2018-2019

TECHNICAL DATA BOOK

MICHELIN TRUCK AND BUS TYRES

MICHELIN

The purpose of this manual is to provide useful information to help obtain maximum performance at minimum cost per kilometre. This manual will assist fleets to increase their tyre knowledge and covers the full life cycle of the tyres: selection, vehicle characteristics that affect tyre performance, maintenance and tyre life extension through regrooving and retreading.

MICHELIN tyres are designed for a specific use as detailed in this catalogue. Any other use constitutes 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 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 is essential to safe and efficient operation.

MICHELIN Remix and the tyre designations mentioned are trademarks of Michelin.

This manual gives Michelin recommendations for optimum use of tyres, nevertheless, please refer to the regulation of each country for local operation.

For further information about any of the products in this document, contact your local Michelin representative or refer to the Michelin website trucks.michelin.eu

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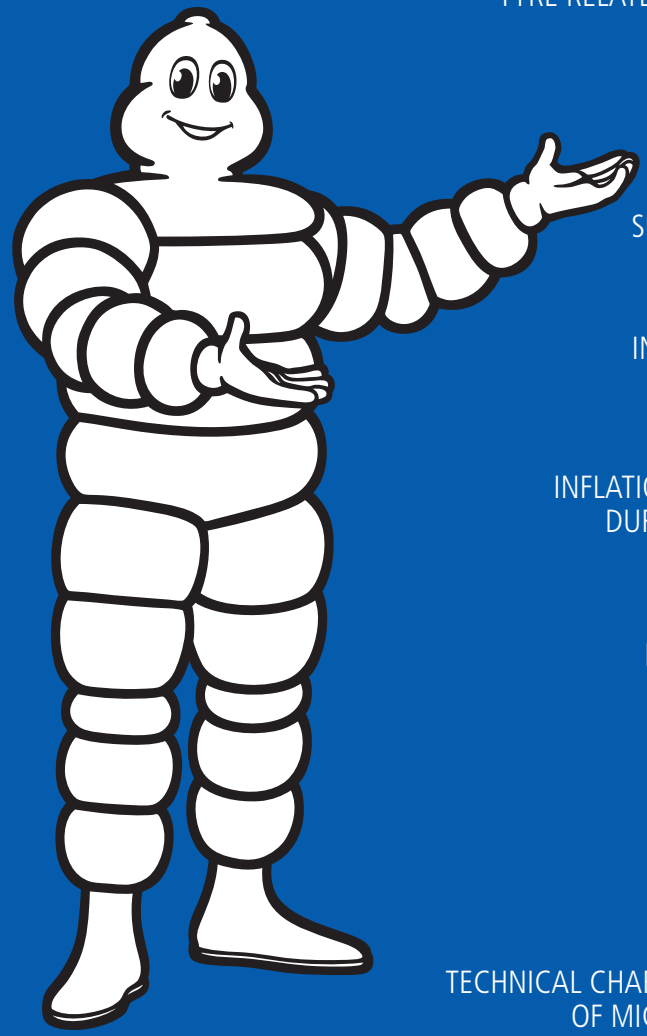

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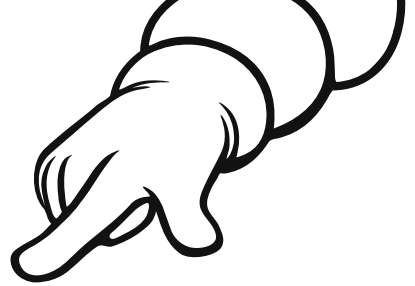

TYRE RELATED GUIDANCE

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FITTING NEW TYRES

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 dual tyres of the same type. This can vary according to country regulation.

European Union commission regulation (EU) No 458/2011 of 12 May 2011 requires that all the tyres mounted on same axle of a vehicle, should be of the same type or construction.

Fitting tyres with different tread patterns is allowed provided they have:

- the same brand
- the same size
- the same structure (radial or diagonal)
- the category of use (road, special, snow)
- sufficient speed capacity
- sufficient load capacity for the plated weights of the vehicle axle

Please refer to the regulations of each country for specific fitment.

FITTING REGROOVED TYRES

Regulations permit the fitting of regrooved tyres on all axles of commercial vehicles, 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 pages 79 to 123 for more detail.

Possible mounting for regrooved truck tyres

FITTING RETREADED TYRES

MICHELIN Remix tyres are designed and manufactured to be used on drive axles and trailer axles to drive, trailer and tag axles. Michelin does not recommend mounting retreaded tyres on the front steer axle of motor vehicles. As an example, it is therefore possible to use a retreaded tyre on a second axle of a 8x4 truck or a tag axle.

EXAMPLE OF A UNIFORM FITMENT (RETREAD - RETREAD) ON THE AXLE

- **Michelin recommends that 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 indices
  - tyre tread pattern
- **It is NOT ADVISED to mount retreaded tyres from different retreaders on the same axle, regardless of the make of the casing.**
- **It is ADVISED to mount retreaded tyres from the same retreader regardless of the make of the casing.**

Example of uniform retread fitment

Type A Retread on casing type W
Type A Retread on casing type X

Type A Retread on casing type Y
Type A Retread on casing type Z

EXAMPLE OF A MIXED FITMENT (NEW - RETREAD) ON THE AXLE

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

- **The retreaded and new tyres are of the same brand.**
- **The make of the casing is the same on new and retreaded tyres.**
- **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 indices
  - tread type (road, all-terrain, snow – M+S marking)

Diagram of axles for new/retreaded combination

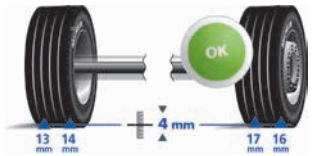
New type A
New type A

Retread type A on casing type A
Retread type A on casing type A

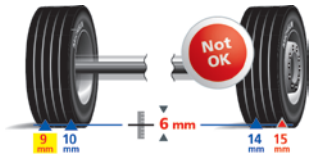
DEPTHS OF TREAD PATTERN ACROSS THE SAME AXLE

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

Example 1: maximum difference on the axle: acceptable for ≤ 5 mm



Example 2: maximum difference on the axle: not recommended for > 5 mm



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 recommends 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 "2016" indicates a tyre made in the 20th week (May) of 2016.

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.

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TYRE WEAR REMOVAL CRITERIA

The minimum remaining tread depth limits defined by each country per the chart below are defined to optimise tyre mileage potential while keeping safe operations. To that end Michelin offers tyres with high levels of performance throughout their service life and therefore recommends to keep the tyres in service until the legal limit for wear has been reached.

In addition, tyre mileage potential can be optimised by keeping the tyre in service for longer by regrooving when necessary.

Each millimetre of tread rubber can give up to 35,000 km or 3 months of service*.

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

MAIN EUROPEAN MINIMUM TREAD DEPTH REGULATIONS

Country	Minimum Tread Depth	Country	Minimum Tread Depth
Austria	2.0 mm	Lithuania	2.0 mm for coaches and buses carrying more than 8 passengers
Belgium	1.6 mm	Luxembourg	1.0 mm for towed vehicles 1.6 mm for motor vehicles
Bulgaria	1.6 mm	Netherlands	none
Croatia	1.6 mm	Norway	1.6 mm
Czech Republic	1.6 mm	Poland	3.0 mm for coaches reaching speeds of 100 kph 1.6 mm for other vehicles
Denmark	1.0 mm	Portugal	1.0 mm
Eurasian EU (1)	2.0 mm for coaches and buses 1.0 mm for other trucks	Romania	1.6 mm
Finland	1.6 mm	Serbia	2.0 mm
Estonia	1.6 mm	Slovakia	1.6 mm
France	1.0 mm	Slovenia	1.6 mm
Germany	1.6 mm	Spain	none
Greece	2.0 mm	Sweden	1.6 mm (2)
Hungary	1.6 mm for tyres with a diameter ≤ 750 mm 3.0 mm for tyres with a diameter > 750 mm	Switzerland	1.6 mm
Ireland	1.6 mm	Turkey	1.6 mm
Italy	1.6 mm	Ukraine	2.0 mm for coaches and buses 1.0 mm for other trucks
Latvia	1.6 mm	UK	1.0 mm

(1) Eurasian Economic Union: Armenia, Belorussia, Kazakhstan, Kyrghyzstan, Russia
(2) Outer tyres in dual configuration. No min. depth unless in winter.
Provided for informational purposes only, may be subject to changes in local regulations.
* Internal Michelin tests.

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.

Repair must always be preceded by removal of the tyre and a complete inspection both internally and externally spelling change required, by a professional.

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

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WINTER REGULATIONS IN EUROPE

Understanding winter tyre symbols:
The M+S symbol is a manufacturer's independent statement based on their own non-regulatory standards.
The Alpine (3PMSF) symbol is awarded if the tyre passes a traction test in winter conditions performed in accordance with UNECE Regulation 117. The test results are tangible and comparable. 3PMSF is the only real standard for measuring winter mobility.

Country	Minimum Tread Depth	Legislated use of tyres marked M+S or 3PMSF	Use of Chains	Defined Winter Period
Austria	5 mm Radial & 6 mm bias	Yes. Drive axles only.	Allowed for min 2mm drive tyres.	01 Nov-15 Apr for Trucks and 01 Nov-15 Mar for Coaches.
Belgium	1.6 mm	No.	Allowed in winter conditions	
Bosnia & Herzegovina	4 mm	Yes. Drive axles only.	Mandatory if no M+S/3PMSF marked tyres chains, shovel and sand bag.	15 Nov-15 Apr
Croatia	4 mm	Yes. Drive axles only.	Allowed if no M+S/3PMSF. Min 4mm	When roads covered or expected to have snow/ slush/ice.
Czech Republic	6 mm for drive axles. 1.6 mm for all others.	Yes. Drive axles only.	Allowed in winter conditions. Mandatory when signs indicate.	01 Nov-31 Mar or when road signs dictate.
Denmark	1 mm	No.	Allowed.	
Eurasian EU [1]	4 mm	Yes. All axles.	Allowed.	Basic period is 1 Dec -28 Feb. But any Federation subject is able to enlarge this period if needed.
Finland	Winter 2016 & 2017: 1.6 mm. Winter 2017 & 2018 : 5.0 mm for drive axle, 3.0 mm for all others.	Winter 2016 & 2017: No. Winter 2017 & 2018: Yes. Drive axles only.	Allowed in winter conditions.	01 Dec-01 Mar Studded tyres can be used 1 Nov -31 Mar
France	1 mm	No.	Allowed.	Studded tyres can be used from the Saturday before 11 Nov to last Sunday of March.
Germany	1.6 mm	Yes. [2]	Allowed. Speed limited to 50 km/h.	When roads covered or expected to have snow/ slush/ice.
Greece	2mm for drive, 1.6 for all others.	No.	When signs indicate.	Mandatory use of chains when signs indicate.
Hungary	1.6 mm if tyre size is <750mm 3 mm if tyre size is >750mm	No.	When signs indicate.	
Italy	1.6 mm	No.	Mandatory if no M+S/3PMSF marked tyres when signs indicate.	Mandatory use of chains when signs indicate.

Country	Minimum Tread Depth	Legislated use of tyres marked M+S or 3PMSF	Use of Chains	Defined Winter Period
Kosovo	4 mm	Yes. Drive axles only.	Mandatory in winter conditions.	When roads covered or expected to have snow/ slush/ice.
Luxembourg	1.6 mm	Yes. Drive axles only.	Allowed in winter conditions.	When roads covered or expected to have snow/ slush/ice.
Macedonia	6mm on drive axles and min. 4 mm on the other axles.	Yes. All axles.	For axles without tyres with M+S marking and min. 4 mm. Should have as well shovel and bag of sand.	15 Nov - 15 Mar
Montenegro	4 mm	Drive axles only.	Chains, shovel and sand bag when there is snow on the road.	1 Nov - 1 Apr
Netherlands	1.6 mm	No.	Not allowed.	
Norway	5 mm	All axles including lift axles.	Allowed with requirement to carry 3-7 sets depending on number of axles.	15 Nov - 31 Mar
Poland	1.6 mm (3 mm for coaches)	No.	When signs indicate.	Mandatory use of chains when signs indicate.
Portugal	1mm	No.	When signs indicate.	No period defined.
Romania	4 mm	Yes.	Allowed on drive axles.	1 Nov - 31 Mar
Serbia	4mm	Yes. Drive axles only.	Allowed if no M+S/3PMSF. Chains mandatory for at least 2 drive wheels and shovel.	1 Nov - 1 Apr
Slovakia	3 mm for drive axles, 1.6 mm for all others.	Yes. Drive axles only.	Allowed in winter conditions. Mandatory when signs indicate.	1 Nov - 31 Mar
Slovenia	4 mm	Yes. Drive axles only.	Allowed if no M+S/3PMSF. Min 3 mm	1 Nov - 31 Mar
Spain	Tread depth visible in main grooves.	No.	When signs indicate.	No period, truck and bus traffic can be stopped by the authorities depending on road conditions. See Exception in [3].
Sweden	5mm, all position on truck only 1.6 mm on trailer.	Yes. Drive axles only.	Allowed.	1 Dec -1 Apr
Switzerland	1.6 mm	No.	When signs indicate.	
Turkey	4 mm	Yes. Drive axles	Allowed.	1 Dec - 1 Apr
Ukraine	Truck: 1 mm & Coach: 2 mm.	Yes.	Allowed.	NA
UK	1 mm	No.	Not mandatory.	1 Dec - 1 Apr
Other EU countries	1.6mm	No.	When signs indicate	Chains or winter tyres can be required when signs indicate.

Provided for informational purposes only, may be subject to changes in local regulations,
(1) Eurasian Economic Union: Armenia, Belorussia, Kazakhstan, Kyrghyzstan, Russia
(2) 3PMSF for drive axle tyres manufactured > 01 Jan 2018 and steer axle > 01 July 2020 for winter use - M+S drive tyres manufactured < 31 Dec 2017 valid for winter use until 30 Sept 2024.
(3) Exception: some vehicles can be authorised to circulate during winter red level alert, such as buses and coaches but it's mandatory to have:
- Tyres with 3PMSF on all axles. - Tyres with more than 4 mm remaining tread depth
- A certificate that guarantees that the tyres are 3PMSF - A sticker with a visible icon on the windscreen
- For small trucks 3PMSF tyres can be replaced by chains

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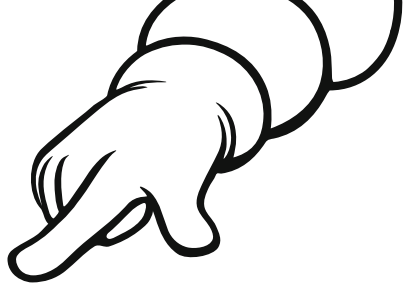

CHOOSING THE MOST SUITABLE TYRE

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 of operation). In some countries, vehicles modified in this way need to obtain official authorisation.
- Any second-hand or worn 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 tyre care page 30).
- Incorrect use or the wrong choice of tyre may also contribute to premature failure 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 tyre size must be approved by the vehicle manufacturer and the load index should be equal or greater than the maximum permitted axle load.
- The maximum permitted axle load is 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 flexing of the casing which can be prejudicial to safety, handling, grip and tyre service life.

STEP 2: CHOOSE THE CORRECT 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.

X LINE™	Designed for long distance, high average speed, international journeys, constant speed.
X MULTI™	Designed for national and regional operations on all types of roads.
X WORKS™	Designed for roads, in and around worksites and quarries.
X COACH™	Designed for people transportation for long and short distance on all types of roads.
X INCITY™	Designed for journeys in urban and suburban driving.
X FORCE™	Designed for specialised, civil or military vehicles mostly driven on off-road surfaces.

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.

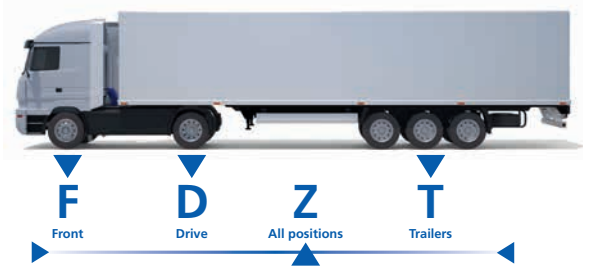

Diagram of tyre position code

Examples
X® MULTI™ F = **F** for Front
X® LINE ENERGY™ D or X® COACH™ XD = **D** for Drive
X® MULTI™ T = **T** for Trailers
X® INCITY™ XZU = **Z** for All positions

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■ Associated risks if the 4 steps are not followed

Tyre functions		Associated risks of using inappropriate tyres
Carry the load	Defined by the vehicle characteristics: axle load	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 maybe affected. Retreading may be compromised. Service life will be reduced.
Ability to carry the load at maximum speed	Defined by the vehicle characteristics: maximum speed of vehicle	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.
Travel on different road surfaces	According to the conditions of use	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.
Steer the vehicle	According to the conditions of use By providing feedback to the driver about the conditions of use	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.
	Special feature of front axle: specially adapted tread pattern and uniformity	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.
Provide a comfortable ride	Special feature of front axle tyres: specially designed tread and uniformity	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.
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.	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 it's service life will be reduced.
Long life for optimised business efficiency	In relation to mileage performance	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.
	In relation to the vehicle's fuel consumption	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.

OTHER RECOMMENDATIONS

For fitments on a steering axle we must

Use primarily "F" or "Z" tread patterns. These tread patterns have been designed for use on the steer position. Michelin does not recommend mounting retreaded tyres on the front steer axle of motor vehicles. As an example, it is therefore possible to use a retreaded tyre on a second axle of a 8x4 truck or a tag axle.

When fitting tyres on a drive axle we must

Use tyres with "D" or "Z" tread patterns exclusively. "D" tread patterns are designed for the specific conditions of drive axles like torque and grip. 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 for the specific conditions of trailer axles like scrubbing or high mileage on the centre axles. 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.

Tyres marked FRT

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) is applicable for tyres designed for the equipment of trailer axles and axles of motor vehicles other than front steering and drive axles."
Michelin also apply the FRT marking to MICHELIN Remix tyres.
Michelin does not recommend the fitment of any Michelin Group trailer tyres to the Front Steer axle and Drive axle positions.

Michelin shall not be held liable for the consequences of any damage or injury caused by the use of tyres contrary to their recommendations.
Please see your local Michelin representative for the use of other tyre types.

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MICHELIN TYRE RANGE

X LINE™

Designed for long distance, high average speed, international journeys, constant speed.


X® LINE™ ENERGY™ F | XFA 2 ENERGY™ | X® ENERGY™ XF


X® LINE™ ENERGY™ Z | XZA 2 ENERGY™


X® LINE™ ENERGY™ D2 | X® LINE™ ENERGY™ D | XDA 2+ ENERGY™


X® LINE™ ENERGY™ T | XTA 2 ENERGY™ | XTA 2+ ENERGY™ (445/45 R 19.5) | XTA (315/80 R22.5)

X COACH™

Designed for people transportation for long and short distance on all types of roads.


X® COACH™ HL Z | X® COACH™ XD

X WORKS™

Designed for roads, in and around worksites and quarries.


X® WORKS™ Z | X® WORKS™ HD Z | XZY 2 | XZY 3


X® WORKS™ D | X® WORKS™ HD D | XDY 3 | XDY+ | X® WORKS™ T | XTY 2

X MULTI™

Designed for national and regional operations on all types of roads.


X® MULTI™ F | XFN 2+ | XFN 2 Antisplash | X® MULTIWAY HD XZE


X® MULTI™ Z (Serie 70) | X® MULTI™ ENERGY™ Z | X® MULTIWAY 3D XZE | XZE 2+ | X® MULTI™ WINTER Z | X® MULTI™ Z (Serie 17.5/19.5)


X® MULTI™ D (Serie 70) | X MULTI™ ENERGY™ D | X® MULTI™ D (Serie 17.5/19.5) | X® MULTIWAY 3D XDE | XDE 2+ | X ONE™ MULTI™ D


XDW ICE GRIP


X® MULTI™ T | X® MULTI™ WINTER T | X ONE™ MAXITRAILER + | X® MAXITRAILER | XTE 2+


X® MULTI™ T2

X INCITY™

Designed for journeys in urban and suburban driving.


X® INCITY™ XZU | X® INCITY™ HLZ | X® INCITY™ XZU 3 + (295/80 R 22.5) | X® INCITY™ Z (305/70 R 22.5)


X® ONE™ XDU (455/45 R 22.5)

X FORCE™

Designed for specialised, civil or military vehicles mostly driven on off-road surfaces.


