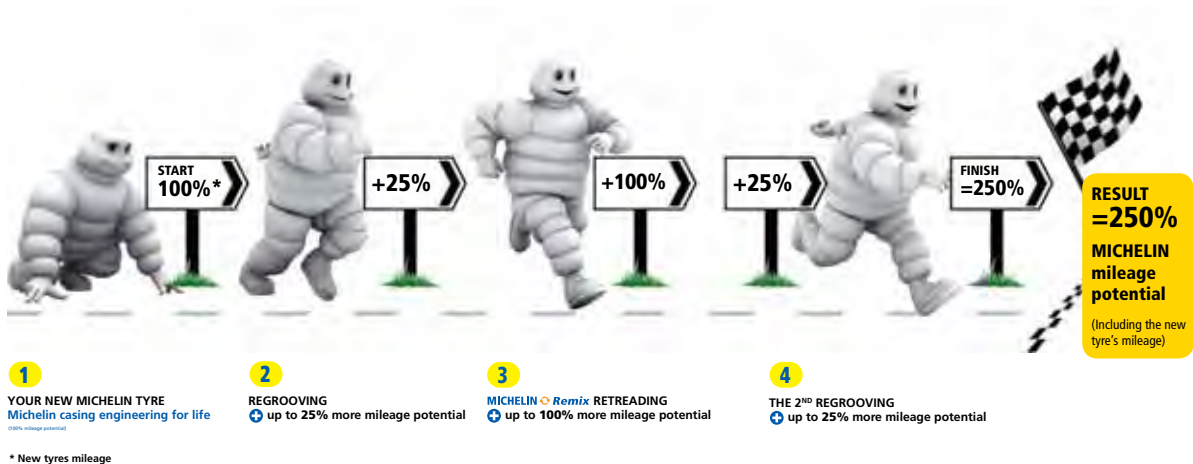
■ Protect the environment by reducing your waste

- Reduction in the number of new tyres used
- Less scrap to be processed
- 45 kg^(*) of raw materials saved per REMIX tyre
- Assured traceability, simplified management
 - The casing represents about 70 % of the weight of a tyre. By retreading it, the raw materials used are considerably reduced, as a large proportion of the original materials is kept.



* Weighted average of the weight of a carded casing.
2011 calculation performed on a sample of 1,500,000 REMIX tyres

REGROOVING



1 THE MICHELIN CASING: RELIABLE

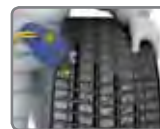


- From its design, the high technology of the Michelin casing includes a thickness of rubber which allows regrooving and retreading.

As soon as it is fitted...

Mr. Marshall drives a vehicle equipped with MICHELIN XFA 2 Energy tyres. He clocks up 100 000 km in the tyre's first life.

2 REGROOVING: DRIVE up to 25% MORE KILOMETRES.



- Regrooving enables you to increase your tyres' mileage potential so you can continue to drive safely without compromising the casing for Remix.

Improved grip...

By regrooving his MICHELIN XFA 2 Energy tyres, Mr. Marshall benefits from good road grip and can drive a further 25 000 kilometres, i.e. 125 000 kilometres since the tyres were fitted.



3 RETREADING MICHELIN **Remix** FIND A NEW TYRE.



- It is possible to retread the reliable MICHELIN casing with MICHELIN Remix.

Back to zero...

Mr. Marshall retreads his Michelin tyres with MICHELIN Remix. He benefits from tyres which are like new and can drive a further 100 000 kilometres, approx 225 000 kilometres since the tyres were first fitted.*

4 TYRE REGROOVING MICHELIN **Remix** DRIVE up to 25% MORE KM's.



- As tyres retreaded with MICHELIN Remix are like new tyres, they benefit from the same technology, which means a 2nd regrooving is possible.

Still further!

Tyres retreaded with MICHELIN Remix can be regrooved a second time, enabling Mr. Marshall to drive up to 25 000 kilometres.

In total, without changing his tyres and thanks to Michelin technology, Mr. Marshall can drive for 250 000 kilometres with his MICHELIN XFA 2 Energy tyres: 100 000 with his new original tyres + 150 000 through regrooving and retreading.*

Focus on MICHELIN Remix

By choosing to retread your tyres with MICHELIN Remix, you benefit from Michelin's extensive expertise to ensure that your tyres have a long lifespan.

- Reconstruction similar to a new tyre.
- Multiple tread pattern options.

On trucks, Michelin recommends that retreaded tyres are fitted on the rear axles

*The number of kilometres in the examples are for illustrative purposes only and are not for guidance.

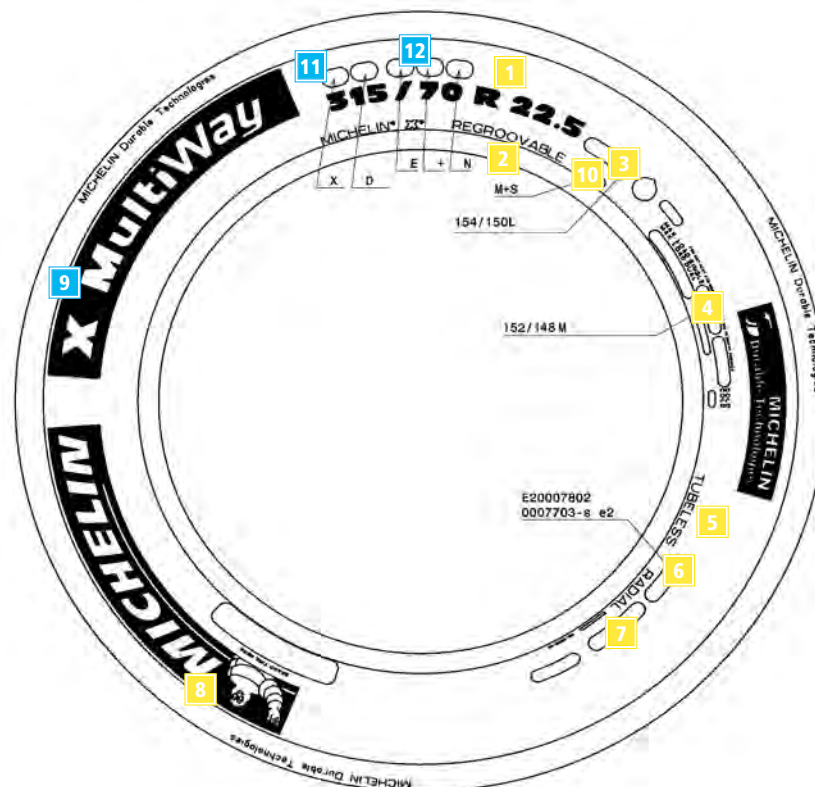


THE TECHNICAL CHARACTERISTICS OF MICHELIN TYRES

- 116** TRUCK AND BUS TYRE MARKINGS
- 119** CHANGES TO THE MARKINGS OF TRUCK AND BUS TYRES
- 120** THE NAMES OF MICHELIN TYRES
- 121** LOAD CAPACITY INDICES AND SPEED CATEGORY SYMBOLS
- 122** LABELLING CLASSIFICATIONS
- 128** TECHNICAL SPECIFICATIONS

TRUCK AND BUS TYRE MARKINGS

FOR TYRES PRODUCED BEFORE JUNE 2012



1 315/70 R 22.5 :

Tyre size

2 REGROOVABLE :

Regroovable tyre

3 154/150 L :

Load / speed indices

4 152/148 M :

"Unique point"

Additional load/speed operating conditions

5 Tubeless :

Without an inner tube

6 E2:

CEE homologation number

7 Radial :

Indication of construction


8 MICHELIN :

Manufacturer's brand

9 X MultiWay™ :

Indication of tread pattern

10 Category of use:

M+S: tyre in the "snow" category according to regulation 54 (CE) 661/2009: 

"Snow" category tyre according to regulation "R117"

Traction: tyre for traction use according to regulation "R117"

11 XD :

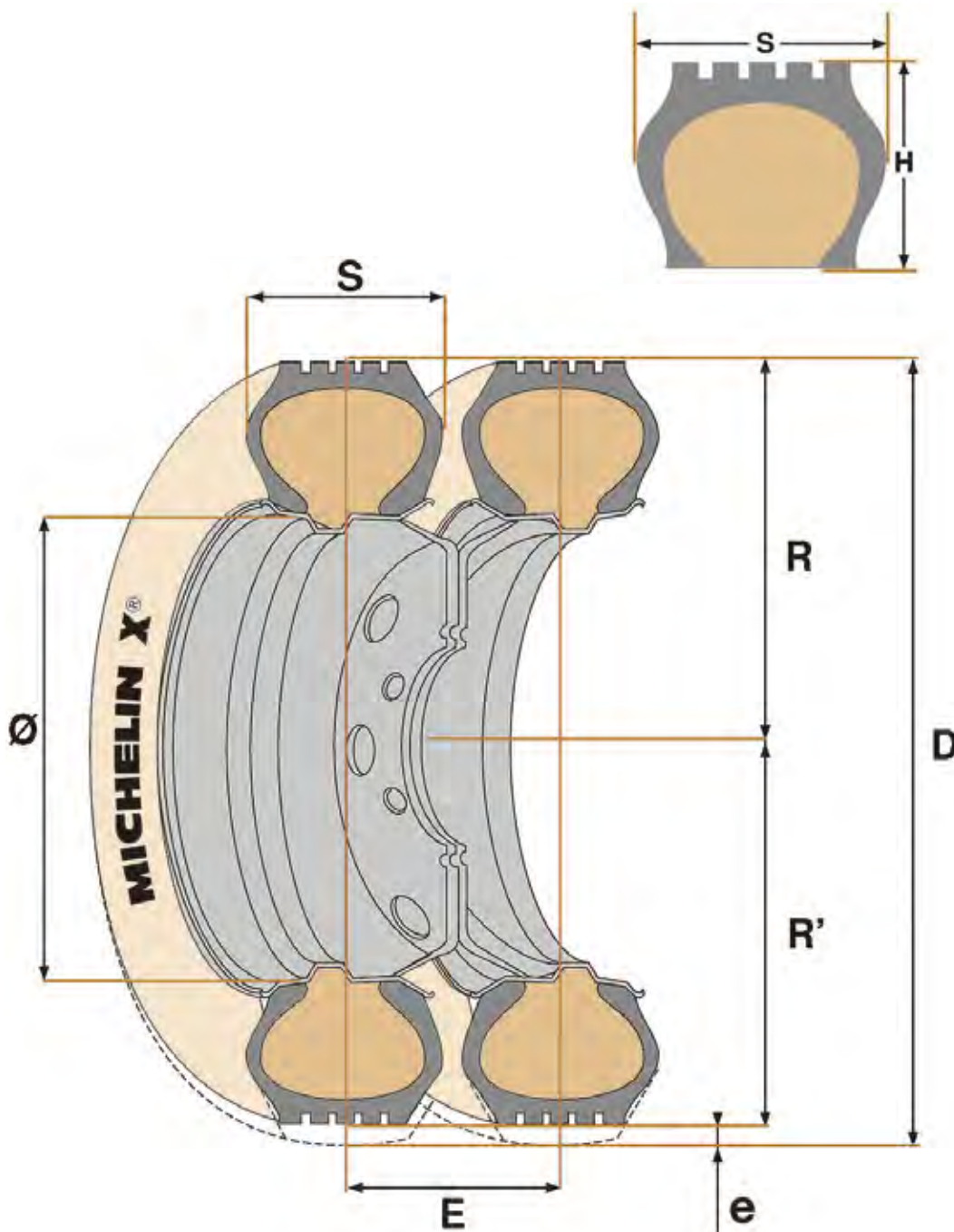
Tyre position code
XD: drive axle

12 E+N :

Tyre conditions of use
E: road - N: winter

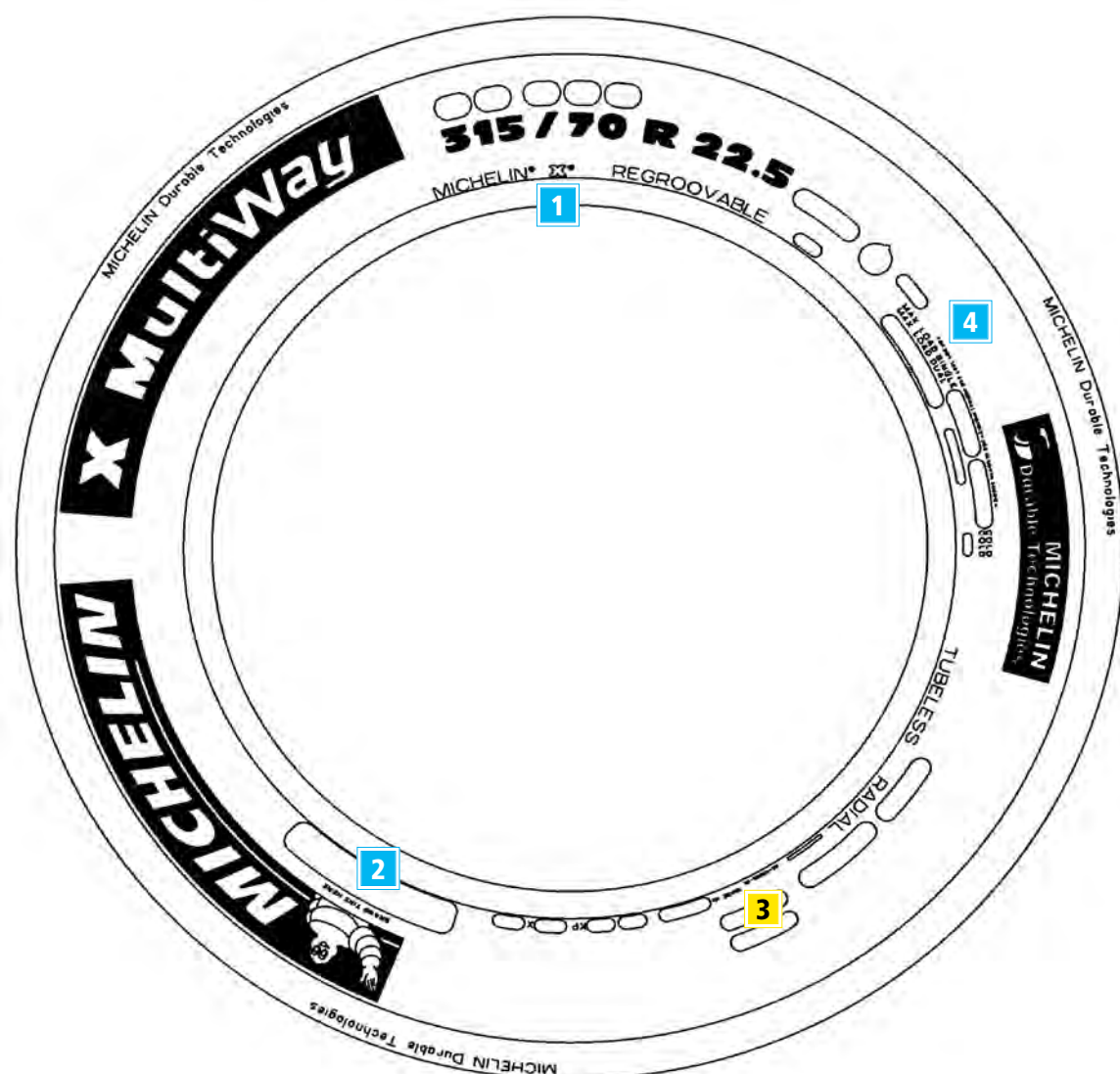
 Mandatory markings in yellow

DIMENSIONAL TYRE DATA



- S** Free section width (mm)
- R** Free radius (mm)
- R'** Static laden radius (mm)
- D** Free diameter (mm)
- \emptyset** Rim diameter
- E** Minimum dual spacing
- e** Static deflection (mm)
- H** Section height (mm)

ADDITIONAL INFORMATION



1 X[®]:

Michelin Radial construction symbol™

2 BRAND TYRE ZONE:

Zone in which the tyre can be branded if required

3 DATE OF MANUFACTURE: 2710

Department of Transport (conformity marking). Ends with 4 figures, an indication if the date of manufacture

27: Week number

10: Year number

e.g. 2710 (27th week of 2010)

4 Tyre serial number:

e.g. PRZ65967G (the same)

 Mandatory markings in yellow

CHANGES TO THE MARKINGS OF TRUCK AND BUS TYRES

TYRES PRODUCED FROM JUNE 2012 ONWARDS



As and when MICHELIN tyre ranges are replaced, they will bear a new marking which makes it easier to read the information on the product.

These new markings are organised into three zones:

- MICHELIN brand name: your guarantee of product authenticity.
- **Tyre range:** Identifying your tyre type.
- **Size and position of the tyre:** Positioning on the vehicle.

These markings will simplify product recognition and make it easier to understand for which conditions of use the tyre is suited.

The axle position indication will make handling easier in workshops.

Retreaded tyres will also be given this new marking as and when they are replaced.

THE NAMES OF MICHELIN TYRES

- MICHELIN currently uses the following naming convention for its tyres:



- These designates will be changing to a new version which identifies the environment in which the tyre is used: these designations will start to appear as and when products are renewed, as in the case of the replacement of the MICHELIN XTE 2 tyre by the MICHELIN X[®] MULTI[™] T:



- In some cases product designations will also include an option which expresses an additional benefit of the product to meet the specific needs of the haulier. For example:



OPTIONS

ENERGY[™]: Fuel efficiency
 GRIP: All-season grip
 WINTER: Winter conditions
 ICEGRIP: Grip in icy conditions
 HD: Reinforced casing
 HL: Heavy loads

This list is subject to change.

