01 2023 TECHNICAL BROCHURE

MICHELIN TRUCK TYRES

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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: tyre 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 allow for a derogation. Michelin disclaims any liability for any abnormal use of its 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 safe and efficient operation.

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 business.michelin.co.uk

Contents

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Legislation

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FITTING NEW TYRES

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.

French legislation requires that all the tyres mounted on same axle of a vehicle, should be of the same type.

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

- the same brand,
- the same certification number,
- the same size,
- the same structure (radial or diagonal),
- the same category of use (road, special, snow tyres with M+S marking),
- identical load capacity indices,
- and the same speed rating.

Reminder: for technical reasons, we recommend not mounting tyres with a deviation of more than 10 mm in diameter on the same axle.

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

FITTING REGROOVED TYRES

In France, according to Article 4 of the decree of 24/10/94 (Appendix 3 of the Highway Code), retreaded tyres may be fitted to the front and rear of trucks exceeding 3.5 tonnes, including for the transport of persons or hazardous materials. Please refer to page 104 for a summative table of the main European regulations concerning regrooving.

Possible mounting for regrooved truck tyres

FITTING RETREADED TYRES

Michelin retreaded tyres (MICHELIN Remix and LAURENT Retread) are designed and manufactured to be used on drive axles and trailer axles.

We do not recommend mounting retreaded tyres on the front steer axle of motor vehicles; including tread Z.

It is possible to mount retreaded tyres on the second front axle of a 8 x 4 truck.

UNIFORM MOUNTING: AXLE ONLY FITTED WITH RETREADED TYRES

- **The characteristics of retreaded tyres which must be the same are:**
  - belonging to the same manufacturer (example: MICHELIN Remix and LAURENT Retread brands belong to the same manufacturer),
  - tyre size,
  - tyre structure,
  - speed rating and tyre load indices,
  - same tyre use category.
- **Retreaded tyres from different manufacturers MUST NOT be mounted on the same axle, regardless of the make of the casing.**
- **Retreaded tyres from the same manufacturer MAY BE mounted, regardless of the make of the casing.**

Diagram of authorised axles with permitted uniform retread mounting

Retread manufacturer A on casing type W
Retread manufacturer A on casing type X

Retread manufacturer A on casing type Y
Retread manufacturer A on casing type Z

Reminder: for technical reasons, we recommend not mounting tyres with a deviation of more than 10 mm in diameter on the same axle.

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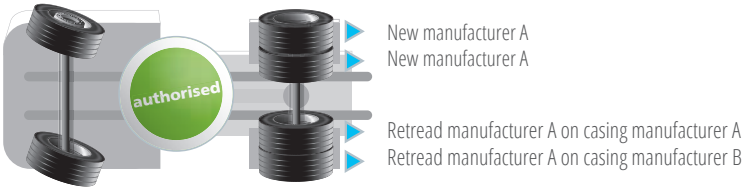
MIXED FITTING: RETREAD + NEW ON SAME AXLE

In France, mixing new and retreaded tyres of different brands is only permitted under the following conditions:

- **Compliance with the following characteristics:**
  - same size
  - same category of use (road, special, snow tyres with M+S marking)
  - same structure (radial or diagonal)
  - same load capacity index
  - same speed category index
- **Belonging to the same manufacturer***

Diagram of authorised axles with new - retreaded combination



Reminder: for technical reasons, we recommend not mounting tyres with a deviation of more than 10 mm in diameter on the same axle.

DEPTHS OF TREAD PATTERN ACROSS THE SAME AXLE

The difference between the depths of the main grooves on two tyres fitted on the same axle must not exceed 5 mm.

* The MICHELIN Remix and LAURENT Retread brands belong to the same manufacturer

PRODUCT LIFE

Tyres are constructed using various types of material and components where the properties evolve over time.

This evolution depends upon the storage conditions (temperature, humidity, position, etc.) and conditions of use (load, speed, inflation pressure, condition of wheels, etc.) to which the tyre is subjected.

Since the aging factors vary and are difficult to measure, that is why in addition to regular inspections by the user, Michelin recommends that tyres should be inspected regularly by a qualified tyre specialist who will assess the tyre's suitability for continued service.

This inspection must take place at least once a year. If the tyre has been in use, it must be inspected at the earliest upon 5 years in circulation. If the tyre has not been in use, it must be checked at the earliest upon 8 years.

At the end of one of these periods, in addition to the normal visual aspect and pressure check, tyres should be inspected annually by a tyre specialist.

It is recommended that tyres 10 years or older are not used on steering axles of trucks and buses.

It is recommended that they be used on Trailer (T) axles.

Failure to follow these recommendations may lead to a reduction in the performance your vehicle and cause it to respond abnormally and/or a tyre could pose a safety risk to the user and others. Michelin shall not be responsible under any circumstances for damage that occurs as a result of and/or during use that does not comply with its guidelines.

TYRE WEAR

The depth of the main grooves at four points evenly distributed across the circumference of the tyre must not be less than a millimetre for more than one point in four.

According to an extract of article R.314-1 of the Highway Code, it states that:

- tyres, with the exception of those for civil engineering equipment, must have an obvious tread pattern across the whole rolling surface,
- there must be no gauze neither on the surface nor at the base of the tire treads,
- there must be no deep tears on the sidewalls.

If the legal or technical wear limit is reached, the tyre must be removed and replaced.

A specialist must be consulted if there is abnormal wear or if there is a difference in tyre wear on the same axle.

LEGAL WEAR LIMITS OF TRUCK TYRES FOR THE MAIN EUROPEAN COUNTRIES

Country	Minimum depth	Country	Minimum depth
Austria	2.0 mm	Lithuanie	7.0 mm for coaches and buses carrying more than 8 passengers
Belgium	1.6 mm	Luxembourg	1 mm for towed vehicles 1.6 mm for motor vehicles
Bulgaria	1.6 mm	Netherlands	1.6 mm
Croatia	1.6 mm	Norway	1.6 mm
Czech Republic	1.6 mm	Poland	3 mm for coaches reaching speeds of 100 km/h 1.6 mm for other vehicles
Denmark	1.0 mm	Portugal	1.0 mm
Eurasian(1)	2.0 mm for coaches and bus 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 for steering axle 1.6 mm for other axles Sweden 1.6 mm	Sweden	1.6 mm(2)
Hungary	1.6 mm if the diameter of the tyre is < 750 mm 3 mm if it is > 750 mm	Switzerland	1.6 mm
Ireland	1.6 mm	Turkey	4 mm
Italy	1.6 mm	Ukraine	2 mm for coaches and bus 1 mm for other trucks
Latvia	1.6 mm	UK	1.0 mm

(1) Eurasian Economic Union: Armenia, Belorussia, Kazakhstan, Kyrgyzstan and Russia.
(2) The tyres must be designed specifically for winter conditions.
Provided for informational purposes only, may be subject to changes in local regulations.

TYRE REPAIRS

During the lifetime of a tyre, it is subjected to a number of stresses and can be damaged in various ways.

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.

CAUTION, 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 suitability and quality of the work done on the tyre.

Repairs are systematically preceded by the removal of the tyre and a meticulous inspection both internally and externally of the tyre by a professional.

WINTER REGULATIONS FOR TRUCKS IN THE EUROPEAN UNION

Understanding the different winter markings:
The M+S marking is a manufacturer's independent statement based on their own non-regulatory criteria.
The 3PMSF* marking is a certification awarded if the tyre passes a winter traction test in accordance with European regulation UNECE R117.
3PMSF is the only real criterion for measuring winter mobility.
Test results are tangible and comparable.

Country	Minimum tread depth	Legislated use of tyres marked M+S or 3PMSF	Use of chains	Defined winter period
Germany	1.6 mm	3PMSF mandatory in winter conditions on steering and drive axle. Tolerance up to 2024 for M+S tyres produced before 2018.	Allowed with speed limited to 50 km/h.	None. The road condition (snow cover, ice) defines the period.
Austria	Radial: 5 mm Diagonal: 6 mm	Yes, at least on a drive axle.	Mandatory when the signs indicate the need for chains.	Trucks: 1 November to 15 April Coaches: 1 November to 15 March
Belgium	1.6 mm	No, but symmetrical mounting mandatory for M+S.	Allowed in winter conditions	
Bosnia & Herzegovina	4 mm	Yes, at least on a drive axle.	Mandatory if the casings currently on the vehicle are not M+S/3PMSF.	15 November - 15 April
Bulgaria	1.6 mm for M+S/3PMSF tyres, 4 mm for the others.	No	Mandatory if the casings currently on the vehicle are not M+S/3PMSF.	15 November - 15 April
Croatie	1.6 mm for M+S/3PMSF tyres, 4 mm for the others.	No	Mandatory if the casings currently on the vehicle are not M+S/3PMSF.	15 November - 15 April
Denmark	1 mm	No	Allowed in winter conditions	From 1 November to 15 April. Studded tyres allowed
Spain	None. The main grooves must be visible.	No. But since 2020, mandatory to have 3PMSF tyres on vehicles used to transport persons when the driving conditions are poor.	Mandatory when the signs indicate.	None. But the local authorities can stop vehicles depending on the road conditions. See also [1]
Finland	5 mm for drive axle, 3 mm for the others.	M+S marking mandatory on all axles of the motor vehicle.	Allowed in winter conditions.	From 1 December to 28 February. Studded tyres allowed between 1 November and 31 March.
France	1 mm	No. From 11/2021, in mountainous regions for: - motor vehicle without trailer: 3PMSF mandatory[2] on steering and drive axles, or chains on drive - motor vehicle with trailer: chains mandatory (even if 3PMSF tyres on the vehicle).	Allowed and even mandatory when the signs indicate. From 11/2021, it is mandatory in mountainous regions to have a pair of chains for road trains (tractor + semi-trailer, or truck + trailer) even if the vehicle is fitted with 3PMSF tyres.	From 1 November to 31 March, except for occasional local signs.
Greece	2 mm for steering axle, 1.6 mm for other axles.	No	Allowed and even mandatory on 2 tyres of the drive axle when the signs indicate.	None
Netherlands	1.6 mm	No	Not allowed	None
Hungary	1.6 mm for tyre diameter < 750 mm 3 mm for tyre diameter > 750 mm	No	Allowed and even mandatory on 2 tyres of the drive axle when the signs indicate.	None
Irland	1.6 mm	No	Allowed in winter conditions.	None
Italy	1.6 mm	On drive axle only.	Mandatory when the signs indicate unless the vehicle is fitted with M+S tyres.	From 15 October to 15 May
Kosovo	4 mm	No	Mandatory in winter conditions.	None. The road condition (snow cover, ice) defines the period.
Luxembourg	1.6 mm for trucks, 1 mm for trailer/ semi-trailers.	Yes. On drive axle.	Allowed in winter conditions.	None. The road condition (snow cover, ice) defines the period.

* 3 Peak Mountain Snow Flake

Country	Minimum tread depth	Legislated use of tyres marked M+S or 3PMSF	Use of chains	Defined winter period
North Macedonia	6 mm	Yes. On all axles.	Allowed in winter conditions.	From 15 November to 15 March
Monténégro	4 mm	Oui. Sur essieu moteur.	Allowed in winter conditions.	From 15 November to 15 March
Norway	5 mm	3PMSF mandatory on steering and drive axles and M+S on the other axles.	Mandatory during winter period.	From 15 November to 15 March
Poland	1.6 mm when transporting goods. 3 mm when transporting persons.	No	Mandatory when the signs indicate.	Variable. The period is defined by the local authorities.
Portugal	1 mm	No	Mandatory when the signs indicate.	None
Czech Republic	6 mm on drive axle, 1.6 mm for the others.	Mandatory on drive axle.	Allowed and even mandatory when the signs indicate.	From 1 November to 31 March, except for occasional local signs
Romania	4 mm	Yes	Allowed on drive axle.	From 1 November to 31 March
UK	1 mm	No	Allowed	None
Serbia	4 mm	Yes. On drive axle.	Mandatory if the casings currently on the vehicle are not M+S/3PMSF.	From 1 November to 31 March
Slovakia	3 mm for drive axle, 1.6 mm for the others.	Yes. On drive axle.	Allowed in winter conditions. Mandatory when the signs indicate.	From 15 November to 31 March
Slovenia	3 mm	Yes. On drive axle.	Allowed when no M+S/3PMSF tyres.	From 15 November to 31 March
Sweden	5 mm for all axles of a motor vehicle, 1.6 mm on trailer/ semi-trailer.	3PMSF mandatory on steering and drive axles and M+S on the other axles.	Allowed	From 1 October to 15 April
Switzerland	1.6 mm	No	Mandatory when the signs indicate.	
Turkey	4 mm	Yes on drive axle.	Allowed	From 1 December to 31 March
Ukraine	1 mm for transporting goods, 2 mm for transporting persons.	No	Allowed	
Eurasian EU(3)	4 mm	No but 3PMSF becomes mandatory on steering and drive axles as from 2023.	Allowed in winter conditions.	From 1 December to 28 February but every member country can define its own period.
Other EU countries	1.6 mm	No	Mandatory when the signs indicate.	Variable. The period is defined by the local authorities.

The above information is subject to changes according to the decisions of the different countries.
(1) In extreme winter conditions, exceptions are permitted when transporting persons on condition that:
- all axles are fitted with 3PMSF tyres,
- they have a certificate which guarantees 3PMSF approval,
- the tread depth of the casings is not less than 4 mm,
- a sticker is affixed on the windscreen showing clearance to travel.
(2) Permissible transition period until 11/2024 if the tyres are at least M+S.
(3) Eurasia consisting of the following countries: Armenia, Belorussia, Kazakhstan, Kyrgyzstan, Russia.

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Choosing a tyre

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INTRODUCTION TO HOW TYRES ARE USED

The choice of tyre must comply with legislation and be in line with the equipment recommended by the vehicle manufacturer, the tyre manufacturer or by an official body (size, load and speed ratings, structure, etc.).

- The tyre's conditions of use have to be taken into consideration to ensure that its performance meets the expectations of the haulier.
- In the case of a modification to the original vehicle equipment, is advisable to make sure that the solution proposed complies with the current legislation, the constraints and the manufacturer's recommendations (refer to the regulations in force in the country). In some countries, the modified vehicle needs 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 Correct mounting and inflation of tyres page 48).
- Incorrect use or the wrong choice of tyre may also contribute to premature failure of certain mechanical components.

HOW TO CHOOSE A TYRE?

To ensure optimum safety and reliability it's important to fit the correct tyre to vehicles and to observe certain selection criteria. 4 steps to observe!

STEP 1: DETERMINE THE CORRECT TYRE SIZE

- The tyre size must be approved by the vehicle manufacturer and the load capacity index must be equal or greater than the maximum axle load.
- The maximum 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 wheel sizes , in particular 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.

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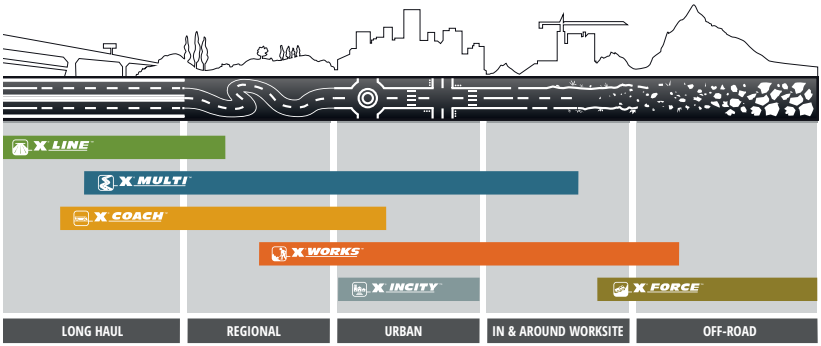
STEP 2:
DEFINE THE CORRECT TYRE USE

- The MICHELIN truck offer consists of 6 tyre ranges which each meet the different applications of hauliers.
- To select the right tyre, you have to take into account the type of use and the benefits of each range.