X® FORCE™ ZL / XZL | X® FORCE™ 2 / XZL 2 | X® FORCE™ S / XS | X® FORCE™ ML / XML | X® FORCE™ ZH / XZH2R

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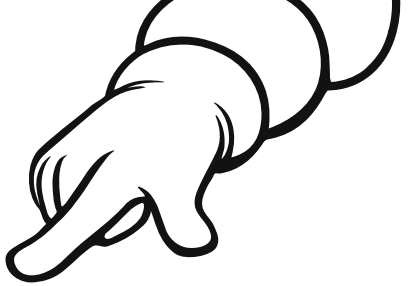


OPERATING INSTRUCTIONS

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

- The 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 and use appropriate equipement.
- The vehicle must be stationary with its engine switched off and must be correctly stabilised (parking brake, chock, axle stands, etc.).

FITTING PRECAUTIONS

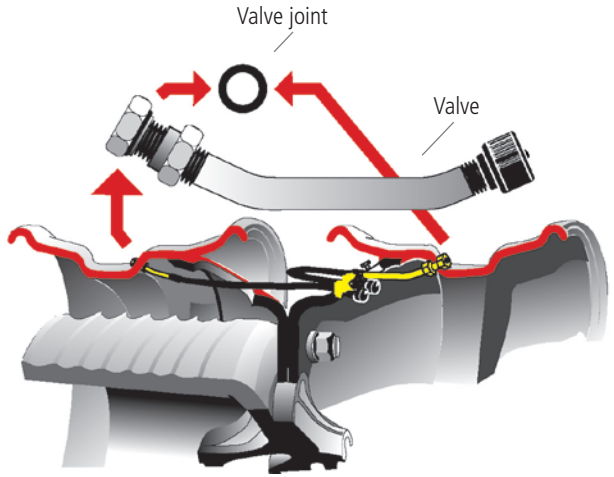
- Make sure that the wheel and its components are suitable, clean and in good condition.
- Check the compatibility of tyre and wheel, tyre and vehicle and tyre and use.
- Respect the positions, fitting direction, direction of rotation and any relevant instructions when mentioned on the tyre sidewalls.
- 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, dislocation).
- Change the valve seal for tubeless wheels or the tube and flap for tube type wheels.
- 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. 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.
- 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.

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

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

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INFLATION PRESSURE IN WORKSHOP

- **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 cold tyre inflation pressure must be defined in relation to the load, speed and condition of use.**
- **Michelin recommends inflating the tyre in a safety cage.**
- **The inflation must be carried out in 2 stages :**
  - 1st stage:

  – pre-inflate to 1.5 bar (22 PSI),
  – 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.**

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.

WHEEL INSTALLATION ON VEHICLE

After fitting the wheel on the vehicle, the wheel nuts must be tightened with a calibrated torque device to the torque setting defined by the vehicle manufacturer. The correct wheel tightening process is essential to maintain wheel security, and along with it your safety.

WHEELS CONDITION

- 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 MOUNTING / WHEEL ASSEMBLY, 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 nuts or washers

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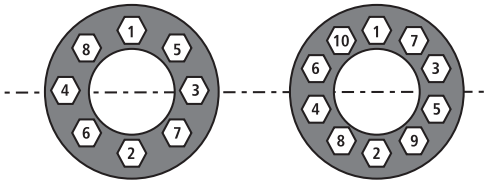
■ Final tightening torque:

- Use a calibrated torque device.
- Follow the methods recommended by the vehicle manufacturer and their recommended tightening torques.
- The nuts should be tightened alternately diagonally according to the number of nuts as per the illustration below. The diametrically opposite rotational sequence ensures that the mating faces are pulled together squarely and evenly.
- Tightening to the correct torque with a calibrated torque device 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.

After a period of thirty minutes, or after 50 – 100 kilometres of use, the wheel nuts should be rechecked for tightness using a calibrated torque device. When the retorque is carried out, the nuts should not be slackened off and then retightened. They should simply be checked.

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, 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 INSPECTION AND RECOMMENDATIONS

■ Tyre wear on the steering axles of motor vehicles

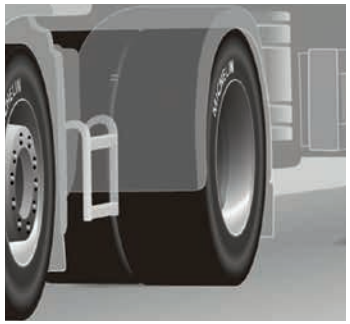
■ Observations

- The front nearside tyre normally 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.

SOLUTION: 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 advises against fitting retreaded tyres on the front steer axles of motor vehicles.

Note: for advice on Antisplash™ tyres see page 35.

■ Tyre wear on the drive axle

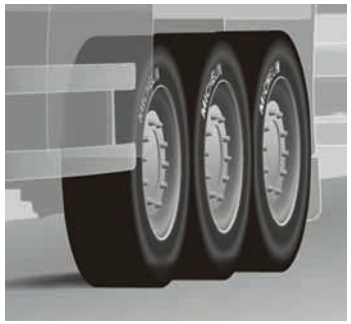


■ Observations

- 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.

SOLUTION: 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 on drive axles in rear position.
For directional tyres see page 34.

■ Wear on trailer axle tyres (semi-trailer with three fixed axles)



■ Observations

As a result of lateral scrubbing whilst cornering and maneuvering, 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.

SOLUTION: 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 tyres may be regrooved and fitted to the 2nd axle.
For trailers and semi-trailers, MICHELIN Remix tyres can be fitted in any position.

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TYRE ROTATION AND TURNING ON THE RIM

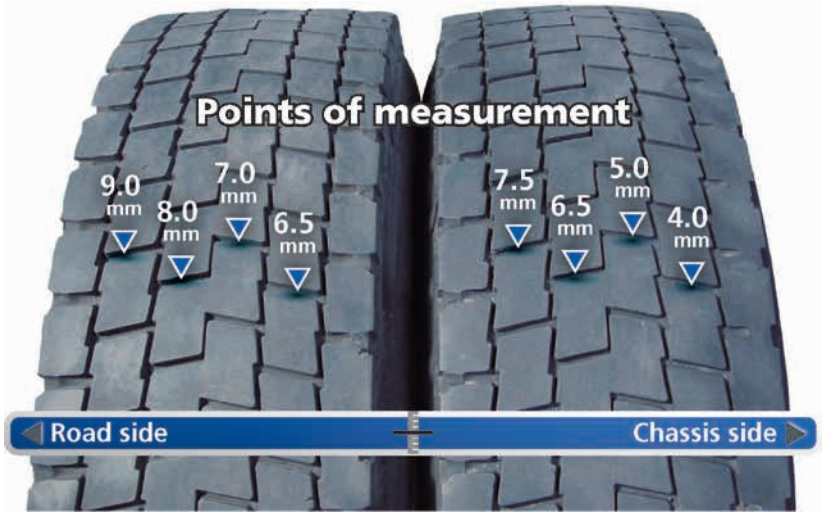
■ What is it?

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.

WHEEL ALIGNMENT

By measuring and adjusting wheel angles on a vehicle, fuel costs and tyre wear are reduced. This leads to better economy and environment for everyone. It also means improving safety in taking up less space with a vehicle traveling on highway with correctly aligned wheels.

PRECAUTIONS FOR TYRE REMOVAL

■ When removing the wheel from the vehicle

If the tyre is part of a dual 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 core.

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STORAGE AND HANDLING

Conditions for good tyre storage:

- Clean, dry, temperate and well-ventilated premises, sheltered from direct sunlight and bad weather.
- 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.
- 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.).
- 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.
- Storage:
  - For short term storage (up to 4 weeks) tyres can be stacked horizontally, one on top of another, on wooden pallets 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 on shelf racks.
  - 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 inner 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 pallets 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.
- 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, dust, grease and moisture. Never suspend them – this can cause deformation and elongation.

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.

ADDITIONAL MICHELIN STORAGE INFORMATION

- Stored tyres which reach five 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.

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RECOGNITION OF TYRE WEAR AND DAMAGE

FEATHERED RAPID ABNORMAL WEAR

1| OBSERVATION

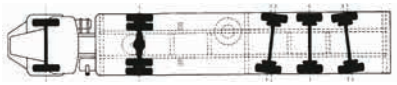
Presence of feathering at the edge of the tread blocks, more evident on one side than the other.

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**

■ **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 53

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.

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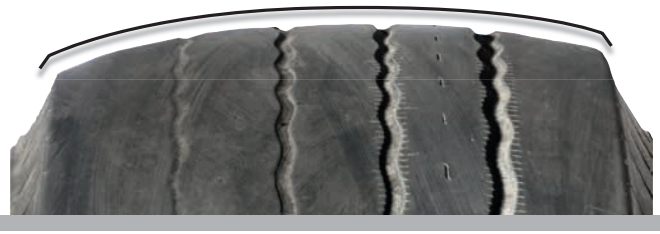
SLOPED WEAR



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 53

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.

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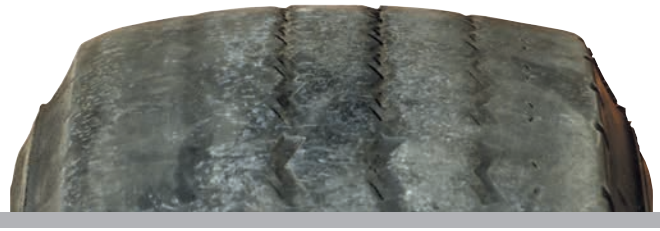
ROUNDED WEAR



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 53

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 53

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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 53

"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 53

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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 53

ECCENTRIC WEAR

1| OBSERVATION

Diametrically opposed maximum and minimum tread wear rates.

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 53

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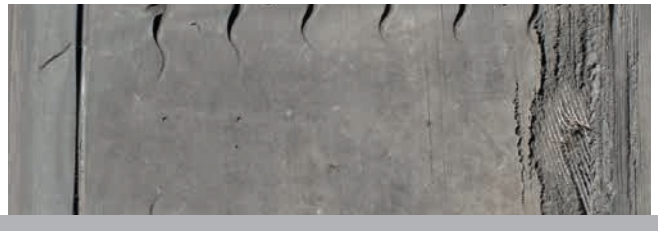
BRAKE FLATTING



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.

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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.

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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

1| OBSERVATION

Different rubber aspect with no cut to tread rubber.

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 MICHELIN Remix potential and prevent potential structural damage by excessive wear.

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RUBBER CRACKING

1| OBSERVATION

Superficial cracks to the rubber of the sidewall.

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

1| OBSERVATION

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

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.

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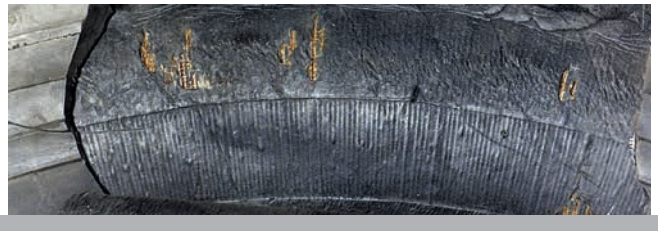
RUBBER DETACHMENT



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

1| OBSERVATION

Regular circumferential rupture to the sidewall.

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.

MICHELIN

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 toe 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.

MICHELIN

DETERIORATION

1| OBSERVATION

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

2| PROBABLE CAUSE(S)

Rim in poor condition (corroded). 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

1| OBSERVATION

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

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.

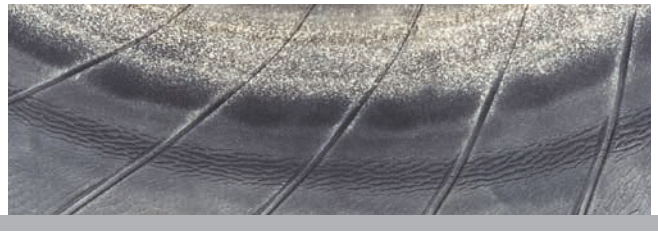
VEHICLE

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.

MICHELIN

MARBLING



1| OBSERVATION

Presence of marbling and creasing of the interior lining in the flexion zone.

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).

MICHELIN

DAMAGE CAUSED BY ELECTRICAL ARCING

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.

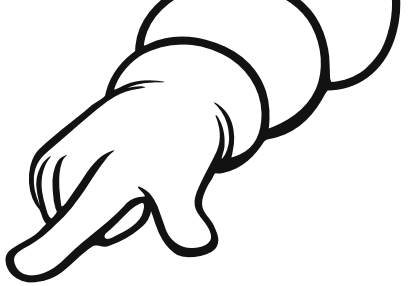
2| PROBABLE CAUSE(S)

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

3| TIPS

TYRE

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



INFLATION PRESSURE DURING SERVICE

MICHELIN

INFLATION PRESSURE

Choosing and maintaining the correct inflation pressure is key for optimum 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

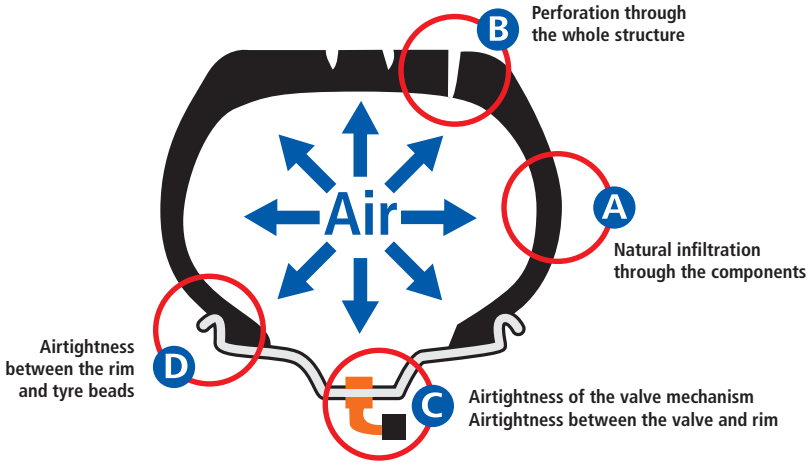
Incorrect tyre pressure has a negative impact on certain basic aspects of safety performance such as:

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

■ Variation in inflation pressure

A tyre may lose pressure for various different reasons:

Airtightness of the wheel rim (e.g. cracks or welds).



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

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REASONS FOR INFLATION PRESSURE CHECK

■ **Pressure checks should be made on all the tyres on the vehicle:**

- 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.
- The spare tyre should also be checked.
- Tyre pressures must be checked on cold tyres regularly or when the vehicle is serviced, using a calibrated pressure gauge.
- 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 (7 PSI)	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 14.5 PSI)	Reduced longevity. Increased irregular wear. Increased fuel consumption.	TEMPORARILY ACCEPTABLE PRESSURE Correct immediately and monitor.
Under-inflation of more than - 1 bar (14.5 PSI)	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

- Tyre pressures must be checked on cold tyres at ambient temperature. 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.
- Under-inflation leads to:
  - An increase of rolling resistance and thus vehicle's fuel consumption
  - A reduction in tyre service life (mileage)
  - An impact on vehicle handling and safety
  - A reduction in casing resistance which limits the potential of retreading
- Over-inflation reduces:
  - Safety and ride comfort
  - Grip
  - Tyre service life (mileage), particularly on drive axles tyres
- Tyre pressures greater than 10 Bar (145 PSI) are not recommended for normal highway operations.
- Inflation pressures on cold tyres which are more than 0.6 bar (8 PSI) below the suggested values must be corrected immediately.
- The regulations in force in the country of use are to be observed in all cases.
- 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.
- Tyres for commercial vehicles should be inflated to a pressure relevant to the load, speed and conditions of use.
- Guidelines on 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).

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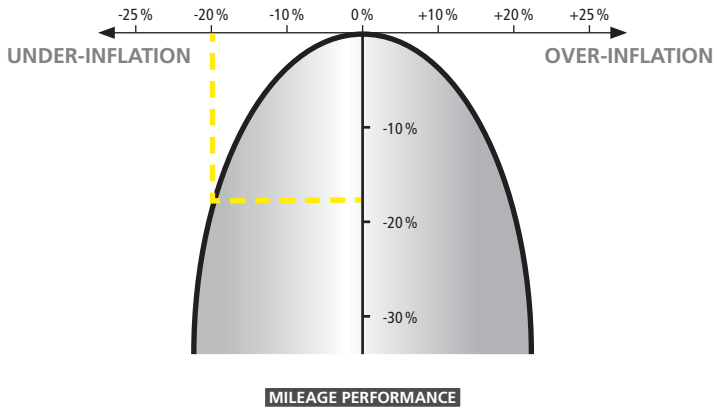
THE INFLUENCE OF INFLATION PRESSURE ON TYRE MILEAGE

A tyre under-inflated by 1.5 bar (22 PSI) may lead up to a 10% mileage loss.

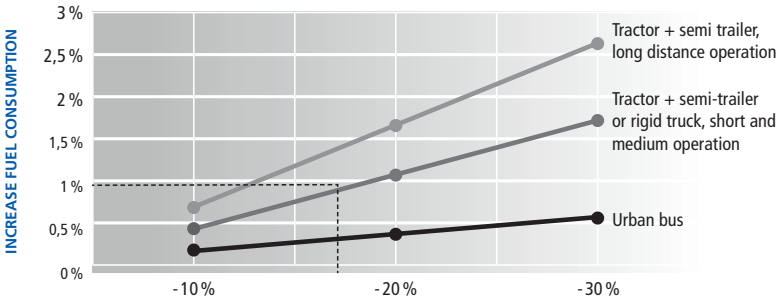


THE INFLUENCE OF INFLATION PRESSURE ON FUEL CONSUMPTION

Inflation pressure has a proven influence on fuel consumption. An unsuitable inflation pressure increases tyre rolling resistance and thus vehicle's fuel consumption.

Under-inflation of 1.5 bar = 1 % increased fuel consumption*

Increased fuel consumption of tyre at 7.5 bar for recommendation of 9 bar or 17% under-inflated



UNDER-INFLATION IN RELATION TO SUGGESTED NOMINAL PRESSURE
INFLUENCE ON 22.5" RIM TRUCK TYRE

* Internal Michelin source.

INFLATION PRESSURE CHART

The cold tyre inflation pressures indicated in the table below are for guidance purposes pending weighing of the vehicle for setting optimum pressures. They do not cover all conditions of use and should be discussed with your Michelin representative before being put into use with your vehicles.

For tyre sizes and types of vehicles not indicated, please contact your Michelin representative.

RECOMMENDATIONS

- Check the tyre pressures regularly when the tyres are cold at ambient temperature or after the vehicle has stopped for several hours.
- NEVER DEFLATE HOT TYRES.

MICHELIN

Transportation of goods

Road

		Tractor units					Semi-trailer
		4x2		6x2			1-2 or 3 axle
							
Tyre size	Load index	S	D	S	L	D	All positions
205/65 R 17.5 X TL	129/127J						9.0
205/75 R 17.5 X TL	124/122M						
215/75 R 17.5 X TL	126/124M						
215/75 R 17.5 X TL	135/133J						8.5
225/75 R 17.5 X TL	129/127M						
235/75 R 17.5 X TL	132/130M						
235/75 R 17.5 X TL	143/141J						8.5
245/70 R 17.5 X TL	136/134M						
245/70 R 17.5 X TL	143/141J						8.5
265/70 R 17.5 X TL	138/136M						
265/70 R 17.5 X TL	140/136M						
9.5 R 17.5 X	143/141J						8.5
245/70 R 19.5 X TL	136/134L-M						
245/70 R 19.5 X TL	141/140J						8.5
255/60 R 19.5 X TL	143/141J						9.0
265/70 R 19.5 X TL	140/138L-M						
265/70 R 19.5 X TL	143/141J						8.5
285/70 R 19.5 X TL	146/144L-M						
285/70 R 19.5 X TL	150/148J						8.5
305/70 R 19.5 X TL	147/145M						
445/45 R 19.5 X TL	160J-K						9.0
10 R 22.5 X	144/142K-L						
255/70 R 22.5 X TL	140/137M						8.0
275/70 R 22.5 X TL	148/145L-M						8.5

These are nominal pressures for guidance purposes only and should be confirmed by contacting your local Michelin representative who may arrange for the vehicle to be weighed to confirm optimum cold inflation pressure for your conditions of use.
S = Steer / L = Lift / D = Drive / T = Tag
(A) When fitting to the front steering axle: load on the axle = pressure. Example: 7.5 tons = 7.5 bars, 8 tons = 8.0 bars, 9 tons = 9.0 bars. (B) For 2 axles rear, otherwise 9.0 bars. (C) If assembling with simple axle: 7.1 tons = 8.5 bars. (D) If assembling with simple axle: 8 tons = 9,0 bars. (E) For axle load 10 Tons, otherwise for 9 Tons = 8 bars.