LOAD CAPACITY INDICES AND SPEED CATEGORY SYMBOLS


| LI | kg | LI | kg | LI | kg | LI | kg |
|-----|------|-----|------|-----|------|-----|------|
| 95 | 690 | 117 | 1285 | 139 | 2430 | 161 | 4625 |
| 96 | 710 | 118 | 1320 | 140 | 2500 | 162 | 4750 |
| 97 | 730 | 119 | 1360 | 141 | 2575 | 163 | 4875 |
| 98 | 750 | 120 | 1400 | 142 | 2650 | 164 | 5000 |
| 99 | 775 | 121 | 1450 | 143 | 2725 | 165 | 5150 |
| 100 | 800 | 122 | 1500 | 144 | 2800 | 166 | 5300 |
| 101 | 825 | 123 | 1550 | 145 | 2900 | 167 | 5450 |
| 102 | 850 | 124 | 1600 | 146 | 3000 | 168 | 5600 |
| 103 | 875 | 125 | 1650 | 147 | 3075 | 169 | 5800 |
| 104 | 900 | 126 | 1700 | 148 | 3150 | 170 | 6000 |
| 105 | 925 | 127 | 1750 | 149 | 3250 | 171 | 6150 |
| 106 | 950 | 128 | 1800 | 150 | 3350 | 172 | 6300 |
| 107 | 975 | 129 | 1850 | 151 | 3450 | 173 | 6500 |
| 108 | 1000 | 130 | 1900 | 152 | 3550 | 174 | 6700 |
| 109 | 1030 | 131 | 1950 | 153 | 3650 | 175 | 6900 |
| 110 | 1060 | 132 | 2000 | 154 | 3750 | 176 | 7100 |
| 111 | 1090 | 133 | 2060 | 155 | 3875 | | |
| 112 | 1120 | 134 | 2120 | 156 | 4000 | | |
| 113 | 1150 | 135 | 2180 | 157 | 4125 | | |
| 114 | 1180 | 136 | 2240 | 158 | 4250 | | |
| 115 | 1215 | 137 | 2300 | 159 | 4375 | | |
| 116 | 1250 | 138 | 2360 | 160 | 4500 | | |





























Speed category symbols

| SI | kph | mph |
|----|-----|-----|
| D | 65 | 40 |
| E | 70 | 43 |
| F | 80 | 50 |
| G | 90 | 56 |
| J | 100 | 62 |
| K | 110 | 68 |
| L | 120 | 75 |
| M | 130 | 81 |
| N | 140 | 87 |
| P | 150 | 93 |
| Q | 160 | 99 |
| R | 170 | 105 |
























Before fitting, it is essential to verify the various markings to make sure that the tyre corresponds properly to the maximum load and speed capacities of the vehicle and/or the regulations in force.

LABELLING CLASSIFICATIONS

| RIM DIAMETER | PATTERN AND SIZE |  |  |  |
|---|--|---|---|---|
|  | | | | |
| 17.5 | 245/70 R 17.5 X® LINE™ ENERGY™ T TL 143/141J VB MI | B | B |  68 dB |
| 17.5 | 215/75 R 17.5 X® LINE™ ENERGY™ T TL 135/133J VB MI | B | B |  68 dB |
| 17.5 | 215/75 R 17.5 XZA 2 TL 126/124M MI | D | B |  67 dB |
| 17.5 | 235/75 R 17.5 X® LINE™ ENERGY™ T TL 143/141J VB MI | B | B |  68 dB |
| 17.5 | 235/75 R 17.5 XTA 2+ ENERGY™ TL 143/141J MI | C | B |  69 dB |
| 19.5 | 445/45 R 19.5 XTA 2+ ENERGY™ TL 160J MI | C | B |  69 dB |
| 19.5 | 425/55 R 19.5 XTA 2 ENERGY™ TL 160J MI | C | B |  69 dB |
| 19.5 | 245/70 R 19.5 XTA 2 ENERGY™ TL 141/140J MI | C | B |  69 dB |
| 19.5 | 265/70 R 19.5 X® LINE™ ENERGY™ T TL 143/141J VB MI | B | B |  68 dB |
| 19.5 | 285/70 R 19.5 XTA 2 ENERGY™ TL 150/148J MI | C | B |  69 dB |
| 22.5 | 385/55 R 22.5 X® LINE™ ENERGY™ T TL VB 160K MI | A | B |  70 dB |
| 22.5 | 385/55 R 22.5 XFA 2 ENERGY™ AS TL 158L MI | C | B |  67 dB |
| 22.5 | 295/60 R 22.5 XZA 2 ENERGY™ TL 150/147K MI | C | B |  67 dB |
| 22.5 | 295/60 R 22.5 XDA 2+ ENERGY™ TL 150/147K MI | D | C |  73 dB |
| 22.5 | 315/60 R 22.5 XDA 2+ ENERGY™ TL 152/148L MI | D | C |  73 dB |
| 22.5 | 315/60 R 22.5 XZA 2 ENERGY™ TL 152/148L MI | C | B |  67 dB |
| 22.5 | 315/60 R 22.5 X® ENERGY™ XF TL 154/148L MI | C | B |  67 dB |
| 22.5 | 385/65 R 22.5 X® ENERGY™ SAVERGREEN XT TL 160J MI | B | B |  69 dB |
| 22.5 | 255/70 R 22.5 XZA TL 140/137M MI | D | C |  66 dB |
| 22.5 | 275/70 R 22.5 XDA 2+ ENERGY™ TL 148/145M MI | D | C |  73 dB |
| 22.5 | 275/70 R 22.5 XZA 2 ENERGY™ TL 148/145M MI | D | C |  67 dB |
| 22.5 | 275/70 R 22.5 XTA 2 ENERGY™ TL 152/148J MI | C | B |  69 dB |
| 22.5 | 305/70 R 22.5 XZA 2 ENERGY™ TL 152/148L MI | C | B |  67 dB |
| 22.5 | 305/70 R 22.5 XDA 2+ ENERGY™ TL 152/148L MI | C | C |  73 dB |
| 22.5 | 315/70 R 22.5 X® LINE™ ENERGY™ D TL 154/150L MI | B | C |  71 dB |
| 22.5 | 315/70 R 22.5 X® LINE™ 2 ENERGY™ TL 156/150L MI | B | B |  69 dB |
| 22.5 | 295/80 R 22.5 XZA 2 ENERGY™ TL 152/148M MI | C | C |  67 dB |
| 22.5 | 295/80 R 22.5 XDA 2+ ENERGY™ TL 152/148M MI | D | C |  73 dB |
| 22.5 | 315/80 R 22.5 XZA 2 ENERGY™ TL 156/150L MI | C | C | 67 dB |
| 22.5 | 315/80 R 22.5 X® LINE™ ENERGY™ Z TL 156/150L MI | B | B | 69 dB |


| RIM DIAMETER | PATTERN AND SIZE |  |  |  | |
|---|---|---|--|---|-------|
|  | | | | | |
| 22.5 | 315/80 R 22.5 X® LINE™ ENERGY™ D TL 156/150L MI | B | C |  | 69 dB |
|  | | | | | |
| 12 | 7.00 R 12 XTA 125/123F MI | E | B |  | 66 dB |
| 15 | 7.50 R 15 XTA 135/133G MI | D | B |  | 66 dB |
| 15 | 8.25 R 15 XTA 143/141G MI | C | B |  | 66 dB |
| 15 | 10.00 R 15 XTA 148/145G MI | C | B |  | 66 dB |
| 16 | 225/75 R 16 XCA TL 121/120N MI | C | C |  | 74 dB |
| 17.5 | 8.5 R 17.5 XZA TL 121/120L MI | E | C |  | 66 dB |
| 17.5 | 9.5 R 17.5 XZA TL 129/127L MI | D | C |  | 66 dB |
| 17.5 | 9.5 R 17.5 XZT TL 129/127L MI | E | C |  | 72 dB |
| 17.5 | 9.5 R 17.5 XTE 2 TL 143/141J MI | C | B |  | 67 dB |
| 17.5 | 10 R 17.5 XZA TL 134/132L MI | D | C |  | 66 dB |
| 17.5 | 205/65 R 17.5 X® MAXITRAILER™ TL 129/127J MI | C | B |  | 67 dB |
| 17.5 | 245/70 R 17.5 XTE 2+ TL 143/141J MI | C | B |  | 67 dB |
| 17.5 | 245/70 R 17.5 XZE 2 TL 136/134M MI | D | B |  | 68 dB |
| 17.5 | 245/70 R 17.5 MULTI™ D TL 136/134M MI | D | C |  | 69 dB |
| 17.5 | 265/70 R 17.5 XZE 1 TL 138/136M MI | D | B |  | 68 dB |
| 17.5 | 265/70 R 17.5 XDE 1 TL 138/136M MI | D | C |  | 73 dB |
| 17.5 | 205/75 R 17.5 XDE 2 TL 124/122M MI | E | C |  | 74 dB |
| 17.5 | 205/75 R 17.5 XZE 2 TL 124/122M MI | E | C |  | 68 dB |
| 17.5 | 215/75 R 17.5 XTE 2+ TL 135/133J MI | D | B |  | 67 dB |
| 17.5 | 215/75 R 17.5 XZE 2 TL 126/124M MI | D | C |  | 68 dB |
| 17.5 | 215/75 R 17.5 X® MULTI™ D TL 126/124M MI | D | C |  | 69 dB |
| 17.5 | 225/75 R 17.5 XZE 2 TL 129/127M MI | D | B |  | 68 dB |
| 17.5 | 225/75 R 17.5 X® MULTI™ D TL 129/127M MI | D | C |  | 69 dB |
| 17.5 | 235/75 R 17.5 XZE 2 TL 132/130M MI | D | B |  | 68 dB |
| 17.5 | 235/75 R 17.5 X® MULTI™ D TL 132/130M MI | D | C |  | 69 dB |
| 17.5 | 235/75 R 17.5 XTE 2+ TL 143/141J MI | C | B |  | 67 dB |
| 19.5 | 8 R 19.5 XZA TL LRF MI | D | C |  | 66 dB |
| 19.5 | 255/60 R 19.5 X® MAXITRAILER™ TL 143/141J MI | C | B |  | 67 dB |

LABELLING CLASSIFICATIONS

| RIM DIAMETER | PATTERN AND SIZE |  |  |  |
|---|---|---|---|---|
|  | | | | |
| 19.5 | 225/70 R 19.5 XZE TL LRF | D | B |  66 dB |
| 19.5 | 245/70 R 19.5 XDE 2+ TL 136/134M MI | E | C |  74 dB |
| 19.5 | 245/70 R 19.5 XTE 2 TL 141/140J MI | C | B |  67 dB |
| 19.5 | 245/70 R 19.5 XZE 2+ TL 136/134M MI | D | B |  68 dB |
| 19.5 | 265/70 R 19.5 XDE 2+ TL 140/138M MI | E | C |  74 dB |
| 19.5 | 265/70 R 19.5 XZE 2+ TL 140/138M MI | D | B |  68 dB |
| 19.5 | 265/70 R 19.5 XTE 2 TL 143/141J MI | D | B |  69 dB |
| 19.5 | 285/70 R 19.5 XTE 2 TL 150/148J MI | C | B |  69 dB |
| 19.5 | 285/70 R 19.5 XZE 2+ TL 144/142M MI | D | B |  68 dB |
| 19.5 | 285/70 R 19.5 XDE 2+ TL 144/142M MI | D | C |  74 dB |
| 19.5 | 305/70 R 19.5 XZE 2+ TL 147/145M MI | D | B |  68 dB |
| 19.5 | 305/70 R 19.5 XDE 2+ TL 147/145M MI | E | C |  74 dB |
| 20 | 8.25 R 20 XZE 133/131K MI | D | B |  69 dB |
| 22.5 | 10 R 22.5 XZA TL 144/142L MI | D | B |  67 dB |
| 22.5 | 11 R 22.5 XZE 2+ TL 148/145L MI | D | C |  68 dB |
| 22.5 | 11 R 22.5 X® MULTI™ D TL 148/145L MI | E | C |  75 dB |
| 22.5 | 11 R 22.5 XTE 2 TL 142/142J MI | D | B |  67 dB |
| 22.5 | 12 R 22.5 XZE 2+ TL 152/148L MI | D | C |  68 dB |
| 22.5 | 12 R 22.5 XDE 2+ TL 152/148L MI | In process | In process | In process |
| 22.5 | 455/45 R 22.5 X® ONE™ MAXITRAILER™ + TL 160J MI | C | B |  67 dB |
| 22.5 | 385/55 R 22.5 XFN 2 AS TL 160K MI | C | B |  72 dB |
| 22.5 | 385/55 R 22.5 X® MULTI™ T TL 160K MI | B | B |  69 dB |
| 22.5 | 295/60 R 22.5 X® MULTIWAY™ XD TL 150/147K MI | E | C |  76 dB |
| 22.5 | 315/60 R 22.5 X® MULTIWAY™ XD TL 152/148L MI | F | C |  76 dB |
| 22.5 | 385/65 R 22.5 XTE 3 TL 160J MI | B | B |  69 dB |
| 22.5 | 385/65 R 22.5 X® MULTI™ T TL 158L MI | B | B |  69 dB |
| 22.5 | 385/65 R 22.5 X® MULTIWAY™ HD XZE TL 164K MI | C | B |  69 dB |
| 22.5 | 385/65 R 22.5 XFN 2 AS TL 158L MI | D | C |  72 dB |
| 22.5 | 385/65 R 22.5 XF 2 TL 158L MI | C | B |  68 dB |
| 22.5 | 385/65 R 22.5 XF 2 ANTISPLASH TL 158L MI | C | B |  68 dB |

| RIM DIAMETER | PATTERN AND SIZE |  |  |  | |
|-----------------|---|---|--|---|-------|
| X MULTI™ | | | | | |
| 22.5 | 385/65 R 22.5 X® MULTI™ F TL 158L MI | C | B |  | 69 dB |
| 22.5 | 425/65 R 22.5 XTE 2 TL 165K MI | C | B |  | 69 dB |
| 22.5 | 445/65 R 22.5 XTE 2 TL 169K MI | C | B |  | 69 dB |
| 22.5 | 275/70 R 22.5 XZE 2+ TL 148/145M MI | D | B |  | 68 dB |
| 22.5 | 275/70 R 22.5 XDE 2+ TL 148/145M MI | E | C |  | 74 dB |
| 22.5 | 275/70 R 22.5 XDW ICE GRIP TL 148/145L MI | E | C |  | 72 dB |
| 22.5 | 305/70 R 22.5 XZE 2+ TL 152/148L MI | D | B |  | 68 dB |
| 22.5 | 305/70 R 22.5 XDE 2+ TL 152/148L MI | E | C |  | 74 dB |
| 22.5 | 315/70 R 22.5 X® MULTIWAY™ 3D XDE TL 154/150L MI | D | C |  | 75 dB |
| 22.5 | 315/70 R 22.5 XFN 2 AS TL 154L MI | D | C |  | 72 dB |
| 22.5 | 315/70 R 22.5 X® MULTIWAY™ 3D XZE TL 156/150L VG MI | C | B |  | 72 dB |
| 22.5 | 315/70 R 22.5 X® MULTIWAY™ 3D XDE TL 154/150L MI | D | C |  | 75 dB |
| 22.5 | 315/70 R 22.5 X® MULTIWAY™ 3D XZE TL 154/150L MI | C | B |  | 72 dB |
| 22.5 | 315/70 R 22.5 XDW ICE GRIP TL 154/150L MI | D | C |  | 72 dB |
| 22.5 | 275/80 R 22.5 XZE 2+ TL 149/146L MI | D | B |  | 68 dB |
| 22.5 | 295/80 R 22.5 XDW ICE GRIP TL 152/149L MI | E | C |  | 72 dB |
| 22.5 | 295/80 R 22.5 XFN TL 152/148K MI | D | C |  | 73 dB |
| 22.5 | 295/80 R 22.5 X® MULTIWAY™ 3D XZE TL 152/148M MI | C | B |  | 72 dB |
| 22.5 | 295/80 R 22.5 X® MULTIWAY™ 3D XDE TL 152/148L MI | D | C |  | 75 dB |
| 22.5 | 315/80 R 22.5 XDW ICE GRIP TL 156/150L MI | E | C |  | 72 dB |
| 22.5 | 315/80 R 22.5 X® MULTIWAY™ 3D XDE TL 156/150L MI | D | C |  | 75 dB |
| 22.5 | 315/80 R 22.5 X® MULTIWAY™ 3D XZE TL 156/150L MI | C | B |  | 72 dB |
| X WORKS™ | | | | | |
| 17.5 | 9.5 R 17.5 XZY TL 129/127L MI | D | C |  | 69 dB |
| 19.5 | 445/65 R 19.5 XZY TL 165K MI | D | B |  | 71 dB |
| 19.5 | 265/70 R 19.5 XTY 2 TL 143/141J MI | D | B |  | 70 dB |
| 20 | 12.00 R 20 XZY 2 154/150K MI | D | B |  | 69 dB |
| 22.5 | 10 R 22.5 XZY TL 144/142K MI | D | B |  | 69 dB |
| 22.5 | 11 R 22.5 XZY 2 TL 148/145K MI | D | B |  | 69 dB |
| 22.5 | 11 R 22.5 XDY 3 TL 148/145K MI | E | B |  | 71 dB |