X LINE	LONG DISTANCE JOURNEYS, MOTORWAYS AND MAJOR NATIONAL ROADS
X MULTI	SHORT AND LONG DISTANCE JOURNEYS ON ALL TYPES OF ROADS
X COACH	PEOPLE TRANSPORTATION, SHORT AND LONG DISTANCES, ON ALL TYPES OF ROADS
X WORKS	MIXED USE ON ROADS, WORKSITES AND QUARRIES
X INCITY	URBAN AND SUBURBAN DRIVING
X FORCE	SPECIALISED, CIVIL OR MILITARY VEHICLES MOSTLY DRIVEN ON OFF-ROAD SURFACES

ENERGY™: FUEL SAVING
GRIP: ALL-SEASON GRIP
WINTER: WINTER CONDITIONS
ICEGRIP: GRIP ON ICE
HD: "HEAVY DUTY" = EXTREME USE
HL: "HEAVY LOAD" = VERY HEAVY LOAD

STEP 3: IDENTIFY THE CORRECT BENEFIT

• MICHELIN tyres offer different benefits depending on the user's specific needs.

STEP 4: SELECT THE RIGHT TREAD PATTERN

• There are rules which must be followed when selecting the tread patterns of your tyres.

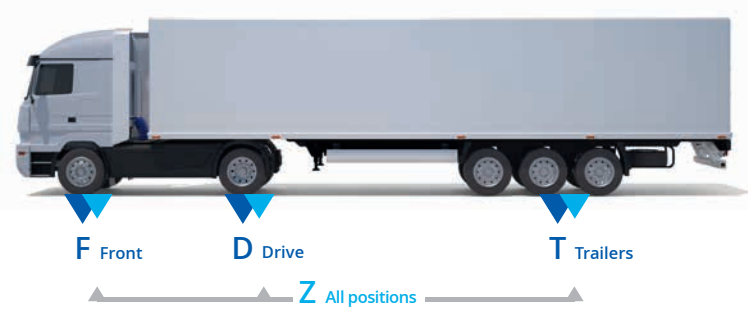


Diagram of tyre position code

Examples
MICHELIN X® MULTI™ F = F for Front (steering axle)
MICHELIN X® LINE ENERGY™ D or X® COACH™ XD = D for Drive (drive axle)
MICHELIN X® MULTI™ T = T for Trailer (trailer axle)
MICHELIN X® INCITY™ Z = Z in multiple positions including Front (steering axle)

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■ **Associated risks if the 4 steps are not followed**

Tyre functions		
Carry the load	Defined by the vehicle characteristics: axle load	
Carry the load at speed	Defined by the vehicle characteristics: maximum speed of vehicle	
Travel on different road surfaces	According to the conditions of use	
Steer the vehicle	According to the conditions of use	
	By providing feedback to the driver about the surface condition	
Provide a comfortable ride	Special feature of tyres for **Steering axles**: adapted tread pattern and uniformity	
Transmit braking	Torque: dependent on the vehicle's deceleration and braking systems. During emergency braking, the **Steering axle** is put under considerable strain. Braking with a retarder system is carried out by the **Drive axle**	
	Drive: dependent on the vehicle's power and torque	
Long life to reduce costs	In relation to mileage performance	
	In relation to the vehicle's fuel consumption	

	Associated risks
	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. Retreading may be compromised. Service life will be reduced.
	An under-sized tyre travelling at speed will overheat. This may lead to rapid deterioration of the tyre on the road which can result in sudden total deflation. Retreading may be compromised. Service life will be reduced.
	A tyre which is not suitable for the position or use may: - overheat: as in the case of a mixed tyre used on long motorway journeys. - deteriorate: as with the tread of a 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 to be used, can be repaired or needs to be withdrawn from service. Note that if the metal plies are exposed they will deteriorate: a tyre with this kind of damage is considered unfit for use under the terms of the Highway Code. This damage may lead to rapid deterioration of the tyre on the road which can result in sudden total deflation. Retreading may be compromised. Service life will be reduced.
	On the **Steering axle**, fitting a tyre which is not suitable for the position or use may result in less precise steering, depending on the state of the road surface and the speed. This may prejudice complete control of the vehicle.
	The tyres on the **Steering axle** are the first ones in contact with the road surface ahead. Tyres designed for this axle must give a steady feedback of information on changes in the condition of the road surface: such as a fleeting reduction in grip, for example. A tyre not designed for this axle may be less progressive or filter out certain information on changes in the road surface.
	The **Steering axle** is particularly sensitive to tyre uniformity: link with the steering wheel, position near the driver, etc. Tyres intended for this axle are specially designed to meet this criterion and also have tread patterns adapted to optimise this function. A tyre not designed for the **Steering axle** will have a poorer response to this function and can also lead to weight balancing of the rotating assemblies.
	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 braking 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 the engine torque and it's service life will be reduced.
	The tyres must be suited to the axle and the use of the vehicle: a tread pattern not suited to the axle or a range unsuitable for the use will not give the mileage performance corresponding to the tyre's potential.
	The tyres on a truck have a major impact on the vehicle's fuel consumption. The choice of range and tread pattern will allow you to improve the rolling resistance and reduce the vehicle's fuel consumption. The rolling resistance of tyres reduces as the tyres become worn, replacing a tyre too soon or not regrooving it results in a loss of potential fuel savings.

OTHER RECOMMENDATIONS

When fitting on a steering axle you must:

Use exclusively "F" or "Z" tread patterns.
These tread patterns have been designed and manufactured to meet the specific rolling demands of steering axles of motor vehicles: load capacity, hanging with dynamic load transfer, slipping, geometry angles of the axles, high mileage, performance etc.

"F" or "Z" tread patterns may have markings on the sidewall indicating that they rotate in both directions. This is intended to optimise tyre performance.
Note: Once the tyre is 50% worn, the tyre can be rotated in order to obtain more even tread wear.

We do not recommend mounting retreaded tyres on the front steer axle of motor vehicles; including tread Z.

When fitting on a drive axle you must:

Use exclusively "D" or "Z" tread patterns. "D" tread patterns are designed to meet the specific demands of drive axles: transmission of engine and braking torques, twin fitment, greatest axle load of all, etc. Tyres with a "Z" tread pattern can be fitted on drive axles but the compromise in performance to meet the demands of this axle will be optimally met with the "D" tread pattern. In some instances, the "Z" tread patterns are also optimised for use on a drive axle: urban usage for example.

When fitting on a trailer axle you must:

Use exclusively "T" or "Z" tread patterns.
These tread patterns are designed to meet the specific demands of carrying axles: static and dynamic loads, slipping, high mileage performance on the centre axles, etc.

Tyres with "T" tread patterns bear load indices and speed ratings suited to towing vehicles (trailer or semi-trailer).

When fitting tyres with "Z" tread patterns, check that the load and speed ratings comply with the needs of the axle.

MICHELIN tyres in Europe with "T" tread patterns bear the "FRT" (Free Rolling Tyre) marking standardised by the ETRTO.

Note: an "F" tread pattern can be fitted on a carrying axle (example: optimised service life, repairs).

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FRT marking

The FRT (Free Rolling Tyre) marking is defined in regulation 54: "Marking 3.1.15".
The inscription "FRT" is applicable for tyres designed specifically for carrying axles (tyres for towed axles).
Tyres with a FRT marking can be fitted to any axle of:
- a towed vehicle,
- an engine-powered vehicle (except the front steer axle and drive axle).

Michelin shall not be responsible for damage that occurs on the road as a result of use that does not comply with its recommendations.

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LARGE TRUCKS

SEAT 22.5

MICHELIN X® LINE™ ENERGY™ Z & D, Z2 & D2

Save fuel

- Reduced fuel consumption by 0.8 L/100 km(1)
- Reduced CO_2 emissions of 22 g/km(1)
- European energy class A in rolling resistance (MICHELIN X® LINE™ ENERGY™ Z2 and D2)

LONG DISTANCE JOURNEYS, MOTORWAYS AND MAJOR NATIONAL ROADS.

X LINE

LARGE TRUCKS

SEAT 22.5

MICHELIN X® LINE™ ENERGY™ F

Contributor to real savings

- Low fuel consumption - European energy class A
- Low cost per km - Total mileage improved by at least 20%(2)
- Optimum visibility for the driver thanks to deflector MICHELIN Antisplash™ which splits the height of the water spray by 4
- 3PMSF of 385/55 R 22.5

SEAT 22.5

MICHELIN X® LINE™ ENERGY™ T

Contributor to real savings

- Low fuel consumption, European energy class A in rolling resistance
- Resistance to slipping thanks to the tread pattern and rubber compounds
- Reduced cost per km with up to 12% more kilometres(3)
- Grip and stability on wet surfaces from the 1st to the last km thanks to longitudinal "rain drop" sipes

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LONG DISTANCE JOURNEYS, MOTORWAYS AND MAJOR NATIONAL ROADS.

X LINE

LOW TRAILER

SEAT 17.5 AND 19.5

MICHELIN X® LINE™ ENERGY™ T

The right choice down to the last litre

- Reduced fuel consumption up to 0.4 L/100 km per axle(4)
- Reduced cost per km with up to 14% more kilometres(4)
- Goods kept safe by trailer stability thanks to wider tread profile of 7% on average(5)

SEAT 19.5

MICHELIN XTA2 & XTA2+ ENERGY™

Optimised profitability and cost per km

- Low fuel consumption
- Improved cost per km: up to 9% less rolling resistance(6)
- High reliability and endurance of the casing for long-haul trucking and high impact resistance
- Low CO_2 emissions

SMALL TRUCKS

SEAT 17.5 AND 19.5

MICHELIN X® MULTI™ Z & D

Mobility maximised

- High level of grip: M+S and 3PMSF markings

Profitability improved

- A lifespan increased by 2 to 6 months[7] compared with its predecessor

Business optimised

- A tyre at least twice as quiet as its competitors[8]

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SHORT AND LONG DISTANCE JOURNEYS ON ALL TYPES OF ROADS.

LOW TRAILER

SEAT 17.5

MICHELIN X® MULTI™ T2

Lower running costs

- Load index: up to + 3[9]
- Robust tread: + 10%[10]
- Total mileage: up to + 5%[11]

SEAT 19.5

MICHELIN X® MAXITRAILER™

Safety and productivity maximised

- Lower running costs. Up to 35% more km![12]
- Braking distance reduced up to 5 metres[13]: grip quality maintained
- With MICHELIN Remix, performance is comparable to new MICHELIN X® MAXITRAILER™ tyres whilst saving 30 kg material

X MULTI

LARGE TRUCKS

SEAT 22.5

MICHELIN X® MULTI™ ENERGY™ Z & D

Increased fuel efficiency, kilometres and safety

- Fuel savings: on average during the 1st life: - 0.5 L/100 km(14)
- Same performance per km as the MICHELIN X® MULTIWAY 3D tyre(15)
- Even wear thanks to REGENION and INFINICOIL technologies(16)

Note: images of 315/70 R 22.5, for 315/80 R 22.5 refer to those of MICHELIN X® MULTI™ Z & D tyres below.

SEAT 22.5

MICHELIN X® MULTI™ Z & D

Greater mileage, flexibility and safety

- Reduced running costs: up to 20% more km(17)
- High level of grip: M+S and 3PMSF markings
- Regroovable and retreadable (up to 90% retreading rate)(18)

MICHELIN

SHORT AND LONG DISTANCE JOURNEYS ON ALL TYPES OF ROADS.

LARGE TRUCKS

SEAT 22.5

MICHELIN X® MULTI™ F & Z

Increased longevity, whatever the road!

- Lower running costs with up to 15% more km[19]
- Excellent grip when braking
- Regroovable and retreadable (up to 90% retreading rate)[20]

SEAT 22.5

MICHELIN X® MULTI™ HLZ

Increased longevity[27] and load capacity

- Reduced running costs: Up to 30% more kilometres[28]
- Increased load capacity at 10 tonnes per axle[29]
- Material and fuel savings thanks to retreading and regrooving

SEAT 22.5

MICHELIN X® MULTI™ HD Z

Tyre suitable for regional working conditions

- High resistance to tread agression
- Strong casing endurance
- High mileage potential

SEAT 22.5

MICHELIN X® MULTI™ HD D

Ultra robust and versatile tyres, with exceptional long-lasting mileage and traction

- Lower running costs: up to 15% more km(21)
- Exceptional traction and grip throughout the year: 3PMSF, M+S markings
- Reduce your environmental footprint: high retreadability (+ 10%)(30)

SEAT 22.5

MICHELIN X® MULTI™ GRIP Z

Safety and mobility in difficult winter conditions

- Increased longevity: up to 10% more mileage(34)
- MICHELIN Antisplash™ device on the front tyres, for greater safety and cleanliness
- Optimum control and grip on wet or snow covered road surface throughout the year, even at the worn stage(33)

SEAT 22.5

MICHELIN X® MULTI™ GRIP D

Safety and mobility in difficult winter conditions

- Increased longevity: up to 30% more mileage(32)
- Optimum control and grip on wet or snow covered road surface throughout the year, even at the end of wear(33)

MICHELIN

SHORT AND LONG DISTANCE JOURNEYS ON ALL TYPES OF ROADS.

LARGE TRUCKS

SEAT 19.5 AND 22.5

MICHELIN XDW ICE GRIP*

Even greater mobility on packed ice and snow

- Exceptional traction and braking
- 3PMSF and M+S markings
- Easy driving and in comfort

* Can be mounted on steering axle in difficult conditions (driving on ice).

SEAT 22.5

MICHELIN X® MULTI™ T

Increased longevity and mobility, whatever the climatic conditions

- Lower running costs: Up to 15%[22] more mileage on the trailer
- CARBION technology: Innovative material significantly increases mileage performance
- Increased multi-life potential of the tyre: running temperature of the shoulder on the MICHELIN 385/65 R 22.5 X® MULTI™ T tyre has been decreased: by 6 °C compared to the MICHELIN 385/65 R 22.5 XTE3 tyre

SEAT 22.5

MICHELIN X® MULTI™ T2

Longevity and mobility without compromise!

- Reduced running costs: up to 20% more km[23]
- High level of grip: M+S and 3PMSF marking
- Regroovable and retreadable (up to 90% retreading rate)[24]

X MULTI

LARGE TRUCKS

SEAT 22.5

MICHELIN X® ONE™ MAXITRAILER™ +

Record longevity for your trailers

- Reduced running costs: up to 50% more km[25]
- Better traction and preservation of goods being transported[26]
- Extremely versatile

SEAT 19.5 AND 22.5

MICHELIN X® MULTI™ HLT

Increased longevity[27] and mobility, whatever the climatic conditions

- Reduced running costs: Up to 25% more kilometres[28]
- Increased load capacity at 10 tonnes per axle[29]
- Material and fuel savings thanks to retreading and regrooving

SEAT 22.5

MICHELIN XTE3

The market benchmark

- Versatility, from the motorway to regional roads
- Stability for transported goods

MICHELIN

MIXED USE ON ROADS,
WORKSITES AND QUARRIES.

SOFT WORKSITE

MICHELIN X® WORKS™ Z, D & T

For vehicles traveling primarily on roads or on access roads to worksites

Optimised performance

- X® WORKS™ Z
- X® WORKS™ D
- X® WORKS™ T

3PMSF marking

- 295/80 R 22.5
- 315/80 R 22.5
- 13 R 22.5
- 385/65 R 22.5

**MIXED USE ON ROADS,
WORKSITES AND QUARRIES.**

X WORKS

AGGRESSIVE WORKSITE

MICHELIN X® WORKS™ HD Z, HD D & XZY 3

For vehicles traveling primarily on construction sites or on non-tarred roads

Productivity and robustness

- Resistant to aggressions
- Versatile use
- XZY 3 adapted for steering axle

MICHELIN X® WORKS™ HLZ

Increased load capacity and robustness

- New generation of metal plies
- Reinforced heel area with DURACOIL technology
- Load index 164: Reinforced load capacity - 10 tonnes on axle

MICHELIN X® WORKS™ Z2 & D2

Robustness, endurance and safety

- Tough design and build for less downtime
- High load capacity

MICHELIN

URBAN AND SUBURBAN DRIVING.