Transportation of goods

Road

Rigid trucks								Trailers		
4x2		6x2				6x2x4		2-3 central axle	2-3 axles	
										
S	D	S	D	T S	R2 D	S	D	All positions	S	D
								9.0	9.0	9.0
6.0	5.5									
6.0	5.5									
								8.5	8.5	8.5
6.5	6.0									
6.5	6.0									
								8.5	8.5	8.5
6.5	6.0									
								8.5	8.5	8.5
7.0	6.5									
7.0	6.5									
								8.5	8.5	8.5
7.0	6.5									
								8.5	8.5	8.5
								9.0	9.0	9.0
7.0	6.5									
								8.5	8.5	8.5
7.0	6.5									
								8.5	8.5	8.5
7.0	6.5									
								9.0	9.0	8.0 (B)
7.0	6.5								7.0	7.0
8.0	7.0									
8.0	7.0									

		Transportation of goods					
		Road					
		Tractor units					Semi-trailer
		4x2		6x2			1-2 or 3 axle
							
Tyre size	Load index	S	D	S	L	D	All positions
275/70 R 22.5 X TL	152/148J						8.5
275/80 R 22.5 X TL	149/146L	7.5	7.5				8.0
11 R 22.5 X	148/145L	7.0	7.5				8.0
11 R 22.5 X	142/142J						8.0
12 R 22.5 X	152/148K-L	7.0	7.5				8.5
12 R 22.5 X	152/149l	7.0	7.5				8.5
295/60 R 22.5 X TL	150/147K-L	9.0	9.0				
295/80 R 22.5 X TL	152/148M	8.5	8.0	8.5	7.0	7.0	8.5
305/70 R 22.5 X TL	152/150L	8.5	7.5				
315/60 R 22.5 X TL	152/148L	9.0	8.5				
315/60 R 22.5 XF TL	154/148L	9.0 (C)		9.0 (C)			
315/70 R 22.5 X TL	154/150L	8.5	7.5	8.5	7,0	7,0	
315/70 R 22.5 X TL	156/150L	9.0 (D)		9.0 (D)			
315/80 R 22.5 X TL	156/150L	8.0	7.0	8.0	6.5	6.5	8.5
355/50 R 22.5 X TL	156K	9.0		9.0			9.0
13 R 22.5 X	156/150L	7.5	7,0				
385/55 R 22.5 X TL	158L-160J	7.5 (A)					9
385/65 R 22.5 X TL	158L-160J	7.5 (A)					9
385/65 R 22.5 X TL	164k	9.0 (E)					9.0 (E)
455/45 R 22.5 X TL	160J						9.0
425/65 R 22.5 X TL	165K						8.5
445/65 R 22.5 X TL	169K						8.5
495/45 R 22.5 XOne TL	169K		9.0				

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Transportation of goods											
Road											
Rigid trucks									Trailers		
4x2		6x2				6x2x4		2-3 central axle	2-3 axles		
											
S	D	S	D	T S	R2 D	S	D	All positions	S	D	
								8.5	8.5	8.5	
8.0	7.0										
7.5	7.0										
8.0	7.5					8.0	7.5				
8.0	7.5					8.0	7.5				
8.5	8.0	8.5	7.0	8.0	7.0	8.5	8.0		8.5	8.5	
8.5	8.0					8.5	8.0				
9.0	8.5	9.0	8.5	8.5	9.0	9.0	8.5				
9.0 (C)		9.0 (C)				9.0 (C)					
8.5	8.0	8.5	8.0	8.0	8.5	8.5	8.0				
9.0 (D)		9.0 (D)				9.0 (D)					
8.5	7.5	8.5	7.5	7.5	8.0	8.5	7.5		8.5	8.5	
8	7.5					8	7.5				
8.0 (A)		8.0 (A)		8,0		8.0 (A)			9.0	8.0 (B)	
8.0 (A)		8.0 (A)		8,0		8.0 (A)			9.0	8.0 (B)	
9.0 (E)		9.0 (E)		9.0 (E)		9.0 (E)		9.0 (E)			
									9.0	8.0 (B)	
									8.5	8.5	
									8.5	8.5	

Tyre size	Load index	Transportation of goods				
		Mixed / Sites				
		Tractor				Semi-Trailor
		4x2		6x4		1-2 or 3 axle
						
		S	D	S	D	All positions
235/75 R 17.5 X TL	143/141J					8.5
265/70 R 19.5 X TL	143/141J					8.5
305/70 R 19.5 X TL	147/145J					
10 R 22.5 X TL	144/142K	7.5	7.0			7.0
275/70 R 22.5 X INCITY TL	148/145J					
11 R 22.5 X TL	148/145K	7.0	7.5			8.0
11 R 22.5 X INCITY TL	148/145J					
12 R 22.5 X TL	152/148K	7.0	7.5			
295/80 R 22.5 X TL	152/148K	7.0	7.5			
295/80 R 22.5 X INCITY TL	152/148J					
305/70 R 22.5 X INCITY TL	153/150J					
315/80 R 22.5 X TL	156/150K	8.0	7.0			8.5
13 R 22.5 X TL	156/154/ 151/150K	8.0 (B)	7.5	7.0 (B)	6.0	8.0
385/65 R 22.5 X TL	160K	7.5 (A)				9.0
425/65 R 22.5 X TL	165K					9.0
445/65 R 22.5 X TL	169K					9.0

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Transportation of goods										
Mixed / Sites						Urban				
Rigid trucks						Urban trucks				
4x2		6x4		8x4		4x2		6x2		
										
S	D	S	D	S	D	S	D	S	D	
						6.5	6.5			
7.0	6.5					7.0	6.5			
						7.0	7.0			
7.5	7.0									
						7.5	7.5			
8.0	7.5	7.5	7.0	7.5	7.0					
8.5	8.0									
						7.5	7.5	7.5	7.5	
						7.5	7.5			
8.0	7.5	7.0	6.5	7.0	6.5	7.5	7.5	7.5	7.5	
8.0 (B)	7.5	7.0 (B)	6.5	7.0 (B)	6.5	7.5 (B)	7.5	7.5 (B)	7.5	
8.0 (A)		8.0 (A)								

		Transportation of people									
		Coach					Urban buses				
		4x2		6x2			4x2		Articulated		
											
		S	D	S	D	T	S	D	S	T	D
205/75 R 17.5 X TL	124/122M	6.0	5.5								
215/75 R 17.5 X TL	126/124M	6.0	5.5								
225/75 R 17.5 X TL	129/127M	6.0	5.5								
235/75 R 17.5 X TL	132/130M	6.0	5.5								
245/70 R 19.5 X TL	136/134M	6.5	6.0								
265/70 R 19.5 X TL	140/138M	6.5	6.0								
305/70 R 19.5 X TL	147/145M						7.5	7.5			
275/70 R 22.5 X TL	148/145L-M	7.5	7.5								
275/70 R 22.5 X INCITY TL	148/145J						8.5	7.5	8.5	7.0	8.0
275/70 R 22.5 X INCITY HL	150/145J						8.5	7.5	8.5	7.0	8.0
295/80 R 22.5 X TL	152/148L-M	8.5	7.5	8.5	8.0	8.5					
295/80 R 22.5 X COACH HLZ	154/149M	8.5	7.5	8.5	8.0	8.5					
295/80 R 22.5 X INCITY TL	152/148J						7.5	7.0	7.5	6.5	7.5
305/70 R 22.5 X INCITY TL	150/147J						8.0	7.5	7.5	7.0	7.5
315/60 R 22.5 X TL	152/148J					8.0	9.0	9.0			
315/80 R 22.5 X TL	156/150L	8.5	7.5	8.0	7.5						
455/45 R 22.5 X One XDU	166J							9.0		9.0	9.0
495/45 R 22.5 X One XDU	169J									9.0	9.0

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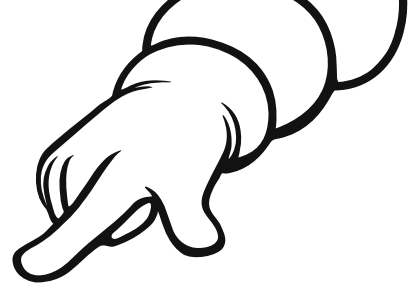


REGROOVING

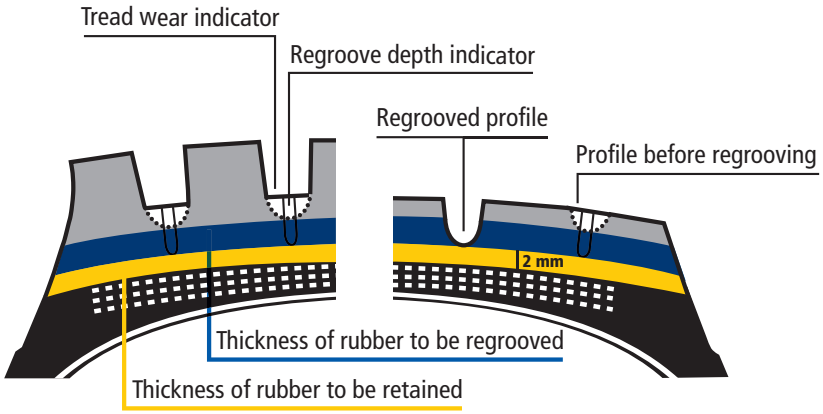
MICHELIN

GENERAL PRINCIPLES

Regrooving involves removing rubber from the layer of existing rubber to restore tread pattern depth.

All MICHELIN tyres applicable for regrooving, are marked "REGROOVABLE" on the tyre sidewall.

The technique is recommended by ETRTO*. Right from the design stage, Michelin provides a sufficient thickness of rubber to allow regrooving without adversely affecting the tyre strength or robustness.

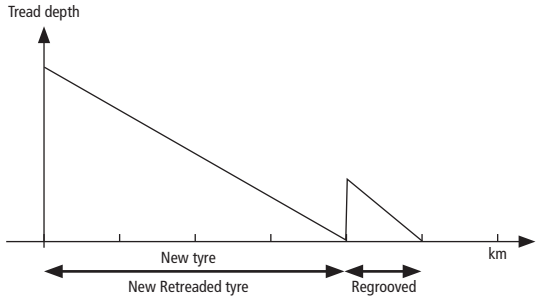


* European Tyre and Rim Technical Organisation.

ADVANTAGES OF REGROOVING

MORE MILEAGE

By re-establishing the tyre's tread pattern again, regrooving extends the mileage potential of the tyre by up to 25% for both new and retreaded Michelin Group tyres.

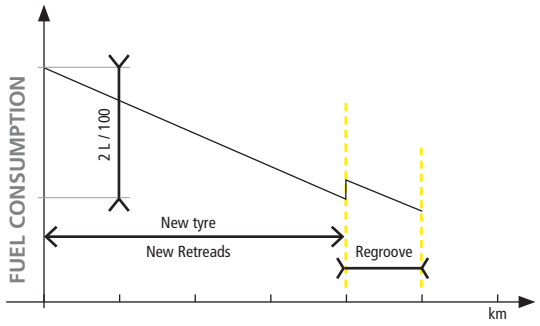


MORE FUEL SAVINGS

Saves up to 2 litres of fuel every 100 km** compared with new tyres.

Rolling resistance decreases while the tread depth decreases during use, therefore 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 as indicated below when fuel consumption is at its lowest.



** 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.

MICHELIN

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*.

REDUCTION OF ENVIRONMENTAL IMPACT

Lower CO_2 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.

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

  Regrooving does not affect Michelin 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.

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:**

- Re-establish 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.

*Internal Michelin source : test conducted on polished concrete.

- **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.

- **Do not regroove if:**

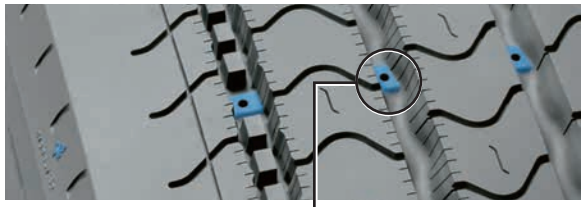
  The tread pattern shows signs of significant accidental damage: penetrations, cuts, tearing, etc. In this condition there is a risk of oxidisation of the metallic reinforcing plies: damage of this nature could lead to rapid deterioration of the tyre whilst in service, possibly leading to rapid deflation.

- **Manage regrooved tyres stock:**

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

TECHNICAL REQUIREMENTS

1. Regrooving should only be carried out in a well ventilated place with a tool which has an electrically heated blade.
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 cut depth of the regrooving blade must be related to the minimum tread depth found. On recent tread patterns, a regroove depth indicator located in the tread wear indicator enables the blade to be set at the optimum depth.



Regroove depth indicator

MICHELIN

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

6. The regrooving diagrams and optional regrooving diagrams can be found on pages 87 to 123 for each tread pattern. Regrooving must be made for each groove with a tread wear indicator.
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) MICHELIN Remix tyres are to be regrooved to the same pattern and tread as the corresponding first life regrooved pattern (see pages 87 to 123) 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 your Michelin representative for advice.

REGROOVING STEER PATTERNS FOR DRIVE

Whilst Michelin recommends regrooving steer truck and bus tyres for steer use, not all users will regroove their front axle tyres and continue to use them on front axles and not all countries accept the use of regrooved tyres on front axles.

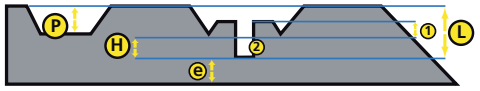
In this case it means that operators are not achieving the tyres' full mileage potential, particularly in cases where the vehicle is a 4x2 configuration and the regrooved tyre cannot, therefore, be fitted to a mid lift or second steer axle. In order to facilitate the use of our latest ranges of 22.5" X® LINE™ Energy™ Z, X® MultiWay 3D XZE and 22.5", 19.5" and 17.5" X® MULTI™ Z tyres fully within the Michelin four lives offer we have approved patterns for these tyres that will enable operators to regroove and use these tyres on drive axles offering better grip and traction capabilities.

The specific regrooving diagrams are given as an option for each of the applicable tyre sizes.

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.

Cross-section of a tyre

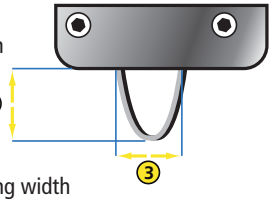


- (P) Depth remaining before regroove
- (H) Theoretical height of regrooving
- (L) Blade setting: **L = P+ H**
  We recommend that you measure **L** with a depth gauge
- (e) Thickness of rubber to be kept after regrooving: **2 mm**
- (1) Height of the wear indicator
- (2) Recess indicating the regrooving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

Regrooving blade

Setting the depth of the blade

(L) = (P) + (H)



(3) Regrooving width

MAIN EUROPEAN REGULATIONS ON REGROOVING

Country	Restrictions on mounting regrooved tyres
Austria	Prohibited on all front axles of all trucks
Belgium	None
Bulgaria	Prohibited on all front axles of all trucks
Croatia	None
Czech Republic	Prohibited on front axles of coaches and buses
Denmark	None
Eurasian EU (1)	Prohibited on all front axles of all trucks
Finland	None
Estonia	None
France	None
Germany	Prohibited on front axles of coaches reaching speeds of 100 kph
Greece	None
Hungary	Prohibited on front axles of coaches
Ireland	None
Italy	None
Latvia	None
Lithuania	None
Luxembourg	None
Netherlands	None
Norway	None
Poland	Prohibited on single axles on coaches reaching speeds of 100 km/hr
Portugal	None
Romania	None
Serbia	None
Slovakia	None
Slovenia	None
Spain	None
Sweden	None
Switzerland	None
Turkey	None
Ukraine	Prohibited on all front axles of all trucks
UK	None

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

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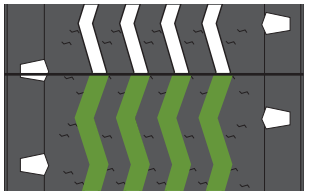
Designed for long distance, high average speed, international journeys, constant speed.

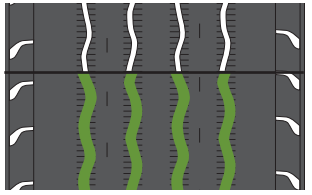
XZA



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
8 R 17.5**	3 mm	8 mm	R3
8.5 R 17.5**			
9.5 R 17.5	3 mm	6 to 8 mm	R3
10 R 17.5			

**3 grooves.

XZA 2 ENERGY™



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
275/70 R 22.5	4 mm	7 to 8 mm	R3
295/60 R 22.5**	3 mm	6 to 8 mm	R3
295/80 R 22.5	4 mm	8 to 10 mm	R3
305/70 R 22.5**	4 mm	8 to 10 mm	R4
315/60 R 22.5	3 mm	6 to 8 mm	R3

**5 grooves.

*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.

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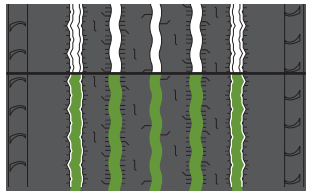
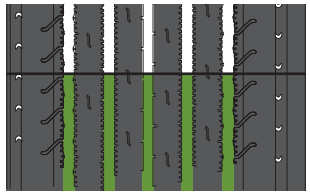
X® ENERGY™ XF



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
315/60 R 22.5	3 mm	6 to 8 mm	R3

XFA 2 ENERGY™ ANTISPLASH™



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
385/55 R 22.5	3 mm	8 to 10 mm	R3

X® LINE™ ENERGY™ Z

Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
315/70 R 22.5	3 mm	8 mm	R3
315/80 R 22.5	3 mm	8 to 10 mm	R3

*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.

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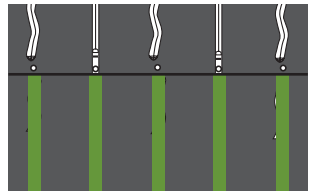
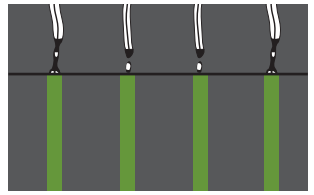
X® LINE™ ENERGY™ Z



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
295/60 R 22.5	3 mm	6 to 8 mm	R3
315/60 R 22.5			
355/50 R 22.5			

*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.

X® LINE™ ENERGY™ F



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
385/55 R 22.5**	3 mm	8 to 10 mm	R3 or R4
385/65 R 22.5	3 mm	8 to 10 mm	R3

**5 grooves.

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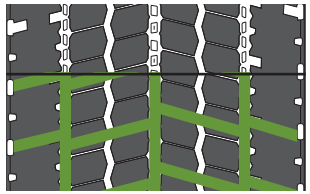
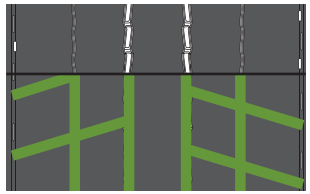
XDA 2+ ENERGY™



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
275/70 R 22.5	4 mm	7 to 8 mm	R3
305/70 R 22.5	4 mm	7 to 8 mm	R3
315/60 R 22.5	3 mm	7 to 8 mm	R3

X® LINE™ ENERGY™ D



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
295/60 R 22.5	3 mm	7 to 8 mm	R3
315/60 R 22.5			
315/70 R 22.5			
315/80 R 22.5			

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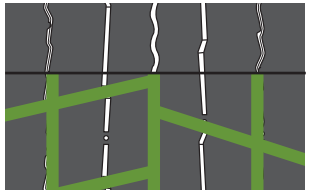
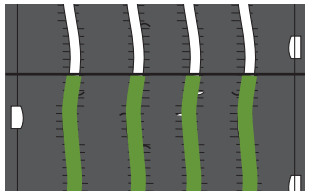
X® LINE™ ENERGY™ D2



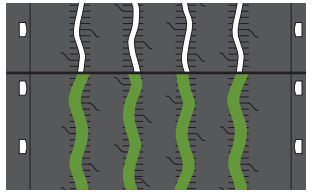
Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
315/70 R 22.5	3 mm	7 to 8 mm	R3

XTA



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
7.50 R 15	3 mm	6 to 8 mm	R3
8.25 R 15			

XTA 2 ENERGY™



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
275/70 R 22.5	3 mm	6 to 8 mm	R3
285/70 R 19.5			

*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.

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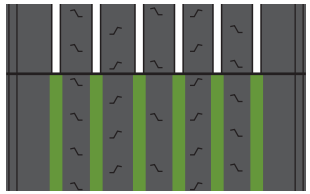
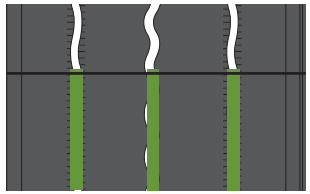
XTA 2+ ENERGY™

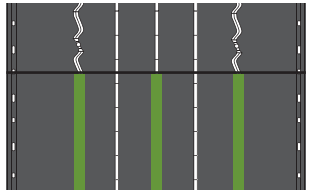


Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
445/45 R 19.5	3 mm	8 to 10 mm	R3

X® LINE™ ENERGY™ T



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
215/75 R 17.5	3 mm	6 to 8 mm	R3
235/75 R 17.5			
245/70 R 17.5			
265/70 R 19.5			
445/45 R 19.5	3 mm	8 to 10 mm	R3



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
385/55 R 22.5	3 mm	8 to 10 mm	R3
385/65 R 22.5			

*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.