LABELLING CLASSIFICATIONS

| RIM DIAMETER | PATTERN AND SIZE |  |  |  | |
|---|---|---|---|---|-------|
| X WORKS™ | | | | | |
| 22.5 | 12 R 22.5 XDY 3 TL 152/148K MI | E | B |  | 71 dB |
| 22.5 | 12 R 22.5 XZY 2 TL 152/148K MI | D | B |  | 69 dB |
| 22.5 | 13 R 22.5 X® WORKS™ XDY TL 156/150K MI | D | B |  | 73 dB |
| 22.5 | 13 R 22.5 X® WORKS™ XZY TL 154/150K MI | D | B |  | 68 dB |
| 22.5 | 385/65 R 22.5 XZY 3 TL 160K MI | C | B |  | 73 dB |
| 22.5 | 425/65 R 22.5 XZY 3 TL 165K MI | C | B |  | 73 dB |
| 22.5 | 445/65 R 22.5 XZY 3 TL 169K MI | D | B |  | 73 dB |
| 22.5 | 275/70 R 22.5 XTY 2 TL 148/145J MI | D | B |  | 70 dB |
| 22.5 | 295/80 R 22.5 XZY 2 TL 152/148K MI | D | B |  | 69 dB |
| 22.5 | 295/80 R 22.5 XDY + PIL TL 152/148K MI | E | B |  | 74 dB |
| 22.5 | 315/80 R 22.5 X® WORKS™ XZY TL 156/150K MI | C | B |  | 68 dB |
| 22.5 | 315/80 R 22.5 X® WORKS™ XDY TL 156/150K MI | D | B |  | 73 dB |
| X FORCE™ | | | | | |
| 20 | 275/80 R 20 XZL TL 128K MPT MI | F | B |  | 73 dB |
| Other CAI are not concerned by the european labelling (professional off-road) | | | | | |
| X INCITY™ | | | | | |
| 19.5 | 305/70 R 19.5 XZU TL 148/145J MI | D | B |  | 66 dB |
| 22.5 | 11 R 22.5 XZU 3 TL 148/145J MI | E | C |  | 71 dB |
| 22.5 | 275/70 R 22.5 X® INCITY™ XZU TL 148/145J MI | D | B |  | 69 dB |
| 22.5 | 275/70 R 22.5 X® INCITY™ HL Z TL 150/145J MI | D | C |  | 70 dB |
| 22.5 | 275/70 R 22.5 X® INCITY™ XZU 3 TL 148/145J MI | E | B |  | 71 dB |
| 22.5 | 305/70 R 22.5 XZU 2 T TL 150/147J MI | D | C |  | 72 dB |
| 22.5 | 295/80 R 22.5 X® INCITY™ XZU 3 TL 152/148J MI | E | C |  | 71 dB |
| X COACH™ | | | | | |
| 22.5 | 295/80 R 22.5 X® COACH™ XD TL 152/148M MI | E | C |  | 72 dB |
| 22.5 | 295/80 R 22.5 X® COACH™ HL Z TL 154/149M MI | C | B |  | 69 dB |

TECHNICAL SPECIFICATIONS

Rim diameter 9-16 inches

| DIMENSION | 6.00 R 9 | 7.00 R 12 | 205/80 R 15 | 7.50 R 15 | 8.25 R 15 | 7.00 R 16 | 7.50 R 16 | | 225/75 R 16 | 8.25 R 16 |
|---|----------|-----------|-------------|------------|------------|-----------|-------------------|-------------------|-------------|------------------|
| TREAD PATTERN | XTA | XTA | XTA | XTA | XTA | AGILIS LT | XZA 1 | XZY* | XCA | AGILIS LT |
| Type | TT | TT | TT | TT | TT | TL | TL | TL | TL | TL |
| Use Category | | | | | | M+S | | | | M+S |
| PR (Ply Rating) | 10 | 12 | | | | 12 | | 14 | | 16 |
| Load/speed index | 109/108F | 125/123F | 124/122J | 135/133G | 143/141G | 117/116L | 122/121L | 122/121L | 121/120N | 128/126K |
| Unique point (1) | 95 /95 J | 122/122J | | 133/132J | 141/140J | | | | 122/121M | |
| | 1380 | 3000 | | 4120 | 5150 | | | | 3000 | |
| Unique Point Load (kg) per axle (single) | | | | | | | | | | |
| Unique Point Load (kg) per axle (twinned) | 2760 | 6000 | | 8000 | 10000 | | | | 5800 | |
| | 8.00 | 8.0 | | 8.50 | 8.50 | | | | 5.50 | |
| Pressure (PSI) per load (unique point) | | | | | | | | | | |
| Laden section width (mm) | 179 | 212 | 222 | 233 | 259 | 217 | 228 | 228 | 243 | 256 |
| Free section width S (mm) | 163 | 194 | 201 | 210 | 232 | 195 | 208 | 208 | 222,5 | 232 |
| Free diameter D (mm) | 530 | 661 | 716 | 769 | 834 | 782 | 804 | 808 | 757 | 858 |
| Static laden radius R' (mm) | 244 | 304 | 328 | 354 | 381 | 365 | 377 | 379 | 348 | 400 |
| Rolling circumference (mm) | 1610 | 2010 | 2160 | 2340 | 2547 | 2388 | 2460 | 2480 | 2300 | 2619 |
| Minimum dual spacing E (mm) | 185 | 220 | 230 | 238 | 262 | 221 | 236 | 236 | 252 | 263 |
| Michelin preferred rim | 4,00E | 5,00S | 5.5 | 6.0 | 6.5 | 5,50F | 6,00G | 6,00G | 6J | 6,50H |
| | 9 F | 12 H | 15/16 J | 15/16 J | 15 K | 16J | 16J | 16J | | 16J |
| Tube | | | | | | | | | | |
| Flap | 110-9 LD | 125-12 LD | 15X6.00 MI | 15X6.00 MI | 15X6.00 MI | 170-16L | 170-16L / 16x6.00 | 170-16L / 16x6.00 | | 170-16L / 16X6.5 |
| Seal | | | | | | | Jt 1786 | | | |

Pressure tables (PSI - bar) according to the maximum axle load (kg)

| DIMENSION (Load indexes, if needed) | | 6.00 R 9 109/108 | | 7.00 R 12 125/123 | | 205/80 R 15 124/122 | | 7.50 R 15 135/133 | | 8.25 R 15 143/141 | | 7.00 R 16 117/116 | | 7.50 R 16 122/121 | | 225/75 R 16 121/120 | | 225/75 R 16 128/126 | |
|--|-----|---------------------|---------|----------------------|---------|------------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|------------------------|---------|------------------------|---------|
| bars | psi | Single | Twinned | Single | Twinned | Single | Twinned | Single | Twinned | Single | Twinned | Single | Twinned | Single | Twinned | Single | Twinned | Single | Twinned |
| 3.00 | 44 | | | | | | | | | | | 1430 | 2780 | | | | | | |
| 3.50 | 51 | | | | | | | | | | | 1620 | 3150 | | | | | | |
| 4.00 | 58 | | | | | | | | | | | 1810 | 3520 | 1840 | 3550 | | | 2280 | 4310 |
| 4.50 | 65 | | | | | 2100 | 3940 | | | | | 2000 | 3890 | 2030 | 3930 | | | 2520 | 4760 |
| 5.00 | 73 | 1350 | 2630 | 2170 | 4070 | 2300 | 4310 | | | | | 2190 | 4260 | 2230 | 4300 | 2310 | 4540 | 2760 | 5210 |
| 5.50 | 80 | 1470 | 2860 | 2360 | 4430 | 2500 | 4690 | 2950 | 5570 | 3680 | 6960 | 2380 | 4630 | 2420 | 4680 | 2900 | 4980 | 3000 | 5670 |
| 6.00 | 87 | 1590 | 3090 | 2550 | 4780 | 2700 | 5060 | 3180 | 6010 | 3980 | 7520 | 2570 | 5000 | 2610 | 5050 | 2780 | 5400 | 3240 | 6120 |
| 6.50 | 94 | 1710 | 3310 | 2730 | 5140 | 2900 | 5440 | 3420 | 6460 | 4270 | 8070 | | | 2810 | 5430 | | | 3480 | 6570 |
| 7.00 | 102 | 1820 | 3540 | 2920 | 5490 | 3100 | 5810 | 3650 | 6900 | 4570 | 8630 | | | 3000 | 5800 | | | | |
| 7.50 | 109 | 1940 | 3770 | 3110 | 5850 | | | 3890 | 7350 | 4860 | 9190 | | | | | | | | |
| 8.00 | 116 | 2060 | 4000 | 3300 | 6200 | | | 4120 | 7790 | 5160 | 9740 | | | | | | | | |
| 8.50 | 123 | | | | | | | 4360 | 8240 | 5450 | 10300 | | | | | | | | |
| 9.00 | 131 | | | | | | | | | | | | | | | | | | |

These values are for guidance only and under no circumstances may be used for judicial or legal motives.

(1) Unique point: Provides additional load/speed operating conditions, in order to supply particular requirements. The indicated variations in load with respect to speed do not apply to the unique point.

(2) From Michelin, measured values using Michelin preferred rim.

Nominal load in kg
(3) Flaps authorised by Michelin.

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TECHNICAL SPECIFICATIONS

Rim diameter 20-24 inches

| DIMENSION | 8.25 R 20 | 9.00 R 20 | 10.00 R 20 | 11.00 R 20 | 12.00 R 20 | | | 365/80 R 20 | 385/95 R 20 | 12.00 R 24 | | | 325/95 R 24 | |
|-------------------------|---|----------------------|-------------------------|-------------------------|---------------------|----------|----------|-------------|-------------|--------------|--------------|--------------|--------------|--------------|
| TREAD PATTERN | XZE | XZY | XZE | XZE | XZE 2 | XZY 2 | XDY | XTE 2 | XT4 | XZE | XZY | XDY | X® WORKS™ XZ | X® WORKS™ XD |
| Type | TT | TT | TT | TT | TT | TL | TL | TL | TL | TT | TT | TT | TL | TL |
| Use Category | | | | | | | | | | | | | M+S | M+S |
| PR (Ply Rating) | | 14 | 16 | 16 | 18 | | 18 | | | 18 | 18 | 18 | | |
| Load/speed index | 133/131K | 140/137K | 146/143K | 150/146K | 154/150K | 154/150K | 154/150K | 160K | 164/160G | 160/156K | 156/153K | 156/153G | 162/160K | 162/160K |
| Unique point (1) | 133/131L | | 146/143L | | | 156/150G | 156/150G | | | | 160/156G | | | |
| | Unique Point Load (kg) per axle (single) | | 6000 | | | 8000 | 8000 | | | | 9000 | | | |
| | Unique Point Load (kg) per axle (twinned) | | 10900 | | | 13400 | 13400 | | | | 16000 | | | |
| | Pressure (PSI) per load (unique point) | | 7.75 | | | 8.50 | 8.50 | | | | 7.50 | | | |
| | Laden section width (mm) | 286 | 307 | 326 | 347 | 348 | 342 | 397 | 428 | 346 | 342 | 347 | 347 | 348 |
| Michelin dimensions (2) | Free section width S (mm) | 258 | 278 | 296 | 315 | 315 | 312 | 368 | 383 | 316 | 313 | 314 | 311 | 314 |
| | Free diameter D (mm) | 962 | 1016 | 1050 | 1081 | 1117 | 1134 | 1102 | 1246 | 1209 | 1222 | 1230 | 1223 | 1230 |
| | Static laden radius R' (mm) | 451 | 475 | 488 | 502 | 520 | 529 | 510 | 571 | 562 | 568 | 572 | 566 | 570 |
| | Rolling circumference (mm) | 2950 | 3110 | 3210 | 3300 | 3410 | 3470 | 3360 | 3784 | 3690 | 3730 | 3760 | 3747 | 3760 |
| | Minimum dual spacing E (mm) | 263 | 292 | 315 | 335 | 356 | 353 | | 433 | 358 | 354 | 355 | 352 | 355 |
| Michelin preferred rim | 6.5 | 7.0 | 7.5 | 8.0 | 8.5 | 8.5 | 8.5 | 10.00V | 10.00W | 8.5 | 8.50 | 8.50 | 8.5 | 8.5 |
| Tube | 20 K | 20 M | 20 N | 20 P | 20 Q | | | | | 24 Q | 24Q | 24Q | | |
| Flap | 20X5.50 - 20X7.50 MI | 20X5.50 - 20X7.50 MI | 20X7.50 MI - 20X8.50 MI | 20X7.50 MI - 20X8.50 MI | 220-20L / 20X8.50MI | | | | | 24/25X8.50MI | 24/25X8.50MI | 24/25X8.50MI | | |
| Seal | | | | | | Jt 1443 | Jt 1443 | | Jt1443 | | | | | |

| DIMENSION (Load indexes, if needed) | | 8.25 R 20 | | 9.00 R 20 | | 10.00 R 20 | | 11.00 R 20 | | 12.00 R 20 | | 365/80 R 20 | | 385/95 R 20 | | 12.00 R 24 160/156 | | 12.00 R 24 156/153 | | 325/95 R 24 | |
|---|-----|-----------|---------|-----------|---------|------------|---------|------------|---------|------------|---------|-------------|---------|-------------|---------|-----------------------|---------|--------------------|---------|-------------|---------|
| | | Single | Twinned | Single | Twinned | Single | Twinned | Single | Twinned | Single | Twinned | Single | Twinned | Single | Twinned | Single | Twinned | Single | Twinned | Single | Twinned |
| bars | psi | | | | | | | | | | | | | | | | | | | | |
| 3.00 | 44 | | | | | | | 3250 | 6100 | | | | | | | | | | | | |
| 3.50 | 51 | 2420 | 4570 | | | | | 3670 | 6670 | | | | | | | | | | | | |
| 4.00 | 58 | 2700 | 5110 | 3060 | 5640 | | | 4000 | 7200 | | | | | | | | | | | | |
| 4.50 | 65 | 2980 | 5650 | 3390 | 6230 | | | 4400 | 7800 | | | | | 6360 | 11450 | | | | | | |
| 5.00 | 73 | 3270 | 6190 | 3710 | 6830 | 4060 | 7370 | 4770 | 8540 | | | | | 6970 | 12550 | | | | | | |
| 5.50 | 80 | 3550 | 6720 | 4030 | 7420 | 4410 | 8010 | 5140 | 9290 | | | | | 7580 | 13640 | | | | | | |
| 6.00 | 87 | 3840 | 7260 | 4350 | 8010 | 4760 | 8660 | 5510 | 10030 | | | 6230 | | 8180 | 14730 | 6570 | 11680 | | | 6930 | 13140 |
| 6.50 | 94 | 4120 | 7800 | 4680 | 8610 | 5120 | 9300 | 5900 | 10720 | | | 6690 | | 8790 | 15820 | 7050 | 12540 | | | 7450 | 14110 |
| 7.00 | 102 | | | 5000 | 9200 | 5470 | 9940 | 6300 | 11360 | | | 7150 | | 9390 | 16910 | 7540 | 13410 | | | 7960 | 15080 |
| 7.50 | 109 | | | | | 5820 | 10580 | 6700 | 12000 | | | 7620 | | 10000 | 18000 | 8030 | 14270 | | | 8470 | 16050 |
| 8.00 | 116 | | | | | | | | | | | 8080 | | | | 8510 | 15140 | | | 8990 | 17030 |
| 8.50 | 123 | | | | | | | | | | | 8540 | | | | 9000 | 16000 | | | 9500 | 18000 |
| 9.00 | 131 | | | | | | | | | | | 9000 | | | | | | | | | |

Pressure tables (PSI - bar) according to the maximum axle load (kg)

These values are for guidance only and under no circumstances may be used for judicial or legal motives.

(1) Unique point: Provides additional load/speed operating conditions, in order to supply particular requirements. The indicated variations in load with respect to speed do not apply to the unique point.

(2) From Michelin, measured values using Michelin preferred rim.

Nominal load in kg
(3) Flaps authorised by Michelin.