X® INCITY™

MICHELIN X® INCITY™ EV Z

Adapted to the high demands of electric vehicles

- Increased load capacity (+ 500 kg on axle in single formation)(31)
- Optimum rolling resistance for longer range
- Improved longevity

MICHELIN X® INCITY™ XZU

Optimum running costs in complete safety

- Lower cost per km thanks to the addition of the Energy™ rubber compound
- Braking and grip is ensured, whatever the weather and road surface

URBAN AND SUBURBAN DRIVING.

X INCITY

MICHELIN X® INCITY™ HLZ

Increased load capacity: 6.7 T on axle single formation

- Reduced fuel consumption and associated CO_2 emissions
- Same mileage longevity as the MICHELIN X® INCITY™ XZU tyre in spite of a higher carried load (of identical load: + 10%)(31)
- Optimum grip in all seasons thanks to network of complex sipes and the 3PMSF marking

MICHELIN REMIX X® INCITY™ ICEGRIP D

Drive safely, all year round

- Grip all year round with the new advanced tread pattern: Winter grip in like-new condition and lined profile when half worn

MICHELIN

PEOPLE TRANSPORTATION, SHORT
AND LONG DISTANCES, ON ALL TYPES OF ROADS.

MICHELIN X® COACH™ Z

A trusted partner for a journey by coach with peace of mind

- Excellent traction and braking, down to the last mm thanks to the REGENION technology
- Reinforced casing for axles of 7.5 tonnes thanks to the INFINICOIL technology(35)
- High retreadability rate

PEOPLE TRANSPORTATION, SHORT AND LONG DISTANCES, ON ALL TYPES OF ROADS.

X COACH

MICHELIN X® COACH™ XD

Exceptional longevity and grip performance

- Optimised mileage performance thanks to full depth "double wave" sipes
- Grip in ever changing weather conditions (3PMSF) ensures versatility all year round
- A tread pattern designed for quiet travel

MICHELIN

SPECIALISED, CIVIL OR MILITARY VEHICLES
MOSTLY DRIVEN ON OFF-ROAD SURFACES.

MICHELIN X® FORCE™ ZL / XZL & XZL+

Robust and effective in all conditions

- Deep tread pattern, jagged and open shoulders provide excellent traction. Studs and chains can be added
- Designed to operate at varied pressures to respond to the conditions of use
- Tread designed to be very resistant to accidental damage
- Rubber compound highly resistant to abrasion
- Tubeless tyre compatible with CTIS (Central Tyre Inflation Systems) and “Bead Locks” tyre inflation systems

SPECIALISED, CIVIL OR MILITARY VEHICLES MOSTLY DRIVEN ON OFF-ROAD SURFACES.

X FORCE

MICHELIN X® FORCE™ 2 & XZL2

Tyre optimised for roads, tracks and sand

- Very good floatation on sand
- Tubeless tyre compatible with CTIS (Central Tyre Inflation Systems) and "Bead Locks" tyre inflation systems
- Robust and tried and tested casing
- New rubber compound for driving up to 110 km/h

MICHELIN X® FORCE™ ML & XML

Tyre specially designed for muddy and loose terrains

- Exceptional mobility in muddy and loose terrain thanks to the tyre's self-cleaning capacity and the design of staggered shoulders
- Can be driven even at very low pressure. Indeed, its patented tread pattern which is capable of functioning at specific reduced pressures, allows for greater off-road mobility
- Tubeless tyre compatible with CTIS (Central Tyre Inflation Systems) and "Bead Locks" tyre inflation systems

MICHELIN

SPECIALISED, CIVIL OR MILITARY VEHICLES MOSTLY DRIVEN ON OFF-ROAD SURFACES.

X FORCE

MICHELIN X® FORCE™ S & XS

Tyre specifically designed for sandy conditions

- Steel casing for greater resistance to damage and impacts with a higher load-carrying capacity
- Optimised manoeuvrability
- Wide and flat tyre for maximum flotation on sand
- Flexible casing and tread pattern designed for driving at low pressure

MICHELIN X® FORCE™ ZH

Robust and traction on worksites and in quarries

- Improved lifespan
- Robust, multi-use tread design
- Very good traction
- Maximum protection of the casing
- Excellent resistance to damage

(1) Values certified using the VECTO calculation tool and comparing the CO_2 emissions of a standard 445 kW/12.7 L semi-trailer fitted with 315/70 R 22.5 tyres (tractor) and 385/55 R 22.5 tyres (semi-trailer) MICHELIN X® LINE™ ENERGY™ Z2/D2/T with class A rolling resistance in relation to those of the same vehicle fitted with MICHELIN X® LINE™ ENERGY™ Z/D/T tyres with class B rolling resistance, in long haul usage and an average cargo load of 17 t.

(2) In relation to 315/70R22.5 MICHELIN X® LINE™ ENERGY™ Z instead of XZA2. Internal Michelin study. 2014.

(3) Internal test (2013) on 385/55 R 22.5 MICHELIN X® LINE™ ENERGY™ T tyres vs MICHELIN X® ENERGY™ Savergreen XT tyres and 10 % in series 65.

(4) Internal study carried out in 2011, on the 265/70 R 19.5 MICHELIN X® LINE™ ENERGY™ T tyre vs 265/70 R 19.5 MICHELIN XTA 2 ENERGY™ tyre.

(5) In relation to the MICHELIN XTA 2 ENERGY™ and XTA 2 + ENERGY™ tyres of the same size.

(6) In relation to the MICHELIN XTE 2 tyre.

(7) Hypothesis: if the MICHELIN XDE 2 tyre lasts 12 months, the MICHELIN X® MULTI™ D tyre lasts 18% longer or 14 months.

(8) According to labelling data from competitors.

(9) Increased load index: + 3 for the MICHELIN 205/65 R 17.5 X® MULTI™ T2 (132/130J PS 133/133F) tyre vs the MICHELIN 205/65 R 17.5 X® MAXITRAILER™(129/127J PS 130/130F) tyre, + 1 for the MICHELIN 215/75 R 17.5 X® MULTI™ T2 (136/134J) tyre vs the MICHELIN 215/75 R 17.5 XTE2+ (135/133J) tyre and + 2 in PS for the MICHELIN 235/75 R 17.5 X® MULTI™ T2 (143/141J PS -) tyre vs the MICHELIN 235/75 R 17.5 XTE2+ (143/141J PS 145/145F) tyre; no change for the MICHELIN 245/70 R17.5 X® MULTI™ T2 (143/141J PS 146/146F) tyre vs the MICHELIN 245/70 R 17.5 X® MULTI® T (143/141J PS 146/146F) tyre.

(10) Robustness of the tread improved by 10% for the MICHELIN 205/65 R 17.5 X® MULTI™ T2 tyre vs the MICHELIN 205/65 R 17.5 X® MAXITRAILER™ tyre, the MICHELIN 215/75 R 17.5 X® MULTI™ T2 tyre vs the MICHELIN 215/75 R 17.5 XTE2+ tyre, the MICHELIN 235/75 R 17.5 X® MULTI™ T2 tyre vs the MICHELIN 235/75 R 17.5 XTE2+ tyre, and the MICHELIN 245/70 R 17.5 X® MULTI™ T2 tyre vs the MICHELIN 245/70 R 17.5 X® MULTI™ T tyre. Internal performance evaluation.

(11) Mileage improved by 5% for the MICHELIN 245/70 R 17.5 X® MULTI™ T2 tyre vs the MICHELIN 245/70 R 17.5 X® MULTI™ T tyre. Same mileage for the MICHELIN 205/65 R 17.5 X® MULTI™ T2 tyre vs the MICHELIN 205/65 R 17.5 X® MAXITRAILER™ tyre, the MICHELIN 215/75 R 17.5 X® MULTI™ T2 tyre vs the MICHELIN 215/75 R 17.5 XTE2+ tyre, and the MICHELIN 235/75 R 17.5 X® MULTI™ T2 tyre vs the MICHELIN 235/75 R 17.5 XTE2+ tyre. Internal tests (2018).

(12) In relation to the MICHELIN 245/70 R 17.5 XTA 2 ENERGY™ tyre.

(13) Emergency braking distance between a trailer fitted with 17.5 inch wheels with drum brakes and a trailer fitted with 19.5 inch wheels with disc brakes, from 80 km/h to 0 km/h on dry road surface.

(14) Comparison between the MICHELIN X® MULTI™ ENERGY™ Z & D 315/80 R 22.5 + MICHELIN X® MULTI™ T 385/65 R 22.5 convoy and the MICHELIN X® MULTI™ Z & D 315/80 R 22.5 + X® MULTI™ T 385/65 R 22.5 convoy, fully loaded (40 t), for 50% long distance journeys / 50% regional journeys, 100 000 km/year, fuel cost: 1 €/L, calculation using the TCO_2 tool.

(15) Mileage performance: MICHELIN X® MULTI™ ENERGY™ Z 315/80 R 22.5 = 85, MICHELIN X® MULTIWAY 3D XZE = 85 and MICHELIN X® MULTI™ Z = 100. (Internal calculation based on the result obtained from MICHELIN X® MULTI™ ENERGY™ Z 315/70 R 22.5), MICHELIN X® MULTI™ ENERGY™ D 315/80 R 22.5 = 95, MICHELIN X® MULTIWAY 3D XDE = 85 and MICHELIN X® MULTI™ D = 100.

(16) Even wear: MICHELIN XME Z & D 315/80 R 22.5 vs MICHELIN XMW3D XZE & XDE: improvement, vs MICHELIN XM Z & D: unchanged, thanks To Regenion (network of sipes) and Infinicoil technologies.

(17) Internal Michelin test carried out in 2015 vs the MICHELIN XFA2 AS 385/55 R 22.5 tyre. Except for the MICHELIN X® MULTI™ Z tyre: + 15%; Internal Michelin test carried out in 2014 vs the MICHELIN X® MULTIWAY™ 3D XZE 315/70 R 22.5 tyre.

(18) Internal Michelin source 2011. Number of retreaded tyres for a number of tyres from the MICHELIN X® MULTI™ range.

(19) Internal study carried out in 2011, MICHELIN X® MULTI™ F 385/65 R 22.5 tyre vs MICHELIN XF 2 385/65 R 22.5 tyre.

(20) Internal Michelin source 2011. Number of retreaded tyres for a number of tyres from the MICHELIN X® MULTI™ range.

(21) Mileage improved by 15% for the MICHELIN 315/80 R 22.5 X® MULTI™ HD D tyre vs. the MICHELIN 315/80 R 22.5 XDE2+ tyre: internal test (2018). Mileage improved by 10% in extreme conditions for MICHELIN 315/70 R 22.5 X® MULTI™ HD D vs MICHELIN 315/70 R 22.5 X® MULTIWAY™ 3D XDE: internal test (2018).

(22) Internal Michelin studies 2011/2013. Comparison of MICHELIN X® MULTI™ T tyres vs MICHELIN XTE2 and XTE3 tyres. From 10 to 15% more kilometres depending on the sizes.

(23) Internal Michelin test carried out in 2015 vs the MICHELIN 385/55 R 22.5 XFA2 AS tyre.

(24) Internal Michelin source 2011. Number of retreaded tyres for a number of tyres from the MICHELIN X® MULTI™ range.

(25) Internal Michelin source. In relation to the MICHELIN 385/65 R 22.5 XTE 3 tyre. Performance monitoring by the customer from 2007 to 2011.

(26) In relation to a semi-trailer fitted with 385/65 R 22.5 tyres. Internal studies carried out in 2010.

(27) HL: Heavy Load (high load).

(28) + 30% for the MICHELIN X® MULTI™ HLZ 385/65 R 22.5 tyre: internal calculations based on the new design methods of tyres etween the MICHELIN X® MULTI™ HLZ 385/65 R 22.5 tyre and the X® MULTIWAY™ HD XZE 385/65 R 22.5 tyre.

(29) IC + 4 for the MICHELIN X® MULTI™ HLZ (164K) 385/65 R 22.5 tyre vs MICHELIN X® MULTI™ Z (160K) 385/65 R 22.5, or 1 tonne more per axle.

(30) Retreadability improved by 10% for the MICHELIN 315/80 R 22.5 X® MULTI™ HD D tyre vs the MICHELIN 315/80 R 22.5 XDE2+ tyre and for the MICHELIN 315/70 R 22.5 X® MULTI™ HD D tyre vs the MICHELIN 315/70 R 22.5 X® MULTIWAY™ 3D XDE tyre (internal performance evaluation).

MICHELIN

(31) Increased load index: + 2 for the MICHELIN 275/70 R 22.5 X® INCITY™ EV Z (152/149J) tyre versus the MICHELIN 275/70 R 22.5 X® INCITY™ HLZ (150/145J) tyre.

(32) Internal calculations carried out by Michelin, In November 2020, comparing the MICHELIN 315/70 R 22.5 tyre and the MICHELIN 315/80 R 22.5 X® MULTI™ GRIP D tyre to the previous MICHELIN XDW ICEGRIP range.

(33) Internal studies carried out at the Michelin Test Centre in Ivalo, Finland, in February 2020, between the MICHELIN 385/65 R 22.5 X® MULTI™ GRIP Z tyre and the MICHELIN 315/80 R 22.5 X® MULTI™ GRIP D tyre vs. the MICHELIN 385/65 R 22.5 XFN2 AS tyre and the MICHELIN 315/80 R 22.5 XDW ICEGRIP tyre, fitted on a heavy load truck 4x2 carrying 10 tonnes.

(34) Internal calculations carried out by Michelin, In November 2020, comparing the MICHELIN 385/55 R 22.5 tyre and the MICHELIN 385/65 R 22.5 X® MULTI™ GRIP Z tyre to the previous MICHELIN XFN2 range.

(35) Mileage improved by 15% for the MICHELIN 275/70 R 22.5 X® INCITY™ EV Z tyre versus the MICHELIN 275/70 R 22.5 X® INCITY™ HLZ tyre (internal test 2020).

Operating instructions

INTRODUCTION TO TYRE FITTING

Before commencing the tyre fitting process the conformity and compatibility of the tyre must be checked. Correct tyre fitting, carried out with the recommended methods of work and in line with the safety rules in force, helps to ensure that personnel and equipment are fully fully protected and will be used to their full potential.

GENERAL PRECAUTIONS

- The operators must always be equipped with their usual protective clothing (ear defenders, gloves, safety shoes, safety goggles, etc.).
- The operators must be correctly trained for the work.
- The operators must make sure that the vehicle is stationary with its engine switched off and that the vehicle is correctly stabilised (parking brake, chock, axle stands, etc.).

FITTING PRECAUTIONS

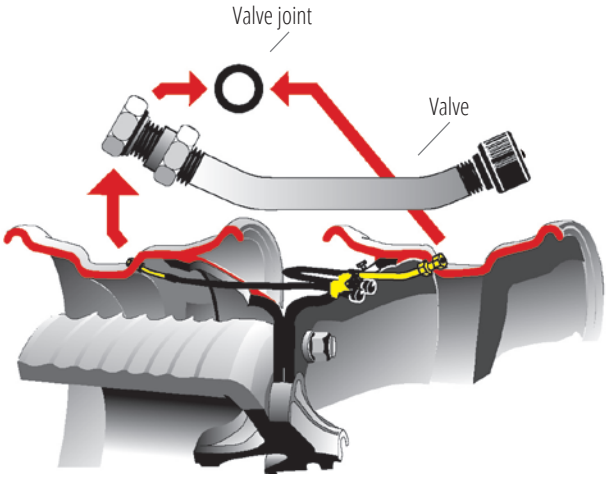
- Make sure that the wheel and its components are in good condition.
- Check the compatibility of tyre and wheel, tyre and vehicle and tyre and use.
- Respect the positions, fitting direction, direction of rotation and any relevant instructions when mentioned on the tyre sidewalls.
- Make sure that the 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 or valve.
- Inflate the tyre safely following the inflation steps. Make sure that all of the components are correctly in place. Never stand facing a fitted tyre but stand in line with the tread, at least 3 metres away.
- 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.