X MULTI™

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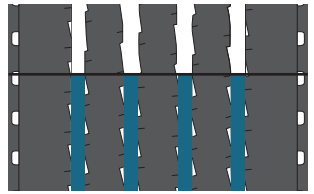
XZE

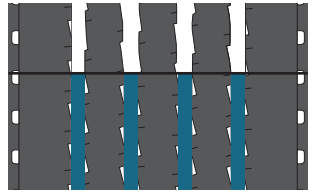


Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
8.25 R 20	3 mm	8 to 10 mm	R3

XZE 2

Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
205/75 R 17.5	3 mm	7 to 8 mm	R3
12.00 R 20	3 mm	8 to 10 mm	R4
13 R 22.5	4 mm	8 to 10 mm	R4

XZE 2+



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
305/70 R 19.5	3 mm	7 to 8 mm	R3
275/80 R 22.5	4 mm	7 to 8 mm	R3
305/70 R 22.5			

*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.

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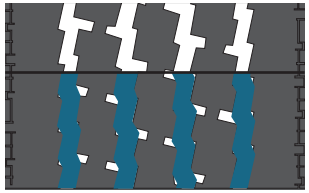
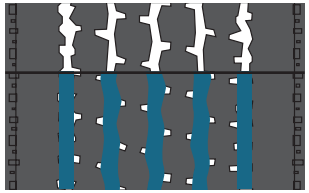
XFN 2+



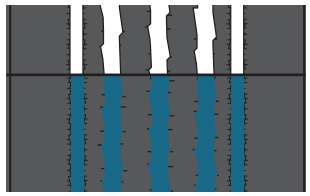
Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
315/80 R 22.5	3 mm	6 to 8 mm	R3

XFN 2 ANTISPLASH™



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
315/70 R 22.5	3 mm	7 to 8 mm	R3
385/55 R 22.5	3 mm	8 to 10 mm	R3
385/65 R 22.5	4 mm	8 to 10 mm	R3

XF 2 ANTISPLASH™



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
385/65 R 22.5	4 mm	8 to 10 mm	R3

*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.

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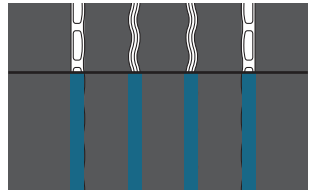
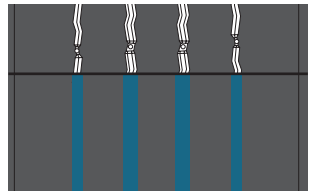
X® MULTIWAY™ 3D XZE



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
295/80 R 22.5	3 mm	8 to 10 mm	R3
315/70 R 22.5			
315/80 R 22.5			

X® MULTIWAY™ HD XZE



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
385/65 R 22.5	3 mm	8 to 10 mm	R3

*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.

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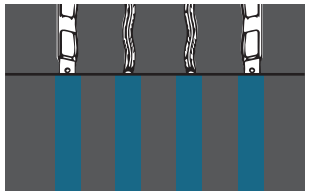
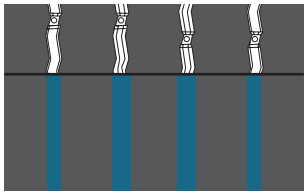
X® MULTI™ Z



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
205/75 R 17.5	2 mm	7 to 8 mm	R3
215/75 R 17.5			
225/75 R 17.5			
235/75 R 17.5			
245/70 R 17.5			
265/70 R 17.5			
245/70 R 19.5	3 mm	8 to 10 mm	R4
265/70 R 19.5			
285/70 R 19.5			



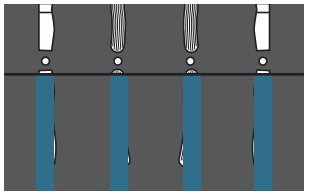
Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
11 R 22.5	3 mm	8 to 9 mm	R3
12 R 22.5	3 mm	8 to 9 mm	R3
275/70 R 22.5	4 mm	7 to 8 mm	R3

*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.

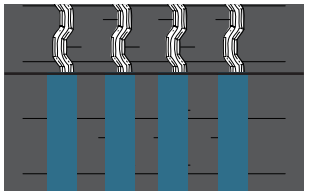
X® MULTI™

Designed for national and regional operations on all types of roads.

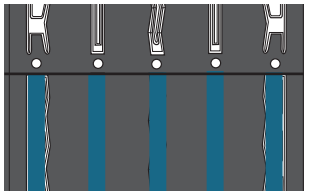
X® MULTI™ Z



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
305/70 R 22.5	3 mm	8 to 9 mm	R3



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
275/80 R 22.5	3 mm	4 to 6 mm	R3



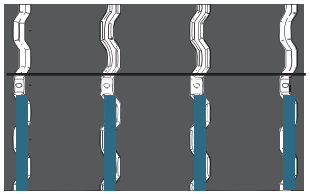
Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
315/70 R 22.5	3 mm	8 to 10 mm	R3 or R4

*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.

X MULTI™

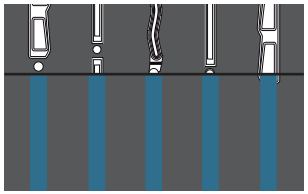
Designed for national and regional operations on all types of roads.

X® MULTI™ HD Z



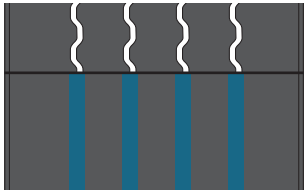
Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
295/80 R 22.5	3 mm	8 to 10 mm	R3

X® MULTI™ ENERGY™ Z



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
315/70 R 22.5	3 mm	8 to 10 mm	R3 or R4

X® MULTI™ F



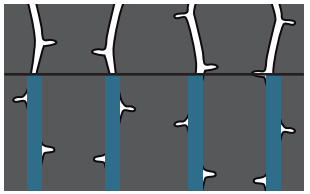
Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
385/55 R 22.5	3 mm	8 to 10 mm	R3 or R4
385/65 R 22.5	3 mm	8 to 10 mm	R3

*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.

X MULTI™

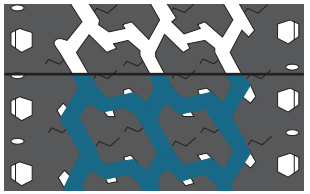
Designed for national and regional operations on all types of roads.

X® MULTI™ WINTER Z



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
295/80 R 22.5	3 mm	8 to 10 mm	R3

XT4



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
10 R 22.5	4 mm	7 to 8 mm	R3

XDE 2

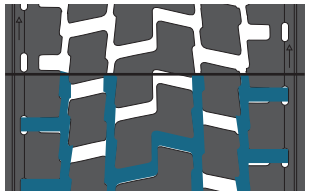
Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
205/75 R 17.5	3 mm	7 to 8 mm	R3

*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.

X MULTI™

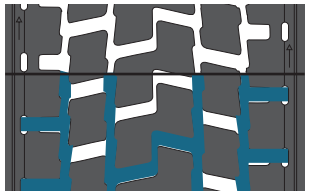
Designed for national and regional operations on all types of roads.

XDE 2



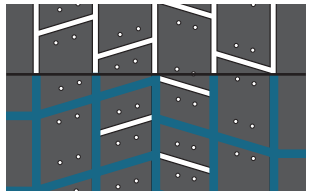
Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
13 R 22.5	4 mm	7 to 8 mm	R3

XDE 2+



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
305/70 R 19.5	4 mm	8 to 10 mm	R4
12 R 22.5	3 mm	11 to 12 mm	R4
275/80 R 22.5	4 mm	7 to 8 mm	R3
305/70 R 22.5			
315/80 R 22.5			

X® MULTIWAY™ 3D XDE



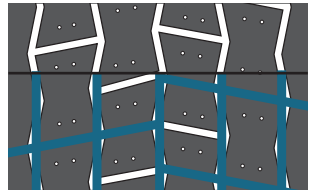
Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
315/70 R 22.5	3 mm	6 to 8 mm	R3

*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.

X MULTI™

Designed for national and regional operations on all types of roads.

X® MULTIWAY™ 3D XDE



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
295/80 R 22.5	3 mm	8 to 10 mm	R3
315/80 R 22.5			

X® MULTIWAY™ XD

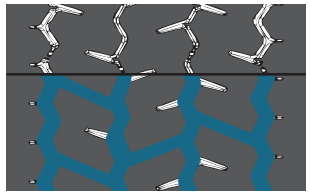
Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
295/60 R 22.5	3 mm	6 to 8 mm	R3
315/60 R 22.5			

*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.

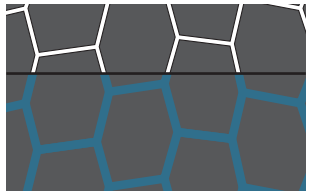
X MULTI™

Designed for national and regional operations on all types of roads.

X® MULTI™ D



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
205/75 R 17.5	2 mm	7 to 8 mm	R3
215/75 R 17.5			
225/75 R 17.5			
235/75 R 17.5			
245/70 R 17.5			
265/70 R 17.5			
245/70 R 19.5	3 mm	8 to 10 mm	R4
265/70 R 19.5			
285/70 R 19.5			



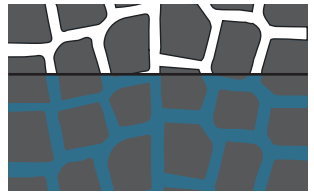
Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
11 R 22.5	3 mm	7 to 8 mm	R3
12 R 22.5			
275/70 R 22.5	4 mm	7 to 8 mm	R3

*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.

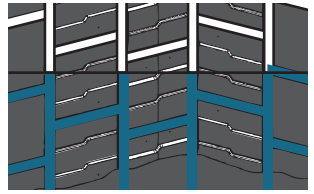
X MULTI™

Designed for national and regional operations on all types of roads.

X® MULTI™ D

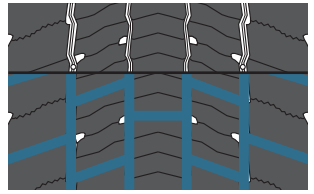


Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
275/80 R 22.5	3 mm	7 to 8 mm	R3



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
295/60 R 22.5	3 mm	6 to 8 mm	R3
315/60 R 22.5			
315/70 R 22.5			

X® MULTI™ ENERGY™ D



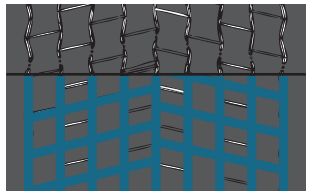
Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
315/70 R 22.5	3 mm	6 to 8 mm	R3

*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.

X MULTI™

Designed for national and regional operations on all types of roads.

X® ONE™ MULTI™ D



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
495/45 R 22.5	3 mm	6 to 8 mm	R3

XDW ICE GRIP

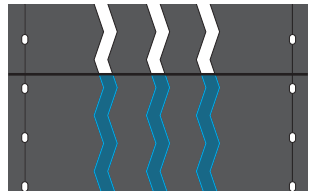
Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
245/70 R 19.5	3 mm	6 to 8 mm	R3
265/70 R 19.5			
11 R 22.5			
12 R 22.5			
275/70 R 22.5			
295/80 R 22.5	4 mm	6 to 8 mm	R3
315/70 R 22.5	3 mm	6 to 8 mm	R3
315/80 R 22.5	4 mm	6 to 8 mm	R3

*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.

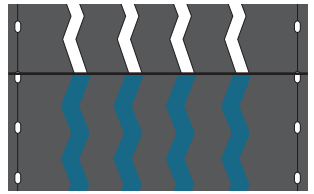
X MULTI™

Designed for national and regional operations on all types of roads.

XTE 2



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
9.5 R 17.5	3 mm	6 to 8 mm	R3
245/70 R 19.5			
265/70 R 19.5			
285/70 R 19.5			
11 R 22.5			



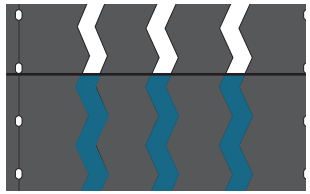
Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
425/65 R 22.5	4 mm	8 to 10 mm	R3 or R4
445/65 R 22.5	4 mm	8 to 10 mm	R3

*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.

X® MULTI™

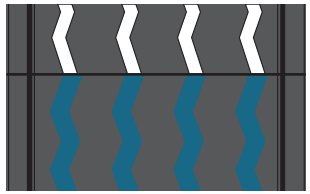
Designed for national and regional operations on all types of roads.

XTE 2+



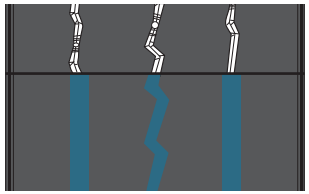
Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
215/75 R 17.5	3 mm	6 to 8 mm	R3
235/75 R 17.5			
245/70 R 17.5			

XTE 3



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
385/65 R 22.5	3 mm	8 to 10 mm	R3

X® MAXITRAILER™



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
205/65 R 17.5	3 mm	6 to 8 mm	R3
255/60 R 19.5			

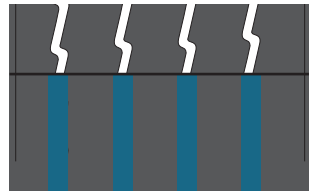
*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.

X® MULTI™

Designed for national and regional operations on all types of roads.

X® MULTI™ T

Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
245/70 R 17.5	3 mm	6 to 8 mm	R3



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
385/55 R 22.5	3 mm	8 to 10 mm	R3
385/65 R 22.5	3 mm	8 to 10 mm	R3 or R4

X® MULTI™ T2

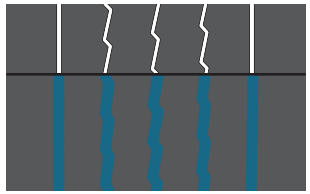
Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
385/55 R 22.5	3 mm	8 to 10 mm	R3

*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.

X MULTI™

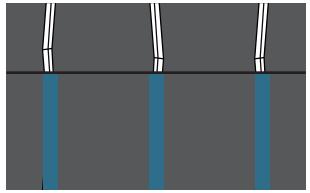
Designed for national and regional operations on all types of roads.

X® ONE™ MAXITRAILER™ +

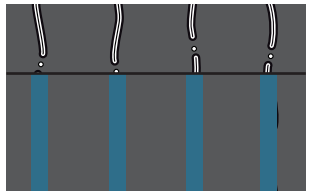


Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
455/45 R 22.5	3 mm	8 to 10 mm	R3

X® MULTI™ WINTER T



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
245/70 R 17.5	3 mm	6 to 8 mm	R3



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
385/65 R 22.5	3 mm	8 to 10 mm	R3

*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.

X WORKS™

Designed for roads, in and around worksites and quarries.

XZY

Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
9.5 R 17.5	3 mm	6 to 8 mm	R3
10 R 22.5	4 mm	8 to 10 mm	R3

XZY 2

Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
12.00 R 20	3 mm	8 to 10 mm	R4
12 R 22.5	4 mm	8 to 10 mm	R4

X® WORKS™ XZY

Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
315/80 R 22.5	4 mm	8 to 10 mm	R3 or R4

*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.

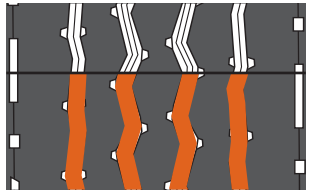
X WORKS™

Designed for roads, in and around worksites and quarries.

X® WORKS™ XZY

Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
13 R 22.5	3 mm	8 to 10 mm	R3 or R4

X® WORKS™ Z



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
295/80 R 22.5	4 mm	8 to 10 mm	R4

Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
13 R 22.5 315/80 R 22.5	3 mm	8 to 10 mm	R4

*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.

X WORKS™

Designed for roads, in and around worksites and quarries.

X® WORKS™ HD Z

Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
13 R 22.5	3 mm	8 to 10 mm	R3 or R4
315/80 R 22.5**	4 mm	8 to 10 mm	R3

**4 grooves.

X® WORKS™ XZ

Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
325/95 R 24	4 mm	8 to 10 mm	R4

XDY

Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
12.00 R 20	4 mm	6 to 8 mm	R3 or R4

*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.

X WORKS™

Designed for roads, in and around worksites and quarries.

XDY +

Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
295/80 R22.5	4 mm	6 to 8 mm	R3

XDY 3

Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
11 R 22.5 12 R 22.5	4 mm	6 to 8 mm	R3 or R4

X® WORKS™ XDY

Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
13 R 22.5	3 mm	6 to 8 mm	R3
315/80 R 22.5	4 mm	6 to 8 mm	R3

*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.

X WORKS™

Designed for roads, in and around worksites and quarries.

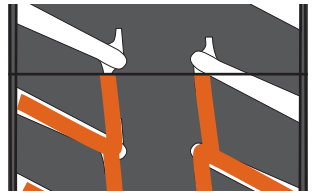
X® WORKS™ D

Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
13 R 22.5 315/80 R 22.5	3 mm	6 to 8 mm	R4

X® WORKS™ HD D

Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
13 R 22.5	3 mm	6 to 8 mm	R3
315/80 R 22.5	4 mm	6 to 8 mm	R3

X® WORKS™ XD



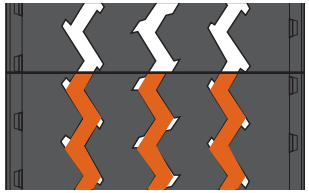
Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
325/95 R 24	4 mm	8 to 10 mm	R4

*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.

X® WORKS™

Designed for roads, in and around worksites and quarries.

XTY 2



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
265/70 R 19.5	3 mm	8 to 10 mm	R4
275/70 R 22.5	4 mm	8 to 10 mm	R4

XZY 3

Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
11 R 22.5	3 mm	8 to 10 mm	R4
445/65 R 22.5	4 mm	10 to 12 mm	R4

Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
385/65 R 22.5	4 mm	10 to 12 mm	R4
425/65 R 22.5			

*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.

X® WORKS™

Designed for roads, in and around worksites and quarries.

X® WORKS™ T

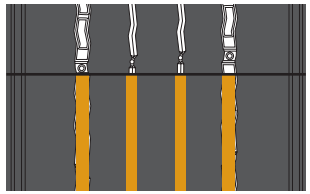
Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
385/65 R 22.5	3 mm	10 to 12 mm	R4

*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.

X COACH™

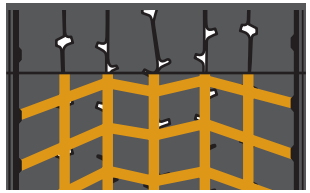
Designed for people transportation for long and short distance on all types of roads.

X® COACH™ HL Z



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
295/80 R 22.5	3 mm	8 to 10 mm	R3

X® COACH™ XD



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
295/80 R 22.5	3 mm	6 to 8 mm	R3

*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.

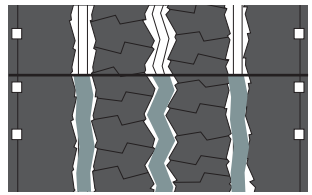
X INCITY™

Designed for journeys in urban and suburban driving.

X® INCITY™ Z

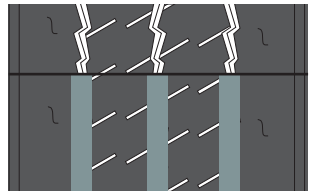
Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
11 R 22.5	4 mm	8 to 10 mm	R4
305/70 R 22.5	3 mm	7 to 8 mm	R3

XZU 2T



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
305/70 R 22.5	3 mm	8 to 10 mm	R3

XZU 3



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
11 R 22.5	4 mm	8 to 10 mm	R4

*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.

X® INCITY™

Designed for journeys in urban and suburban driving.

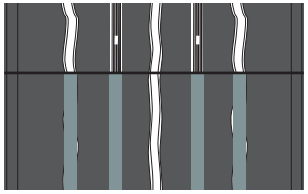
X® INCITY™ XZU 3+

Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
295/80 R 22.5	4 mm	6 to 8 mm	R3

X® INCITY™ XZU

Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
275/70 R 22.5	4 mm	8 to 10 mm	R3 or R4

X® INCITY™ HL Z



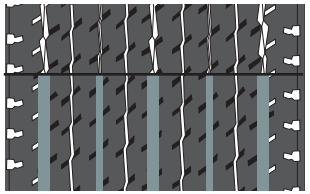
Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
275/70 R 22.5	4 mm	5 to 6 mm	R2 or R3

*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.

X® INCITY™

Designed for journeys in urban and suburban driving.

X® ONE™ XDU



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
455/45 R 22.5	3 mm	6 mm	R3

*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.

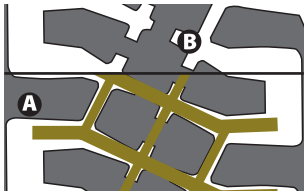
X® FORCE™

Designed for specialised, civil or military vehicles mostly driven on off-road surfaces.