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Rim diameter 17.5 inches

| DIMENSION | | 7 R 17.5 | 8 R 17.5 | 8.5 R 17.5 | | 9.5 R 17.5 | | | 10 R 17.5 | 205/65 R 17.5 | | | |
|-----------------------------|---|---------------------------|----------|------------|----------|------------|----------|----------|-----------|----------------|----------|-----------------|-----|
| TREAD PATTERN | | XCA | XZA | XZA | XZT | XZA | XZT | XZY | XTE 2 | XTA2 + ENERGY™ | XTE 2 | X® MaxiTrailer™ | |
| Unique point (1) | Type | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL | |
| | Use Category | | | | M+S | | M+S | | | | | | |
| | PR (Ply Rating) | 8 | 10 | | | | | | | | | | |
| | Load/speed index | 108/107L | 117/116L | 121/120M | 121/120L | 129/127L | 129/127L | 129/127L | 143/141J | 134/132L | 127/125J | 129/127J | |
| | Unique point (1) | | | | | | | | | 129/129F | 127/127F | 130F | |
| | Unique Point Load (kg) per axle (single) | | | | | | | | | 3700 | 3500 | 3800 | |
| | Unique Point Load (kg) per axle (twinned) | | | | | | | | | 7400 | 7000 | | |
| | Pressure (PSI) per load (unique point) | | | | | | | | | 9.00 | 9.00 | 9.00 | |
| | Michelin dimensions (2) | Laden section width (mm) | 204 | 213 | 221 | 222 | 254 | 253 | 250 | 257 | 266 | 221 | 224 |
| | | Free section width S (mm) | 181 | 196 | 201 | 200 | 232 | 231 | 228 | 230 | 241 | 205,5 | 208 |
| Free diameter D (mm) | | 747 | 785 | 802 | 806 | 838 | 844 | 840 | 846 | 861 | 705 | 711 | |
| Static laden radius R' (mm) | | 339 | 367 | 373 | 374 | 387 | 391 | 388 | 386 | 397 | 330 | 331 | |
| Rolling circumference (mm) | | 2260 | 2400 | 2450 | 2459 | 2550 | 2572 | 2559 | 2560 | 2620 | 2160 | 3177 | |
| Minimum dual spacing E (mm) | | 205 | 222 | 228 | 227 | 263 | 262 | 258 | 260 | 273 | 232 | 235 | |
| Michelin preferred rim | | 5.25 | 5.25 | 5.25 | 5.25 | 6.00 | 6.00 | 6.00 | 6.00 | 6.75 | 6.00 | 6.00 | |

Pressure tables (PSI - bar) according to the maximum axle load (kg)

| DIMENSION (Load indexes, if needed) | | 7 R 17.5 108/107 | | 8 R 17.5 117/116 | | 8.5 R 17.5 121/120 | | 9.5 R 17.5 129/127 | | 9.5 R 17.5 143/141 | | 10 R 17.5 134/132 L | | 205/65 R 17.5 127/125 | | 205/65 R 17.5 129/127 | |
|--|-----|---------------------|---------|---------------------|---------|-----------------------|---------|-----------------------|---------|-----------------------|---------|------------------------|---------|--------------------------|---------|--------------------------|---------|
| bars | psi | Single | Twinned | Single | Twinned | Single | Twinned | Single | Twinned | Single | Twinned | Single | Twinned | Single | Twinned | Single | Twinned |
| 3.00 | 44 | 1430 | 2790 | 1430 | 2780 | | | | | | | | | | | | |
| 3.50 | 51 | 1620 | 3160 | 1620 | 3150 | 1760 | 3400 | | | | | | | | | | |
| 4.00 | 58 | 1810 | 3530 | 1810 | 3520 | 1970 | 3800 | 2270 | 4290 | | | | | | | | |
| 4.50 | 65 | 2000 | 3900 | 2000 | 3890 | 2180 | 4200 | 2510 | 4740 | | | 2700 | 5090 | | | | |
| 5.00 | 73 | | | 2190 | 4260 | 2380 | 4600 | 2750 | 5190 | | | 2960 | 5580 | | | | |
| 5.50 | 80 | | | 2380 | 4630 | 2590 | 5000 | 2980 | 5650 | 3680 | 6960 | 3210 | 6060 | | | | |
| 6.00 | 87 | | | 2570 | 5000 | 2800 | 5400 | 3220 | 6100 | 3980 | 7520 | 3470 | 6550 | 2430 | 4550 | 2560 | 4850 |
| 6.50 | 94 | | | | | | | 3460 | 6550 | 4270 | 8070 | 3730 | 7030 | 2610 | 4890 | 2750 | 5210 |
| 7.00 | 102 | | | | | | | 3700 | 7000 | 4570 | 8630 | 3980 | 7520 | 2790 | 5230 | 2940 | 5560 |
| 7.50 | 109 | | | | | | | | | 4860 | 9190 | 4240 | 8000 | 2960 | 5570 | 3130 | 5920 |
| 8.00 | 116 | | | | | | | | | 5160 | 9740 | | | 3140 | 5920 | 3320 | 6280 |
| 8.50 | 123 | | | | | | | | | 5450 | 10300 | | | 3320 | 6260 | 3510 | 6640 |
| 9.00 | 131 | | | | | | | | | | | | | 3500 | 6600 | 3700 | 7000 |

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(1) Unique point: Provides additional load/speed operating conditions, in order to supply particular requirements. The indicated variations in load with respect to speed do not apply to the unique point.

(2) From Michelin, measured values using Michelin preferred rim.

Nominal load in kg
(3) Flaps authorised by Michelin.

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TECHNICAL SPECIFICATIONS

Rim diameter 17.5 inches (con't)

| DIMENSION | | 205/75 R 17.5 | | | | 215/75 R 17.5 | | | | 225/75 R 17.5 | | | |
|--|---|---------------|----------|----------|----------|---------------|----------|-----------------|-----------------|---------------|----------|----------|----------|
| TREAD PATTERN | | XZA 2 | XZE 2 | XDE 2 | XZA 2 | XZE 2 | XDE 2 | XLine Energy™ T | XTA 2 + ENERGY™ | XTE 2 + | XZA 2 | XZE 2 | XDE 2 |
| | Type | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL |
| | Use Category | M+S | | | | M+S | | | | M+S | | | |
| | PR (Ply Rating) | | | | | | | | | | | | |
| | Load/speed index | 124/122M | 124/122M | 124/122M | 126/124M | 126/124M | 126/124M | 135/133J | 135/133J | 135/133J | 129/127M | 129/127M | 129/127M |
| Unique point (1) | Unique point (1) | | | | | | | | | | | | |
| | Unique Point Load (kg) per axle (single) | | | | | | | | | | | | |
| | Unique Point Load (kg) per axle (twinned) | | | | | | | | | | | | |
| Pressure (PSI) per load (unique point) | | | | | | | | | | | | | |
| Michelin dimensions (2) | Laden section width (mm) | 230 | 230 | 231 | 238 | 238 | 238 | 238 | 235 | 236 | 255 | 255 | 255 |
| | Free section width S (mm) | 209 | 210 | 210 | 216 | 217 | 216 | 215 | 215 | 215 | 233 | 233 | 232 |
| | Free diameter D (mm) | 759 | 763 | 763 | 773 | 774 | 773 | 772 | 773 | 777 | 793 | 792 | 798 |
| | Static laden radius R' (mm) | 351 | 353 | 353 | 357 | 357 | 357 | 357 | 358 | 359 | 367 | 367 | 369 |
| | Rolling circumference (mm) | 2317 | 2310 | 2312 | 2360 | 2353 | 2360 | 2368 | 2350 | 2370 | 2420 | 2414 | 2415 |
| Minimum dual spacing E (mm) | | 239 | 238 | 238 | 245 | 246 | 245 | 243 | 243 | 243 | 264 | 264 | 263 |
| Michelin preferred rim | | 6.00 | 6.00 | 6.00 | 6.00 | 6.00 | 6.00 | 6.00 | 6.00 | 6.00 | 6.75 | 6.75 | 6.75 |


Pressure tables (PSI - bar) according to the maximum axle load (kg)

| DIMENSION (Load indexes, if needed) | | 205/75 R 17.5 124/122 | | 215/75 R 17.5 126/124 | | 215/75 R 17.5 135/133 | | 225/75 R 17.5 129/127 | |
|--|-----|--------------------------|---------|-----------------------|---------|-----------------------|---------|--------------------------|---------|
| bars | psi | Single | Twinned | Single | Twinned | Single | Twinned | Single | Twinned |
| 3.00 | 44 | | | | | | | | |
| 3.50 | 51 | 1880 | 3520 | 1990 | 3750 | | | | |
| 4.00 | 58 | 2100 | 3930 | 2230 | 4190 | | | 2270 | 4290 |
| 4.50 | 65 | 2320 | 4340 | 2460 | 4630 | | | 2510 | 4740 |
| 5.00 | 73 | 2540 | 4760 | 2700 | 5080 | | | 2750 | 5190 |
| 5.50 | 80 | 2760 | 5170 | 2930 | 5520 | 2950 | 5570 | 2980 | 5650 |
| 6.00 | 87 | 2980 | 5590 | 3170 | 5960 | 3180 | 6010 | 3220 | 6100 |
| 6.50 | 94 | 3200 | 6000 | 3400 | 6400 | 3420 | 6460 | 3460 | 6550 |
| 7.00 | 102 | | | | | 3650 | 6900 | 3700 | 7000 |
| 7.50 | 109 | | | | | 3890 | 7350 | | |
| 8.00 | 116 | | | | | 4120 | 7790 | | |
| 8.50 | 123 | | | | | 4360 | 8240 | | |
| 9.00 | 131 | | | | | | | | |

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(2) From Michelin, measured values using Michelin preferred rim.

 Nominal load in kg
(3) Flaps authorised by Michelin.

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Rim diameter 17.5 inches (con't)

[illegible]

Pressure tables (PSI - bar) according to the maximum axle load (kg)

| DIMENSION (Load indexes, if needed) | | 235/75 R 17.5 132/130 | | 235/75 R 17.5 143/141 | | 245/70 R 17.5 136/134 | | 245/70 R 17.5 143/141 | | 265/70 R 17.5 138/136 | |
|--|-----|-----------------------|---------|-----------------------|---------|-----------------------|---------|-----------------------|---------|-----------------------|---------|
| bars | psi | Single | Twinned | Single | Twinned | Single | Twinned | Single | Twinned | Single | Twinned |
| 3.00 | 44 | | | | | | | | | | |
| 3.50 | 51 | | | | | | | | | | |
| 4.00 | 58 | | | | | | | | | | |
| 4.50 | 65 | 2630 | 4990 | | | | | | | | |
| 5.00 | 73 | 2880 | 5460 | | | 2940 | 5570 | | | | |
| 5.50 | 80 | 3130 | 5940 | 3680 | 6960 | 3200 | 6060 | 3680 | 6960 | 3570 | 6600 |
| 6.00 | 87 | 3380 | 6410 | 3980 | 7520 | 3460 | 6540 | 3980 | 7520 | 3850 | 7120 |
| 6.50 | 94 | 3630 | 6890 | 4270 | 8070 | 3710 | 7030 | 4270 | 8070 | 4140 | 7650 |
| 7.00 | 102 | 3880 | 7360 | 4570 | 8630 | 3970 | 7510 | 4570 | 8630 | 4430 | 8180 |
| 7.50 | 109 | | | 4860 | 9190 | 4220 | 8000 | 4860 | 9190 | 4720 | 8960 |
| 8.00 | 116 | | | 5160 | 9740 | 4480 | 8480 | 5160 | 9740 | | |
| 8.50 | 123 | | | 5450 | 10300 | | | 5450 | 10300 | | |
| 9.00 | 131 | | | | | | | | | | |

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(2) From Michelin, measured values using Michelin preferred rim.

 Nominal load in kg
(3) Flaps authorised by Michelin.

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Pressure tables (PSI - bar) according to the maximum axle load (kg)

| DIMENSION (Load indexes, if needed) | | 245/70 R 19.5 136/134 | | 245/70 R 19.5 141/140 | | 255/60 R 19.5 143/141 | | 265/70 R 19.5 140/138 | | 265/70 R 19.5 143/141 | |
|--|-----|-----------------------|---------|-----------------------|---------|-----------------------|---------|-----------------------|---------|-----------------------|---------|
| bars | psi | Single | Twinned | Single | Twinned | Single | Twinned | Single | Twinned | Single | Twinned |
| 3.00 | 44 | | | | | | | | | | |
| 3.50 | 51 | | | | | | | | | | |
| 4.00 | 58 | | | | | | | | | | |
| 4.50 | 65 | | | | | | | | | | |
| 5.00 | 73 | 3030 | 5740 | | | | | 3380 | 6390 | | |
| 5.50 | 80 | 3290 | 6240 | 3480 | 6760 | | | 3670 | 6940 | 3680 | 6960 |
| 6.00 | 87 | 3560 | 6730 | 3760 | 7300 | 3770 | 7130 | 3970 | 7500 | 3980 | 7520 |
| 6.50 | 94 | 3820 | 7230 | 4040 | 7840 | 4050 | 7660 | 4260 | 8050 | 4270 | 8070 |
| 7.00 | 102 | 4080 | 7730 | 4310 | 8380 | 4330 | 8190 | 4550 | 8610 | 4570 | 8630 |
| 7.50 | 109 | 4350 | 8230 | 4590 | 8920 | 4610 | 8720 | 4850 | 9160 | 4860 | 9190 |
| 8.00 | 116 | | | 4870 | 9460 | 4890 | 9240 | | | 5160 | 9740 |
| 8.50 | 123 | | | 5150 | 10000 | 5170 | 9770 | | | 5450 | 10300 |
| 9.00 | 131 | | | | | 5450 | 10300 | | | | |

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Nominal load in kg
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TECHNICAL SPECIFICATIONS

Rim diameter 19.5 inches (con't)

| DIMENSION | | 285/70 R 19.5 | | | | | | 305/70 R 19.5 | | | | 425/55 R 19.5 | | 445/45 R 19.5 | | 445/65 R 19.5 | |
|-------------------------|--|---------------|----------|----------|---------------|----------|----------|---------------|----------|----------|-----|---------------|-------|-----------------|------|---------------|------|
| TREAD PATTERN | | XZE 2 + | XDE 2 + | TL | XTA 2 ENERGY™ | XTE 2 | XZE 2 + | TL | XDE 2 + | TL | XZU | XTA 2 ENERGY™ | TL | XTA 2 + ENERGY™ | TL | XTA 2 ENERGY™ | XZY |
| | Type | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL |
| | Use Category | | M+S | | | | | M+S | | | | | | | | M+S | |
| | PR (Ply Rating) | | | | | | | | | | | | | | | | 20 |
| Unique point (1) | Load/speed index | 144/142M | 144/142M | 150/148J | 150/148J | 150/148J | 147/145M | 147/145M | 147/145M | 148/145J | | 160J | | 160J | 160J | | 165K |
| | Unique point (1) | 145/143L | 145/143L | | | | 148/146L | 148/146L | 148/146L | | | | | | | | |
| | Unique Point | | | | | | | | | | | | | | | | |
| | Load (kg) per axle (single) | 5800 | 5800 | | | | 6300 | 6300 | 6300 | | | | | | | | |
| | Unique Point | | | | | | | | | | | | | | | | |
| Unique point (2) | Load (kg) per axle (twinned) | 10900 | 10900 | | | | 12000 | 12000 | 12000 | | | | | | | | |
| | Pressure (PSI) per load (unique point) | 8.00 | 8.00 | | | | 8.0 | 8.0 | 8.0 | | | | | | | | |
| | Laden section width (mm) | 301 | 300 | 309 | 317 | | 328 | 327 | 327 | 335 | | 439 | 463 | 456 | | 482 | |
| | Free section width S (mm) | 275 | 276 | 285 | 285 | | 301 | 301 | 301 | 307 | | 413 | 436 | 436 | | 451 | |
| | Free diameter D (mm) | 895 | 899 | 890 | 894 | | 924 | 931 | 931 | 925 | | 980 | 903 | 904 | | 1081 | |
| Michelin dimensions (2) | Static laden radius R' (mm) | 412 | 414 | 409 | 409 | | 423 | 428 | 428 | 426 | | 451 | 413 | 414 | | 495 | |
| | Rolling circumference (mm) | 2720 | 2740 | 2723 | 2732 | | 2800 | 2830 | 2830 | 2810 | | 2980 | 2761 | 2740 | | 3281 | |
| | Minimum dual spacing E (mm) | 311 | 310 | 323 | 323 | | 341 | 341 | 341 | 347 | | | | | | | |
| | Michelin preferred rim | 7.50 | 7.50 | 8.25 | 8.25 | | 8.25 | 8.25 | 8.25 | 8.25 | | 13.00 | 14.00 | 14.00 | | 14.00 | |

Pressure tables (PSI - bar) according to the maximum axle load (kg)

| DIMENSION (Load indexes, if needed) | | 285/70 R 19.5 | | 144/142 | | 285/70 R 19.5 | | 150/148 | | 305/70 R 19.5 | | 147/145 | | 305/70R 19.5 148/145 | | 425/55 R 19.5 160 | | 445/45 R 19.5 160 | | 445/65 R 19.5 165 | |
|--|-----|---------------|--|---------|--|---------------|--|---------|--|---------------|--|---------|--|-------------------------|--|----------------------|--|----------------------|--|----------------------|--|
| bars | psi | Single | | Twinned | | Single | | Twinned | | Single | | Twinned | | Single | | Single | | Single | | Single | |
| 3.00 | 44 | | | | | | | | | | | | | | | | | | | | |
| 3.50 | 51 | | | | | | | | | | | | | | | | | | | | |
| 4.00 | 58 | | | | | | | | | | | | | | | | | | | | |
| 4.50 | 65 | | | | | | | | | | | | | | | | | | | | |
| 5.00 | 73 | 3680 | | 6970 | | | | | | 4040 | | 7620 | | 4140 | | 7620 | | | | | |
| 5.50 | 80 | 4000 | | 7570 | | | | | | 4390 | | 8290 | | 4500 | | 8290 | | | | 6960 | |
| 6.00 | 87 | 4320 | | 8180 | | 4640 | | 8720 | | 4740 | | 8950 | | 4860 | | 8950 | | 6230 | | 7520 | |
| 6.50 | 94 | 4640 | | 8780 | | 4980 | | 9370 | | 5100 | | 9610 | | 5220 | | 9610 | | 6690 | | 8070 | |
| 7.00 | 102 | 4960 | | 9390 | | 5330 | | 10020 | | 5450 | | 10270 | | 5580 | | 10270 | | 7150 | | 8630 | |
| 7.50 | 109 | 5280 | | 9990 | | 5670 | | 10660 | | 5800 | | 10940 | | 5940 | | 10940 | | 7620 | | 9190 | |
| 8.00 | 116 | 5600 | | 10600 | | 6010 | | 11310 | | 6150 | | 11600 | | 6300 | | 11600 | | 8080 | | 9740 | |
| 8.50 | 123 | | | | | 6360 | | 11950 | | | | | | | | 8540 | | 8540 | | 10300 | |
| 9.00 | 131 | | | | | 6700 | | 12600 | | | | | | | | 9000 | | 9000 | | | |

These values are for guidance only and under no circumstances may be used for judicial or legal motives.