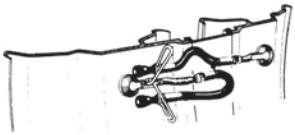
Incorrect fitting may lead to damage to tyres, the vehicle, or injury to persons (serious or even fatal injury).

VERIFICATION OF VALVES

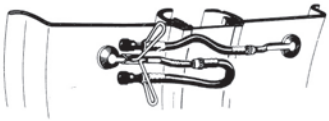
Because of ageing and the high temperature linked to brakes, valve seals and inflation extensions are to be replaced each time a tyre is changed. A valve cap in excellent condition is essential for maintaining an air-tight seal.

Sealing diagram for dual tyre configuration





Inflation extensions on truck tyres



For this type of assembly, always position the valves facing each other.

Fixing claps for inflation extensions

MICHELIN

CORRECT MOUNTING AND INFLATION OF TYRES

- **The cold tyre inflation pressure must be defined in relation to the load, speed and conditions of use.**
- **Michelin recommends inflating tyres in an "inflation cage".**
- **The inflation must be carried out in 2 stages:**

• 1st stage:
– pre-inflate to 1.5 bar;
– check that the tyre is correctly positioned on the wheel by ensuring that the distance between the rim well and centering mark is identical on either side;
– inspect the tyre; if in doubt, stop the operation and call a specialist.

• 2nd stage:
– place the tyre into the inflation cage or vertically in a suitably equipped area;
– inflate the tyre to the required pressure.

- **Position yourself in line with the tread and at least 3 m away during inflation.**

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

TIGHTENING WHEELS

The correct wheel tightening torque maintains the mechanical quality of the contact with the ground, and with it your safety.

CONDITION OF WHEELS

- The condition of all wheels should be regularly checked.
  Any cracked wheel or rim should be replaced.

– Caution: if a wheel has to be repaired by welding, the tyre must be removed to prevent the risk of explosion due to the simultaneous rises in temperature and internal pressure.

- For aluminium wheels, do not fit a tyre on a wheel where the rim flange shows signs of excessive wear (to be checked using a gauge/wear template). Also make sure to remove any possible cutting edges caused by the wear of this rim flange.
- Before any welding on the vehicle chassis, the tyre and wheel assemblies should be removed.
- The tyre can be refitted when all items have returned to ambient temperature.
- When removing wheels in several parts from the vehicle, it is recommended that the tyres are deflated.

BEFORE ANY TIGHTENING OPERATION, THE FOLLOWING MUST BE UNDERTAKEN

Clean:

- the support face 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.).
- if necessary, remove any rust and paint residue with a wire brush.
- any burrs on the metal

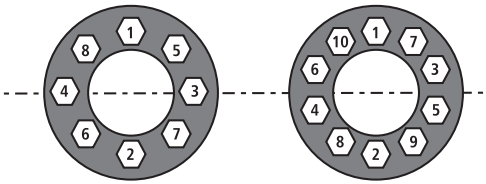
Lubricate:

- the threads of the nuts and studs with a drop of oil and the support face of the flat nuts or lug nuts.
- never lubricate the support face of nuts or washers or type M nuts.

MICHELIN

■ **Final tightening torque:**

- Must be done in accordance with the tightening torques and values recommended by the vehicle manufacturer.
- Follow the tightening sequence and tighten alternately diagonally according to the number of nuts.
- Tightening to the correct torque makes the wheel easier to remove in the event of a puncture, does not distort the axles and helps to ensure safe operation.



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

– deformation and/or breaking of wheel axles;

– distortion of wheel nut threads which may even lead to wheels coming off;

– ovalisation of drums, etc.

After a period of thirty minutes, or after travelling a distance of 50 to 100 kilometres, the tightness of the wheel nuts should be checked.

This should not lead to the retightening of the wheel nuts.

If the wheel nuts have to be retightened, then the wheel or dual tyres should be removed as quickly as possible and operations should be started again from the beginning by a specialist workshop.

MONITORING AND MAINTENANCE

Tyres must be examined regularly. To do so, make sure that the vehicle is stationary and the engine is switched off.

TYRE CARE

- Michelin recommends that a tyre professional examines the tyre for:

– Any signs of abnormal wear, perforations, cuts, deformations on the tread, sidewalls or hanging area of the tyre.

– Any deterioration of the rim flange.

– Where it is put back on the wheel, be reassured that the tyre has been removed to visually examine the interior.

- Causes of vehicle handling problems (eg.: pulling to left or right or concerning driver comfort - eg.: vibrations) must 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 to determine the reason for the loss of pressure.
- 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 no degradation has occurred.

TYRE INSPECTION AND RECOMMENDATIONS

■ Tyre wear on the steering axle of motor vehicles

■ In countries where you drive on the right:

- The Front Left tyre normally wears more quickly than the Front Right tyre
- The shoulder of the Front Right tyre often has more pronounced wear than on the Front Left tyre due to the camber of the roads and the number of roundabouts.

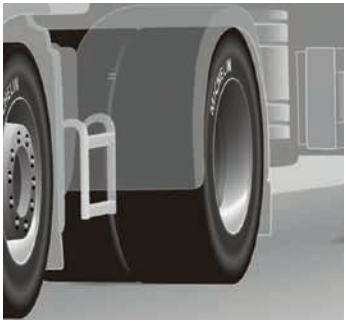
Our solutions: To even out tyre wear and take advantage of the full potential of the 2 tyres by integrating regrooving, follow the advice below:

- **Rotate right and left tyres when 50% worn;**
- **Turn on rim of front right;**
- **Regroove with between 2 and 4 mm of tread remaining or 80% wear.**

For Antisplash™ tyres, see page 55.

MICHELIN

■ Tyre wear on the drive axle



■ Observations:

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

OUR SOLUTIONS:
To even out tyre wear and take advantage of the full potential of the 4 tyres by integrating regrooving, follow the advice below:
– Rotate the inner and outer tyres (twin fitment).
– Turn the two inner tyres on their rims.
– Regroove when 80% worn (3 to 4 mm of tread remaining).
– Remove in accordance with regulation in force.
Fit MICHELIN Remix retreaded tyres in rear position on motor vehicles.

For directional tyres (see page 54).

■ Wear on trailer axle tyres (semi-trailers with 3 fixed axles)

■ Observations:

As a result of significant scrubbing, 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.

OUR SOLUTIONS:
To ensure even wear and take advantage of the full potential of the tyres by integrating regrooving, follow the advice below for a semi-tailer with 3 fixed axles:
– Rotate between positions depending on wear
– Turn on rim on 1st and 3rd axle
– Regroove when 80% worn between 2 and 4 mm of tread remaining
- On 1st axle is possible depending on use
- On 2nd axle is recommended
- On 3rd axle is not recommended
Remove on 1st, 2nd and 3rd axle in accordance with regulation in force.
For trailers and semi-trailers, MICHELIN Remix tyres can be fitted in several positions.

MICHELIN

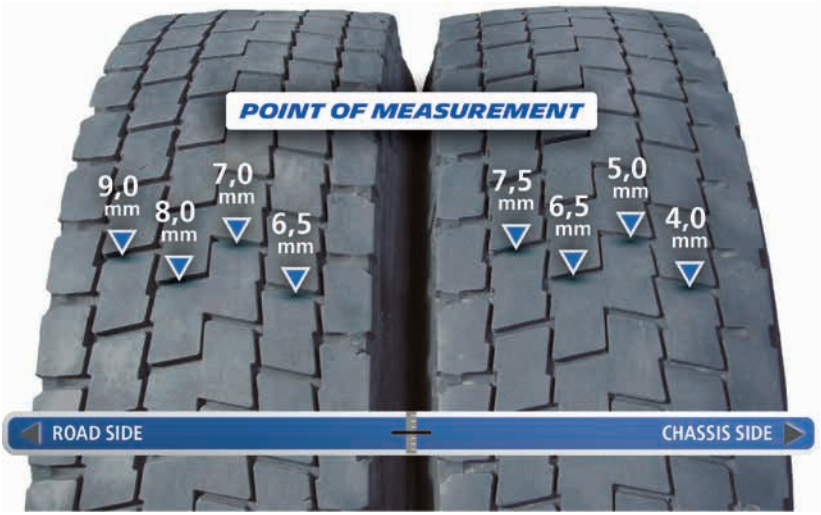
TYRE ROTATION AND TURNING ON THE RIM

What is it?

Tyre swapping 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 the tread performance. In this case, it is necessary to rotate and turn all axle tyres to maintain the same direction of rotation.

Note: when half worn, it is possible to invert the direction of rotation to optimise wear (valid for all axles and all positions).

* Internal Michelin source.

ANTISPLASH™ TYRE

The Antisplash™ system is designed to be effective on the outside of the vehicle. The words “Outer Side” are engraved in several languages on the sidewall along with the inscription Antisplash™.

– 385/55 R 22.5, 385/65 R 22.5 and 315/70 R 22.5 tyres

Check the dimensions before refitting Antisplash™ tyres to avoid contact with any metal parts.

To do this, check the clearances 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.

GEOMETRY

Correct geometry will ensure continued mileage performance and avoid excessive fuel consumption.

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.

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 method. In fact, manipulation during removal can create a fold in the casing ply at the bottom, and increase the risk of the plies breaking whilst on the move.

This method 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.

STORAGE AND HANDLING

Conditions for good tyre storage:

- Clean, airy, dry, temperate and well-ventilated premises, sheltered from direct sunlight and bad weather.
- Well away from any chemical substance, solvent or hydrocarbon likely to alter the nature of the rubber.
- Well away from any object which might penetrate the rubber (metal spike, wood, etc.).
- Well away from any heat source, flames, incandescent objects, equipment which may produce sparks or other electrical discharges and any source of ozone (transformers, electric motors, welding stations, etc.).
- If stacked, make sure that the tyres are not deformed. For long term storage, rotate the tyres (reverse the order of the tyres in the stack), in order to be able to remove the oldest tyres first.
- Avoid crushing the tyres under other objects.
- Storage:
  - For short term storage (up to 4 weeks) tyres can be stacked horizontally, one on top of the other, on wooden pallets. The height of the stack should not exceed 1.2 metres. After 4 weeks, the tyres should be reversed in the stack. 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 10 cm clearance above the floor. To avoid deformation, it is advisable to rotate them once a month.
- Inner 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. 50 cm in the compartments of shelf racks with a level bottom. Slatted wooden pallets are not suitable since they might apply pressure at particular points.
  - If the inner 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 in principle be placed with the inner tubes inside the 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.

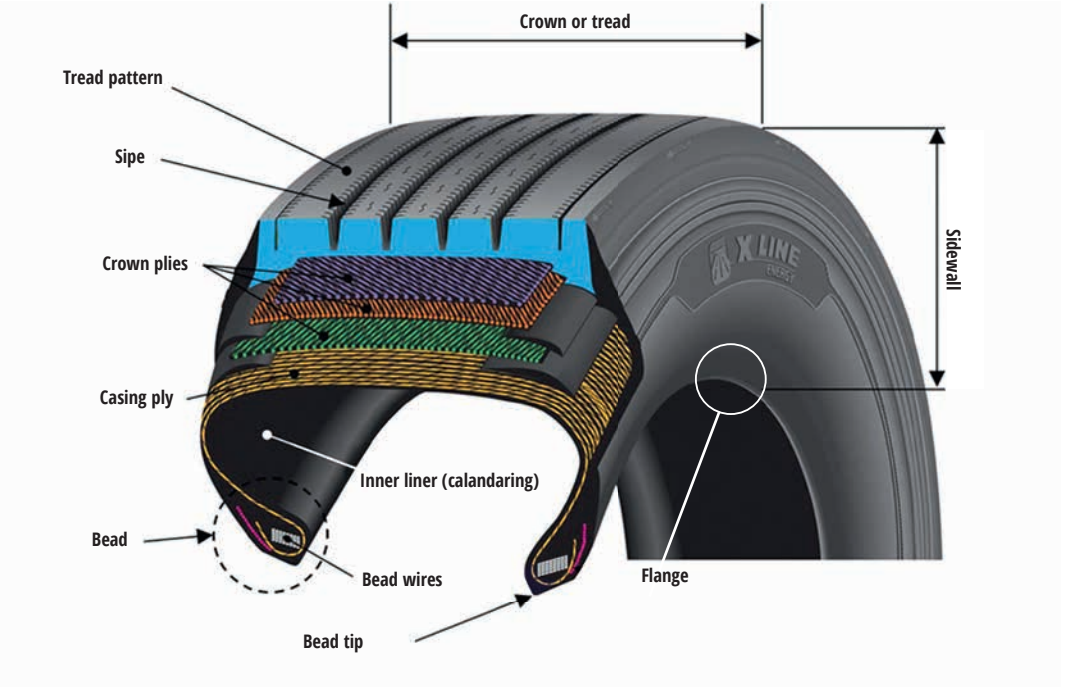
ADDITIONAL MICHELIN STORAGE INFORMATION

- Tyres which are stored for longer than five years should be examined by competent personnel to determine their suitability for further use.
- It is strongly recommended that tyres which are to be stored inflated, should be inflated with nitrogen. If air is used then it must be as dry as possible. Ensure that a valve cap is in place.
- For vehicles with use over a limited period:
  - inflate to normal pressure
  - check that pressure checked every six months
  - rotate the tyres by a quarter of a turn every four months
  - drive the tyres for a distance every year to avoid flat spotting.
- 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.

MICHELIN

Diagnostic help

OVERVIEW AND GLOSSARY



INCREASED WEAR FROM ONE EDGE TO THE OTHER WITH BURRS

1 | OBSERVATION

Presence of burrs, more pronounced on one side of the edges of the tread than the other.

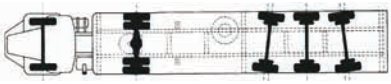
2 | PROBABLE CAUSE(S)

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

- **Alignment of the steering axle**

Toeing in Toeing out

- **Misalignment of axles**



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, forms of wear, usage.

Misadjustment of the geometry affects the tyre performance: approximately 7% per mm of misadjustment.

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

▶ Refer to page 77

MICHELIN

HEEL AND TOE WEAR

1 | OBSERVATION

Each tread block has a sharply defined edge and a more worn edge.

2 | PROBABLE CAUSE(S)

- Extent of acceleration/braking torques associated with the change in performances of vehicles and their technologies (eg.: speed bump, etc.).
- Twin fitment of dissimilar tyres (dimensions, etc.).
- Pressurised.
- Products not suitable for use.

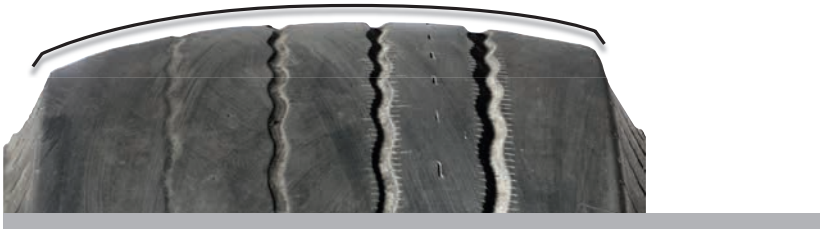
3 | TIPS

TYRE

Can be kept on the vehicle if compliant with the Highway Code and driving is not affected.

- Comply with the direction of rotation of the tyres.
- Check the pressure when the tyre is cold and adjust it if necessary.
- Turn the tyres.
- If necessary, rotate the tyres on the rim.