X® FORCE™ 2 / XZL 2

Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
395/85 R 20	3 mm	8 to 10 mm	R3
395/90 R 560 TR	4 mm	10 to 12 mm	R4
415/80 R 685 TR			

X® FORCE™ ML / XML



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
325/85 R 16	4 mm	9 to 10 mm	R3 or R4
12.00 R 20	4 mm	A = 20 mm B = 10 to 12 mm	R4
14.00 R 20			
395/85 R 20	4 mm	A = 20 mm B = 10 mm	R4
475/80 R 20**	4 mm	A = 20 mm B = 10 to 12 mm	R4
395/90 R 560 TR			
415/80 R 685 TR			

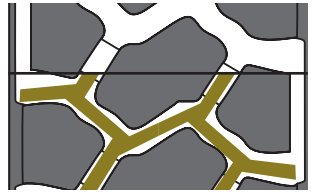
**5 grooves.

*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.

X® FORCE™

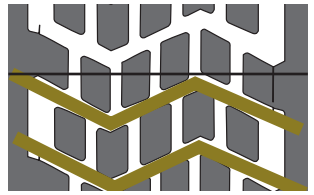
Designed for specialised, civil or military vehicles mostly driven on off-road surfaces.

X® FORCE™ ZH / XZH2R



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
13 R 22.5	4 mm	12 to 14 mm	R4
315/80 R 22.5			

XS



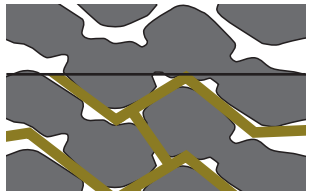
Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
14.00 R 20	4 mm	8 to 10 mm	R3
24 R 20.5	4 mm	8 to 10 mm	R3 or R4
525/65 R 20.5 (20.5 R 20.5)			

*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.

X® FORCE™

Designed for specialised, civil or military vehicles mostly driven on off-road surfaces.

X® FORCE™ Z / XZL



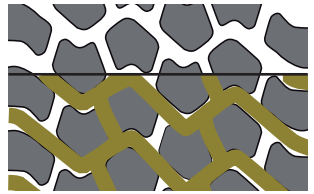
Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
255/100 R 16 (9.00 R 16)	3 mm	10 to 12 mm	R4
325/85 R 16	3 mm	10 mm	R4
10.00 R 20	4 mm	10 to 12 mm	R4
11.00 R 20	4 mm	11 to 13 mm	R3
12.00 R 20	4 mm	10 to 12 mm	R4
14.00 R 20	3 mm	10 to 12 mm	R4
16.00 R 20	4 mm	10 to 12 mm	R4
275/80 R 20 (10.5 R 20)	4 mm	10 to 12 mm	R3
335/80 R 20 (12.5 R 20)	4 mm	10 to 12 mm	R4
365/80 R 20 (14.5 R 20)			
365/85 R 20			
395/85 R 20			
13 R 22.5			

*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.

X® FORCE™

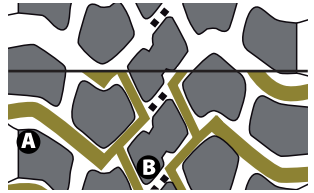
Designed for specialised, civil or military vehicles mostly driven on off-road surfaces.

XZL



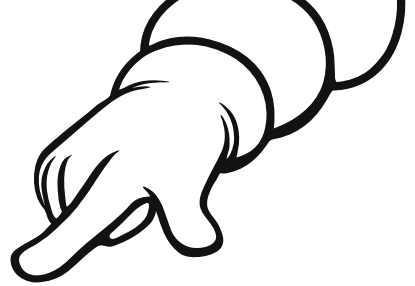
Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
24 R 21	4 mm	10 to 12 mm	R4

XZL (WB)



Tyre size	Regrooving depth*	Approximate regrooving width	Suggested blade
445/65 R 22.5	4 mm	A = 20 mm B = 8 to 10 mm	R3 or R4

*The depth of the regroove should always be checked before regrooving, see details on pages 83-84.



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.

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.

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

BENEFITS OF RETREADING

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

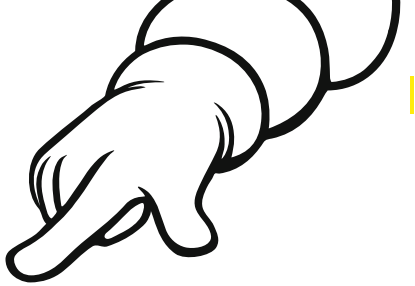
- Performance similar to that of a new tyre.
- Same performance in relation to safety, qualities of grip, damage resistance, handling and road-holding.
  - MICHELIN Remix retreading is carried out with the same materials used for the production of our new tyres.
  - MICHELIN Remix tyres make use of all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

Protect the environment by reducing your waste

- Reduction in the number of new tyres used.
- Less scrap to be processed.
- Up to 45 kg* of raw materials saved per MICHELIN 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.

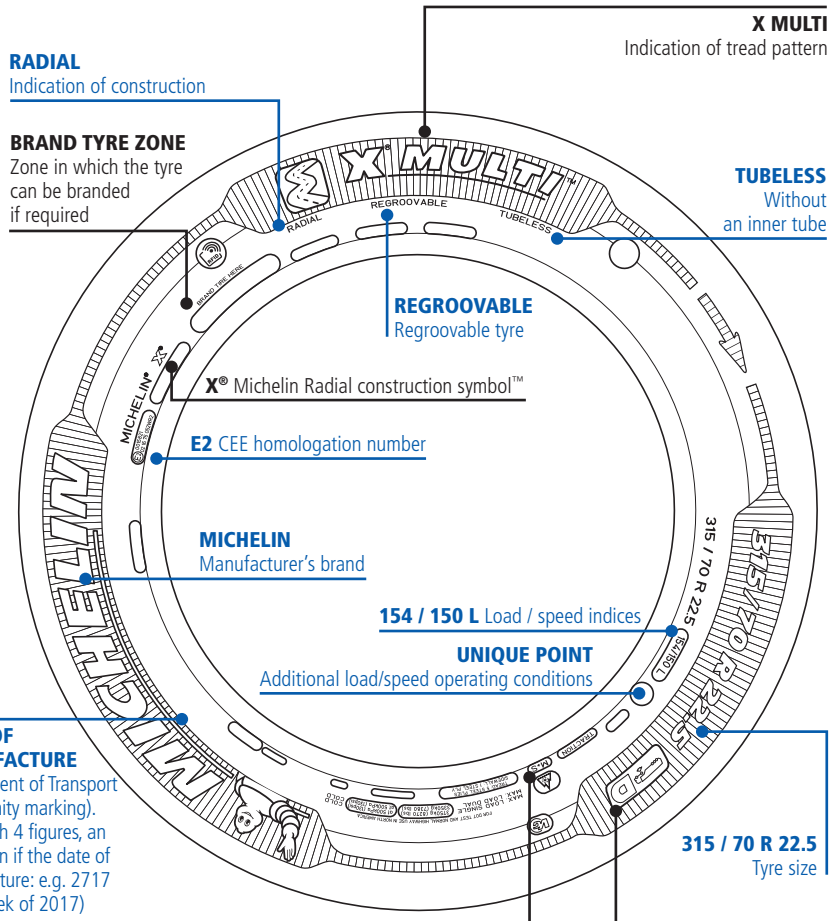
Michelin does not recommend fitting retreaded tyres on the front steer axle of motor vehicles. As an example, It is therefore possible to use a retreaded tyre on a second axle of a 8x4 truck or a tag axle.

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



TECHNICAL CHARACTERISTICS OF MICHELIN TYRES

TRUCK AND BUS TYRE MARKINGS



BLUE TEXT = mandatory markings

NAME OF MICHELIN TYRES

■ **Michelin uses the following naming convention for its tyres:**

MICHELIN **X® MULTI™** **T**

Brand — Range — Position

These designations identify the environment in which the tyre is used. 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:

MICHELIN **X® COACH™** **HL** **Z**

Brand — Range — Option — Position

Ranges	Options	Position
LINE™	ENERGY™: fuel efficiency	F: Front
MULTI™	GRIP: all-season grip	D: Drive
WORKS™	WINTER: winter conditions	T: Trailer
FORCE™	ICEGRIP: grip in icy conditions	Z: Multi Positions
INCITY™	HD: heavy duty	
COACH™	HL: heavy loads	

This list is subject to change.

■ **Older MICHELIN naming convention:**

MICHELIN **X** **T** **E** **2**

Brand — Radial technology — Position — Trade name — Version

■ **Older trade name:**

A: Long distance
E: Regional
Y: On/Off Road
L: Off Road
U: Urban

TECHNICAL SPECIFICATIONS

■ Load capacity indices and speed category symbols

Index	Load kg	Index	Load kg	Index	Load kg	Index	Load kg
100	800	**123**	1550	**146**	3000	**169**	5800
101	825	**124**	1600	**147**	3075	**170**	6000
102	850	**125**	1650	**148**	3150	**171**	6150
103	875	**126**	1700	**149**	3250	**172**	6300
104	900	**127**	1750	**150**	3350	**173**	6500
105	925	**128**	1800	**151**	3450	**174**	6700
106	950	**129**	1850	**152**	3550	**175**	6900
107	975	**130**	1900	**153**	3650	**176**	7100
108	1000	**131**	1950	**154**	3750	**177**	7300
109	1030	**132**	2000	**155**	3875	**178**	7500
110	1060	**133**	2060	**156**	4000	**179**	7750
111	1090	**134**	2120	**157**	4125	**180**	8000
112	1120	**135**	2180	**158**	4250	**181**	8250
113	1150	**136**	2240	**159**	4375	**182**	8500
114	1180	**137**	2300	**160**	4500	**183**	8750
115	1215	**138**	2360	**161**	4625	**184**	9000
116	1250	**139**	2430	**162**	4750	**185**	9250
117	1285	**140**	2500	**163**	4875	**186**	9500
118	1320	**141**	2575	**164**	5000	**187**	9750
119	1360	**142**	2650	**165**	5150	**188**	10000
120	1400	**143**	2725	**166**	5300	**189**	10300

■ Speed index

Speed Index	Speed	
	mph	km/h
D	40	65
E	43	70
F	50	80
G	56	90
J	62	100
K	68	110
L	74	120
M	81	130
N	87	140

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.

■ Speed / Load / Tyre pressue combinations

The load and inflation pressure limits indicated in the section "Dimensional data truck tyres" correspond to operating speeds of 130, 120,110,105, 100, 80 or 65 km/h depending upon tyres and / or sizes. These limits of load and tyre pressure can vary depending on the speed.

Speed in km/h	Load capacity variation (%)						Pressure adjustment (%)
	F (80km/h)	G (90km/h)	J (100km/h)	K (110km/h)	L (120km/h)	M (130km/h)	
0	+150	+150	+150	+150	+150	+150	+40
5	+110	+110	+110	+110	+110	+110	+40
10	+80	+80	+80	+80	+80	+80	+30
15	+65	+65	+65	+65	+65	+65	+25
20	+50	+50	+50	+50	+50	+50	+21
25	+35	+35	+35	+35	+35	+35	+17
30	+25	+25	+25	+25	+25	+25	+13
35	+19	+19	+19	+19	+19	+19	+11
40	+15	+15	+15	+15	+15	+15	+10
45	+13	+13	+13	+13	+13	+13	+9
50	+12	+12	+12	+12	+12	+12	+8
55	+11	+11	+11	+11	+11	+11	+7
60	+10	+10	+10	+10	+10	+10	+6
65	+7.5	+8.5	+8.5	+8.5	+8.5	+8.5	+4
70	+5.0	+7.0	+7.0	+7.0	+7.0	+7.0	+2
75	+2.5	+5.5	+5.5	+5.5	+5.5	+5.5	+1
80	[0]	+4.0	+4.0	+4.0	+4.0	+4.0	0
85		+2.0	+3.0	+3.0	+3.0	+3.0	0
90		[0]	+2.0	+2.0	+2.0	+2.0	0
95			+1.0	+1.0	+1.0	+1.0	0
100			[0]	0	0	0	0
110				[0]	0	0	0
120					[0]	0	0
130						[0]	0

The coefficients given in the above table are for information purposes only. Do not exceed a maximum cold tyre inflation pressure of 10.0 Bars (145 PSI).

For any modification to the basic load limits, please contact your Michelin representative.

MICHELIN

■ Unique point

A number of truck tyre sizes carry a second load speed index marked on the sidewall. This is known as the "Unique Point" and is located after the main load index as shown below. For these sizes, the "Unique Point" provides additional load speed operating conditions in order to satisfy particular requirements.

The unique point loads & pressures are given in the technical specification tables pages 136 to 167.

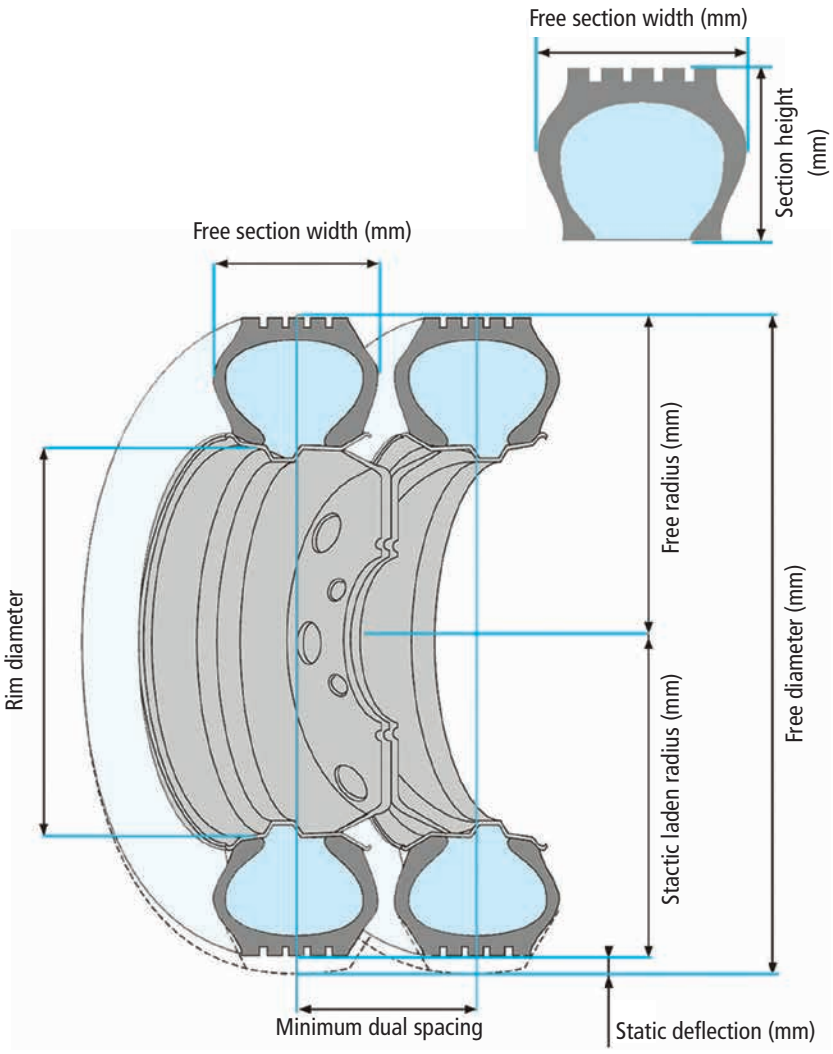
IMPORTANT: load variances based on speed do not apply to the additional dual/ twinned load index / speed symbol of the unique point.

Please check local legislation to ensure that use of the unique point complies with regulations in force.

Example of load and speed indices:

Example of load and speed indices with a unique point marking:

■ Dimensional tyre data given in technical specifications pages 136 to 167



MICHELIN

Tyre size	Tread pattern	Type	M+S	3PMSF	PR	Labelling			Load/speed index	Load capacity per axle (kg) Fitment Single or Dual (S or D)	Nominal pressure (bar)	Laden section width (mm)[1]	Free section width S (mm)[1]	Free diameter D (mm)[1]	Static laden radius R' (mm)[1]	Rolling circumference (mm)[1]	Minimum dual spacing E (mm)[1]
								dB									
RIM DIAMETER 9 INCHES																	
6.00 R 9	XTA	TT			10	NA	NA	NA NA	109/108F	S 2060 D 4000	8.00	179	163	530	244	1610	185
RIM DIAMETER 12 INCHES																	
7.00 R 12	XTA	TT			12	E	B	66	125/123F	S 3300 D 6200	8.00	212	194	661	304	2010	220
RIM DIAMETER 15 INCHES																	
7.50 R 15	XTA	TT			16	D	B	66	135/133G	S 4360 D 8240	8.50	234	210	769	355	2340	238
8.25 R 15	XTA	TT				C	B	66	143/141G	S 5450 D 10300	8.50	260	232	834	381	2547	263
RIM DIAMETER 17.5 INCHES																	
8.5 R 17.5	XZA	TL				E	C	66	121/120L	S 2900 D 5600	6.25	221	200	802	372	2447	227
9.5 R 17.5	XTE 2	TL				C	B	67	143/141J	S 5450 D 10300	8.50	257	230	846	386	2560	260
	XZY	TL				D	C	69	129/127L	S 3700 D 7000	7.00	250	228	840	388	2559	258
10 R 17.5	XZA	TL				D	C	66	134/132L	S 4240 D 8000	7.50	266	241	861	397	2620	273
205/65 R 17.5	X MAXI TRAILER	TL				C	B	67	129/127J	S 3700 D 7000	9.00	225	208	711	330	2177	236
205/75 R 17.5	X MULTI D	TL	✓	✓		D	C	70	124/122M	S 3200 D 6000	7.20	230	210	755	351	2295	238
	X MULTI Z	TL	✓	✓	14	D	B	70	124/122M	S 3200 D 6000	7.20	232	210	755	350	2304	238
215/75 R 17.5	X LINE ENERGY T	TL				B	B	68	135/133J	S 4360 D 8240	8.50	238	215	772	357	2368	243
	X MULTI D	TL	✓	✓		D	C	69	126/124M	S 3400 D 6400	6.90	236	216	775	359	2350	245

ETRTO overall design diameter (mm)	Michelin preferred rim[1]	Unique point[2]	Unique point - Load (kg) per axle - Fitment S or D[2]	Unique point - Pressure (bar)[2]	Load capacity (kg) per axle at inflation pressure (bar / PSI)										
					Fitment S or D	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0
						58	65	73	80	87	94	102	109	116	123	131
540	4.00E	95/95J	S 1380 D 2760	8.00	S D			1350 2630	1470 2860	1590 3090	1710 3310	1820 3540	1940 3770	2060 4000		
672	5.00S	122/122J	S 3000 D 6000	8.00	S D			2170 4070	2360 4430	2550 4780	2730 5140	2920 5490	3110 5850	3300 6200		
772	6.00	133/132J	S 4120 D 8000	8.50	S D				2940 5560	3180 6000	3420 6440	3660 6920	3880 7360	4120 7800	4360 8240	
836	6.50	141/140J	S 5150 D 10000	8.50	S D				3680 6960	3980 7520	4280 8080	4560 8640	4860 9200	5160 9760	5460 10300	
802	5.25				S D	1970 3800	2180 4200	2380 4600	2590 5000	2800 5400						
842	6.00				S D				3680 6960	3980 7520	4270 8070	4570 8630	4860 9190	5160 9740	5450 10300	
842	6.00				S D	2270 4280	2510 4760	2750 5200	2980 5640	3220 6080	3460 6560	3700 7000				
858	6.75				S D		2700 5090	2960 5580	3210 6060	3470 6550	3730 7030	3980 7520	4240 8000			
711	6.00	130F	S 3800	9.00	S D					2560 4850	2750 5210	2940 5560	3130 5920	3320 6280	3510 6640	3700 7000
753	6.00				S D		2120 3960	2320 4320	2520 4720	2720 5080	2920 5480	3120 5840				
753	6.00				S D		2120 3960	2320 4320	2520 4720	2720 5080	2920 5480	3120 5840				
767	6.00				S D				2950 5570	3180 6010	3420 6460	3650 6900	3890 7350	4120 7790	4360 8240	
767	6.00				S D	2110 3970	2330 4390	2560 4810	2780 5230	3000 5650	3220 6070					

Data for general indication only. For more data, please contact your Michelin representative. These values are for guidance only and under no circumstances may be used for judicial or legal motives. (1) Michelin source: measured values using Michelin preferred rim. (2) 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. Not all listings are available in our market and some products have been approved for sale after the printing of this brochure. Please refer to a full list of technical specifications for all our products at trucks.michelin.eu