(1) Unique point: Provides additional load/speed operating conditions, in order to supply particular requirements. The indicated variations in load with respect to speed do not apply to the unique point.

(2) From Michelin, measured values using Michelin preferred rim.

(3) Flaps authorised by Michelin.
Nominal load in kg

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| DIMENSION (Load indexes, if needed) | | 9 R 22.5 133/131 | | 10 R 22.5 144/142 | | 11 R 22.5 148/145 | | 11 R 22.5 142/142 | |
|--|-----|---------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|
| bars | psi | Single | Twinned | Single | Twinned | Single | Twinned | Single | Twinned |
| 3.00 | 44 | | | | | | | | |
| 3.50 | 51 | 2420 | 4570 | | | | | | |
| 4.00 | 58 | 2700 | 5110 | | | | | | |
| 4.50 | 65 | 2980 | 5650 | | | | | | |
| 5.00 | 73 | 3270 | 6190 | 3680 | 6970 | 4140 | 7620 | 3480 | 6970 |
| 5.50 | 80 | 3550 | 6720 | 4000 | 7570 | 4500 | 8290 | 3790 | 7570 |
| 6.00 | 87 | 3840 | 7260 | 4320 | 8180 | 4860 | 8950 | 4090 | 8180 |
| 6.50 | 94 | 4120 | 7800 | 4640 | 8780 | 5220 | 9610 | 4390 | 8780 |
| 7.00 | 102 | | | 4960 | 9390 | 5580 | 10270 | 4690 | 9390 |
| 7.50 | 109 | | | 5280 | 9990 | 5940 | 10940 | 5000 | 9990 |
| 8.00 | 116 | | | 5600 | 10600 | 6300 | 11600 | 5300 | 10600 |
| 8.50 | 123 | | | | | | | | |
| 9.00 | 131 | | | | | | | | |

Pressure tables (PSI - bar) according to the maximum axle load (kg)

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(1) Unique point: Provides additional load/speed operating conditions, in order to supply particular requirements. The indicated variations in load with respect to speed do not apply to the unique point.

(2) From Michelin, measured values using Michelin preferred rim.

 Nominal load in kg
(3) Flaps authorised by Michelin.

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TECHNICAL SPECIFICATIONS

Rim diameter 22.5 inches

| DIMENSION | | 12 R 22.5 | | | | | | 13 R 22.5 | | | | | |
|--|---|-----------|----------|----------|--------------|----------|----------|-----------|----------|----------|---------------|----------|----------|
| TREAD PATTERN | | XZE 2 + | XDE 2 + | XZU 2T | XDW ICE GRIP | XZY 2 | XDY 3 | XZE 2 | XDE 2 | XZY 2 | X® WORKS™ XDY | XDY 3 | XZH 2R |
| | Type | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL |
| | Use Category | | M+S | | M+S | | M+S | | M+S | M+S | M+S | M+S | |
| | PR (Ply Rating) | 16 | 16 | 16 | 16 | 16 | 16 | 18 | 18 | 18 | 18 | 18 | 18 |
| | Load/speed index | 152/148L | 152/148L | 152/148J | 152/148L | 152/148K | 152/148K | 156/150L | 156/150L | 154/150K | 156/150K | 154/150K | 154/150G |
| Unique point (1) | Unique point (1) | | | 154/150E | | | | | | 156/150G | | 156G | 156/150F |
| | Unique Point Load (kg) per axle (single) | | | 7500 | | | | | | 8000 | | 8000 | 8000 |
| | Unique Point Load (kg) per axle (twinned) | | | 13400 | | | | | | 13400 | | | 13400 |
| Pressure (PSI) per load (unique point) | | | | 8.50 | | | | | | 8.50 | | 8.50 | 9.00 |
| Michelin dimensions (2) | Laden section width (mm) | 318 | 320 | 320 | 322 | 328 | 320 | 344 | 340 | 341 | 341 | 343 | 347 |
| | Free section width S (mm) | 287 | 288 | 289 | 288 | 291 | 290 | 310 | 308 | 309 | 308 | 310 | 317 |
| | Free diameter D (mm) | 1085 | 1094 | 1089 | 1094 | 1092 | 1097 | 1122 | 1132 | 1129 | 1130 | 1136 | 1135 |
| | Static laden radius R' (mm) | 504 | 510 | 506 | 508 | 507 | 510 | 519 | 525 | 524 | 525 | 527 | 528 |
| | Rolling circumference (mm) | 3310 | 3340 | 3324 | 3340 | 3330 | 3350 | 3420 | 3450 | 3445 | 3430 | 3465 | 3456 |
| | Minimum dual spacing E (mm) | 325 | 326 | 327 | 326 | 329 | 328 | 351 | 349 | 350 | 349 | 351 | 359 |
| Michelin preferred rim | | 8.25 | 8.25 | 8.25 | 8.25 | 8.25 | 8.25 | 9.00 | 9.00 | 9.00 | 9.75 | 9.00 | 9.00 |

| DIMENSION (Load indexes, if needed) | | 12 R 22.5 152/148 | | 12 R 22.5 152/148 XDW ICE GRIP | | 13 R 22.5 156/150 | | 13 R 22.5 154/150 | |
|--|-----|-------------------|---------|-----------------------------------|---------|-------------------|---------|-------------------|---------|
| bars | psi | Single | Twinned | Single | Twinned | Single | Twinned | Single | Twinned |
| 3.00 | 44 | | | | | | | | |
| 3.50 | 51 | | | | | | | | |
| 4.00 | 58 | | | | | | | | |
| 4.50 | 65 | | | | | | | | |
| 5.00 | 73 | | | 4270 | 7620 | | 8810 | 4930 | 8810 |
| 5.50 | 80 | 4800 | 8510 | 4640 | 8290 | | 9570 | 5360 | 9570 |
| 6.00 | 87 | 5180 | 9190 | 5010 | 8950 | | 10340 | 5790 | 10340 |
| 6.50 | 94 | 5560 | 9880 | 5390 | 9610 | 6270 | 11100 | 6210 | 11100 |
| 7.00 | 102 | 5950 | 10560 | 5760 | 10270 | 6700 | 11870 | 6640 | 11870 |
| 7.50 | 109 | 6330 | 11240 | 6130 | 10940 | 7140 | 12630 | 7070 | 12630 |
| 8.00 | 116 | 6720 | 11920 | 6500 | 11600 | 7570 | 13400 | 7500 | 13400 |
| 8.50 | 123 | 7100 | 12600 | | | 8000 | | | |
| 9.00 | 131 | | | | | | | | |

Pressure tables (PSI - bar) according to the maximum axle load (kg)

These values are for guidance only and under no circumstances may be used for judicial or legal motives.

(1) Unique point: Provides additional load/speed operating conditions, in order to supply particular requirements. The indicated variations in load with respect to speed do not apply to the unique point.

(2) From Michelin, measured values using Michelin preferred rim.

 Nominal load in kg
(3) Flaps authorised by Michelin.

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TECHNICAL SPECIFICATIONS

Rim diameter 22.5 inches

| DIMENSION | | 275/70 R 22.5 | | | | | | | | | | | | |
|---|--|---------------|---------------|-----------------|----------|----------|----------------|------------------|----------|-------------------------|--------------|----------|---------------|----------|
| TREAD PATTERN | | 255/70 R 22.5 | | | | | | | | | | | | |
| | | XZA | XZA 2 ENERGY™ | XDA 2 + ENERGY™ | XZE 2 + | XDE 2 + | X® INCITY™ XZU | X® INCITY™ XZU 3 | XZU + | X® INCITY™ ICE GRIP D * | XDW ICE GRIP | XJW4+ | XTA 2 ENERGY™ | XTY 2 |
| Type | | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL |
| Use Category | | | | M+S | | M+S | M+S | M+S | M+S | M+S | M+S | M+S | | M+S |
| PR (Ply Rating) | | | | | 18 | 16 | | | | | 16 | | | 16 |
| Load/speed index | | 140/137M | 148/145M | 148/145M | 148/145M | 148/145M | 148/145J | 148/145J | 148/145J | 148/145J | 148/145L | 148/145L | 152/148J | 148/145J |
| Unique point (1) | | 140/140L | | | | | 152/148E | 152/148E | 152/148E | 152/148E | | | | |
| Unique Point Load (kg) per axle (single) | | 5000 | | | | | 7100 | 7100 | 7100 | | | | | |
| Unique Point Load (kg) per axle (twinned) | | 10000 | | | | | 12600 | 12600 | 12600 | | | | | |
| Pressure (PSI) per load (unique point) | | 8.50 | | | | | 9.00 | 9.00 | 9.00 | | | | | |
| Laden section width (mm) | | 271 | 301 | 300 | 299 | 299 | 301 | 303 | 302 | | 299 | 298 | 298 | 298 |
| Free section width S (mm) | | 248 | 277 | 277 | 276 | 275 | 278 | 278 | 279 | | 275.5 | 276 | 271 | 276 |
| Free diameter D (mm) | | 930 | 966 | 971 | 966 | 973 | 967 | 971 | 971 | | 970 | 969 | 954 | 970 |
| Static laden radius R' (mm) | | 433 | 448 | 452 | 448 | 454 | 450 | 452 | 451 | | 452 | 450 | 440 | 450 |
| Rolling circumference (mm) | | 2841 | 2950 | 2963 | 2950 | 2970 | 2950 | 2951 | 2956 | | 2970 | 2960 | 2924 | 2960 |
| Minimum dual spacing E (mm) | | 281 | 314 | 314 | 312 | 311 | 315 | 315 | 316 | | 311 | 312 | 307 | 312 |
| Michelin preferred rim | | 6.75 | 7.50 | 7.50 | 7.50 | 7.50 | 7.50 | 7.50 | 7.50 | | 7.50 | 7.50 | 7.50 | 7.50 |

| DIMENSION (Load indexes, if needed) | | | 255/70 R 22.5 140/137 | | 275/70 R 22.5 148/145 | | 275/70 R 22.5 152/148 | |
|--|-----|--|--------------------------|---------|--------------------------|---------|--------------------------|---------|
| bars | psi | | Single | Twinned | Single | Twinned | Single | Twinned |
| 3.00 | 44 | | | | | | | |
| 3.50 | 51 | | | | | | | |
| 4.00 | 58 | | | | | | | |
| 4.50 | 65 | | | | | | | |
| 5.00 | 73 | | 3290 | 6050 | | | | |
| 5.50 | 80 | | 3570 | 6570 | | | | |
| 6.00 | 87 | | 3860 | 7100 | 4360 | 8030 | 4920 | 8720 |
| 6.50 | 94 | | 4140 | 7620 | 4680 | 8630 | 5280 | 9370 |
| 7.00 | 102 | | 4430 | 8150 | 5010 | 9220 | 5640 | 10020 |
| 7.50 | 109 | | 4710 | 8670 | 5330 | 9820 | 6010 | 10660 |
| 8.00 | 116 | | 5000 | 9200 | 5650 | 10410 | 6370 | 11310 |
| 8.50 | 123 | | | | 5980 | 11010 | 6740 | 11950 |
| 9.00 | 131 | | | | 6300 | 11600 | 7100 | 12600 |

Pressure tables (PSI - bar) according to the maximum axle load (kg)

These values are for guidance only and under no circumstances may be used for judicial or legal motives.

(1) Unique point: Provides additional load/speed operating conditions, in order to supply particular requirements. The indicated variations in load with respect to speed do not apply to the unique point.

(2) From Michelin, measured values using Michelin preferred rim.

(3) Flaps authorised by Michelin.
Nominal load in kg

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| DIMENSION (Load indexes, if needed) | | 275/80 R 22.5 149/146 | | 295/60 R 22.5 150/147 | | 295/80 R 22.5 152/148 | |
|--|-----|--------------------------|---------|--------------------------|---------|--------------------------|---------|
| bars | psi | Single | Twinned | Single | Twinned | Single | Twinned |
| 3.00 | 44 | | | | | | |
| 3.50 | 51 | | | | | | |
| 4.00 | 58 | | | | | | |
| 4.50 | 65 | | | | | | |
| 5.00 | 73 | | | | | | |
| 5.50 | 80 | 4390 | 8110 | | | 4800 | 8510 |
| 6.00 | 87 | 4740 | 8760 | 4640 | 8520 | 5180 | 9190 |
| 6.50 | 94 | 5090 | 9410 | 4980 | 9150 | 5560 | 9880 |
| 7.00 | 102 | 5450 | 10050 | 5330 | 9780 | 5950 | 10560 |
| 7.50 | 109 | 5800 | 10700 | 5670 | 10410 | 6330 | 11240 |
| 8.00 | 116 | 6150 | 11350 | 6010 | 11040 | 6720 | 11920 |
| 8.50 | 123 | 6500 | 12000 | 6360 | 11670 | 7100 | 12600 |
| 9.00 | 131 | | | 6700 | 12300 | | |

Pressure tables (PSI - bar) according to the maximum axle load (kg)

These values are for guidance only and under no circumstances may be used for judicial or legal motives.

(1) Unique point: Provides additional load/speed operating conditions, in order to supply particular requirements. The indicated variations in load with respect to speed do not apply to the unique point.

(2) From Michelin, measured values using Michelin preferred rim.

Nominal load in kg
(3) Flaps authorised by Michelin.

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Rim diameter 22.5 inches

[illegible]

| DIMENSION (Load indexes, if needed) | | 295/80 R 22.5 152/148 | | 295/80 R 22.5 152/149 | |
|--|-----|-----------------------|---------|-----------------------|---------|
| bars | psi | Single | Twinned | Single | Twinned |
| 3.00 | 44 | | | | |
| 3.50 | 51 | | | | |
| 4.00 | 58 | | | | |
| 4.50 | 65 | | | | |
| 5.00 | 73 | | | | |
| 5.50 | 80 | 4800 | 8510 | 4800 | 8780 |
| 6.00 | 87 | 5180 | 9190 | 5180 | 9490 |
| 6.50 | 94 | 5560 | 9880 | 5560 | 10190 |
| 7.00 | 102 | 5950 | 10560 | 5950 | 10890 |
| 7.50 | 109 | 6330 | 11240 | 6330 | 11590 |
| 8.00 | 116 | 6720 | 11920 | 6720 | 12300 |
| 8.50 | 123 | 7100 | 12600 | 7100 | 13000 |
| 9.00 | 131 | | | | |

Pressure tables (PSI - bar) according to the maximum axle load (kg)

These values are for guidance only and under no circumstances may be used for judicial or legal motives.

(1) Unique point: Provides additional load/speed operating conditions, in order to supply particular requirements. The indicated variations in load with respect to speed do not apply to the unique point.

(2) From Michelin, measured values using Michelin preferred rim.

 Nominal load in kg
(3) Flaps authorised by Michelin.