INCREASED WEAR FROM ONE EDGE TO THE OTHER WITH SMOOTH APPEARANCE



1 | OBSERVATION

Increased smooth and even wear from one edge to the other without longitudinal burrs.

2 | PROBABLE CAUSE(S)

Excessive camber or negative camber.

The flexion of the loaded axle causes more pronounced wear on the chassis side of a twinned assembly.

3 | TIPS

TYRE

Can be kept on the vehicle if compliant with the Highway Code and driving is not affected.

- Rotate on rim.
- Turn the tyres.
- Adjust the recommended pressure according to use and vehicle.

VEHICLE

Check the geometry. Make sure the load is distributed evenly.

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

▶ Refer to page 77

MICHELIN

WEAR IN CENTRE OF TREAD

1 | OBSERVATION

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

2 | PROBABLE CAUSE(S)

Overinflation of tyres.

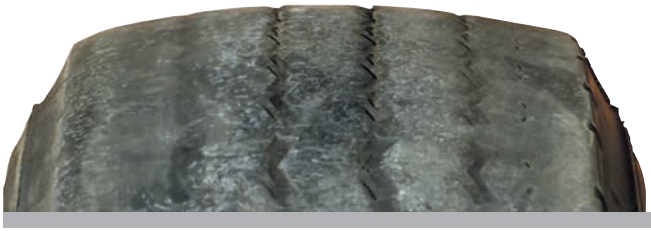
3 | TIPS

TYRE

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

- Check the pressure when the tyre is cold and adjust it if necessary.
- Adjust the recommended pressure according to use and vehicle.

ROUNDED WEAR



1 | OBSERVATION

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

2 | PROBABLE CAUSE(S)

Tyre underinflated and/or overloaded. Find the cause of the underinflation and resolve it (check pressures, punctures, valve, valve stems, etc.).

3 | TIPS

TYRE

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

- Check the pressure when the tyre is cold and adjust it if necessary.
- Adjust the recommended pressure according to use.
- Weigh the loaded vehicle, axle by axle, and define the correct pressure.

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

▶ Refer to page 77

MICHELIN

PECULIAR WEAR

1 | OBSERVATION

Wear said to be: wavy, skewed, affecting more than or half the tread, etc.

2 | PROBABLE CAUSE(S)

- Fatigue or play in suspension or steering systems.
- Imbalance, incorrect fitting.
- Incorrect twinning (different wear, marking, etc.).
- Unequal pressure in twin assembly, etc.
- Severe pitching.

3 | TIPS

TYRE

Can be kept on the vehicle if compliant with the Highway Code and driving is not affected.

- Check the tyre fitting (centring in relation to wheel).
- Check the pressure when the tyre is cold and adjust it if necessary.
- Adjust the recommended pressure according to use and vehicle.
- Check the twin fitment which must comply with the Highway Code:

difference in wear < 5 mm, same marking and same type of tyre.

VEHICLE

Check and if necessary repair the suspension and steering systems.

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

▶ Refer to page 77

SHOULDER WEAR

1 | OBSERVATION

Circumferential wear where shoulder is partially or completely worn away.

2 | PROBABLE CAUSE(S)

- Frequent reports of dynamic load (roundabouts, winding roads, high centre of gravity, etc.).
- Prolonged running at a pressure which is inappropriate for the load or use.

3 | TIPS

TYRE

Can be kept on the vehicle if compliant with the Highway Code and driving is not affected.

- Check the pressure when the tyre is cold and adjust it if necessary.
- Adjust the recommended pressure according to use and vehicle.
- Turn the tyres.

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

▶ Refer to page 77

MICHELIN

"TRAMLINE" WEAR

1 | OBSERVATION

Wear in more or less circumferential area affecting only part of tread width.

2 | PROBABLE CAUSE(S)

- Sign of slow wear.
- Undemanding usage on for example less windy roads, motorways, major roads.
- Products not suitable for use.

3 | TIPS

TYRE

Can be kept on the vehicle if compliant with the Highway Code and driving is not affected.

- Check the pressure when the tyre is cold and adjust it if necessary.
- Adjust the recommended pressure according to use and vehicle.
- Swap and/or turn the tyres on the rim: in the case of slow wear, these operations prevent the appearance of so-called "tramline" wear
- Check if the type of tyre is appropriate for the conditions of use.

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

▶ Refer to page 77

WEAR AND COLLAPSE OF ONE "RIB"

1 | OBSERVATION

Wear with longitudinal collapse of one "rib" of the tread pattern except for in the centre.

2 | PROBABLE CAUSE(S)

- Sign of slow wear.
- Undemanding usage on for example less windy roads, motorways, major roads.
- Products not suitable for use.

3 | TIPS

TYRE

Can be kept on the vehicle if compliant with the Highway Code and driving is not affected.

- Check the pressure when the tyre is cold and adjust it if necessary.
- Adjust the recommended pressure according to use and vehicle.
- Swap and/or turn the tyres on the rim: in the case of slow wear, these operations prevent of the appearance of this type of tyre wear
- Check if the type of tyre is appropriate for the conditions of use.

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

▶ Refer to page 77

MICHELIN

WEAR ACROSS THE SHOULDER

1 | OBSERVATION

Wear across the shoulder (less than or half the tread).

2 | PROBABLE CAUSE(S)

- Pressure unsuitable for load. Severe pitching.
- Suspension with significant clearance is a worsening factor.

3 | TIPS

TYRE

Can be kept on the vehicle if compliant with the Highway Code and driving is not affected.

- Check the pressure when the tyre is cold and adjust it if necessary.
- Adjust the recommended pressure according to use and vehicle.
- Swap and/or turn on rim.

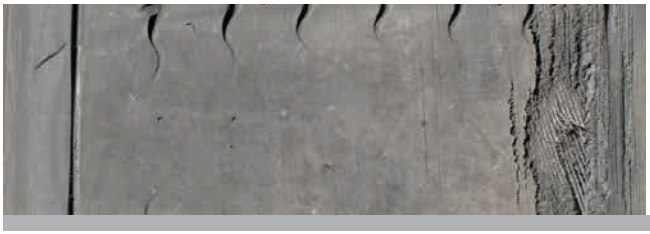
VEHICLE

Check the suspensions, loading conditions, mobility of the load.

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

▶ Refer to page 77

LOCALISED WEAR CAUSED BY BRAKES



1 | OBSERVATION

Very localised wear, where the shape resembles that of the contact patch.
Possible presence of 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

Can be kept on the vehicle if compliant with the Highway Code and driving is not affected.

VEHICLE

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

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SPLITS IN THE BASE OF THE TREAD PATTERN

1 | OBSERVATION

Splits in the base of the tread pattern with or without rubber tears.

2 | PROBABLE CAUSE(S)

Associated with the severe load demands, repetitive crossing of protruding obstacles (pavements, rails, sliding rails of gates, ruts, etc.). Frequent manoeuvring on the spot.

Hot tyres are particularly sensitive to this type of damage. Pressure unsuitable to the load accentuates the risk of such damage appearing.

3 | TIPS

TYRE

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

- Check if the type of tyre is appropriate for the conditions of use.
- Remove if splits are deep or crown plies are visible.
- Check the pressure when the tyre is cold and adjust it if necessary.
- Adjust the recommended pressure according to use and vehicle.

VEHICLE

Avoid obstacles as much as possible and/or proceed with care.

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

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

- Check if the type of tyre is appropriate for the conditions of use.
- Check the pressure when the tyre is cold and adjust it if necessary.
- Adjust the recommended pressure according to use and vehicle.
- Use the type of tyre appropriate for the conditions of use.

KNOCK TO CROWN

1 | OBSERVATION

Impact with rupture of crown plies.
Usually, evidence of the impact is found on the tread.

2 | PROBABLE CAUSE(S)

Exterior damage from hitting sharp/blunt objects.

3 | TIPS

TYRE

Check the conditions of use: roads, access roads.

- Type of driving, load, speed, pressure.
- Choose a tyre which is suitable for the intended use.
- Adapt the tyre pressures to the use.
- Replacer the tyre, examine the other tyres on the vehicle.

DETACHMENT OF THE CROWN

1 | OBSERVATION

Separation between plies and crown which can eventually lead to complete loss of the tread and complete dislocation of the tyre.

2 | PROBABLE CAUSE(S)

- Prolonged use in an underinflated and/or overloaded condition causing abnormal heating of the crown block components.
- Dimension not suitable for the vehicle.
- Damage not repaired with infiltration of air, etc.

3 | TIPS

TYRE

Remove from service.

- Check if the tyre is appropriate for the conditions of use.
- Regularly check the pressure on cold tyres.
- Adjust the recommended pressure according to use and vehicle.
- Avoid overloading and check the load conditions (best load distribution).

VEHICLE

Do not exceed the authorised load limits.

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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 of the tread close up.
This change is accompanied by a strong smell of hydrocarbons.

2 | PROBABLE CAUSE(S)

- Tyres stored or vehicle parked in a polluted area.
- Oil or fuel leaks onto the spare wheel.

3 | TIPS

TYRE

Remove from service.

Check the storage conditions.

VEHICLE

Check for and remove any leakage of hydrocarbons.

Protect the spare wheel.

APPEARANCE OF A TINT GUM DIFFERENT ON THE TREAD

1 | OBSERVATION

Different rubber colour and/or aspect. No cut to plies.

2 | PROBABLE CAUSE(S)

Advanced level of wear.

3 | TIPS

TYRE

- Can be kept on the vehicle as long as the tyres comply with legislation. Provide for replacement.
- Monitor the tyre wear in order to maintain the best possible retreading potential and prevent the appearance of crown plies.

MICHELIN

RUBBER CRACKING

1 | OBSERVATION

Superficial cracks to the rubber of the sidewall.

2 | PROBABLE CAUSE(S)

Ageing, exposure (even for a couple of hours) to a source of ozone: arc welding tool, electric motors, etc.

3 | TIPS

TYRE

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

- Check the storage conditions: store the tyres away from the source of ozone (ozone emissions).
- Follow the recommendation on tyre longevity on page 9.

VEHICLE

Remove the wheels from the vehicle before any arc welding operations.

Do not park the vehicle in an area where arc welding is being done.

CONTACT BETWEEN TWINS

1 | OBSERVATION

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

2 | PROBABLE CAUSE(S)

Underinflation, overloading and/or insufficient clearance between the twinned tyres, causes contact between the two twinned tyres and circumferential wear to the sidewalls which can lead to their premature removal.

3 | TIPS

TYRE

Remove from the vehicle and scrap if mottling on the inside and/or if the rubber of the sidewall is damaged.

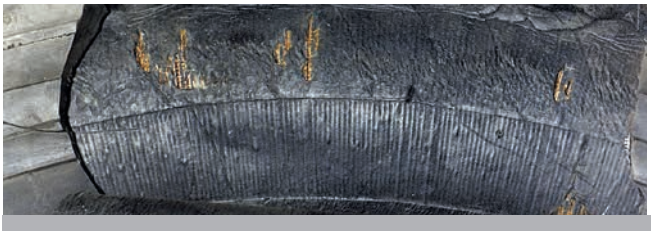
- Check the pressure regularly when the tyre is cold and adjust it if necessary.
- Adjust the recommended pressure according to use, vehicle type and load.
- Respect the minimum spacing for each tyre size.

VEHICLE

Follow the wheel recommendations of the manufacturer

MICHELIN

GUM SEPARATION



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 (eg.: staple, etc.), during fitting (eg.: breakage of bead toe by a tyre lever) or whilst on the move (eg.: perforating object stays in place.).

3 | TIPS

TYRE

Remove from service.

- Check the mounting and/or labelling methods.
- Regularly check the pressure (to detect slow punctures) and the condition of the tyre tread (eg.: presence of nails, screws, etc.).

VEHICLE

Make sure the rims are clean and in good condition, as these can damage the bead.

BROKEN CABLES BODY COVER

1 | OBSERVATION

Regular circumferential rupture to the sidewall casing plies.

2 | PROBABLE CAUSE(S)

- Running with inadequate or zero inflation pressure.
- Prolonged running overloaded.
- Running with different pressures between twinned tyres
- Poor twinning

3 | TIPS

TYRE

Remove from service.

- Regularly check the pressure on cold tyres.
- Adjust the recommended pressure according to use, vehicle type and load.
- Avoid overloading.
- Check that the twinned tyres have:
  - the same diameter
  - the same dimension
  - the same load/speed indices
  - the same level of wear

Reminder: for technical reasons, we recommend not fitting tyres with a deviation of more than 10 mm in diameter on the same axle.

MICHELIN

IMPACT / PINCHING

1 | OBSERVATION

Rupture of the cables with cuts to sidewall rubber.

2 | PROBABLE CAUSE(S)

Severe impact on an obstacle (eg.: pavement, 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 service.

Hand over to a specialist for possible repair after thorough investigation.

INJURY

1 | OBSERVATION

Damage to the bead toe or the heel caused by contact with the valve, lever or fitting tool.

2 | PROBABLE CAUSE(S)

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

3 | TIPS

TYRE

Remove from service.

- Follow the fitting and removal instructions.
- Use appropriate tools.
- Ensure the tools are in good condition.

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DETERIORATION

1 | OBSERVATION

Deterioration of the bead seat and/or the heel caused by foreign matter (eg.: pavement, stones, holes).

2 | PROBABLE CAUSE(S)

Wheel or rim in poor condition, oxidised. Lack of precautions taken on fitting.

3 | TIPS

TYRE

Remove from service.

- Follow the fitting instructions.
- Make sure that tyre fitting areas are clean.
- Clean the wheels correctly. If the wheel is too heavily oxidised, scrap it.

WARMING UP

1 | OBSERVATION

Change of the state of the rubber through heating: blue - sticky - bakelised - broken - etc.
Coming away of the heel components up to unwrapping of the casing around the bead core.

2 | PROBABLE CAUSE(S)

Extreme increase in temperature in the heel area often caused by malfunction of the braking system, prolonged or frequent braking, welding on rim or wheel.

3 | TIPS

TYRE

Remove from service.

VEHICLE

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

If the tyre has been subjected to abnormal heat build up, stop the vehicle in an open area, keep people far away from the vehicle, and particularly the tyres, and then deflate after it has cooled down.

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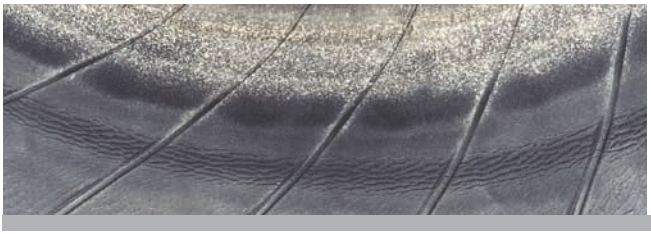
MARBLE



1 | OBSERVATION

Presence of marbling and creasing of the interior rubber in the flexion zones.

2 | PROBABLE CAUSE(S)

Prolonged running underinflated and/or overloaded.

3 | TIPS

TYRE

Find the causes of the leaks, remove from service and have the casing retreaded.

Important: never reinflate a tyre that has been running underinflated without first examining the interior.

MICHELIN and LAURENT Retread have the expertise to check that the marbling does not change the endurance performance of the tyre.

DISLOCATION

1 | OBSERVATION

Detachment and breakage of interior lining, even as far as complete dislocation and rupture of the casing.

2 | PROBABLE CAUSE(S)

Running with pressure loss, prolonged running very underinflated and / or overloaded.

3 | TIPS

TYRE

Remove from service.

- Regularly check the pressure on cold tyres.
- Adjust the recommended pressure according to use, vehicle type and load.
- Find the origin of the loss in pressure eg.: puncture, valve, seal, stem, wheel, rim.
- Avoid overloading.

MICHELIN

DETERIORATION CAUSED BY ELECTRIC ARCING

1 | OBSERVATION

Electric discharges can cause localised burns to the rubber and in certain cases deterioration of the cables, break the bead core and form small holes.