Tyre size	Tread pattern	Type	M+S	3PMSF	PR	Labelling			Load/speed index	Load capacity per axle (kg) Fitment Single or Dual (S or D)	Nominal pressure (bar)	Laden section width (mm)[1]	Free section width S (mm)[1]	Free diameter D (mm)[1]	Static laden radius R' (mm)[1]	Rolling circumference (mm)[1]	Minimum dual spacing E (mm)[1]
								dB									
215/75 R 17.5	X MULTI Z	TL	✓	✓		D	B	68	126/124M	S 3400	6.90	237	217	770	357	2346	245
										D 6400							
	XTE 2+	TL				D	B	67	135/133J	S 4360	8.50	236	215	777	359	2370	243
										D 8240							
225/75 R 17.5	X MULTI D	TL	✓	✓		D	C	69	129/127M	S 3700	7.20	257	234	790	366	2400	265
										D 7000							
	X MULTI Z	TL	✓	✓		D	B	68	129/127M	S 3700	7.20	255	233	787	365	2407	264
										D 7000							
235/75 R 17.5	X LINE ENERGY T	TL				B	B	68	143/141J	S 5450	8.50	270	246	793	363	2424	278
										D 10300							
	X MULTI D	TL	✓	✓	16	D	C	69	132/130M	S 4000	7.60	263	240	801	370	2433	272
										D 7600							
	X MULTI Z	TL	✓	✓	16	D	B	69	132/130M	S 4000	7.60	243	241	799	371	2439	273
										D 7600							
	XTE 2+	TL				C	B	67	143/141J	S 5450	8.50	266	241	796	363	2410	273
										D 10300							
245/70 R 17.5	X LINE ENERGY T	TL				B	B	68	143/141J	S 5450	8.50	270	246	793	363	2424	278
										D 10300							
	X MULTI D	TL	✓	✓		D	C	69	136/134M	S 4480	8.30	268	246	795	368	2415	278
										D 8480							
	X MULTI T	TL				C	C	67	143/141J	S 5450	8.50	264	239	796	363	2432	271
										D 10300							
	X MULTI WINTER T	TL	✓	✓		C	B	72	143/141J	S 5450	8.50	262	239	791	362	2422	271
										D 10300							
	X MULTI Z	TL	✓	✓		D	B	69	136/134M	S 4480	8.30	269	246	793	366	2417	209
										D 8480							
	XTE 2+	TL				C	B	67	143/141J	S 5450	8.50	266	241	796	363	2410	273
										D 10300							

ETRTO overall design diameter (mm)	Michelin preferred rim[1]	Unique point[2]	Unique point - Load (kg) per axle - Fitment S or D[2]	Unique point - Pressure (bar)[2]	Load capacity (kg) per axle at inflation pressure (bar / PSI)											
					Fitment S or D	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0
						58	65	73	80	87	94	102	109	116	123	131
767	6.00				S	2110	2330	2560	2780	3000	3220					
					D	3970	4390	4810	5230	5650	6070					
767	6.00				S				2950	3180	3420	3650	3890	4120	4360	
					D				5570	6010	6460	6900	7350	7790	8240	
783	6.75				S	2210	2440	2680	2900	3140	3380	3600				
					D	4180	4640	5080	5520	5960	6400	6840				
783	6.75				S	2210	2440	2680	2900	3140	3380	3600				
					D	4180	4640	5080	5520	5960	6400	6840				
797	6.75				S				3680	3980	4270	4570	4860	5160	5450	
					D				6960	7520	8070	8630	9190	9740	10300	
797	6.75				S		2520	2760	3000	3240	3480	3720	3960			
					D		4760	5240	5680	6160	6600	7040	7520			
797	6.75				S		2520	2760	3000	3240	3480	3720	3960			
					D		4760	5240	5680	6160	6600	7040	7520			
797	6.75				S				3680	3980	4270	4570	4860	5160	5450	
					D				6960	7520	8070	8630	9190	9740	10300	
789	6.75	144/144F	S 5600	8.50	S				3680	3980	4270	4570	4860	5160	5450	
			D 11200		D				6960	7520	8070	8630	9190	9740	10300	
789	6.75				S			2850	3090	3340	3590	3840	4080	4330		
					D			5390	5860	6320	6790	7260	7730	8200		
789	6.75	146/146F	S 6000	9.00	S				3680	3980	4270	4570	4860	5160	5450	
			D 12000		D				6960	7520	8070	8630	9190	9740	10300	
789	6.75	144/144F	S 5600	8.50	S				3680	3980	4270	4570	4860	5160	5450	
			D 11200		D				6960	7520	8070	8630	9190	9740	10300	
789	6.75				S			2850	3090	3340	3590	3840	4080	4330		
					D			5390	5860	6320	6790	7260	7730	8200		
789	6.75	144/144F	S 5600	8.50	S				3680	3980	4270	4570	4860	5160	5450	
			D 11200		D				6960	7520	8070	8630	9190	9740	10300	

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Tyre size	Tread pattern	Type	M+S	3PMSF	PR	Labelling			Load/speed index	Load capacity per axle (kg) Fitment Single or Dual (S or D)	Nominal pressure (bar)	Laden section width (mm)[1]	Free section width S (mm)[1]	Free diameter D (mm)[1]	Static laden radius R' (mm)[1]	Rolling circumference (mm)[1]	Minimum dual spacing E (mm)[1]
								dB									
265/70 R 17.5	X MULTI D	TL	✓	✓		D	C	72	140/138M	S 5000	7.90	290	266	814	374	2472	301
										D 9440							
	X MULTI Z	TL	✓	✓		D	B	72	140/138M	S 5000	7.90	289	266	816	376	2487	301
										D 9440							
RIM DIAMETER 19.5 INCHES																	
245/70 R 19.5	X MULTI D	TL	✓	✓		D	C	70	136/134M	S 4480	7,90	264	241	847	394	2580	273
										D 8480							
	X MULTI Z	TL	✓	✓	16	D	B	68	136/134M	S 4480	7,90	246	243	845	393	2583	275
										D 8480							
255/60 R 19.5	X MAXI TRAILER	TL				C	B	67	143/141J	S 5450	9,00	277	256	805	373	2469	290
										D 10300							
265/70 R 19.5	X LINE ENERGY T	TL				B	B	68	143/141J	S 5450	8,50	290	265	862	399	2646	300
										D 10300							
	X MULTI D	TL	✓	✓		D	C	71	140/138M	S 5000	7,60	286	262	868	402	2638	297
										D 9440							
	X MULTI Z	TL	✓	✓	14	D	B	69	140/138M	S 5000	7,60	287	259	864	400	2642	293
										D 9440							
	XDW ICE GRIP	TL	✓	✓		E	C	72	140/138L	S 5000	7,60	288	264	875	405	2670	299
										D 9440							
	XTE 2	TL	✓			D	B	68	143/141J	S 5450	8,50	286	265	870	403	2650	300
										D 10300							
	XTY 2	TL	✓	✓		D	B	70	143/141J	S 5450	8,50	285	263	873	403	2660	298
										D 10300							
285/70 R 19.5	XTA 2 ENERGY	TL				C	B	69	150/148J	S 6700	9,00	309	285	890	409	2723	323
										D 12600							
	X MULTI D	TL	✓	✓		D	C	72	146/144L	S 6000	8,30	276	273	897	412	2720	309
										D 11200							
	X MULTI Z	TL	✓	✓		C	B	70	146/144L	S 6000	8,30	298	273	893	411	2721	309
										D 11200							
	XTE 2	TL	✓			C	B	68	150/148J	S 6700	9,00	311	285	894	409	2732	323
										D 12600							

Tyre size	Tread pattern	ETRTO overall design diameter (mm)	Michelin preferred rim[1]	Unique point[2]	Unique point - Load (kg) per axle - Fitment S or D[2]	Unique point - Pressure (bar)[2]	Fitment S or D	Load capacity (kg) per axle at inflation pressure (bar / PSI): 4.0 / 58	4.5 / 65	5.0 / 73	5.5 / 80	6.0 / 87	6.5 / 94	7.0 / 102	7.5 / 109	8.0 / 116	8.5 / 123	9.0 / 131
265/70 R 17.5	X MULTI D	817	7.50				S			3320	3620	3900	4200	4480	4760			
							D			6280	6840	7360	7920	8440	9000			
	X MULTI Z	817	7.50				S			3320	3620	3900	4200	4480	4760			
							D			6280	6840	7360	7920	8440	9000			
RIM DIAMETER 19.5 INCHES																		
245/70 R 19.5	X MULTI D	839	6.75	136/135J	S 4480	7,90	S			2980	3240	3500	3750	4010	4400			
					D 8720		D			5640	6130	6620	7110	7600	8090			
	X MULTI Z	839	6.75				S			2980	3240	3500	3750	4010	4400			
							D			5640	6130	6620	7110	7600	8090			
255/60 R 19.5	X MAXI TRAILER	801	7.50				S					3770	4050	4330	4610	4890	5170	5450
							D					7130	7660	8190	8720	9240	9770	10300
265/70 R 19.5	X LINE ENERGY T	867	7.50				S				3680	3980	4270	4570	4860	5160	5450	
							D				6960	7520	8070	8630	9190	9740	10300	
	X MULTI D	867	7.50				S		3140	3440	3740	4040	4340	4640	4940			
							D		5920	6520	7080	7640	8200	8760	9320			
	X MULTI Z	867	7.50				S		3140	3440	3740	4040	4340	4640	4940			
							D		5920	6520	7080	7640	8200	8760	9320			
	XDW ICE GRIP	867	7.50				S		3140	3440	3740	4040	4340	4640	4940			
							D		5920	6520	7080	7640	8200	8760	9320			
	XTE 2	867	7.50				S				3680	3980	4270	4570	4860	5160	5450	
							D				6960	7520	8070	8630	9190	9740	10300	
	XTY 2	867	7.50				S				3680	3980	4270	4570	4860	5160	5450	
							D				6960	7520	8070	8630	9190	9740	10300	
285/70 R 19.5	XTA 2 ENERGY	895	8.25				S					4640	4980	5330	5670	6010	6360	6700
							D					8720	9370	10020	10660	11310	11950	12600
	X MULTI D	895	7.50	145/143M	S 5800	8,30	S			3810	4140	4480	4810	5140	5470	5800		
					D 10900		D			7120	7730	8350	8970	9590	10210	10830		
	X MULTI Z	895	7.50	145/143M	S 5800	8,30	S			3810	4140	4480	4810	5140	5470	5800		
					D 10900		D			7120	7730	8350	8970	9590	10210	10830		
	XTE 2	895	8.25				S					4640	4980	5330	5670	6010	6360	6700
							D					8720	9370	10020	10660	11310	11950	12600

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Tyre size	Tread pattern	Type	M+S	3PMSF	PR	Labelling		dB	Load/speed index	Load capacity per axle (kg) Fitment Single or Dual (S or D)	Nominal pressure (bar)	Laden section width (mm)[1]	Free section width S (mm)[1]	Free diameter D (mm)[1]	Static laden radius R' (mm)[1]	Rolling circumference (mm)[1]	Minimum dual spacing E (mm)[1]
305/70 R 19.5	XDE 2+	TL	✓			E	C	74	147/145M	S 6150 D 11600	8.00	327	301	931	428	2830	341
	XZE 2+	TL				D	B	68	147/145M	S 6150 D 11600	8.00	328	301	924	423	2800	341
445/45 R 19.5	X LINE ENERGY T	TL				A	C	71	160K	S 9000	9.00	457	430	896	411	2754	
	XTA 2+ ENERGY	TL	✓			C	B	70	160J	S 9000	9.00	463	436	903	413	2761	
RIM DIAMETER 20 INCHES																	
12.00 R 20	XDY	TT	✓		18	E	B	74	154/150K	S 7500 D 13400	8.50	342	312	1134	529	3470	353
	XZY-2	TT	✓		18	D	B	69	154/150K	S 7500 D 13400	8.50	348	315	1127	524	3440	356
RIM DIAMETER 22.5 INCHES																	
10 R 22.5	XZY	TL				D	B	69	144/142K	S 5600 D 10600	8.00	271	244	1017	473	3110	276
11 R 22.5	X MULTI D	TL	✓	✓	16	E	B	75	148/145L	S 6300 D 11600	8.00	297	268	1066	496	3234	303
	X MULTI Z	TL			16	D	C	68	148/145L	S 6300 D 11600	8.00	302	281	1048	492	3267	314
	XZY 3	TL	✓		16	D	B	69	148/145K	S 6300 D 11600	8.00	303	275	1060	493	3236	311
	XDY 3	TL	✓		16	E	B	71	148/145K	S 6300 D 11600	8.00	306	277	1065	496	3250	314
	X INCITY Z	TL	✓	✓	16	D	C	69	148/145J	S 6300 D 11600	8.30	308	282	1054	492	3221	320
12 R 22.5	X MULTI D	TL	✓	✓	18	E	C	72	152/149L	S 7100 D 13000	8.50	TBD	TBD	TBD	TBD	TBD	TBD
	X MULTI Z	TL			18	D	B	68	152/149L	S 7100 D 13000	8.50	323	296	1082	504,5	3314	338
	XDY 3	TL	✓		16	E	B	71	152/148K	S 7100 D 12600	8.50	320	290	1097	510	3350	328

ETRTO overall design diameter (mm)	Michelin preferred rim[1]	Unique point[2]	Unique point - Load (kg) per axle - Fitment S or D[2]	Unique point - Pressure (bar)[2]	Fitment S or D	Load capacity (kg) per axle at inflation pressure (bar / PSI)										
						4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0
						58	65	73	80	87	94	102	109	116	123	131
923	8.25	148/146L	S 6300	8.00	S			4040	4400	4740	5100	5440	5800	6150		
			D 12000		D			7640	8280	8960	9600	10280	10920	11600		
923	8.25	148/146L	S 6300	8.00	S			4040	4400	4740	5100	5440	5800	6150		
			D 12000		D			7640	8280	8960	9600	10280	10920	11600		
895	14.00				S					6230	6690	7150	7620	8080	8540	9000
					D											
895	14.00				S					6230	6690	7150	7620	8080	8540	9000
					D											
1122	8.50	156/150G	S 8000	8.50	S				5070	5470	5880	6280	6690	7090	7500	
			D 13400		D				9050	9780	10500	11230	11950	12680	13400	
1122	8.50	156/150G	S 8000	8.50	S				5070	5470	5880	6280	6690	7090	7500	
			D 13400		D				9050	9780	10500	11230	11950	12680	13400	
1020	6.75				S			3680	4000	4320	4640	4960	5280	5600		
					D			6970	7570	8180	8780	9390	9990	10600		
1050	7.50				S			4140	4500	4860	5220	5580	5940	6300		
					D			7620	8290	8950	9610	10270	10940	11600		
1050	7.50				S			4140	4500	4860	5220	5580	5940	6300		
					D			7620	8290	8950	9610	10270	10940	11600		
1050	7.50				S			4140	4500	4860	5220	5580	5940	6300		
					D			7620	8290	8950	9610	10270	10940	11600		
1050	7.50				S			4140	4500	4860	5220	5580	5940	6300		
					D			7620	8290	8950	9610	10270	10940	11600		
1050	7.50	151/148E	S 6900	8.30	S				4350	4700	5050	5400	5740	6090		
			D 12600		D				8010	8650	9290	9930	10570	11220		
1084	8.25				S				4800	5180	5560	5950	6330	6720	7100	
					D				8780	9490	10190	10890	11590	12300	13000	
1084	8.25				S				4800	5180	5560	5950	6330	6720	7100	
					D				8780	9490	10190	10890	11590	12300	13000	
1084	8.25				S				4800	5180	5560	5950	6330	6720	7100	
					D				8510	9190	9880	10560	11240	11920	12600	

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Tyre size	Tread pattern	Type	M+S	3PMSF	PR	Labelling: Fuel	Labelling: Wet grip	Labelling: Noise dB	Load/speed index	Load capacity per axle (kg) Fitment Single or Dual (S or D)	Nominal pressure (bar)	Laden section width (mm)[1]	Free section width S (mm)[1]	Free diameter D (mm)[1]	Static laden radius R' (mm)[1]	Rolling circumference (mm)[1]	Minimum dual spacing E (mm)[1]
12 R 22.5	XZY-2	TL	✓		16	D	B	69	152/148K	S 7100 D 12600	8.50	328	291	1092	507	3330	329
13 R 22.5	XZE 2	TL			18	D	B	68	156/150L	S 8000 D 13400	8.50	343	310	1122	520	3420	351
13 R 22.5	X WORKS D	TL	✓	✓		C	B	74	156/150K	S 8000 D 13400	8.50	342	307	1120	520	3400	347
13 R 22.5	X WORKS HD D	TL	✓		18	D	B	73	156/151K	S 8000 D 13400	8.50	343	306	1129	524	3430	349
13 R 22.5	X WORKS HD Z	TL	✓		18	D	B	69	156/151K	S 8000 D 13400	8.50	340	307	1122	523	3425	349
13 R 22.5	X WORKS XDY	TL	✓		18	D	B	73	156/150K	S 8000 D 13400	8.50	341	308	1130	525	3430	349
13 R 22.5	X WORKS XZY	TL	✓		18	D	B	68	156/150K	S 8000 D 13400	8.50	343	309	1122	520	3425	350
13 R 22.5	X WORKS Z	TL	✓			C	B	69	156/150K	S 8000 D 13400	8.50	344	306.8	1110	514	3401	347
275/70 R 22.5	XTA 2 ENERGY	TL				C	B	69	152/148J	S 7100 D 12600	9.00	298	271	954	440	2224	307
275/70 R 22.5	X MULTI D	TL	✓	✓	18	D	C	72	148/145L	S 6300 D 11600	9.00	298	274	958	446	2929	310
275/70 R 22.5	X MULTI Z	TL			18	D	B	69	148/145L	S 6300 D 11600	9.00	302	278	959	447,5	2942	311
275/70 R 22.5	XDW ICE GRIP	TL	✓	✓		E	C	72	148/145L	S 6300 D 11600	9.00	299	275,5	970	452	2970	311
275/70 R 22.5	XTY 2	TL	✓	✓	16	D	B	70	148/145J	S 6300 D 11600	9.00	298	276	970	450	2960	312
275/70 R 22.5	X INCITY HL Z	TL	✓	✓	18	D	C	70	150/145J	S 6700 D 11600	9.00	305	277	968	448	2953	314
275/70 R 22.5	X INCITY XZU	TL	✓	✓	16	D	B	69	148/145J	S 6300 D 11600	9.00	302	278	967	450	2950	315
275/80 R 22.5	X MULTI D	TL	✓		16	E	C	72	149/146L	S 6500 D 12000	8.50	305	278	1035	482	3162	315

Tyre size / Tread pattern	ETRTO overall design diameter (mm)	Michelin preferred rim[1]	Unique point[2]	Unique point - Load (kg) per axle - Fitment S or D[2]	Unique point - Pressure (bar)[2]	Fitment S or D	4.0 / 58	4.5 / 65	5.0 / 73	5.5 / 80	6.0 / 87	6.5 / 94	7.0 / 102	7.5 / 109	8.0 / 116	8.5 / 123	9.0 / 131
							Load capacity (kg) per axle at inflation pressure (bar / PSI)										
12 R 22.5 XZY-2	1084	8.25				S				4800	5180	5560	5950	6330	6720	7100	
						D				8510	9190	9880	10560	11240	11920	12600	
13 R 22.5 XZE 2	1124	9.00				S				5400	5840	6280	6700	7140	7560	8000	
						D				9040	9760	10520	11240	11960	12680	13400	
13 R 22.5 X WORKS D	1124	9.00				S				5400	5840	6280	6700	7140	7560	8000	
						D				9040	9760	10520	11240	11960	12680	13400	
13 R 22.5 X WORKS HD D	1124	9.00	158/152G	S 8500	9.00	S				5400	5840	6280	6700	7140	7560	8000	
				D 14200		D				9040	9760	10520	11240	11960	12680	13400	
13 R 22.5 X WORKS HD Z	1124	9.00	158/152G	S 8500	9.00	S				5400	5840	6280	6700	7140	7560	8000	
				D 14200		D				9040	9760	10520	11240	11960	12680	13400	
13 R 22.5 X WORKS XDY	1124	9.00	158/152G			S				5400	5840	6280	6700	7140	7560	8000	
						D				9040	9760	10520	11240	11960	12680	13400	
13 R 22.5 X WORKS XZY	1124	9.00	158/152G			S				5400	5840	6280	6700	7140	7560	8000	
						D				9040	9760	10520	11240	11960	12680	13400	
13 R 22.5 X WORKS Z	1124	9.00	158/152G			S				5400	5840	6280	6700	7140	7560	8000	
						D				9040	9760	10520	11240	11960	12680	13400	
275/70 R 22.5 XTA 2 ENERGY	958	7.50				S					4920	5280	5640	6010	6370	6740	7100
						D					8720	9370	10020	10660	11310	11950	12600
275/70 R 22.5 X MULTI D	958	7.50		S 6500	9.00	S					4360	4680	5010	5330	5650	5980	6300
				D 12000		D					8030	8630	9220	9820	10410	11010	11600
275/70 R 22.5 X MULTI Z	958	7.50		S 6500	9.00	S					4360	4680	5010	5330	5650	5980	6300
				D 12000		D					8030	8630	9220	9820	10410	11010	11600
275/70 R 22.5 XDW ICE GRIP	958	7.50				S					4360	4680	5010	5330	5650	5980	6300
						D					8030	8630	9220	9820	10410	11010	11600
275/70 R 22.5 XTY 2	958	7.50				S					4360	4680	5010	5330	5650	5980	6300
						D					8030	8630	9220	9820	10410	11010	11600
275/70 R 22.5 X INCITY HL Z	958	7.50				S					4640	4980	5330	5670	6010	6360	6700
						D					8030	8630	9220	9820	10410	11010	11600
275/70 R 22.5 X INCITY XZU	958	7.50	152/148E	S 7100	9.00	S					4360	4680	5010	5330	5650	5980	6300
				D 12600		D					8030	8630	9220	9820	10410	11010	11600
275/80 R 22.5 X MULTI D	1012	7.50				S				4390	4740	5090	5450	5800	6150	6500	
						D				8110	8760	9410	10050	10700	11350	12000	