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TECHNICAL SPECIFICATIONS

Rim diameter 22.5 inches

| DIMENSION | | 305/70 R 22.5 | | | | 315/60 R 22.5 | | | |
|---|---------------|-----------------|----------|----------|----------|---------------|----------|----------|-----------------|
| TREAD PATTERN | XZA 2 ENERGY™ | XDA 2 + ENERGY™ | XZE 2 + | XDE 2 + | XZU 2T | X® ENERGY™ XF | | | |
| | TL | TL | TL | TL | | TL | TL | TL | X® MULTIWAY™ XD |
| Type | TL | TL | TL | TL | TL | TL | TL | TL | TL |
| Use Category | | M+S | | M+S | | | | M+S | M+S |
| PR (Ply Rating) | 16 | 16 | | | 16 | | | | |
| Load/speed index | 152/148L | 152/148L | 152/148L | 152/148L | 150/147J | 154/148L | 152/148L | 152/148L | 152/148L |
| Unique point (1) | 150/147M | 150/147M | 150/147M | 150/147M | 154/150E | | | | |
| Unique Point Load (kg) per axle (single) | 6700 | 6700 | 6700 | 6700 | 7500 | | | | |
| Unique Point Load (kg) per axle (twinned) | 12300 | 12300 | 12300 | 12300 | 13400 | | | | |
| Pressure (PSI) per load (unique point) | 8.50 | 8.50 | 8.50 | 8.50 | 8.75 | | | | |
| Laden section width (mm) | 324 | 325 | 324 | 325 | 327 | 340 | 335 | 337 | 339 |
| Free section width S (mm) | 300 | 299 | 300 | 301 | 302 | 316 | 314 | 313 | 317 |
| Free diameter D (mm) | 995 | 1002 | 999 | 1006 | 1003 | 950 | 952 | 964 | 956 |
| Static laden radius R' (mm) | 460 | 466 | 462 | 467 | 465 | 439 | 441 | 447 | 444 |
| Rolling circumference (mm) | 3030 | 3064 | 3040 | 3070 | 3060 | 2912 | 2900 | 2940 | 2919 |
| Minimum dual spacing E (mm) | 339 | 340 | 340 | 340 | 342 | 350 | 350 | 350 | 359 |
| Michelin preferred rim | 8.25 | 8.25 | 8.25 | 8.25 | 8.25 | 9.00 | 9.00 | 9.00 | 9.00 |

| DIMENSION (Load indexes, if needed) | | 305/70 R 22.5 152/148 | | 305/70 R 22.5 150/147 | | 315/60 R 22.5 154/148 | | 315/60 R 22.5 152/148 | |
|--|-----|-----------------------|---------|-----------------------|---------|-----------------------|---------|-----------------------|---------|
| bars | psi | Single | Twinned | Single | Twinned | Single | Twinned | Single | Twinned |
| 3.00 | 44 | | | | | | | | |
| 3.50 | 51 | | | | | | | | |
| 4.00 | 58 | | | | | | | | |
| 4.50 | 65 | | | | | | | | |
| 5.00 | 73 | | | | | | | | |
| 5.50 | 80 | | | 4530 | 8790 | | | | |
| 6.00 | 87 | 4920 | 8720 | 4890 | 9490 | 5190 | 9190 | 4920 | 9190 |
| 6.50 | 94 | 5280 | 9370 | 5250 | 10190 | 5580 | 9880 | 5280 | 9880 |
| 7.00 | 102 | 5640 | 10020 | 5610 | 10890 | 5960 | 10560 | 5640 | 10560 |
| 7.50 | 109 | 6010 | 10660 | 5980 | 11600 | 6350 | 11240 | 6010 | 11240 |
| 8.00 | 116 | 6370 | 11310 | 6340 | 12300 | 6730 | 11920 | 6370 | 11920 |
| 8.50 | 123 | 6740 | 11950 | 6700 | | 7120 | 12600 | 6740 | 12600 |
| 9.00 | 131 | 7100 | 12600 | | | 7500 | | 7100 | |

Pressure tables (PSI - bar) according to the maximum axle load (kg)

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(2) From Michelin, measured values using Michelin preferred rim.

Nominal load in kg
(3) Flaps authorised by Michelin.

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TECHNICAL SPECIFICATIONS

Rim diameter 22.5 inches

[illegible]

| DIMENSION (Load indexes, if needed) | | 315/70 R 22.5 156/150 | | 315/70 R 22.5 154/150 | | 315/70 R 22.5 154 |
|--|-----|-----------------------|---------|-----------------------|---------|-------------------|
| bars | psi | Single | Twinned | Single | Twinned | Single |
| 3.00 | 44 | | | | | |
| 3.50 | 51 | | | | | |
| 4.00 | 58 | | | | | |
| 4.50 | 65 | | | | | |
| 5.00 | 73 | | | | | |
| 5.50 | 80 | | | | | |
| 6.00 | 87 | 5540 | 9280 | 5190 | 9280 | 5190 |
| 6.50 | 94 | 5950 | 9960 | 5580 | 9960 | 5580 |
| 7.00 | 102 | 6360 | 10650 | 5960 | 10650 | 5960 |
| 7.50 | 109 | 6770 | 11340 | 6350 | 11340 | 6350 |
| 8.00 | 116 | 7180 | 12030 | 6730 | 12030 | 6730 |
| 8.50 | 123 | 7590 | 12710 | 7120 | 12710 | 7120 |
| 9.00 | 131 | 8000 | 13400 | 7500 | 13400 | 7500 |

Pressure tables (PSI - bar) according to the maximum axle load (kg)

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(2) From Michelin, measured values using Michelin preferred rim.

 Nominal load in kg
(3) Flaps authorised by Michelin.

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TECHNICAL SPECIFICATIONS

Rim diameter 22.5 inches

[illegible]

| DIMENSION (Load indexes, if needed) | | 315/70 R 22.5 | | 315/80 R 22.5 | | 156/150 | |
|--|-----|---------------|---------|---------------|---------|---------|---------|
| bars | psi | Single | Twinned | Single | Twinned | Single | Twinned |
| 3.00 | 44 | | | | | | |
| 3.50 | 51 | | | | | | |
| 4.00 | 58 | | | | | | |
| 4.50 | 65 | | | | | | |
| 5.00 | 73 | | | | | | |
| 5.50 | 80 | | | | | | |
| 6.00 | 87 | 5190 | 9280 | 5840 | 10340 | | |
| 6.50 | 94 | 5580 | 9960 | 6270 | 11100 | | |
| 7.00 | 102 | 5960 | 10650 | 6700 | 11870 | | |
| 7.50 | 109 | 6350 | 11340 | 7140 | 12630 | | |
| 8.00 | 116 | 6730 | 12030 | 7570 | 13400 | | |
| 8.50 | 123 | 7120 | 12710 | 8000 | | | |
| 9.00 | 131 | 7500 | 13400 | | | | |

Pressure tables (PSI - bar) according to the maximum axle load (kg)

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(1) Unique point: Provides additional load/speed operating conditions, in order to supply particular requirements. The indicated variations in load with respect to speed do not apply to the unique point.

(2) From Michelin, measured values using Michelin preferred rim.

(3) Flaps authorised by Michelin.
Nominal load in kg

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TECHNICAL SPECIFICATIONS

Rim diameter 22.5 inches

| DIMENSION | | 315/80 R 22.5 | | 315/80 R 22.5 | | | | | | 385/55 R 22.5 | | | | | | | | | | | | | | | |
|-------------------------|---|---------------|----------|---------------|----------|---------------|----------|---------------|----------|---------------|----------|----------|----------|----------|----------|--------------------------|-------|------------------|-------|-------------------|-------|-------------------------|-------|---------------|------|
| TREAD PATTERN | | XDN 2 GRIP | | XDW ICE GRIP | | X® WORKS™ XZY | | X® WORKS™ XDY | | XZY 2 | | XDY 3 | | XTA | | XFA 2 ENERGY™ Antisplash | | XFN 2 Antisplash | | X® Line ENERGY™ T | | X®ENERGY™ SAVERGREEN XT | | XTA 2 ENERGY™ | |
| | | TL | M+S | TL | M+S | TL | M+S | TL | M+S | TL | M+S | TL | M+S | TL | M+S | TL | M+S | TL | M+S | TL | M+S | TL | M+S | TL | M+S |
| Unique point (1) | Type | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL |
| | Use Category | M+S | M+S | M+S | M+S | M+S | M+S | M+S | M+S | M+S | M+S | M+S | M+S | M+S | M+S | M+S | M+S | M+S | M+S | M+S | M+S | M+S | M+S | M+S | M+S |
| | PR (Ply Rating) | | | | | | | | | | | | | | | | | | | | | | | | |
| | Load/speed index | 156/150L | 156/150L | 156/150L | 156/150L | 156/150K | 156/150K | 156/150K | 156/150K | 156/150K | 156/150K | 156/150K | 156/150K | 156/150K | 154/150M | 158L | 160K | 160J | 158L | 160J | 158L | 160J | 158L | 160J | 158L |
| Unique point (1) | Unique point (1) | 154/150M | | | | | | | | | | | | | 160J | 158L | 160J | 158L | 158L | 158L | 158L | 158L | 158L | 158L | |
| | Unique Point Load (kg) per axle (single) | 7500 | | | | | | | | | | | | | 9000 | 8500 | 9000 | 8500 | 8500 | 8500 | 8500 | 8500 | 8500 | 8500 | |
| | Unique Point Load (kg) per axle (twinned) | 13400 | | | | | | | | | | | | | | | | | | | | | | | |
| | Pressure (PSI) per load (unique point) | 8.00 | | | | | | | | | | | | | | 9.00 | 8.50 | 9.00 | 8.50 | 8.50 | 8.50 | 8.50 | 8.50 | 8.50 | |
| Michelin dimensions (2) | Laden section width (mm) | 349 | 348 | 348 | 348 | 348 | 348 | 348 | 348 | 343 | 343 | 349 | 349 | 346 | 406 | 407 | 403 | 403 | 406 | 406 | 406 | 406 | 406 | 406 | |
| | Free section width S (mm) | 317 | 315 | 315 | 317 | 317 | 317 | 317 | 317 | 316 | 316 | 318 | 318 | 317 | 380 | 380 | 376 | 376 | 380 | 380 | 380 | 380 | 380 | 380 | |
| | Free diameter D (mm) | 1094 | 1090 | 1090 | 1080 | 1080 | 1091 | 1091 | 1091 | 1088 | 1088 | 1099 | 1099 | 1080 | 997 | 998 | 996 | 996 | 1002 | 1002 | 1002 | 1001 | 1001 | 1001 | |
| | Static laden radius R' (mm) | 507 | 504 | 504 | 502 | 502 | 507 | 507 | 507 | 505 | 505 | 509 | 509 | 501 | 461 | 460 | 459 | 459 | 463 | 463 | 463 | 460 | 460 | 460 | |
| Michelin dimensions (2) | Rolling circumference (mm) | 3314 | 3320 | 3320 | 3308 | 3308 | 3312 | 3312 | 3312 | 3320 | 3320 | 3350 | 3350 | 3296 | 3040 | 3060 | 3060 | 3060 | 3072 | 3072 | 3072 | 3040 | 3040 | 3040 | |
| | Minimum dual spacing E (mm) | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 350 | | | | | | | | | | | |
| | Michelin preferred rim | 9.00 | 9.00 | 9.00 | 9.00 | 9.00 | 9.00 | 9.00 | 9.00 | 9.00 | 9.00 | 9.00 | 9.00 | 9.00 | 11.75 | 11.75 | 11.75 | 11.75 | 11.75 | 11.75 | 11.75 | 11.75 | 11.75 | 11.75 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |

Michelin dimensions (2)

Unique point (1)

| DIMENSION (Load indexes, if needed) | | 315/80 R 22.5 156/150 | | 315/80 R 22.5 154/150 | 385/55 R 22.5 158 | 385/55 R 22.5 160 |
|--|-----|-----------------------|--|-----------------------------|----------------------|-------------------|
| bars | psi | Twinned | | Single Twinned | Single | Single |
| 3.00 | 44 | | | | | |
| 3.50 | 51 | | | | | |
| 4.00 | 58 | | | | | |
| 4.50 | 65 | | | | | |
| 5.00 | 73 | | | | | |
| 5.50 | 80 | | | 5070 9570 | | |
| 6.00 | 87 | 10340 | | 5470 10340 | 5880 | 6230 |
| 6.50 | 94 | 11100 | | 5880 11100 | 6320 | 6690 |
| 7.00 | 102 | 11870 | | 6280 11870 | 6760 | 7150 |
| 7.50 | 109 | 12630 | | 6690 12630 | 7190 | 7620 |
| 8.00 | 116 | 13400 | | 7090 13400 | 7630 | 8080 |
| 8.50 | 123 | | | 7500 | 8060 | 8540 |
| 9.00 | 131 | | | | 8500 | 9000 |

Pressure tables (PSI - bar) according to the maximum axle load (kg)

These values are for guidance only and under no circumstances may be used for judicial or legal motives.

(1) Unique point: Provides additional load/speed operating conditions, in order to supply particular requirements. The indicated variations in load with respect to speed do not apply to the unique point.

(2) From Michelin, measured values using Michelin preferred rim.

(3) Flaps authorised by Michelin.

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| DIMENSION (Load indexes, if needed) | | 385/55 R 22.5 160 | 385/65 R 22.5 164 | 385/65 R 22.5 158 | 385/65 R 22.5 160 |
|--|-----|-------------------|-------------------|-------------------|-------------------|
| bars | psi | Single | Single | Single | Single |
| 3.00 | 44 | | | | |
| 3.50 | 51 | | | | |
| 4.00 | 58 | | | | |
| 4.50 | 65 | | | | |
| 5.00 | 73 | | | | |
| 5.50 | 80 | | | 5740 | |
| 6.00 | 87 | 6230 | 6920 | 6200 | 6230 |
| 6.50 | 94 | 6690 | 7440 | 6660 | 6690 |
| 7.00 | 102 | 7150 | 7950 | 7120 | 7150 |
| 7.50 | 109 | 7620 | 8460 | 7580 | 7620 |
| 8.00 | 116 | 8080 | 8970 | 8040 | 8080 |
| 8.50 | 123 | 8540 | 9490 | 8500 | 8540 |
| 9.00 | 131 | 9000 | 10000 | | 9000 |

Pressure tables (PSI - bar) according to the maximum axle load (kg)

These values are for guidance only and under no circumstances may be used for judicial or legal motives.

(1) Unique point: Provides additional load/speed operating conditions, in order to supply particular requirements. The indicated variations in load with respect to speed do not apply to the unique point.

(2) From Michelin, measured values using Michelin preferred rim.

(3) Flaps authorised by Michelin.

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TECHNICAL SPECIFICATIONS

Rim diameter 22.5 inches

| DIMENSION | | 425/65 R 22.5 | | 445/65 R 22.5 | | 455/45 R 22.5 | | 495/45 R 22.5 | | | |
|--|---|---------------|-------|---------------|-------|----------------------|--------------------|---------------|---------------------|------------------|-----------|
| TREAD PATTERN | | XTE 2 | XZY 3 | XZY 3 | XTE 2 | XONE™ MAXITRAILER™ + | XONE™ MAXITRAILER™ | XONE™ XDU | XONE™ XDA 2 ENERGY™ | XONE™ XDN 2 Grip | XOne™ XDU |
| | Type | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL |
| | Use Category | | M+S | | | | | M+S | M+S | M+S | M+S |
| | PR (Ply Rating) | 20 | 20 | 20 | 20 | | | | | | |
| | Load/speed index | 165K | 165K | 169K | 169K | 160J | 160J | 166J | 169K | 169K | 169J |
| | Unique point (1) | | | | | | | | | | |
| Unique point (1) | Unique Point Load (kg) per axle (single) | | | | | | | | | | |
| | Unique Point Load (kg) per axle (twinned) | | | | | | | | | | |
| Pressure (PSI) per load (unique point) | | | | | | | | | | | |
| Michelin dimensions (2) | Laden section width (mm) | 449 | 454 | 486 | 481 | 482 | 483 | 494 | 520 | 539 | 526 |
| | Free section width S (mm) | 421 | 421 | 451 | 451 | 458 | 460 | 466 | 492 | 511 | 499 |
| | Free diameter D (mm) | 1130 | 1136 | 1164 | 1158 | 980 | 980 | 982 | 1013 | 1024 | 1012 |
| | Static laden radius R' (mm) | 522 | 524 | 536 | 534 | 456 | 456 | 450 | 465 | 471 | 464 |
| | Rolling circumference (mm) | 3440 | 3460 | 3540 | 3520 | 3022 | 3013 | 2980 | 3100 | 3119 | 3085 |
| Minimum dual spacing E (mm) | | | | | | 518 | | | | | |
| Michelin preferred rim | | 13.00 | 13.00 | 14.00 | 14.00 | 15.00 | 15.00 | 15.00 | 17.00 | 17.00 | 17.00 |

| DIMENSION (Load indexes, if needed) | | 425/65 R 22.5 165 | 445/65 R 22.5 169 | 455/45 R 22.5 160 | 455/45 R 22.5 166 | 495/45 R 22.5 169 |
|--|-----|-------------------|-------------------|-------------------|-------------------|-------------------|
| bars | psi | Single | Single | Single | Single | Single |
| 3.00 | 44 | | | | | |
| 3.50 | 51 | | | | | |
| 4.00 | 58 | | | | | |
| 4.50 | 65 | | | | | |
| 5.00 | 73 | | | | | |
| 5.50 | 80 | 6960 | | | | |
| 6.00 | 87 | 7520 | 8030 | 6230 | | |
| 6.50 | 94 | 8070 | 8630 | 6690 | | |
| 7.00 | 102 | 8630 | 9220 | 7150 | 8600 | 9220 |
| 7.50 | 109 | 9190 | 9820 | 7620 | 9130 | 9820 |
| 8.00 | 116 | 9740 | 10410 | 8080 | 9660 | 10410 |
| 8.50 | 123 | 10300 | 11010 | 8540 | 10130 | 11010 |
| 9.00 | 131 | | 11600 | 9000 | 10600 | 11600 |

Pressure tables (PSI - bar) according to the maximum axle load (kg)

These values are for guidance only and under no circumstances may be used for judicial or legal motives.

(1) Unique point: Provides additional load/speed operating conditions, in order to supply particular requirements. The indicated variations in load with respect to speed do not apply to the unique point.

(2) From Michelin, measured values using Michelin preferred rim.

Nominal load in kg
Flaps authorised by Michelin.