2 | PROBABLE CAUSE(S)

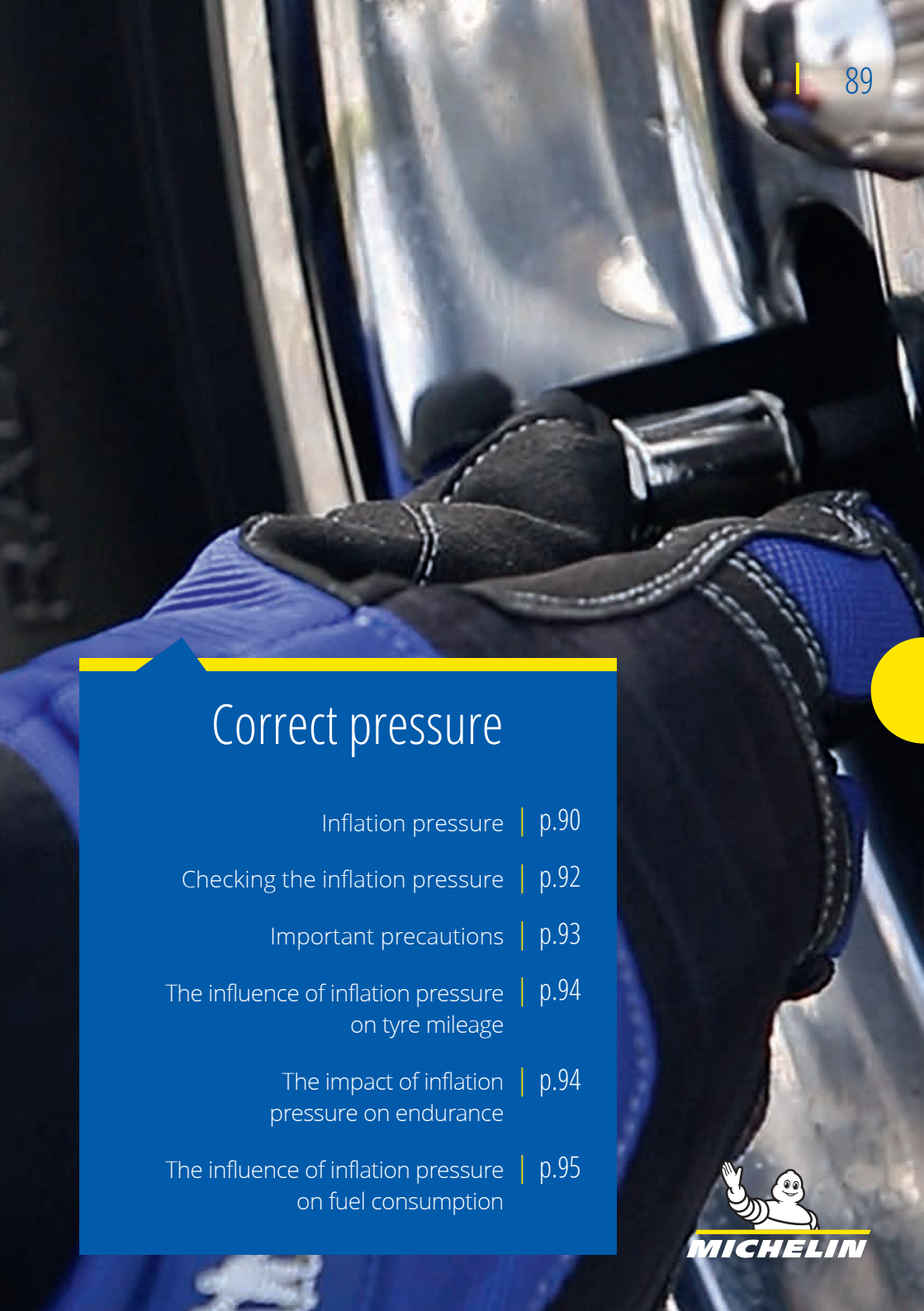
These discharges are caused by the proximity or contact of the vehicle to an electric line or lightening.

3 | TIPS

TYRE

Remove from service.

- ALL tyres from the vehicle and trailer must also be removed and destroyed.



Correct pressure

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 ground.

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 the correct operation of the tyres: it is this pressure which both supports and moves loads or people:

- Safely
- Durably
- Economically
- Comfortably

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

Pressure and safety

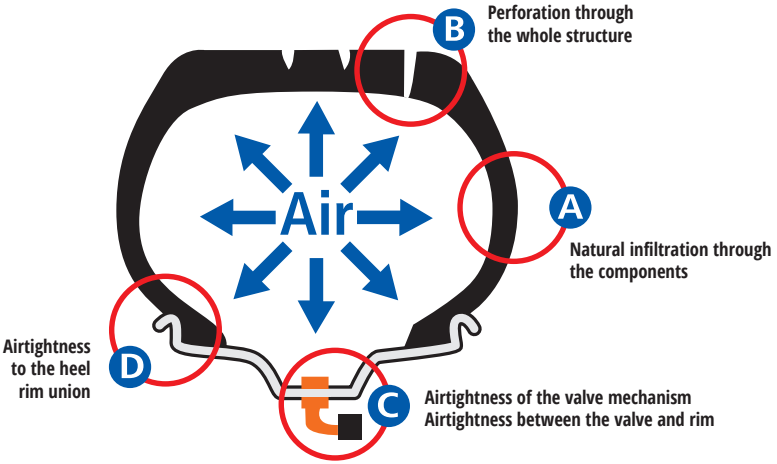
Incorrect tyre pressure has a negative impact on certain basic aspects of safety performance such as:

- Casing resistance.
- Vehicle stability and handling.
- Vehicle grip.
- Sensitivity to “kerbing”.

Variation in inflation pressure

During use, a tyre may lose pressure for various different reasons:

Airtightness of the wheel rim (eg. cracks or welds).



Apart from the vehicle's on-board monitoring systems, visual and periodic pressure checks with a pressure gauge is the most common method for detecting possible air leak problems.

MICHELIN

CHECKING THE INFLATION PRESSURE

■ This check should be made on all the tyres on the vehicle (including the spare wheel)

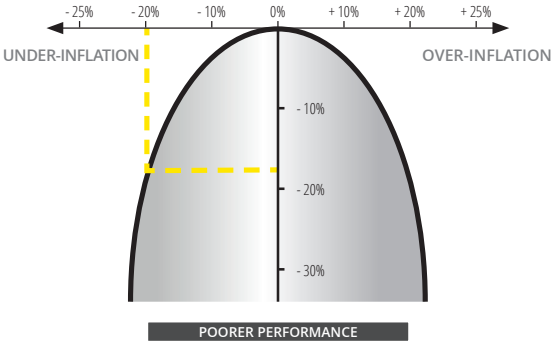
- The use of a vehicle that has tyres with insufficient inflation pressure leads to an abnormal increase in operational temperature and may cause damage to internal components.
  This damage, which affects the overall endurance of the casing (see diagram page 94), is irreversible and may lead to the tyre bursting, with sudden deflation.
  The consequences of running with insufficient inflation pressure are not necessarily immediately visible and may appear even after rectification.
- Insufficient inflation pressure also greatly increases the risk of impact-pinching related damage and aqua planing.
- UNDER-INFLATION can cause rapid and/or irregular wear and increased sensitivity to impact (tread damage, rupture of casing).
- Inflating tyres with nitrogen does not mean that the inflation pressure (at least once a month) does not need to be checked regularly.

In all cases, 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.

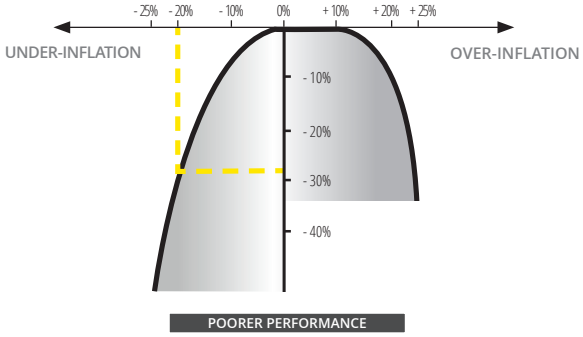
IMPORTANT PRECAUTIONS

- Use an accurate, regularly calibrated pressure gauge and handle it with care.
- Tyre pressures must be checked on cold tyres.
- Comply with the inflation pressures recommended by the vehicle or tyre manufacturer.
- Always observe the regulation in force in the country of use.
- The pressure should be checked 24 hours after a tyre has been fitted and must not have reduced by more than 5% of the original pressure.
- The inflation pressures of the tyres on the same axle should normally be about the same.
- The pressure increases in use; never reduce the pressure of a tyre while it is hot.
- If the pressure in a tyre checked when hot is lower than the suggested pressure or seems hotter, the tyre must be removed and checked, complying with the safety instructions.
- Never re-inflate a tyre which has been running underinflated without a thorough inspection both inside and out.
- Tyre pressures greater than 10 bar when cold are strictly not recommended.

INFLUENCE OF THE INFLATION PRESSURE ON TYRE MILEAGE



INFLUENCE OF INFLATION PRESSURE ON CASING ENDURANCE



RECOMMANDATIONS

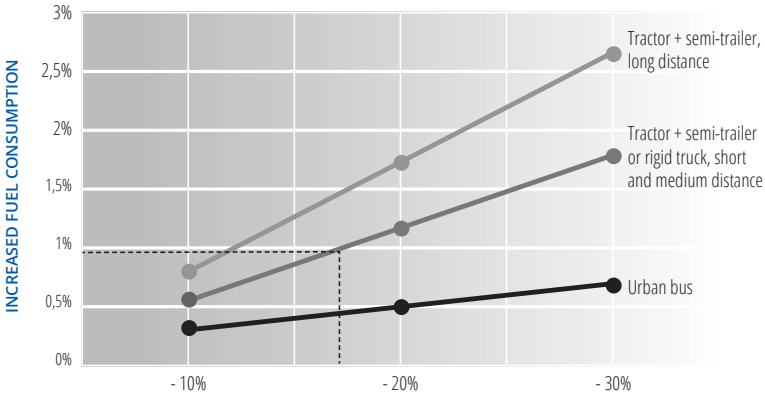
- Check the tyre pressure regularly when tyres are cold at ambient temperature or after the vehicle has stopped for several hours.
- NEVER DEFLATE HOT TYRES.

THE INFLUENCE OF THE INFLATION PRESSURE ON FUEL CONSUMPTION

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

Under-inflation by 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



* Internal Michelin source.

BASIC PRESSURE CHART

The cold tyre inflation pressures indicated in the tables pages 172 to 177 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 on your vehicles.

Regrooving

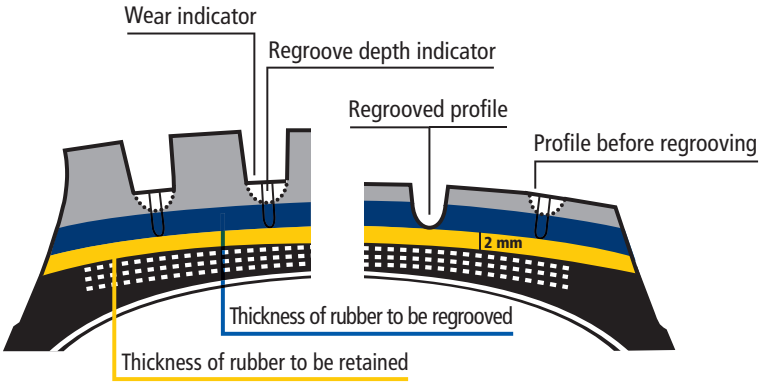
MICHELIN

GENERAL PRINCIPLE

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

Regroovable MICHELIN tyres are marked with the symbol “U” on the sidewall or the word “REGROOVABLE”.

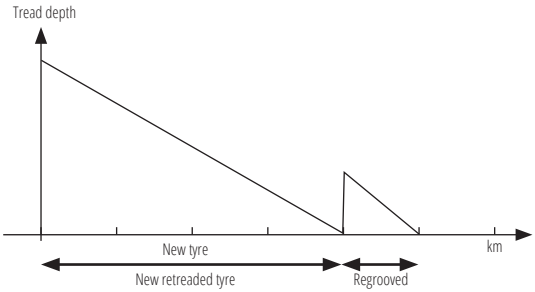
Regrooving Truck tyres is an operation authorised by the Highway Code (Art. 4 of the decree of 24/10/94) and recommended by E.T.R.T.O. and A.F.N.O.R. (standard NFR12714) for the safety and increase in performance which it brings about.



WHY REGROOVE?

GREATER LONGEVITY

By re-establishing the height of the tyre's tread pattern again, regrooving extends the mileage of the tyre by **25% kilometres**(1) on average, for both new MICHELIN tyres and retreaded MICHELIN Remix tyres.

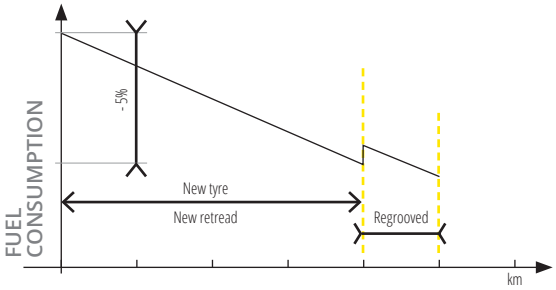


MORE FUEL SAVINGS

Save up to **5% of fuel**(2).

Regrooving which is carried out when the tyre has its lowest rolling resistance, also optimises fuel consumption.

The potential 25% extra mileage provided by regrooving is obtained during the period when fuel consumption is at its lowest.



(1) Compared to a worn non-regrooved MICHELIN tyre. Based on a 4-mm average regrooving. Information taken from recommendations made by the French tyre manufacturers' federation TNPF in 2013 according to which regrooving of worn tyres increases tyre lifetime by using all available rubber.
(2) 5,6% fuel consumption gain: Internal study performed at Ladoux (France), May 2021, carried out under DEKRA supervision, comparing 315/70 R 22.5 MICHELIN X® LINE™ ENERGY™ Z2 & D2 new tyres vs. regrooved tyres (R5mm). Results may vary depending on weather conditions, road type, tyre size and driving style.

BETTER GRIP

Better grip and improved safety. Regrooving re-establishes a deeper tyre tread pattern, giving you better road grip to drive safely. On wet roads, regrooved tyres offer improved transversal grip and approximately 10% higher traction than the same worn tyres(3).

REDUCE YOUR ENVIRONMENTAL IMPACT

Lower CO_2 emissions | Less waste | Fewer materials

- **By reducing your fuel consumption and improving the mileage potential, regrooving is good for the environment.**
  Regrooving extends the life of your tyre when it is using the least amount of fuel. This allows you to reduce your CO_2 emissions up to 1.1 kg/100 km per axle.
- **By extending the life of new MICHELIN tyres and retreaded MICHELIN Remix tyres by up to 25%(1), you are saving 1 tread for every 4 tyres you regroove.**
  Regrooving does not affect MICHELIN Remix retreading. The acceptance rate of MICHELIN Remix retreading is similar for a regrooved and non-regrooved MICHELIN tyre: 89%(4)

REGROOVING IN PRACTICE

The operator and company assume responsibility if regrooving is different to the tyre manufacturers' recommendations (compliance with 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 at least a 2 mm depth of rubber between the base of the tread and the crown plies when the tyre no longer has a regroove depth indicator showing.

(3) On wet ground, regrooved tyres offer approx. 10% greater transverse grip and traction compared to the same worn tyres. Internal study carried out by Michelin in 2010 at Ladoux on a polished concrete track; results may vary depending on the conditions of use.
(4) Michelin test performed on 1 million tyres for MICHELIN Remix retreading in 2018 and 2019. The difference between the acceptance rates of regrooved tyres and non-regrooved tyres is less than 0.5 point.

Regrooving that is too deep:

- Can cause damage to the tyre resulting in premature destruction of the tyres ;
- Can compromise acceptance for retreading ;
- Can expose the plies at the base of the tread which is prohibited by the legislation.