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Tyre size	Tread pattern	Type	M+S	3PMSF	PR	Labelling			Load/speed index	Load capacity per axle (kg) Fitment Single or Dual (S or D)	Nominal pressure (bar)	Laden section width (mm)[1]	Free section width S (mm)[1]	Free diameter D (mm)[1]	Static laden radius R' (mm)[1]	Rolling circumference (mm)[1]	Minimum dual spacing E (mm)[1]
								dB									
275/80 R 22.5	X MULTI Z	TL			16	D	C	69	149/146L	S 6500	8.50	306	278	1019	474	3113	315
										D 12000							
	XZE 2+	TL	✓		16	D	C	68	149/146L	S 6500	8.50	306	279	1025	476	3130	316
										D 12000							
295/60 R 22.5	X LINE ENERGY D	TL	✓	✓		B	B	70	150/147K	S 6700	9.00	323	298.1	920	425	2824	337
										D 12300							
	X LINE ENERGY Z	TL	✓			B	B	70	150/147L	S 6700	9.00	320	298.9	917	425	2822	338
										D 12300							
	XDA 2+ ENERGY	TL	✓	✓		D	C	73	150/147K	S 6700	9.00	312	289	928	429	2830	330
										D 12300							
	XZA 2 ENERGY	TL	✓			C	B	68	150/147K	S 6700	9.00	311	290	918	424	2800	330
										D 12300							
	X MULTI D	TL	✓	✓		D	C	74	150/147L	S 6700	9.00	323	300	928	432	2829	339
										D 12300							
	X MULTIWAY XD	TL	✓	✓		E	C	76	150/147K	S 6700	9.00	312	289	927	430	2809	330
										D 12300							
295/80 R 22.5	XDA 2+ ENERGY	TL	✓	✓		D	C	73	152/148M	S 7100	8.50	327	300	1055	491	3215	339
										D 12600							
	XZA 2 ENERGY	TL				C	C	67	152/148M	S 7100	8.50	327	299	1048	486	3212	338
										D 12600							
	X MULTI HD Z	TL	✓			C	B	69	152/148L	S 7100	8.50	328	299	1053	490	3230	326
										D 12600							
	X MULTI WINTER Z	TL	✓	✓	18	D	B	73	154/149L	S 7500	8.50	329	299	1060	491	1771	335
										D 13000							
	X MULTIWAY 3D XDE	TL	✓	✓		D	C	75	152/148L	S 7100	8.50	328	297	1061	492	3228	336
										D 12600							
	X MULTIWAY 3D XZE	TL	✓	✓		C	B	72	152/148M	S 7100	8.50	328	297	1054	488	3221	336
										D 12600							
	XDW ICE GRIP	TL	✓	✓		E	C	72	152/149L	S 7100	8.50	329	300	1066	496	3260	330
										D 12600							
	X WORKS Z	TL	✓		18	D	B	68	152/149K	S 7100	8.50	327	298	1060	493	3239	326
										D 13000							

ETRTO overall design diameter (mm)	Michelin preferred rim[1]	Unique point[2]	Unique point - Load (kg) per axle - Fitment S or D[2]	Unique point - Pressure (bar)[2]	Load capacity (kg) per axle at inflation pressure (bar / PSI)											
					Fitment S or D	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0
						58	65	73	80	87	94	102	109	116	123	131
1012	7.50				S				4390	4740	5090	5450	5800	6150	6500	
					D				8110	8760	9410	10050	10700	11350	12000	
1012	7.50				S				4390	4740	5090	5450	5800	6150	6500	
					D				8110	8760	9410	10050	10700	11350	12000	
926	9.00				S					4640	4980	5330	5670	6010	6360	6700
					D					8520	9150	9780	10410	11040	11670	12300
926	9.00				S					4640	4980	5330	5670	6010	6360	6700
					D					8520	9150	9780	10410	11040	11670	12300
926	9.00	149/146L	S 6500	9.00	S					4640	4980	5330	5670	6010	6360	6700
			D 12000		D					8520	9150	9780	10410	11040	11670	12300
926	9.00	149/146L	S 6500	8.50	S					4640	4980	5330	5670	6010	6360	6700
			D 12000		D					8520	9150	9780	10410	11040	11670	12300
926	9.00				S					4640	4980	5330	5670	6010	6360	6700
					D					8520	9150	9780	10410	11040	11670	12300
926	9.00	149/146L	S 6500	9.00	S					4640	4980	5330	5670	6010	6360	6700
			D 12000		D					8520	9150	9780	10410	11040	11670	12300
1044	8.25				S				4800	5180	5560	5940	6340	6720	7100	
					D				8510	9190	9880	10560	11240	11920	12600	
1044	8.25				S				4800	5180	5560	5940	6340	6720	7100	
					D				8510	9190	9880	10560	11240	11920	12600	
1044	8.25				S				4800	5180	5560	5950	6330	6720	7100	
					D				8510	9190	9880	10560	11240	11920	12600	
1044	8.25	153/150J	S 7300	8.75	S				5070	5470	5880	6280	6690	7090	7500	
			D 13400		D				9290	9490	10190	10890	11590	12300	13000	
1044	8.25				S				4800	5180	5560	5950	6330	6720	7100	
					D				8510	9190	9880	10560	11240	11920	12600	
1044	8.25				S				4800	5180	5560	5950	6330	6720	7100	
					D				8510	9190	9880	10560	11240	11920	12600	
1044	8.25	153/150J	S 7300	8.75	S				4800	5180	5560	5950	6330	6720	7100	
			D 13400		D				8780	9490	10190	10890	11590	12300	13000	
1044	8.25	154/150J	S 7500	8.50	S				4800	5180	5560	5950	6330	6720	7100	
			D 13400		D				8780	9490	10190	10890	11590	12300	13000	

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Tyre size	Tread pattern	Type	M+S	3PMSF	PR	Labelling: fuel	Labelling: wet grip	Labelling: noise dB	Load/speed index	Load capacity per axle (kg) Fitment Single or Dual (S or D)	Nominal pressure (bar)	Laden section width (mm)[1]	Free section width S (mm)[1]	Free diameter D (mm)[1]	Static laden radius R' (mm)[1]	Rolling circumference (mm)[1]	Minimum dual spacing E (mm)[1]
295/80 R 22.5	XDY+	TL	✓			E	B	74	152/148K	S 7100 D 12600	8.50	328	300	1064	495	3239	330
	X COACH HL Z	TL				C	B	69	154/149M	S 7500 D 13000	8.50	329	299	1055	488	3229	338
	X COACH XD	TL	✓	✓		E	C	72	152/148M	S 7100 D 12600	8.50	329	300	1062	494	3223	339
	X COACH Z	TL	✓	✓		C	B	71	154/150M	S 7500 D 6700	8.50	337	307	1052	486	3305	345
	X INCITY XZU 3+	TL	✓	✓	16	D	C	70	152/148J	S 7100 D 12600	8.50	328	297	1056	491	3225	336
305/70 R 22.5	XDA 2+ ENERGY	TL	✓	✓		C	C	73	152/148L	S 7100 D 12600	9.00	325	299	1002	466	3064	340
	XZA 2 ENERGY	TL			16	C	B	67	152/148L	S 7100 D 12600	9.00	324	300	995	460	3030	339
	X MULTI Z	TL	✓	✓	20	C	C	70	152/150L	S 7100 D 13400	9.00	333	308	1010	471	3093	340
	XDE 2+	TL	✓			E	C	74	152/148L	S 7100 D 13400	9.00	325	301	1006	467	3070	340
	X INCITY Z	TL	✓	✓		D	C	69	153/150J	S 7300 D 13400	9.00	338	312	1003	467	3053	353
315/60 R 22.5	X ENERGY XF	TL	✓			C	B	68	154/148L	S 7500 D 12600	9.00	340	316	950	439	2912	350
	X LINE ENERGY D	TL	✓	✓		B	C	72	152/148L	S 7100 D 12600	9.00	339	312	949	441	2907	352
	X LINE ENERGY Z	TL	✓			B	B	70	154/148L	S 7500 D 12600	9.00	336	312	946	436	2908	353
	XDA 2+ ENERGY	TL	✓	✓		D	C	73	152/148L	S 7100 D 12600	9.00	337	313	964	447	2940	350
	XZA 2 ENERGY	TL				C	B	68	152/148L	S 7100 D 12600	9.00	335	314	953	441	2900	350
	X MULTI D	TL	✓	✓		D	C	74	152/148L	S 7100 D 12600	9.00	336	313	956	444	2916	354

Tread pattern	ETRTO overall design diameter (mm)	Michelin preferred rim[1]	Unique point[2]	Unique point - Load (kg) per axle - Fitment S or D[2]	Unique point - Pressure (bar)[2]	Fitment S or D	4.0 / 58	4.5 / 65	5.0 / 73	5.5 / 80	6.0 / 87	6.5 / 94	7.0 / 102	7.5 / 109	8.0 / 116	8.5 / 123	9.0 / 131
							Load capacity (kg) per axle at inflation pressure (bar / PSI)										
XDY+	1044	8.25				S				4800	5180	5560	5950	6330	6720	7100	
						D			8510	9190	9880	10560	11240	11920	12600		
X COACH HL Z	1044	8.25				S				5070	5470	5880	6280	6690	7090	7500	
						D				9290	9490	10190	10890	11590	12300	13000	
X COACH XD	1044	8.25	154L	S 7500	8.50	S				4800	5180	5560	5940	6340	6720	7100	
						D				8510	9190	9880	10560	11240	11920	12600	
X COACH Z	1072	8.25 22.5				S			4660	5070	5470	5880	6280	6690	7090	7500	
						D			8590	9280	9960	10650	11340	12030	12710	13400	
X INCITY XZU 3+	1044	8.25	154/150E	S 7500	8.75	S				4800	5180	5560	5950	6330	6720	7100	
				D 13400		D				8510	9190	9880	10560	11240	11920	12600	
XDA 2+ ENERGY	1000	8.25	150/147M	S 6700	8.50	S					4920	5280	5640	6010	6370	6740	7100
				D 12300		D					8720	9370	10020	10660	11310	11950	12600
XZA 2 ENERGY	1000	8.25	150/147M	S 6700	8.50	S					4920	5280	5640	6010	6370	6740	7100
				D 12300		D					8720	9370	10020	10660	11310	11950	12600
X MULTI Z	1000	8.25				S					4920	5280	5640	6010	6370	6740	7100
						D					9280	9960	10650	11340	12030	12710	13400
XDE 2+	1000	8.25	150/147M	S 6700	8.50	S					4920	5280	5640	6010	6370	6740	7100
				D12300		D					8720	9370	10020	10660	11310	11950	12600
X INCITY Z	1000	8.25				S					5050	5430	5800	6180	6550	6930	7300
						D					9280	9960	10650	11340	12030	12710	13400
X ENERGY XF	950	9.00				S					5190	5580	5960	6350	6730	7120	7500
						D					9190	9880	10560	11240	11920	12600	
X LINE ENERGY D	950	9.00				S					4920	5280	5640	6010	6370	6740	7100
						D					9190	9880	10560	11240	11920	12600	
X LINE ENERGY Z	950	9.00				S					5190	5580	5960	6350	6730	7120	7500
						D					9190	9880	10560	11240	11920	12600	
XDA 2+ ENERGY	950	9.00				S					4920	5280	5640	6010	6370	6740	7100
						D					9190	9880	10560	11240	11920	12600	
XZA 2 ENERGY	950	9.00				S					4920	5280	5640	6010	6370	6740	7100
						D					9190	9880	10560	11240	11920	12600	
X MULTI D	950	9.00				S					4920	5280	5640	6010	6370	6740	7100
						D					9190	9880	10560	11240	11920	12600	

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Tyre size	Tread pattern	Type	M+S	3PMSF	PR	Labelling			Load/speed index	Load capacity per axle (kg) Fitment Single or Dual (S or D)	Nominal pressure (bar)	Laden section width (mm)[1]	Free section width S (mm)[1]	Free diameter D (mm)[1]	Static laden radius R' (mm)[1]	Rolling circumference (mm)[1]	Minimum dual spacing E (mm)[1]
								dB									
315/70 R 22.5	X MULTIWAY XD	TL	✓	✓		F	C	76	152/148L	S 7100	9.00	337	314	962	447	2921	350
										D 12600							
	X LINE ENERGY D	TL	✓			B	C	71	154/150L	S 7500	9.00	341	311	1016	472	3113	352
										D 13400							
	X LINE ENERGY D2	TL	✓	✓		A	B	70	154/150L	S 7500	9.00	343	316	1012	470	3094	358
										D 13400							
	X LINE ENERGY Z	TL				B	B	69	156/150L	S 8000	9.00	349	316	1015	470	3119	358
										D 13400							
	X MULTI D	TL	✓	✓		D	C	75	154/150L	S 7500	9.00	338	316	1017	475	3103	358
										D 13400							
	X MULTI ENERGY D	TL	✓	✓		C	B	72	154/150L	S 7500	9.00	343	317	1012	471	3094	359
										D 13400							
	X MULTI ENERGY Z	TL	✓			B	B	72	156/150L	S 8000	9.00	346	317.3	1015	469	3094	359
										D 13400							
	X MULTI Z	TL	✓	✓		C	B	72	156/150L	S 8000	9.00	345	318.2	1014	468	3097	360
										D 13400							
	X MULTIWAY 3D XDE	TL	✓	✓		D	C	75	154/150L	S 7500	9.00	342	316	1020	475	3109	358
										D 13400							
	X MULTIWAY 3D XZE	TL	✓	✓		C	B	72	156/150L	S 8000	9.00	345	317	1014	469	3099	359
										D 13400							
	XDW ICE GRIP	TL	✓	✓		D	C	72	154/150L	S 7500	9.00	339	318	1018	473	3110	350
										D 13400							
	XFN 2 ANTISPLASH	TL	✓	✓		D	C	72	154L	S 7500	9.00	345	317.8	1018	471	3106	350
315/80 R 22.5	X LINE ENERGY D	TL	✓	✓		B	C	69	156/150L	S 8000	8.50	350	316	1080	499	3363	358
										D 13400							
	X LINE ENERGY Z	TL				B	B	69	156/150L	S 8000	8.50	346	315	1075	496	3357	356
										D 13400							
	XTA	TL				C	B	69	154/150M	S 7500	8.50	346	317	1080	501	3296	350
										D 6700							
	X MULTIWAY 3D XDE	TL	✓	✓		D	C	75	156/150L	S 8000	8.50	350	318	1087	504	3303	360
										D 13400							

ETRTO overall design diameter (mm)	Michelin preferred rim[1]	Unique point[2]	Unique point - Load (kg) per axle - Fitment S or D[2]	Unique point - Pressure (bar)[2]	Load capacity (kg) per axle at inflation pressure (bar / PSI)											
					Fitment S or D	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0
						58	65	73	80	87	94	102	109	116	123	131
950	9.00				S					4920	5280	5640	6010	6370	6740	7100
					D					9190	9880	10560	11240	11920	12600	
1014	9.00				S					5190	5580	5960	6350	6730	7120	7500
					D					9280	9960	10650	11340	12030	12710	13400
1014	9.00				S					5190	5580	5960	6350	6730	7120	7500
					D					9280	9960	10650	11340	12030	12710	13400
1014	9.00				S					5540	5940	6360	6760	7180	7580	8000
					D					9280	9960	10650	11340	12030	12710	13400
1014	9.00				S					5190	5580	5960	6350	6730	7120	7500
					D					9280	9960	10650	11340	12030	12710	13400
1014	9.00				S					5190	5580	5960	6350	6730	7120	7500
					D					9280	9960	10650	11340	12030	12710	13400
1014	9.00				S					5540	5940	6360	6760	7180	7580	8000
					D					9280	9960	10650	11340	12030	12710	13400
1014	9.00				S					5540	5950	6360	6770	7180	7590	8000
					D					9280	9960	10650	11340	12030	12710	13400
1014	9.00				S					5190	5580	5960	6350	6730	7120	7500
					D					9280	9960	10650	11340	12030	12710	13400
1014	9.00				S					5540	5950	6360	6770	7180	7590	8000
					D					9280	9960	10650	11340	12030	12710	13400
1014	9.00				S					5190	5580	5960	6350	6730	7120	7500
					D					9280	9960	10650	11340	12030	12710	13400
1014	9.00				S					5190	5580	5960	6350	6730	7120	7500
					D											
1076	9.00	154/150M	S 7500	8.00	S				5410	5840	6270	6700	7140	7570	8000	
			D 13400		D				9570	10340	11100	11870	12630	13400		
1076	9.00	154/150M	S 7500	8.00	S				5410	5840	6270	6700	7140	7570	8000	
			D 13400		D				9570	10340	11100	11870	12630	13400		
1106	9.00				S			5070	5070	5470	5880	6280	6690	7090	7500	
					D			8800	9570	10340	11100	11870	12630	13400		
1076	9.00	154/150M	S 7500	8.00	S				5410	5840	6270	6700	7140	7570	8000	
			D 13400		D				9570	10340	11100	11870	12630	13400		

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Tyre size	Tread pattern	Type	M+S	3PMSF	PR	Labelling		dB	Load/speed index	Load capacity per axle (kg) Fitment Single or Dual (S or D)	Nominal pressure (bar)	Laden section width (mm)[1]	Free section width S (mm)[1]	Free diameter D (mm)[1]	Static laden radius R' (mm)[1]	Rolling circumference (mm)[1]	Minimum dual spacing E (mm)[1]
315/80 R 22.5	X MULTIWAY 3D XZE	TL	✓	✓		C	B	72	156/150L	S 8000 D 13400	8.50	349	316	1081	501	3302	358
315/80 R 22.5	XDE 2+	TL	✓			E	C	75	156/150L	S 8000 D 13400	8.50	347	318	1095	507	3320	350
315/80 R 22.5	XDW ICE GRIP	TL	✓	✓		E	C	72	156/150L	S 8000 D 13400	8.50	348	315	1090	504	3320	350
315/80 R 22.5	XFN 2+	TL	✓	✓	18	D	C	72	156/150L	S 8000 D 13400	8.50	350	318	1082	501	3297	360
315/80 R 22.5	XZ ALL ROADS	TL	✓			C	B	68	156/150L	S 8000 D 6700	8.50	348	318	1083	501	3331	360
315/80 R 22.5	XD ALL ROADS	TL	✓			E	B	75	156/150L	S 8000 D 6700	8.50	347	318	1095	507	3357	360
315/80 R 22.5	X WORKS D	TL	✓	✓		C	B	75	156/150K	S 8000 D 13400	8.50	342	312	1072	498	3253	353
315/80 R 22.5	X WORKS HD D	TL	✓			D	B	73	156/150K	S 8000 D 13400	8.50	348	317	1091	507	3312	359
315/80 R 22.5	X WORKS HD Z	TL	✓			C	B	68	156/150K	S 8000 D 13400	8.50	348	317	1080	502	3308	359
315/80 R 22.5	X WORKS XDY	TL	✓			D	B	73	156/150K	S 8000 D 13400	8.50	348	317	1091	506	3312	359
315/80 R 22.5	X WORKS XZY	TL	✓			C	B	68	156/150K	S 8000 D 13400	8.50	349	317	1080	501	3308	359
315/80 R 22.5	X WORKS Z	TL	✓			C	B	69	156/150K	S 8000 D 13400	8.50	342	312	1066	494	3257	353
355/50 R 22.5	X LINE ENERGY Z	TL	✓			B	B	70	156K	S 8000	9.00	379	359	935	434	2876	
385/55 R 22.5	X LINE ENERGY F	TL	✓			A	B	70	160K	S 9000	9.00	415	391	990	456	3047	
385/55 R 22.5	X LINE ENERGY T	TL				A	B	70	160K	S 9000	9.00	403	376	996	458	3060	
385/55 R 22.5	XFA 2 ENERGY ANTISPLASH	TL				C	B	67	158L	S 8500	9.00	404	380	997	462	3040	