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TECHNICAL SPECIFICATIONS

OFF ROAD

| DIMENSION | 255/100 R 16 | 11.00 R 16 | 325/85 R 16 | 10.00 R 20 | 11.00 R 20 | 12.00 R 20 |
|---|--------------|------------|-------------|-------------------------|---------------------|--------------------|
| TREAD PATTERN | XZL | XZL | XML | XZL | XZL | XZL |
| Type | TL | TL | TL | TT | TL | TL |
| Use Category | | | | | | |
| PR (Ply Rating) | | | | 16 | 16 | 18 |
| Load/speed index | 126/124K | 135K | 137J | 146/143K | 150/146K | 154/149K |
| Unique point (1) | 134/128J | | | | | |
| Unique Point Load (kg) per axle (single) | 4240 | | | | | |
| Unique Point Load (kg) per axle (twinned) | 7200 | | | | | |
| Pressure (PSI) per load (unique point) | 5.75 | | | | | |
| Laden section width (mm) | 286 | 319 | 364 | 311 | 330 | 344 |
| Free section width S (mm) | 255 | 287 | 327 | 281 | 299 | 311 |
| Free diameter D (mm) | 923 | 984 | 984 | 1060 | 1092 | 1131 |
| Static laden radius R' (mm) | 426 | 455 | 449 | 493 | 508 | 527 |
| Rolling circumference (mm) | 2798 | 3000 | 2980 | 3240 | 3340 | 3460 |
| Minimum dual spacing E (mm) | 288 | | | 318 | 338 | 352 |
| Michelin preferred rim | 6.50H | 6.50H | 9.00 | 7.5 | 8.0 | 8.5 |
| Tube | | | | 20 N | 20 P | 20 Q |
| Flap | | | | 20X7.50 MI - 20X8.50 MI | 220-20L / 20X8.50MI | 230-20LB / 20X8.50 |
| Seal | Jt 1967 | | Jt 1967 | | Jt 1443 | Jt 1443 |

| DIMENSION (Load indexes, if needed) | | 255/100 R 16 126/124 | | 11.00 R 16 135 | | 325/85 R 16 137 | | 10.00 R 20 146/143 | | 11.00 R 20 150/146 | | 12.00 R 20 154/149 | |
|--|-----|----------------------|---------|----------------|--------|-----------------|--------|--------------------|---------|--------------------|---------|--------------------|---------|
| bars | psi | Single | Twinned | Single | Single | Single | Single | Single | Twinned | Single | Twinned | Single | Twinned |
| 3.00 | 44 | 2430 | 4570 | 2800 | 3290 | 3290 | | | | | | | |
| 3.50 | 51 | 2750 | 5180 | 3110 | 3720 | 3720 | | | | 3250 | 6100 | | |
| 4.00 | 58 | 3080 | 5790 | 3430 | 4160 | 4160 | | | | 3670 | 6670 | | |
| 4.50 | 65 | 3400 | 6400 | 3740 | 4600 | 4600 | | | | 4000 | 7200 | | |
| 5.00 | 73 | | | 4050 | | | 4060 | 7370 | | 4400 | 7800 | 4690 | 8130 |
| 5.50 | 80 | | | 4360 | | | 4410 | 8010 | | 4770 | 8540 | 5070 | 8780 |
| 6.00 | 87 | | | | | | 4760 | 8660 | | 5140 | 9290 | 5470 | 9490 |
| 6.50 | 94 | | | | | | 5120 | 9300 | | 5510 | 10030 | 5880 | 10190 |
| 7.00 | 102 | | | | | | 5470 | 9940 | | 5900 | 10720 | 6280 | 10890 |
| 7.50 | 109 | | | | | | 5820 | 10580 | | 6300 | 11360 | 6690 | 11590 |
| 8.00 | 116 | | | | | | | | | 6700 | 12000 | 7090 | 12300 |
| 8.50 | 123 | | | | | | | | | | | 7500 | 13000 |
| 9.00 | 131 | | | | | | | | | | | | |

Pressure tables (PSI - bar) according to the maximum axle load (kg)

These values are for guidance only and under no circumstances may be used for judicial or legal motives.

(1) Unique point: Provides additional load/speed operating conditions, in order to supply particular requirements. The indicated variations in load with respect to speed do not apply to the unique point.

(2) From Michelin, measured values using Michelin preferred rim.

Nominal load in kg
(3) Flaps authorised by Michelin.

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TECHNICAL SPECIFICATIONS

OFF ROAD

| DIMENSION | 12.00 R 20 | 275/80 R 20 | 335/80 R 20 | 365/80 R 20 | 365/85R20 |
|---|------------|--------------------|---------------------|---------------------|---------------------|
| TREAD PATTERN | XML | XZL MPT | XZL MPT | XZL MPT | XZL |
| Type | TL | TL | TL | TL | TL |
| Use Category | | | | | |
| PR (Ply Rating) | 18 | 8 | 16 | | |
| Load/speed index | 149J/146J | 128K | 141K | 152K | 164G |
| Unique point (1) | | | | | |
| Unique Point Load (kg) per axle (single) | | | | | |
| Unique Point Load (kg) per axle (twinned) | | | | | |
| Pressure (PSI) per load (unique point) | | | | | |
| Laden section width (mm) | 339 | 305 | 381 | 410 | 412 |
| Free section width S (mm) | 308 | 280 | 345 | 372 | 368 |
| Free diameter D (mm) | 1131 | 939 | 1037 | 1096 | 1144 |
| Static laden radius R' (mm) | 526 | 431 | 473 | 501 | 520 |
| Rolling circumference (mm) | 3443 | 2850 | 3140 | 3330 | 3460 |
| Minimum dual spacing E (mm) | 349 | | | | |
| Michelin preferred rim | 8.5 | 9 | 11 | 11 | 10.00W |
| Tube | 20 Q | 20 P | 20 P | 20 Q | 20 S |
| Flap | | 230-20LB / 20X8.50 | 310-20LB / 20X10.00 | 310-20LB / 20X10.00 | 270-20LB / 20X10.00 |
| Seal | | Jt 1681 | Jt1681 | Jt 1443 | Jt 1443 |

| DIMENSION (Load indexes, if needed) | | 12.00 R 20 | 149/146 | 275/80 R 20 128 | 335/80 R 20 141 | 365/80 R 20 152 | 365/85 R 20 164 |
|--|-----|------------|---------|-----------------|-----------------|-----------------|-----------------|
| bars | psi | Single | Twinned | Single | Single | Single | Single |
| 3.00 | 44 | | | 2730 | 3750 | | |
| 3.50 | 51 | | | 3090 | 4250 | | |
| 4.00 | 58 | | | 3435 | 4825 | | |
| 4.50 | 65 | 4290 | 7920 | | | | 6360 |
| 5.00 | 73 | 4700 | 8680 | | | | 6970 |
| 5.50 | 80 | 5110 | 9430 | | | 6700 | 7580 |
| 6.00 | 87 | 5520 | 10190 | | | 7100 | 8180 |
| 6.50 | 94 | 5930 | 10940 | | | | 8790 |
| 7.00 | 102 | 6340 | 11700 | | | | 9390 |
| 7.50 | 109 | | | | | | 10000 |
| 8.00 | 116 | | | | | | |
| 8.50 | 123 | | | | | | |
| 9.00 | 131 | | | | | | |

Pressure tables (PSI - bar) according to the maximum axle load (kg)

These values are for guidance only and under no circumstances may be used for judicial or legal motives.

(1) Unique point: Provides additional load/speed operating conditions, in order to supply particular requirements. The indicated variations in load with respect to speed do not apply to the unique point.

(2) From Michelin, measured values using Michelin preferred rim.

Nominal load in kg
(3) Flaps authorised by Michelin.

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TECHNICAL SPECIFICATIONS

OFF ROAD

| DIMENSION | 255/100 R 16 | 11.00 R 16 | 325/85 R 16 | 10.00 R 20 | 11.00 R 20 | 12.00 R 20 |
|------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| TREAD PATTERN | XZL | XZL | XML | XZL | XZL | XZL |
| Type | TL | TL | TL | | TL | TL |
| Use Category | | | | | | |
| PR (Ply Rating) | | | | 16 | 16 | 18 |
| Load/speed index | 126/124K | 135K | 137J | 146/143K | 150/146K | 154/149K |
| Unique point (1) | 134/128J | | | | | |
| | Track Sand/Mud | Track Sand/Mud | Track Sand/Mud | Track Sand/Mud | Track Sand/Mud | Track Sand/Mud |
| 0.60 | 1600 | 2200 | 2400 | | 2500 | |
| 0.70 | 1800 | 2400 | 2600 | | | 2000 |
| 0.80 | 2000 | 2600 | 3000 | 2500 | 3000 | |
| 0.90 | | 1800 | 2000 | | 2000 | 3500 |
| 1.00 | 1400 | 2200 | 3400 | 3000 | | 2500 |
| 1.10 | 2400 | 3200 | 3600 | 2000 | 3500 | 4000 |
| 1.20 | 1600 | 2600 | 3400 | | 2500 | |
| 1.30 | | 3600 | 4000 | | 4000 | 4500 |
| 1.40 | 1800 | 2800 | 3800 | | | |
| 1.50 | 3000 | 4000 | 4400 | 2500 | 4400 | 4900 |
| 1.60 | 2000 | 3200 | 4600 | | 3000 | 3500 |
| 1.70 | 3400 | 2800 | 3000 | | 4500 | 5500 |
| 1.80 | 2200 | | 3200 | | | |
| 1.90 | | 3000 | | 4500 | 5000 | 6000 |
| 2.00 | 2400 | | | | | |
| 2.10 | | 3200 | 3400 | 3000 | | 4000 |
| 2.20 | | | | | 3500 | |
| 2.30 | 2800 | 3400 | 3600 | | 5500 | |
| 2.40 | | | 3800 | | | 6500 |
| 2.50 | 3000 | 3600 | | 3500 | | |
| 2.60 | | | 4000 | | 4000 | |
| 2.70 | 3200 | 3800 | | | | |
| 2.80 | | | 4200 | | | |
| 2.90 | 3400 | 4000 | 4400 | 3900 | 6000 | 7000 |
| 3.00 | | | | 4000 | 4500 | |
| 3.10 | | 4200 | 4600 | | | |

Pressure tables (PSI - bar) according to the maximum axle load (kg)

Pressure tables (PSI - bar) according to the maximum axle load (kg)

| | | | | | | | |
|------|------|--|------|--|------|------|------|
| 3.20 | 4360 | | | | | 5500 | |
| 3.30 | | | | | | | |
| 3.40 | | | 4500 | | 5000 | | 7500 |
| 3.50 | | | | | | | |
| 3.60 | | | | | 6000 | 6700 | 7660 |
| 3.70 | | | | | 6120 | | |
| 3.80 | | | | | | | |
| 3.90 | | | | | 6240 | | 7800 |
| 4.00 | | | | | | 5500 | |
| 4.10 | | | | | | | |
| 4.20 | | | | | | | |
| 4.30 | | | 5000 | | 6520 | | 8140 |
| 4.40 | | | | | | | |
| 4.50 | | | | | | 6500 | |
| 4.60 | | | | | 6720 | | |
| 4.70 | | | | | | | 8400 |
| 4.80 | | | | | | | |
| 4.90 | | | | | | | |
| 5.00 | | | | | 6900 | | 8620 |
| 5.10 | | | | | | 6000 | |
| 5.20 | | | | | | | |
| 5.30 | | | 5500 | | | | |
| 5.40 | | | | | | | |
| 5.50 | | | | | | | |
| 5.60 | | | | | | | |
| 5.70 | | | | | | 7000 | |
| 5.80 | | | | | | | |
| 5.90 | | | | | | | |
| 6.00 | | | | | | | |

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Rated load in kg

1) Unique point: Provides additional load/speed operating conditions, in order to supply particular requirements. The indicated variations in load with respect to speed do not apply to the unique point.

Track: for driving on poor roads and sand at a maximum speed of 65 kph.

Sand/mud: short legs in areas of difficult terrain.
Limit speed to 20 kph to safeguard the tyre.

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TECHNICAL SPECIFICATIONS

OFF ROAD

| DIMENSION | 12.00 R 20 | | 275/80 R 20 | | 335/80 R 20 | | 365/80 R 20 | | 365/85 R 20 | |
|------------------|------------|----------|-------------|----------|-------------|----------|-------------|----------|-------------|----------|
| TREAD PATTERN | XML | | XZL MPT | | XZL MPT | | XZL MPT | | XZL | |
| Type | TL | | TL | | TL | | TL | | TL | |
| Use Category | | | | | | | | | | |
| PR (Ply Rating) | | | 8 | | 16 | | | | | |
| Load/speed index | 149J | | 128K | | 141K | | 152K | | 164G | |
| Unique point (1) | | | | | | | | | | |
| | Track | Sand/Mud | Track | Sand/Mud | Track | Sand/Mud | Track | Sand/Mud | Track | Sand/Mud |
| 0.60 | | 2800 | | 1600 | | | | 2800 | | 3000 |
| 0.70 | | 3000 | | | | 2500 | | 3000 | 2000 | |
| 0.80 | 2200 | 3400 | 1400 | 1800 | | | | 3200 | | 3500 |
| 0.90 | | 3600 | 1600 | 2000 | | 3000 | | 3600 | | |
| 1.00 | 2400 | 3800 | | | | | | 3800 | 2500 | 4000 |
| 1.10 | 2600 | 4000 | 1800 | 2200 | 2000 | 3500 | | 4000 | | |
| 1.20 | 2800 | 4400 | | 2400 | | | | 4200 | 3000 | 4500 |
| 1.30 | 3000 | 4600 | 2000 | 2500 | | 4400 | | 4400 | | |
| 1.40 | 3200 | 4800 | | 2600 | | 4000 | 2800 | 4800 | | 5000 |
| 1.50 | | 5200 | 2200 | 2800 | 2500 | 4500 | 3000 | 5000 | 3500 | |
| 1.60 | 3400 | 5400 | 2400 | 3000 | | | | 5200 | | 5500 |
| 1.70 | 3600 | 5600 | 2500 | | | | | 5400 | | |
| 1.80 | | 5800 | 2600 | 3200 | | 5000 | 3400 | 5800 | 4000 | 6000 |
| 1.90 | | | | 3400 | 3000 | 5150 | 3600 | 6000 | | |
| 2.00 | | | 2800 | 3600 | | 6200 | | 6200 | | |
| 2.10 | 3800 | 6000 | 3000 | | | 6400 | | 6400 | | 6500 |
| 2.20 | 4000 | 6200 | | | | | 3800 | 6600 | | |
| 2.30 | | 6500 | 3200 | | 3500 | 6800 | 4000 | 6800 | | |
| 2.40 | 4200 | | | | | 7100 | | 7100 | 4500 | |
| 2.50 | 4400 | | 3400 | | | | 4200 | | | |
| 2.60 | | | 3500 | | | | 4400 | | | 7500 |
| 2.70 | 4600 | | 3600 | | 4000 | | | | 5000 | |
| 2.80 | 4800 | | | | | | 4600 | | | 8000 |
| 2.90 | | | | | | | 4800 | | | |
| 3.00 | 5000 | | | | | | | | | |
| 3.10 | 5200 | | | | 4500 | | 5000 | | 5500 | 8500 |

Pressure tables (PSI - bar) according to the maximum axle load (kg)

Pressure tables (PSI - bar) according to the maximum axle load (kg)

| | | | | | | | |
|------|------|--|--|------|------|------|-------|
| 3.20 | | | | | 5200 | | |
| 3.30 | 5400 | | | | | | |
| 3.40 | 5600 | | | | 5400 | 6000 | |
| 3.50 | | | | | 5600 | | 9000 |
| 3.60 | 5800 | | | 5000 | | | |
| 3.70 | 6000 | | | 5150 | 5800 | | |
| 3.80 | | | | | | 6500 | |
| 3.90 | 6200 | | | | 6000 | | |
| 4.00 | 6400 | | | | 6200 | | |
| 4.10 | 6500 | | | | | | |
| 4.20 | | | | | 6400 | | 10000 |
| 4.30 | | | | | 6600 | | |
| 4.40 | | | | | | | |
| 4.50 | | | | | 6800 | 7500 | |
| 4.60 | | | | | 7000 | | 10400 |
| 4.70 | | | | | 7100 | | |
| 4.80 | | | | | | 8000 | |
| 4.90 | | | | | | | 10860 |
| 5.00 | | | | | | | |
| 5.10 | | | | | | | |
| 5.20 | | | | | | | |
| 5.30 | | | | | | | |
| 5.40 | | | | | | 8500 | |
| 5.50 | | | | | | | |
| 5.60 | | | | | | | |
| 5.70 | | | | | | | |
| 5.80 | | | | | | | |
| 5.90 | | | | | | 9000 | |
| 6.00 | | | | | | | |

These values are for guidance only and under no circumstances may be used for judicial or legal motives.

Rated load in kg

1) Unique point: Provides additional load/speed operating conditions, in order to supply particular requirements. The indicated variations in load with respect to speed do not apply to the unique point.

Track: for driving on poor roads and sand at a maximum speed of 65 kph.

Sand/mud: short legs in areas of difficult terrain.
Limit speed to 20 kph to safeguard the tyre.