Do not regroove if:

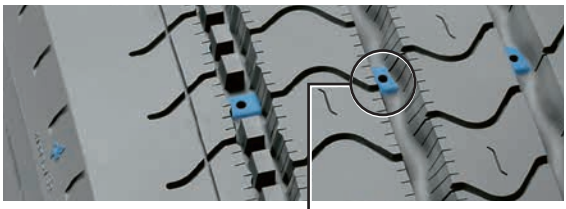
The tread pattern shows signs of significant damage: perforations, scratches, cuts, tearing, etc. In this condition there is a risk of oxidisation the metallic plies: damage of this nature could lead to rapid deterioration of the tyre whilst in service, possibly leading to sudden total deflation.

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 in order to optimise the operation.

TECHNICAL REQUIREMENTS

- Regrooving should only be carried out in a well ventilated place with a tool which has an electrically heated blade.
- 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 knocks, multiple notches or wear of the tread blocks, then regrooving is not recommended.
- 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.
- The 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

• The depth of the blade can also be adjusted using the gauge opposite.

• The regrooving diagrams of the main dimensions can be found on pages 106 to 132. Each groove must be regrooved using the treadwear indicator.

NOTES:

• If a tyre shows signs of abnormal wear, it is technically possible to only regroove part of the tread.

•The treads of MICHELIN Remix tyres can be regrooved in a similar way to new tyres.

• All regrooving widths given are approximate.

• To regroove any MICHELIN tyre not shown in this booklet, please contact your Michelin representative for advice.

REGROOVING TREAD PATTERNS OF STEERING TYRES FOR USE ON DRIVE AXLE

Even if Michelin recommends regrooving bus and truck steering tyres, not all users will do so.

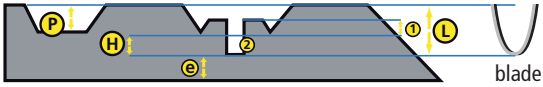
In addition, some countries regulations do not accept regrooved tyres on the front axles.

In order to optimise the tyre's mileage potential and reduce the user's costs, specific regrooving diagrams for drive axles are available as an option. They offer grip and traction capabilities.

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

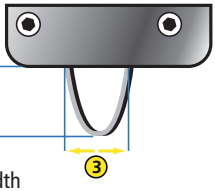


- (P) Depth remaining before regroove
- (H) Theoretical height of regrooving
- (L) Adjustment height of the blade: **L = P+ H**
  We recommend that you measure **L**
  with a "depth gauge"
- (e) Thickness of rubber to be kept after regrooving: **2 mm**
- (1) Thickness of wear indicator
- (2) Recess indicating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

Regrooving blade

Setting the height of the blade

(L) = (P) + (H)



(3) Regrooving width

MAIN EUROPEAN REGULATIONS ON REGROOVING

Country	Restrictions on mounting regrooved tyres
Austria	Prohibited on all steering axles of all trucks
Belgium	None
Bulgaria	Prohibited on all steering axles of all trucks
Croatia	None
Czech Republic	Prohibited on steering axles of coaches and buses
Denmark	None
UEEA(1)	Prohibited on all steering axles of all trucks
Finland	None
Estonia	None
France	None
Germany	Prohibited on steering axles of coaches where speeds reach 100 km/h
Greece	None
Hungary	Prohibited on steering axles of coaches and buses
Ireland	None
Italy	None
Latvia	None
Lithuania	None
Luxembourg	None
Netherlands	None
Norway	None
Poland	Prohibited on single axles of coaches where speeds reach 100 km/h
Portugal	None
Romania	None
Serbia	None
Slovakia	None
Slovenia	None
Spain	None
Sweden	None
Switzerland	None
Turkey	None
Ukraine	Prohibited on all steering axles of all trucks
United Kingdom	None

Provided for informational purposes only, may be subject to changes in local regulations.
(1) Eurasian Economic Union: Armenia, Belorussia, Kazakhstan, Kyrgyzstan and Russia

REGROOVING DIAGRAMS

Long distance journeys, motorways and major national roads. p.106

Short and long distance journeys on all types of roads. p.111

Mixed use on roads, worksites and quarries. p.123

People transportation, short and long distances, on all types of roads. p.127

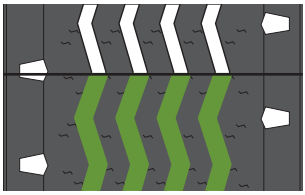
Urban and suburban driving. p.128

Specialised, civil or military vehicles mostly driven on off-road surfaces. p.129

X LINE™

Long distance journeys, motorways and major national roads.

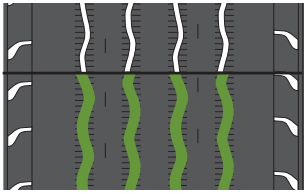
XZA



Dimension	Theoretical regrooving depth*	Regrooving width	Blade
8.5 R 17.5**	3 mm	8 mm	R3
10 R 17.5	3 mm	6 to 8 mm	R3

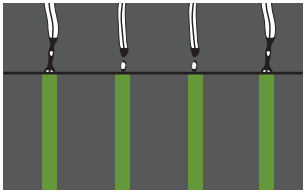
** 3 ribs.

XZA 2 ENERGY™



Dimension	Theoretical regrooving depth*	Regrooving width	Blade
295/80 R 22.5	4 mm	8 to 10 mm	R3

X® LINE™ ENERGY™ F ANTISPLASH



Dimension	Theoretical regrooving depth*	Regrooving width	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 ribs.

*The regrooving depth should always be checked before regrooving, see details on page 103.

X LINE™

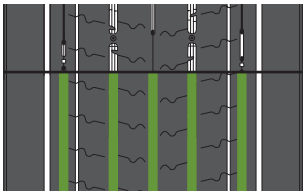
Long distance journeys, motorways and major national roads.

X® LINE™ ENERGY™ Z

Dimension	Theoretical regrooving depth*	Regrooving width	Blade
295/60 R 22.5**	3 mm	6 to 8 mm	R3
315/60 R 22.5**			
355/50 R 22.5**			
315/70 R 22.5	3 mm	8 mm	R3
315/80 R 22.5	3 mm	8 to 10 mm	R3

** 5 ribs.

X® LINE™ ENERGY™ Z2



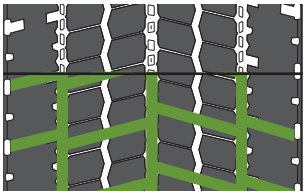
Dimension	Theoretical regrooving depth*	Regrooving width	Blade
315/70 R 22.5	3 mm	7 to 8 mm	R3

*The regrooving depth should always be checked before regrooving, see details on page 103.

X LINE™

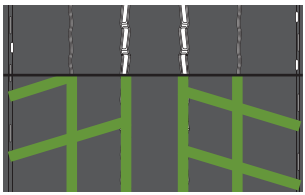
Long distance journeys, motorways and major national roads.

XDA 2+ ENERGY™



Dimension	Theoretical regrooving depth*	Regrooving width	Blade
295/80 R 22.5	4 mm	7 to 8 mm	R3

X® LINE™ ENERGY™ D



Dimension	Theoretical regrooving depth*	Regrooving width	Blade
295/60 R 22.5**	3 mm	7 to 8 mm	R3
315/60 R 22.5**			
315/80 R 22.5			

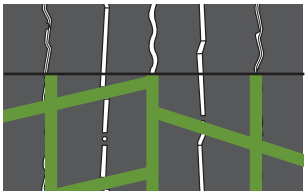
** The regrooving pattern is identical to the Tread pattern MICHELIN X® LINE™ ENERGY™ D2 below.

*The regrooving depth should always be checked before regrooving, see details on page 103.

X LINE™

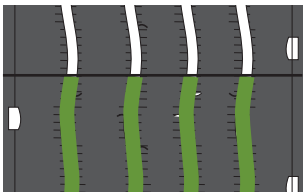
Long distance journeys, motorways and major national roads.

X® LINE™ ENERGY™ D2



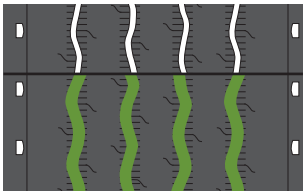
Dimension	Theoretical regrooving depth*	Regrooving width	Blade
315/70 R 22.5	3 mm	7 to 8 mm	R3

XTA



Dimension	Theoretical regrooving depth*	Regrooving width	Blade
8.25 R 15	3 mm	6 to 8 mm	R3
315/80 R 22.5	3 mm	8 to 10 mm	R3 or R4

XTA 2 ENERGY™



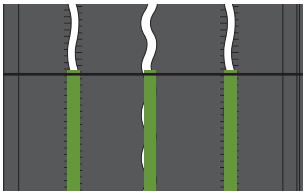
Dimension	Theoretical regrooving depth*	Regrooving width	Blade
285/70 R 19.5	3 mm	6 to 8 mm	R3
275/70 R 22.5			

*The regrooving depth should always be checked before regrooving, see details on page 103.

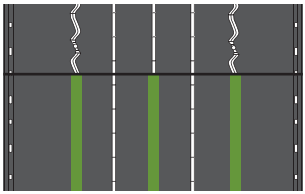
X LINE™

Long distance journeys, motorways and major national roads.

X® LINE™ ENERGY™ T



Dimension	Theoretical regrooving depth*	Regrooving width	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



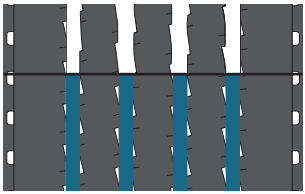
Dimension	Theoretical regrooving depth*	Regrooving width	Blade
385/55 R 22.5	3 mm	8 to 10 mm	R3
385/65 R 22.5			

*The regrooving depth should always be checked before regrooving, see details on page 103.

X MULTI™

Short and long distance journeys on all types of roads.

XZE 2+

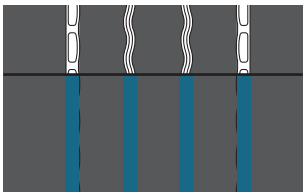


Dimension	Theoretical regrooving depth*	Regrooving width	Blade
305/70 R 19.5	3 mm	7 to 8 mm	R3

XFN 2 ANTISPLASH™

Dimension	Theoretical regrooving depth*	Regrooving width	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

X® MULTIWAY™ 3D XZE



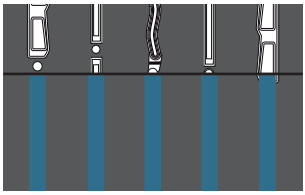
Dimension	Theoretical regrooving depth*	Regrooving width	Blade
295/80 R 22.5	3 mm	8 to 10 mm	R3

*The regrooving depth should always be checked before regrooving, see details on page 103.

X® MULTI™

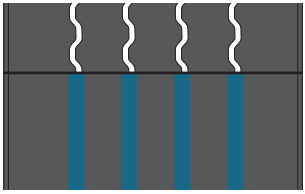
Short and long distance journeys on all types of roads.

X® MULTI™ ENERGY™ Z



Dimension	Theoretical regrooving depth*	Regrooving width	Blade
315/70 R 22.5	3 mm	8 to 10 mm	R3 or R4
315/80 R 22.5	3 mm	8 to 10 mm	R3

X® MULTI™ F



Dimension	Theoretical regrooving depth*	Regrooving width	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

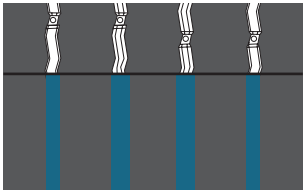
*The regrooving depth should always be checked before regrooving, see details on page 103.

X MULTI™

Short and long distance journeys on all types of roads.

X® MULTI™ Z

Dimension	Theoretical regrooving depth*	Regrooving width	Blade
17.5 (205/75, 215/75, 225/75, 235/75, 245/70, 265/70)	2 mm	7 to 8 mm	R3
19.5 (245/70, 265/70, 285/70)	3 mm	8 to 10 mm	R4



Dimension	Theoretical regrooving depth*	Regrooving width	Blade
12 R 22.5	3 mm	8 to 9 mm	R3
275/70 R 22.5	4 mm	7 to 8 mm	R3
275/80 R 22.5	3 mm	4 to 6 mm	R3
315/60 R 22.5**	3 mm	6 to 8 mm	R3
315/70 R 22.5**	3 mm	8 to 10 mm	R3 or R4
315/80 R 22.5**	3 mm	8 to 10 mm	R3
355/50 R 22.5**	3 mm	8 to 10 mm	R3 or R4
385/65 R 22.5**			

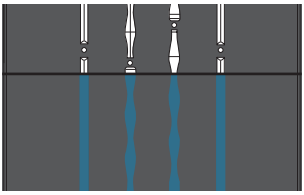
** 5 ribs.

*The regrooving depth should always be checked before regrooving, see details on page 103.

X MULTI™

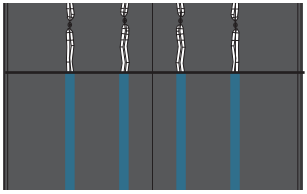
Short and long distance journeys on all types of roads.

X® MULTI™ Z2



Dimension	Theoretical regrooving depth*	Regrooving width	Blade
11 R 22.5 et 12 R 22.5	3 mm	8 to 10 mm	R3 or R4
295/80 R 22.5	3 mm	7 to 8 mm	R3

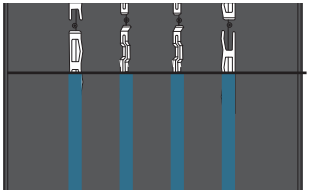
X® MULTI™ HL Z



Dimension	Theoretical regrooving depth*	Regrooving width	Blade
305/70 R 22.5**	3 mm	8 to 10 mm	R3 or R4
385/65 R 22.5			

** 5 ribs.

X® MULTI™ HD Z



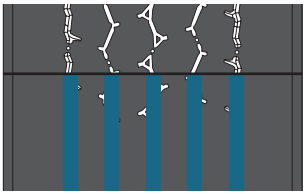
Dimension	Theoretical regrooving depth*	Regrooving width	Blade
315/70 R 22.5	3 mm	8 to 10 mm	R3 or R4
315/80 R 22.5			

*The regrooving depth should always be checked before regrooving, see details on page 103.

X MULTI™

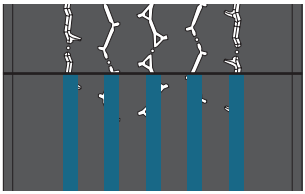
Short and long distance journeys on all types of roads.

X® MULTI™ GRIP™ Z



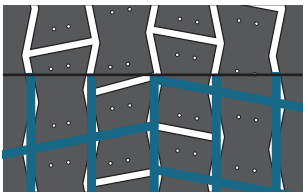
Dimension	Theoretical regrooving depth*	Regrooving width	Blade
295/80 R 22.5	3 mm	8 to 10 mm	R3 or R4
315/70 R 22.5			
315/80 R 22.5			

X® MULTI™ GRIP™ Z ANTISPLASH



Dimension	Theoretical regrooving depth*	Regrooving width	Blade
385/55 R 22.5	3 mm	8 to 10 mm	R3
385/65 R 22.5	4 mm	8 to 10 mm	R3

X® MULTIWAY™ 3D XDE



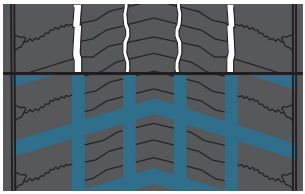
Dimension	Theoretical regrooving depth*	Regrooving width	Blade
295/80 R 22.5	3 mm	8 to 10 mm	R3

*The regrooving depth should always be checked before regrooving, see details on page 103.

X MULTI™

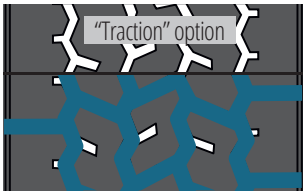
Short and long distance journeys on all types of roads.