Tyre size	Tread pattern	ETRTO overall design diameter (mm)	Michelin preferred rim[1]	Unique point[2]	Unique point - Load (kg) per axle - Fitment S or D[2]	Unique point - Pressure (bar)[2]	Fitment S or D	Load capacity (kg) per axle at inflation pressure (bar / PSI) 4.0 / 58	4.5 / 65	5.0 / 73	5.5 / 80	6.0 / 87	6.5 / 94	7.0 / 102	7.5 / 109	8.0 / 116	8.5 / 123	9.0 / 131
315/80 R 22.5	X MULTIWAY 3D XZE	1076	9.00	154/150M	S 7500	8.00	S				5410	5840	6270	6700	7140	7570	8000	
					D 13400		D				9570	10340	11100	11870	12630	13400		
315/80 R 22.5	XDE 2+	1076	9.00	154/150M	S 7500	8.00	S				5410	5840	6270	6700	7140	7570	8000	
					D 13400		D				9570	10340	11100	11870	12630	13400		
315/80 R 22.5	XDW ICE GRIP	1076	9.00				S				5410	5840	6270	6700	7140	7570	8000	
							D				9570	10340	11100	11870	12630	13400		
315/80 R 22.5	XFN 2+	1076	9.00				S				5410	5840	6270	6700	7140	7570	8000	
							D				9570	10340	11100	11870	12630	13400		
315/80 R 22.5	XZ ALL ROADS	1076	9.00				S				5400	5840	6280	6700	7140	7560	8000	
							D				9560	10320	11120	11880	12640	13400	14160	
315/80 R 22.5	XD ALL ROADS	1076	9.00				S				5400	5840	6280	6700	7140	7560	8000	
							D				9560	10320	11120	11880	12640	13400	14160	
315/80 R 22.5	X WORKS D	1076	9.00				S				5410	5840	6270	6700	7140	7570	8000	
							D				9570	10340	11100	11870	12630	13400		
315/80 R 22.5	X WORKS HD D	1076	9.00				S				5410	5840	6270	6700	7140	7570	8000	
							D				9570	10340	11100	11870	12630	13400		
315/80 R 22.5	X WORKS HD Z	1076	9.00				S				5410	5840	6270	6700	7140	7570	8000	
							D				9570	10340	11100	11870	12630	13400		
315/80 R 22.5	X WORKS XDY	1076	9.00				S				5410	5840	6270	6700	7140	7570	8000	
							D				9570	10340	11100	11870	12630	13400		
315/80 R 22.5	X WORKS XZY	1076	9.00				S				5410	5840	6270	6700	7140	7570	8000	
							D				9570	10340	11100	11870	12630	13400		
315/80 R 22.5	X WORKS Z	1076	9.00				S				5410	5840	6270	6700	7140	7570	8000	
							D				9570	10340	11100	11870	12630	13400		
355/50 R 22.5	X LINE ENERGY Z	928	11.75				S					5540	5940	6360	6760	7180	7580	8000
							D											
385/55 R 22.5	X LINE ENERGY F	996	11.75	158L	S 8500	9.00	S					6230	6690	7150	7620	8080	8540	9000
							D											
385/55 R 22.5	X LINE ENERGY T	996	11.75	158L	S 8500	8.50	S					6230	6690	7150	7620	8080	8540	9000
							D											
385/55 R 22.5	XFA 2 ENERGY ANTISPLASH	996	11.75	160J	S 9000	9.00	S					5880	6320	6760	7200	7620	8060	8500
							D											

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Tyre size	Tread pattern	Type	M+S	3PMSF	PR	Labelling			Load/speed index	Load capacity per axle (kg) Fitment Single or Dual (S or D)	Nominal pressure (bar)	Laden section width (mm)[1]	Free section width S (mm)[1]	Free diameter D (mm)[1]	Static laden radius R' (mm)[1]	Rolling circumference (mm)[1]	Minimum dual spacing E (mm)[1]
								dB									
385/55 R 22.5	X MULTI F	TL	✓	✓	20	B	B	72	160K	S 9000	9.00	406	380	996	458	3128	
	X MULTI T	TL	✓			B	B	69	160K	S 9000	9.00	406	378	998	460	3068	
	X MULTI T2	TL	✓			B	B	70	160K	S 9000	9.00	410	381	1001	461	3071	
	XFN 2 ANTISPLASH	TL	✓	✓		C	B	72	160K	S 9000	9.00	407	380	998	459	3060	
385/65 R 22.5	X LINE ENERGY F	TL				B	B	69	160K	S 9000	9.00	406	376	1066	494	3270	
	X LINE ENERGY T	TL				A	B	69	160K	S 9000	9.00	406	377	1066	494	3272	
	X MULTI F	TL	✓			C	B	69	158L	S 8500	8.50	404	376	1073	497	3288	
	X MULTI T	TL	✓			B	B	69	160K	S 9000	9.00	404	377	1070	496	3286	
	X MULTI WINTER T	TL	✓	✓		C	A	70	160K	S 9000	9.00	409	380	1070	495	3274	
	X MULTIWAY HD XZE	TL	✓			C	B	68	164K	S 10000	9.00	414	384	1078	497	3309	
	XFN 2 ANTISPLASH	TL	✓	✓		D	C	72	158L	S 8500	8.50	409	380	1074	498	3274	
	XTE 3	TL				C	B	69	160J	S 9000	9.00	407	378	1074	497	3292	
	X WORKS T	TL	✓			C	B	71	160K	S 9000	9.00	403	373	1073	495	3283	
	XZY 3	TL	✓		20	C	B	73	160K	S 9000	9.00	409	379	1078	499	3280	
425/65 R 22.5	XTE 2	TL			20	C	B	69	165K	S 10300	8.50	449	421	1130	522	3440	
	XZY 3	TL	✓		20	C	B	73	165K	S 10300	8.50	453	421	1136	523	3460	

ETRTO overall design diameter (mm)	Michelin preferred rim[1]	Unique point[2]	Unique point - Load (kg) per axle - Fitment S or D[2]	Unique point - Pressure (bar)[2]	Load capacity (kg) per axle at inflation pressure (bar / PSI)											
					Fitment S or D	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0
						58	65	73	80	87	94	102	109	116	123	131
996	11.75	158L	S 8500	8.50	S					6230	6690	7150	7620	8080	8540	9000
					D											
996	11.75	158L	S 8500	8.50	S					6230	6690	7150	7620	8080	8540	9000
					D											
996	11.75	158L	S 8500	9.00	S					6230	6690	7150	7620	8080	8540	9000
					D											
996	11.75	158L	S 8500	9.00	S					6230	6690	7150	7620	8080	8540	9000
					D											
1072	11.75	158L	S 8500	9.00	S					6240	6700	7160	7620	8080	8540	9000
					D											
1072	11.75	158L	S 8500	8.50	S					6240	6700	7160	7620	8080	8540	9000
					D											
1072	11.75	160K	S 9000	9.00	S				5740	6200	6660	7120	7580	8040	8500	
					D											
1072	11.75	158L	S 8500	8.50	S					6240	6700	7160	7620	8080	8540	9000
					D											
1072	11.75	158L	S 8500	8.50	S					6240	6700	7160	7620	8080	8540	9000
					D											
1072	11.75				S					6920	7440	7940	8460	8980	9480	10000
					D											
1072	11.75	160J	S 9000	9.00	S				5740	6200	6660	7120	7580	8040	8500	
					D											
1072	11.75	158L	S 8500	8.50	S					6240	6700	7160	7620	8080	8540	9000
					D											
1072	11.75				S					6240	6700	7160	7620	8080	8540	9000
					D											
1072	11.75	158L	S 8500	8.50	S					6240	6700	7160	7620	8080	8540	9000
					D											
1124	13.00				S				6960	7520	8080	8620	9180	9740	10300	
					D											
1124	13.00				S				6960	7520	8080	8620	9180	9740	10300	
					D											

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Tyre size	Tread pattern	Type	M+S	3PMSF	PR	Labelling			Load/speed index	Load capacity per axle (kg) Fitment Single or Dual (S or D)	Nominal pressure (bar)	Laden section width (mm)[1]	Free section width S (mm)[1]	Free diameter D (mm)[1]	Static laden radius R' (mm)[1]	Rolling circumference (mm)[1]	Minimum dual spacing E (mm)[1]
								dB									
445/65 R 22.5	XTE 2	TL			20	C	B	69	169K	S 11600	9.00	481	451	1158	534	3520	
	XZY 3	TL	✓		20	D	B	73	169K	S 11600	9.00	486	451	1164	536	3540	
455/45 R 22.5	X ONE XDU	TL	✓	✓		D	C	73	166J	S 10600	9.00	494	466	982	450	2980	
495/45 R 22.5	X ONE INCITY D	TL	✓	✓		D	C	73	169K	S 11600	9.00	546	510	1025	468	3120	
	X ONE MULTI D	TL	✓	✓		D	B	75	169K	S 11600	9.00	527	504	1025	471	3123	
RIM DIAMETER 24 INCHES																	
325/95 R 24	X WORKS XD	TL	✓			D	B	72	162/160K	S 9500	8.50	349	314	1230	569	3760	355
										D 18600							
	X WORKS XZ	TL	✓			D	B	73	162/160K	S 9500	8.50	347	311	1223	566	3747	352
										D 18000							

ETRTO overall design diameter (mm)	Michelin preferred rim[1]	Unique point[2]	Unique point - Load (kg) per axle - Fitment S or D[2]	Unique point - Pressure (bar)[2]	Load capacity (kg) per axle at inflation pressure (bar / PSI)											
					Fitment S or D	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0
						58	65	73	80	87	94	102	109	116	123	131
1150	14.00				S					8040	8620	9220	9820	10420	11000	11600
					D											
1150	14.00				S					8040	8620	9220	9820	10420	11000	11600
					D											
982	15.00				S					7580	8090	8600	9130	9660	10130	10600
					D											
1018	17.00				S					8030	8630	9220	9820	10410	11010	11600
					D											
1018	17.00				S					8030	8630	9220	9820	10410	11010	11600
					D											
1228	8.50				S					6930	7450	7960	8470	8990	9500	
					D				12160	13140	14110	15080	16050	17030	18000	
1228	8.50				S					6930	7450	7960	8470	8990	9500	
					D				12160	13140	14110	15080	16050	17030	18000	

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Tyre size	Tread pattern	Type	M+S	3PMSF	PR	Labelling			Load/speed index	Load capacity per axle (kg) Fitment Single or Dual (S or D)	Nominal pressure (bar)	Laden section width (mm)[1]	Free section width S (mm)[1]	Free diameter D (mm)[1]	Static laden radius R' (mm)[1]	Rolling circumference (mm)[1]	Minimum dual spacing E (mm)[1]
								dB									
RIM DIAMETER 16 INCHES																	
7.50 R 16	XS	TL	✓						116/114N	S 2500 D 4720	5.3		214	826	384		
11.00 R 16	XZL	TL	✓						135K	S 4360	5.5	319	287	984	455	3000	242
255/100 R 16 (9.00 R 16)	XZL	TL	✓						126K	S 3700	4.5	286	255	923	426	2810	
325/85 R 16	X FORCE Z	TL	✓						140K	S 5000	5.0	363	329	983	448	2973	
	XML	TL	✓						137J	S 4600	4.5	364	327	984	449	2980	
RIM DIAMETER 20 INCHES																	
10.00 R 20	XZL	TT	✓		16				146/143K	S 6000 D 10900	7.8	311	281	1060	493	3240	318
11.00 R 20	XZL	TL	✓		16				150/146K	S 6700 D 12000	8.0	330	299	1092	508	3340	338
12.00 R 20	XZL	TL	✓		18				154/149K	S 7500 D 13000	8.5	344	311	1131	527	3460	352
	XML	TL	✓		18				149/146J	S 6500 D 12000	7.2	339	308	1131	526	3443	349
14.00 R 20	XZL+	TL	✓		20				164/160J	S 10000 D 18000	7.6	428	386	1258	578	3832	436
	XML	TL	✓						153G	S 7300	6.2	421	383	1258	581	3830	
	XS	TL	✓						160/157F	S 9000 D 16500	7.0	410	369	1238	566	3772	417

Michelin preferred rim[1]	Unique point[2]	Unique point - Load (kg) per axle - Fitment S or D[2]	Unique point - Pressure (bar)[2]	Tube	Flap	Seal	ROAD SINGLE Load (Kg/KPa)	ROAD SINGLE Pressure (bar)	ROAD SINGLE Pressure (PSI)	ROAD SINGLE Maximum Speed (km/h)	ROAD SINGLE Maximum Speed (mph)	ROAD SINGLE Footprint (cm²)	Regrooving depth (mm)	Regrooving Width (mm)	Blade
6.00G				16J	16x 6.00		1250	5.3	77	140	87	277	-	-	-
6.50H				16P	16x6.00 E M	LR R1967	2180	5.5	80	110	68	583			
6.50H	134 J	S 4240		16J	16x6.00 E M	LR SPRAT R1014	1700	4.5	65	110	68	437	3,0	10 to 12 mm	R4
9.00							2500	5.0	72	110	68	564	3,0	10 mm	R4
9.00	134K	S 4240	4.5				2300	4.5	65	100	62	604	4,0	9 to 10 mm	R3 or R4
7.5				20N	20x8.50 E		3000	7.8	116	110	68	500	4,0	10 to 12 mm	R4
8.00				20P	20x8.50 E		3350	8.0	116	110	68	546	4,0		
8.50				20Q	20x8.50 E		3750	8.5	123	110	68	611	4,0	10 to 12 mm	R4
8.50				20Q	20x8.50 E		3250	7.2	105	100	62	787	4,0	A = 20 mm B = 10 to 12 mm	R4
10.00W	166G	S 10600	7.9	20S	20x10.00 E		5000	7.6	110	100	62	983	3,0	10 to 12 mm	R4
10.00W	149 K	S 6500	6.2	20S	20x10.00 E		3650	6.2	90	90	56	935	4,0	A = 20 mm B = 10 to 12 mm	R4
10.00W				20S	20x10.00 E		4500	7.0	102	80	50	813	4,0	8 to 10 mm	R3

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								dB									
16.00 R 20	XZL	TL	NO						173/170G	S 13000 D 24000	7.5	488	438	1343	609	4090	495
275/80 R 20 (10.5 R 20)	X FORCE ZL MPT	TL	✓						128K	S 3600	4.2		277	940	433	2857	
335/80 R 20 (12.5 R 20)	X FORCE ZL MPT	TL	✓						150K	S 6700	6.5		341	1037	478	3160	
	XZL MPT	TL	✓		16				141K	S 5150	4.3	381	345	1037	473	3140	
365/80 R 20 (14.5 R 20)	XZL MPT	TL	✓						152K	S 7100	6.0	410	372	1096	501	3330	
365/85 R 20	XZL	TL	✓						164G	S 10000	7.5	411	368	1144	520	3460	
395/85 R 20	XZL	TL	✓						168G	S 11200	8.5	425	388	1189	542	3600	
	XZL 2	TL	✓						168K	S 11200	8.5	429	388	1176	534	3584	
	XML	TL	✓		14				161G	S 9250	7.0	418	385	1187	543	3590	
475/80 R 20	XML	TL	✓						166G	S 10600	6.0	526	480	1272	581	3860	
RIM DIAMETER 20.5 INCHES																	
24 R 20.5	XS	TL	✓						176F	S 14200	6.0	661	602	1374	620	4150	
525/65 R 20.5 (20.5 R 20.5)	XS	TL	✓		20				173F	S 13000	8.0	558	521	1200	548	3640	
RIM DIAMETER 21 INCHES																	
24 R 21	XZL	TL	✓		16				176G	S 14200	6.0	663	608	1388	631	4200	

Michelin preferred rim[1]	Unique point[2]	Unique point - Load (kg) per axle - Fitment S or D[2]	Unique point - Pressure (bar)[2]	Tube	Flap	Seal	ROAD SINGLE Load (Kg/KPa)	ROAD SINGLE Pressure (bar)	ROAD SINGLE Pressure (PSI)	ROAD SINGLE Maximum Speed (km/h)	ROAD SINGLE Maximum Speed (mph)	ROAD SINGLE Footprint (cm²)	Regrooving depth (mm)	Regrooving Width (mm)	Blade
10.00W				20V	20x10.00 E		6500	7.5	109	90	56	1288	4,0	10 to 12 mm	R4
9.00				20P15			1800	4.2	61	110	68	419	4,0	10 to 12 mm	R3
11.00				20P15			3350	6.5	93	110	68	635	4,0	10 to 12 mm	R4
11.00				20P15			2575	4.3	62	110	68	715	4,0	10 to 12 mm	R4
11.00				20P15			3550	6.0	87	110	68	777	4,0	10 to 12 mm	R4
10.00W				20S	20x10.00 E	TYRAN	5000	7.5	109	90	55	857	4,0	10 to 12 mm	R4
10.00W	161J	S 9250	8.5	20S	20x10.00 E	TYRAN	5600	8.5	123	90	55	932	4,0	18 to 20 mm	R4
10.00	164 L	S 10000	8.5	20S	20x10.00 E	TYRAN	5600	8.5	120	110	68	913	3,0	8 to 10 mm	R3
10.00				20S	20x10.00 E	TYRAN	4625	7.0	102	90	56	874	4,0	A = 20 mm B = 10 mm	R4
14.0V				20V			5300	6.0	87	90	56	1141	4,0		
18.00				20,5 WAMD			7100	6.0	90	80	50	1563	4,0	8 to 10	R3 or R4
16.00				19,5/ 20,5 UD			6500	8.0	120	80	50	1121	4,0		
18.00				21 WAM			7100	6.0	87	90	56	1675	4,0	10 to 12 mm	R4

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Tyre size	Tread pattern	Type	M+S	3PMSF	PR	Labelling			Load/speed index	Load capacity per axle (kg) Fitment Single or Dual (S or D)	Nominal pressure (bar)	Laden section width (mm)[1]	Free section width S (mm)[1]	Free diameter D (mm)[1]	Static laden radius R' (mm)[1]	Rolling circumference (mm)[1]	Minimum dual spacing E (mm)[1]
								dB									
RIM DIAMETER 22.5 INCHES																	
13 R 22.5	XZH2R	TL	✓			E	B	72dB	154/150G	S 7500 D 13400	8.0		317	1135	528	3456	359
	XZL	TL	✓		18				154/150K	S 7500 D 13400	8.0	338	307	1130	525	3450	347
315/80 R 22.5	X FORCE ZH	TL	✓						156/150G	S 8000 D 13400	8.5		317	1088	503	3318	359
445/65 R 22.5	XZL (WB)	TL	✓						168G	S 11200	8.0	486	448	1168	537	3550	
RIM DIAMETER 560 MM																	
395/90 R 560 TR	X FORCE 2	TL	✓						160J	S 9000	7.1		390	1252	577	3807	
	XML	TL	✓		14				154K	S 7500	6.4	417	392	1256	582	3835	
	X FORCE ML	TL	✓		16				158G	S 8500	6.6		392	1256	579	3823	
RIM DIAMETER 685 MM																	
415/80 R 685 TR	X FORCE 2	TL	✓						164J	S 10000	7.6		402	1331	610	4050	
	XML	TL	✓						160K	S 9000	6.7	435	404	1330	613	4072	
	X FORCE ZL	TL	✓						164K	S 10000	7.6	435	400	1332	615	4080	

Michelin preferred rim[1]	Unique point[2]	Unique point - Load (kg) per axle - Fitment S or D[2]	Unique point - Pressure (bar)[2]	Tube	Flap	Seal	ROAD SINGLE Load (Kg/KPa)	ROAD SINGLE Pressure (bar)	ROAD SINGLE Pressure (PSI)	ROAD SINGLE Maximum Speed (km/h)	ROAD SINGLE Maximum Speed (mph)	ROAD SINGLE Footprint (cm²)	Regrooving depth (mm)	Regrooving Width (mm)	Blade
9.00	156/150F	S 8000 D 13400		20S			3750	8.0	116	90	56	633	4,0	12 to 14 mm	R4
9.00				20S			3750	8.0	116	110	68	637	4,0		
9.00				20PD			4000	8.5	123	90	56	591	4,0	12 to 14 mm	R4
14.00				22.5 U AMD			5600	8.0	116	90	56	1037	4,0	A = 20 mm B = 10 mm	R4
240TR	154K	S 7500					4500	7.1	103	100	62	914			
240 TR	156 F	S 7500 D 16000	6.4				3750	6.4	90	110	68	810	4,0	A = 20 mm B = 10 to 12 mm	R4
240 TR	156J	S 8000					4250	6.6	96	90	56	860	4,0	A = 20 mm B = 10 to 12 mm	R4
230-685TR							5000	7.6	110	100	62	918	4,0	10 to 12 mm	R4
230 - 685TR							4500	6.7	95	110	68	918	4,0	A = 20 mm B = 10 to 12 mm	R4
230 - 685TR							5000	7.6	110	110	68	903	4,0	10 to 12 mm	R4

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