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TECHNICAL SPECIFICATIONS

OFF ROAD

| DIMENSION TREAD PATTERN | 14.00 R 20 | | | | | 395/85 R 20 | | | | |
|---|------------|----------|---------|----------|---------|---------------------|-----|--------|--------|-----|
| | XZL + | XZL | XML | XS | XZL 2 | XZL | XML | XZL 2 | XZL | XML |
| Type | TL | TL | TL | TL | TL | TL | TL | TL | TL | TL |
| Use Category | | | | | | | | | | |
| PR (Ply Rating) | 22 | 22 | | | | | | | | 14 |
| Load/speed index | 164/160J | 164/160G | 153G | 160/157F | 168K | 168G | | 161 J | 161G | |
| Unique point (1) | 166G | | 149K | | 164L | | | | | |
| Unique Point Load (kg) per axle (single) | 10600 | | 6500 | | 10000 | 9250 | | | | |
| Unique Point Load (kg) per axle (twinned) | | | | | | | | | | |
| Pressure (PSI) per load (unique point) | 7.90 | | 6.20 | | 8.5 | 8.50 | | | | |
| Laden section width (mm) | 428 | 427 | 421 | 410 | 429 | 425 | | 418 | | |
| Free section width S (mm) | 386 | 384 | 383 | 369 | 388 | 388 | | 385 | | |
| Free diameter D (mm) | 1258 | 1258 | 1258 | 1238 | 1176 | 1189 | | 1187 | | |
| Static laden radius R' (mm) | 578 | 578 | 581 | 566 | 534 | 542 | | 543 | | |
| Rolling circumference (mm) | 3832 | 3826 | 3830 | 3772 | 3584 | 3600 | | 3600 | | |
| Minimum dual spacing E (mm) | 436 | 434 | | 417 | | | | | | |
| Michelin preferred rim | 10.00W | 10.00W | 10.00W | 10.00W | 10.00 W | 10.00W | | 10.00W | 10.00W | |
| Tube | | | | | | 20 S | | | | |
| Flap | | Jt 1443 | | | | 270-20LB / 20X10.00 | | | | |
| Seal | | | Jt 1443 | | | J 1443 | | | | |

TECHNICAL SPECIFICATIONS

OFF ROAD

| DIMENSION | | 14.00 R 20 | | | | 395/85 R 20 | | | |
|------------------|--|------------|----------|-------|----------|-------------|----------|-------|--|
| TREAD PATTERN | | XZL + | XZL | XML | XS | XZL 2 | XZL | XML | |
| Type | | TL | TL | TL | TL | TL | TL | TL | |
| Use Category | | 22 | 22 | | | | | | |
| PR (Ply Rating) | | 164/160J | 164/160G | 153G | 160/157F | 168K | 168G | 161G | |
| Load/speed index | | | | | | | | | |
| Unique point (1) | | Track | Sand/Mud | Track | Sand/Mud | Track | Sand/Mud | Track | |
| 0.60 | | | | | | | | | |
| 0.70 | | 2500 | 4000 | 2500 | 3400 | 3000 | | | |
| 0.80 | | | 4500 | 4000 | 3600 | | 3500 | | |
| 0.90 | | 3000 | | 4500 | 4000 | | | | |
| 1.00 | | | 5000 | 3000 | 2600 | 4000 | 4000 | | |
| 1.10 | | 3500 | 5500 | 5000 | 2800 | 4000 | 3000 | 4500 | |
| 1.20 | | | | 5800 | 3000 | | | | |
| 1.30 | | | | 6200 | 3200 | 4500 | 5000 | | |
| 1.40 | | 4000 | 6000 | 6600 | 5200 | | | | |
| 1.50 | | | 6500 | 6000 | 5600 | 3500 | 3500 | | |
| 1.60 | | 4500 | 4000 | 6800 | 3400 | 5000 | 5500 | | |
| 1.70 | | | | 7200 | 3600 | | | | |
| 1.80 | | 5000 | 7000 | 7300 | 3800 | 4000 | 4000 | 6400 | |
| 1.90 | | | 7500 | 4000 | 4200 | | | 6600 | |
| 2.00 | | 5000 | 8000 | 4200 | | 4500 | 6500 | 7000 | |
| 2.10 | | | 8000 | 4400 | 4400 | | 7000 | 7200 | |
| 2.20 | | | | 4600 | 4600 | | | | |
| 2.30 | | 5500 | 8500 | 4800 | 3500 | | | 7400 | |
| 2.40 | | | 5500 | 5000 | 5000 | 5000 | 7300 | 7800 | |
| 2.50 | | | | 5200 | 5000 | | | 8000 | |
| 2.60 | | 6000 | | 5400 | 5200 | | | 8100 | |
| 2.70 | | | 6000 | 5600 | 5400 | 5500 | 5500 | 8400 | |
| 2.80 | | | 9000 | 5800 | 5600 | | | 8800 | |
| 2.90 | | 6500 | | 6000 | 5800 | 8500 | | 9000 | |
| 3.00 | | | 6500 | 6200 | 6000 | 9000 | 6000 | 9250 | |
| 3.10 | | 7000 | 9500 | 6400 | 6200 | | | | |
| | | | 7000 | 6600 | 6400 | 6500 | 9500 | 6400 | |

Pressure tables (PSI - bar) according to the maximum axle load (kg)

Pressure tables (PSI - bar) according to the maximum axle load (kg)



TECHNICAL SPECIFICATIONS

OFF ROAD

| DIMENSION | | 16.00 R 20 | 457/80 R 20 | 525/65 R 20.5 | 24 R 20.5 | 24 R 21 |
|-------------------------|---|---------------------|-------------|---------------|-----------|---------|
| TREAD PATTERN | | XZL | XML | XS | XS | XZL |
| Type | | TL | TL | TL | TL | TL |
| Use Category | | | | | | |
| PR (Ply Rating) | | 22 | | 20 | | 16 |
| Load/speed index | | LRM (173/170G) | 166G | 173F | 176F | 176G |
| Unique point (1) | Unique point (1) | | | | | |
| | Unique Point Load (kg) per axle (single) | | | | | |
| | Unique Point Load (kg) per axle (twinned) | | | | | |
| | Pressure (PSI) per load (unique point) | | | | | |
| Michelin dimensions (2) | Laden section width (mm) | 488 | 526 | 558 | 661 | 663 |
| | Free section width S (mm) | 438 | 480 | 521 | 602 | 608 |
| | Free diameter D (mm) | 1343 | 1272 | 1200 | 1374 | 1388 |
| | Static laden radius R' (mm) | 609 | 581 | 548 | 620 | 631 |
| | Rolling circumference (mm) | 4060 | 3859 | 3639 | 4148 | 4200 |
| | Minimum dual spacing E (mm) | 495 | | | | |
| Michelin preferred rim | | 10.00W | 14.00V | 16.00 | 18.00 | 18.00 |
| Tube | | 20 V | | 19.5/20.5 UD | 20.5 WAMD | |
| Flap | | 310-20LB / 20X10.00 | | | | |
| Seal | | Jt 1443 | | | | |

| DIMENSION (Load indexes, if needed) | | 16.00 R 20 173/170 | 457/80 R 20 166 | 535/65 R 20.5 173 | 24 R 20.5 176 | 24 R 21 176 |
|--|-----|--------------------|-----------------|-------------------|---------------|-------------|
| bars | psi | Single | Single | Single | Single | Single |
| 3.00 | 44 | | 5890 | | | |
| 3.50 | 51 | | 6670 | | 9000 | 9000 |
| 4.00 | 58 | | 7460 | | 10000 | 10000 |
| 4.50 | 65 | 8300 | 8240 | | 11000 | 11000 |
| 5.00 | 73 | 9090 | 9030 | 8500 | 12000 | 12000 |
| 5.50 | 80 | 9880 | 9810 | 9250 | 13000 | 13000 |
| 6.00 | 87 | 10670 | 10600 | 10000 | 14200 | 14200 |
| 6.50 | 94 | 11460 | 20840 | 10750 | | |
| 7.00 | 102 | 12250 | 22280 | 11500 | | |
| 7.50 | 109 | 13000 | 24000 | 12250 | | |
| 8.00 | 116 | | | 13000 | | |
| 8.50 | 123 | | | | | |
| 9.00 | 131 | | | | | |

Pressure tables (PSI - bar) according to the maximum axle load (kg)

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(1) Unique point: Provides additional load/speed operating conditions, in order to supply particular requirements. The indicated variations in load with respect to speed do not apply to the unique point.

(2) From Michelin, measured values using Michelin preferred rim.

Nominal load in kg
(3) Flaps authorised by Michelin.

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TECHNICAL SPECIFICATIONS

OFF ROAD

| DIMENSION | 16.00 R 20 | 457/80 R 20 | 525/65 R 20.5 | 24 R 20.5 | 24 R 21 |
|------------------|----------------|-------------|---------------|-----------|----------|
| TREAD PATTERN | XZL | XML | XS | XS | XZL |
| Type | TL | TL | TL | TL | TL |
| Use Category | | | | | |
| PR (Ply Rating) | 22 | | 20 | | 16 |
| Load/speed index | LRM (173/170G) | 166G | 173F | 176F | 176G |
| Unique point (1) | | | | | |
| | Track | Track | Track | Track | Track |
| | Sand/Mud | Sand/Mud | Sand/Mud | Sand/Mud | Sand/Mud |
| 0.60 | 4500 | | | | |
| 0.70 | | 4500 | | | |
| 0.80 | 5000 | 5000 | 4000 | | 6500 |
| 0.90 | 5500 | 5500 | 4500 | 6500 | 7000 |
| 1.00 | 6000 | | | 7000 | 8000 |
| 1.10 | 6500 | 6000 | 5000 | 7500 | 8500 |
| 1.20 | | 6500 | 5500 | | 9000 |
| 1.30 | 4500 | 4500 | | 8000 | 9500 |
| 1.40 | 5000 | 5000 | 6000 | 8500 | 10000 |
| 1.50 | | 7500 | | 9000 | 10500 |
| 1.60 | | 8000 | | 9500 | 11000 |
| 1.70 | 5500 | 5500 | 6500 | | |
| 1.80 | | 8580 | 7000 | 6500 | |
| 1.90 | 6000 | 6000 | 7500 | 7000 | |
| 2.00 | | | 8000 | 10000 | |
| 2.10 | | | | 10500 | |
| 2.20 | 6500 | 6500 | 8000 | 11000 | |
| 2.30 | | | 11500 | 12000 | |
| 2.40 | 7000 | 7000 | 8600 | 12500 | 12700 |
| 2.50 | | 10000 | | | |
| 2.60 | | | | 13000 | 13200 |
| 2.70 | 7500 | 7500 | 6500 | 9000 | 9500 |
| 2.80 | | | | | |
| 2.90 | 8000 | 8000 | | 9500 | 10000 |
| 3.00 | | | 10500 | 10000 | 10500 |
| 3.10 | 8500 | 8500 | 7000 | 14000 | 14200 |

Pressure tables (PSI - bar) according to the maximum axle load (kg)

Pressure tables (PSI - bar) according to the maximum axle load (kg)

| | | | | | | | | | |
|------|-------|-------|--|-------|-------|-------|-------|-------|-------|
| 3.20 | 8580 | | | | 7500 | 11000 | 10500 | | 14760 |
| 3.30 | | 12500 | | | | | | | |
| 3.40 | | | | | | 11500 | 11000 | | |
| 3.50 | | | | | 8000 | | | | 15400 |
| 3.60 | | 13000 | | 9000 | | | | | |
| 3.70 | | 13200 | | | | 12000 | 11500 | | |
| 3.80 | | | | | 8600 | | | 12100 | 15900 |
| 3.90 | | | | | | | | | |
| 4.00 | | | | | | | 12000 | | 16340 |
| 4.10 | | | | 9500 | | | | | |
| 4.20 | | | | | | | | 12700 | |
| 4.30 | | | | | | | 12500 | | |
| 4.40 | | | | | | 13000 | | | |
| 4.50 | | | | | | | | 13200 | |
| 4.60 | | | | 10000 | | | 13000 | | |
| 4.70 | | | | | | | | | |
| 4.80 | | | | | | | | | 17760 |
| 4.90 | 11500 | | | | 10500 | | 13500 | 13700 | |
| 5.00 | | | | | | | | | |
| 5.10 | | | | | | | | | |
| 5.20 | | | | | | | | | |
| 5.30 | | | | 10600 | 11000 | | | 14200 | |
| 5.40 | 12000 | | | | | | 14000 | | |
| 5.50 | | | | | | | 14200 | | |
| 5.60 | | | | | | | | | |
| 5.70 | | | | | | | | | |
| 5.80 | | | | | 11500 | | | 14760 | |
| 5.90 | 12500 | | | | | | | | |
| 6.00 | | | | | | | | | |

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Rated load in kg

1) Unique point: Provides additional load/speed operating conditions, in order to supply particular requirements. The indicated variations in load with respect to speed do not apply to the unique point.

Track: for driving on poor roads and sand at a maximum speed of 65 kph.

Sand/mud: short legs in areas of difficult terrain.

Limit speed to 20 kph to safeguard the tyre.

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TECHNICAL SPECIFICATIONS

OFF ROAD

| DIMENSION | 13 R 22.5 | 445/65 R 22.5 |
|---|-----------|---------------|
| TREAD PATTERN | XZL | XZL |
| Type | TL | TL |
| Use Category | | |
| PR (Ply Rating) | 18 | |
| Load/speed index | 154/150K | 168G |
| Unique point (1) | | |
| Unique Point Load (kg) per axle (single) | | |
| Unique Point Load (kg) per axle (twinned) | | |
| Pressure (PSI) per load (unique point) | | |
| Laden section width (mm) | 338 | 486 |
| Free section width S (mm) | 307 | 448 |
| Free diameter D (mm) | 1130 | 1168 |
| Static laden radius R' (mm) | 525 | 537 |
| Rolling circumference (mm) | 3450 | 3550 |
| Minimum dual spacing E (mm) | 347 | |
| Michelin preferred rim | 9.00 | 14.00 |

Unique point (1)

Michelin dimensions (2)

| DIMENSION (Load indexes, if needed) | | | 13 R 22.5 154/150 | 445/65 R 22.5 168 |
|--|-----|--|-------------------|-------------------|
| bars | psi | | Single | Single |
| 3.00 | 44 | | | |
| 3.50 | 51 | | | |
| 4.00 | 58 | | | |
| 4.50 | 65 | | | |
| 5.00 | 73 | | 4930 | 7360 |
| 5.50 | 80 | | 5360 | 8000 |
| 6.00 | 87 | | 5790 | 8640 |
| 6.50 | 94 | | 6210 | 9280 |
| 7.00 | 102 | | 6640 | 9920 |
| 7.50 | 109 | | 7070 | 10560 |
| 8.00 | 116 | | 7500 | 11200 |
| 8.50 | 123 | | | |
| 9.00 | 131 | | | |

Pressure tables (PSI - bar) according to the maximum axle load (kg)

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Nominal load in kg
(3) Flaps authorised by Michelin.

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TECHNICAL SPECIFICATIONS

OFF ROAD

| DIMENSION | 13 R 22.5 | | 445/65 R 22.5 | |
|------------------|-----------|----------|---------------|----------|
| TREAD PATTERN | XZL | | XZL | |
| Type | TL | | TL | |
| Use Category | | | | |
| PR (Ply Rating) | 18 | | | |
| Load/speed index | 154/150K | | 168G | |
| Unique point (1) | | | | |
| | Track | Sand/Mud | Track | Sand/Mud |
| 0.60 | | 2500 | | |
| 0.70 | | | | |
| 0.80 | | 3000 | | 3500 |
| 0.90 | 2000 | | | 4000 |
| 1.00 | | | | |
| 1.10 | | 3500 | | 4500 |
| 1.20 | 2500 | | | |
| 1.30 | | 4000 | | 5000 |
| 1.40 | | | 3500 | |
| 1.50 | | 4500 | | 5500 |
| 1.60 | 3000 | | 4000 | |
| 1.70 | | 4900 | | 6000 |
| 1.80 | | 5000 | | 6500 |
| 1.90 | | | | |
| 2.00 | | | | |
| 2.10 | | 5500 | 4500 | 7000 |
| 2.20 | 3500 | | | |
| 2.30 | | | | 7600 |
| 2.40 | | 6000 | 5000 | |
| 2.50 | | | | 8000 |
| 2.60 | 4000 | | | |
| 2.70 | | | 5500 | 8500 |
| 2.80 | | 6500 | | |
| 2.90 | | | | |
| 3.00 | 4500 | | 6000 | 9000 |
| 3.10 | | | | |

Pressure tables (PSI - bar) according to the maximum axle load (kg)

Pressure tables (PSI - bar) according to the maximum axle load (kg)

| | | | | |
|------|------|------|-------|-------|
| 3.20 | 4900 | 7000 | 6500 | 9500 |
| 3.30 | | | | |
| 3.40 | 5000 | | | |
| 3.50 | | | | |
| 3.60 | | | 7000 | 10000 |
| 3.70 | | | | |
| 3.80 | 5500 | | | |
| 3.90 | | 7500 | | 10500 |
| 4.00 | | | 7600 | |
| 4.10 | | | | |
| 4.20 | 6000 | | | |
| 4.30 | | | 8000 | 11000 |
| 4.40 | | | | |
| 4.50 | | | | 11200 |
| 4.60 | | | 8500 | |
| 4.70 | | | | |
| 4.80 | | | | 11640 |
| 4.90 | | | | |
| 5.00 | | | 9000 | |
| 5.10 | 6500 | | | |
| 5.20 | | | | 12160 |
| 5.30 | | | | |
| 5.40 | | | 9500 | |
| 5.50 | | | | 12540 |
| 5.60 | | | | |
| 5.70 | | | | |
| 5.80 | | | | 12880 |
| 5.90 | | | | |
| 6.00 | | | 10000 | |

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Rated load in kg

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Limit speed to 20 kph to safeguard the tyre.

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