X® MULTI™ ENERGY™ D



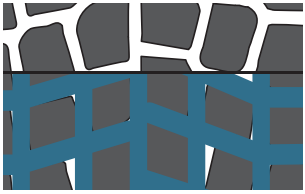
Dimension	Theoretical regrooving depth*	Regrooving width	Blade
315/70 R 22.5	3 mm	6 to 8 mm	R3
315/80 R 22.5	Same as 315/80 R 22.5 MICHELIN X® MULTI™ D page 117		

X® MULTI™ D



Dimension	Theoretical regrooving depth*	Regrooving width	Blade
17.5 (205/75, 215/75, 225/75, 235/75, 245/70, 265/70)	2 mm	7 to 8 mm	R3
19.5 (245/70, 265/70, 285/70)	3 mm	8 to 10 mm	R4

X® MULTI™ D** / X® MULTI™ D +



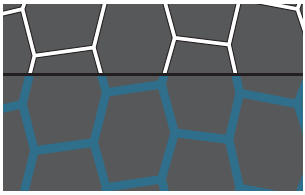
Dimension	Theoretical regrooving depth*	Regrooving width	Blade
**275/80 R 22.5	3 mm	7 to 8 mm	R3
11 R 22.5	3 mm	6 to 8 mm	R3

*The regrooving depth should always be checked before regrooving, see details on page 103.

X MULTI™

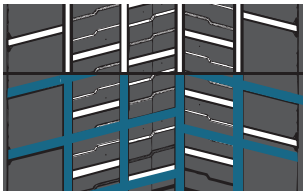
Short and long distance journeys on all types of roads.

X® MULTI™ D



Dimension	Theoretical regrooving depth*	Regrooving width	Blade
12 R 22.5	3 mm	7 to 8 mm	R3
275/70 R 22.5	4 mm	7 to 8 mm	R3

X® MULTI™ D



Dimension	Theoretical regrooving depth*	Regrooving width	Blade
295/60 R 22.5	3 mm	6 to 8 mm	R3
305/70 R 22.5			
315/45 R 22.5			
315/60 R 22.5			
315/70 R 22.5			
315/80 R 22.5			

*The regrooving depth should always be checked before regrooving, see details on page 103.

X® MULTI™

Short and long distance journeys on all types of roads.

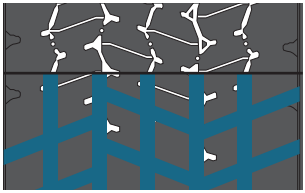
X® MULTI™ D2

Dimension	Theoretical regrooving depth*	Regrooving width	Blade
12 R 22.5	3 mm	8 to 10 mm	R3 or R4

X® MULTI™ HD D

Dimension	Theoretical regrooving depth*	Regrooving width	Blade
315/70 R 22.5	3 mm	7 to 8 mm	R3
315/80 R 22.5	3 mm	8 to 10 mm	R3

X® MULTI™ GRIP D



Dimension	Theoretical regrooving depth*	Regrooving width	Blade
295/80 R 22.5	3 mm	8 to 9 mm	R3 or R4
315/70 R 22.5	3 mm	6 to 8 mm	R3
315/80 R 22.5			

*The regrooving depth should always be checked before regrooving, see details on page 103.

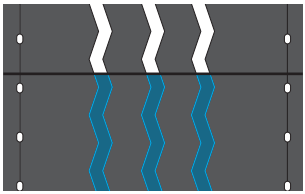
X MULTI™

Short and long distance journeys on all types of roads.

XDW ICE GRIP

Dimension	Theoretical regrooving depth*	Regrooving width	Blade
265/70 R 19.5	3 mm	6 to 8 mm	R3
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

XTE 2



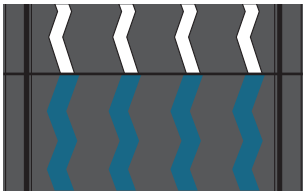
Dimension	Theoretical regrooving depth*	Regrooving width	Blade
9.5 R 17.5	3 mm	6 to 8 mm	R3
245/70 R 19.5			
265/70 R 19.5			
285/70 R 19.5			

*The regrooving depth should always be checked before regrooving, see details on page 103.

X MULTI™

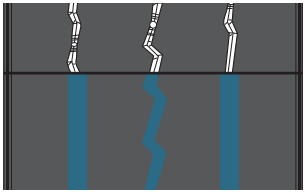
Short and long distance journeys on all types of roads.

XTE 3



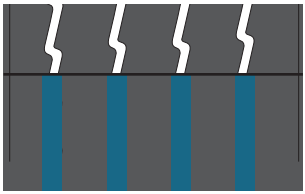
Dimension	Theoretical regrooving depth*	Regrooving width	Blade
385/65 R 22.5	3 mm	8 to 10 mm	R3

X® MAXITRAILER™



Dimension	Theoretical regrooving depth*	Regrooving width	Blade
255/60 R 19.5	3 mm	6 to 8 mm	R3

X® MULTI™ T



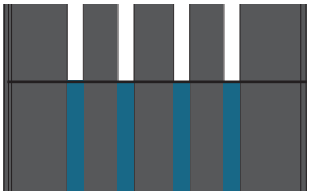
Dimension	Theoretical regrooving depth*	Regrooving width	Blade
385/65 R 22.5	3 mm	8 to 10 mm	R3 or R4

*The regrooving depth should always be checked before regrooving, see details on page 103.

X MULTI™

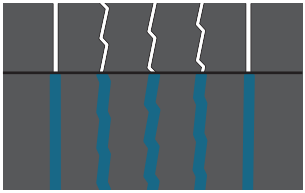
Short and long distance journeys on all types of roads.

X® MULTI™ T2



Dimension	Theoretical regrooving depth*	Regrooving width	Blade
205/65 R 17.5	3 mm	6 to 7 mm	R3
215/75 R 17.5			
235/75 R 17.5	3 mm	6 to 8 mm	R3
245/70 R 17.5			
385/55 R 22.5	3 mm	8 to 10 mm	R3

X® ONE™ MAXITRAILER™ +



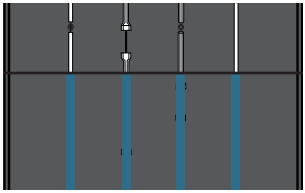
Dimension	Theoretical regrooving depth*	Regrooving width	Blade
455/45 R 22.5	3 mm	8 to 10 mm	R3

*The regrooving depth should always be checked before regrooving, see details on page 103.

X® MULTI™

Short and long distance journeys on all types of roads.

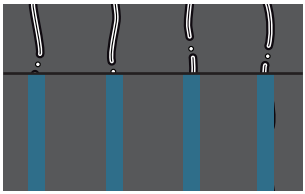
X® MULTI™ HL T



Dimension	Theoretical regrooving depth*	Regrooving width	Blade
445/45 R 19.5**	3 mm	6 to 8 mm	R3
385/65 R 22.5	3 mm	8 to 10 mm	R3

** 6 ribs.

X® MULTI™ WINTER T



Dimension	Theoretical regrooving depth*	Regrooving width	Blade
385/65 R 22.5	3 mm	8 to 10 mm	R3

*The regrooving depth should always be checked before regrooving, see details on page 103.

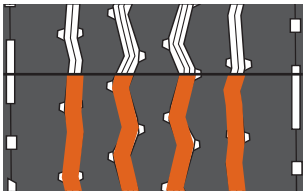
X® WORKS™

Mixed use on roads, worksites and quarries.

XZY

Dimension	Theoretical regrooving depth*	Regrooving width	Blade
9.5 R 17.5	3 mm	6 to 8 mm	R3
10 R 22.5	4 mm	8 to 10 mm	R3

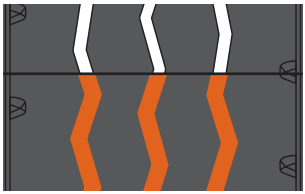
X® WORKS™ Z



Dimension	Theoretical regrooving depth*	Regrooving width	Blade
295/80 R 22.5	4 mm	8 to 10 mm	R4
315/80 R 22.5**	3 mm	8 to 10 mm	R4
13 R 22.5**			

** 3 ribs.

X® WORKS™ Z2



Dimension	Theoretical regrooving depth*	Regrooving width	Blade
325/95 R 24	4 mm	8 to 10 mm	R3 or R4

*The regrooving depth should always be checked before regrooving, see details on page 103.

X® WORKS™

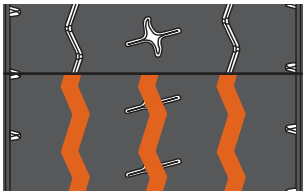
Mixed use on roads, worksites and quarries.

X® WORKS™ HD Z

Dimension	Theoretical regrooving depth*	Regrooving width	Blade
315/80 R 22.5**	4 mm	8 to 10 mm	R3
13 R 22.5	3 mm	8 to 10 mm	R3 or R4

** 4 ribs.

X® WORKS™ HL Z



Dimension	Theoretical regrooving depth*	Regrooving width	Blade
385/65 R 22.5	3 mm	10 to 12 mm	R4

X® WORKS™ D

Dimension	Theoretical regrooving depth*	Regrooving width	Blade
295/80 R 22.5	3 mm	6 to 8 mm	R3
315/80 R 22.5	3 mm	6 to 8 mm	R4
13 R 22.5			

*The regrooving depth should always be checked before regrooving, see details on page 103.

X WORKS™

Mixed use on roads, worksites and quarries.

X® WORKS™ D2

Dimension	Theoretical regrooving depth*	Regrooving width	Blade
325/95 R 24	4 mm	8 to 10 mm	R3 or R4

X® WORKS™ HD D

Dimension	Theoretical regrooving depth*	Regrooving width	Blade
315/80 R 22.5	4 mm	6 to 8 mm	R3
13 R 22.5	3 mm	6 to 8 mm	R3

XTY 2

Dimension	Theoretical regrooving depth*	Regrooving width	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

*The regrooving depth should always be checked before regrooving, see details on page 103.

X® WORKS™

Mixed use on roads, worksites and quarries.

XZY 3

Dimension	Theoretical regrooving depth*	Regrooving width	Blade
11 R 22.5	3 mm	8 to 10 mm	R4
445/65 R 22.5	4 mm	10 to 12 mm	R4

XZY 3

Dimension	Theoretical regrooving depth*	Regrooving width	Blade
385/65 R 22.5	4 mm	10 to 12 mm	R4
425/65 R 22.5			

X® WORKS™ T

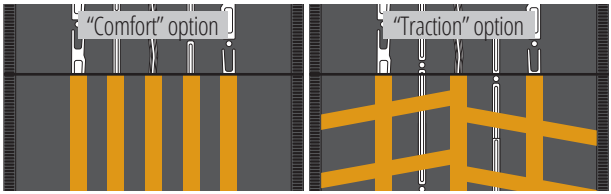
Dimension	Theoretical regrooving depth*	Regrooving width	Blade
385/65 R 22.5	3 mm	10 to 12 mm	R4

*The regrooving depth should always be checked before regrooving, see details on page 103.

X COACH™

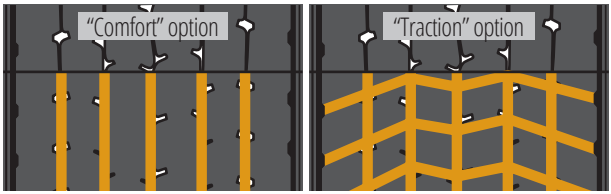
People transportation, short and long distances, on all types of roads.

X® COACH™ Z



Dimension	Theoretical regrooving depth*	Regrooving width	Blade
295/80 R 22.5	3 mm	8 to 10 mm	R3 or R4

X® COACH™ XD



Dimension	Theoretical regrooving depth*	Regrooving width	Blade
295/80 R 22.5	3 mm	6 to 8 mm	R3

*The regrooving depth should always be checked before regrooving, see details on page 103.

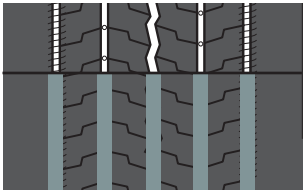
X INCITY™

Urban and suburban driving.

X® INCITY™ XZU

Dimension	Theoretical regrooving depth*	Regrooving width	Blade
275/70 R 22.5	4 mm	8 to 10 mm	R3 or R4

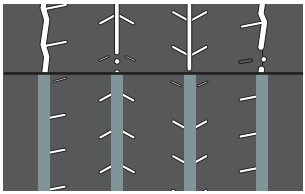
X® INCITY™ Z



Dimension	Theoretical regrooving depth*	Regrooving width	Blade
11 R 22.5**	4 mm	8 to 10 mm	R4
295/80 R 22.5	3 mm	6 to 8 mm	R3

** 3 ribs.

X® INCITY™ EV Z
X® INCITY™ HL Z**



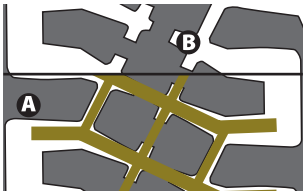
Dimension	Theoretical regrooving depth*	Regrooving width	Blade
275/70 R 22.5	3 mm	7 to 8 mm	R3
** 275/70 R 22.5	4 mm	5 to 6 mm	R2 or R3

*The regrooving depth should always be checked before regrooving, see details on page 103.

X® FORCE™

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

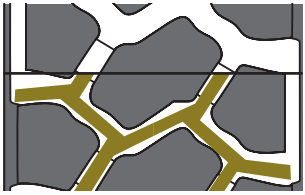
X® FORCE™ ML / XML



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

** 5 ribs.

X® FORCE™ ZH



Dimension	Theoretical regrooving depth*	Regrooving width	Blade
13 R 22.5	4 mm	12 to 14 mm	R4
315/80 R 22.5			
325/95 R 24		10 to 12 mm	R4

*The regrooving depth should always be checked before regrooving, see details on page 103.

X® FORCE™

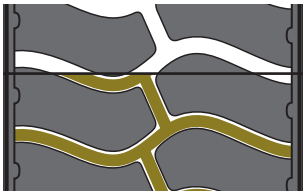
Specialised, civil or military vehicles mostly driven on off-road surfaces.

X® FORCE™ Z** / X® FORCE™ ZL

Dimension	Theoretical regrooving depth*	Regrooving width	Blade
** 325/85 R 16 (1)	3 mm	10 mm	R4
275/80 R 20 (10.5 R 20) (1)	4 mm	10 to 12 mm	R3
335/80 R 20 (12.5 R 20) (1)	4 mm	10 to 12 mm	R4
*** 365/80 R 20 (14.5 R 20)	4 mm	8 to 10 mm	R4
*** 14.00 R 20	3 mm	8 to 10 mm	R4
*** 16.00 R 20	3 mm	10 to 12 mm	R4
*** 365/85 R 20	3 mm	8 to 10 mm	R4
*** 395/85 R20			

*** 5 ribs.
(1) see diagram number 1 on the next page (MICHELIN XZL / XZL+).

XZL 2



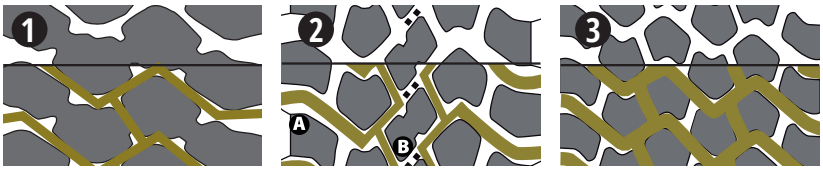
Dimension	Theoretical regrooving depth*	Regrooving width	Blade
395/85 R 20	3 mm	8 to 10 mm	R3

*The regrooving depth should always be checked before regrooving, see details on page 103.

X-FORCE™

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

XZL / XZL+**



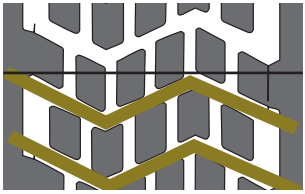
Dimension	Theoretical regrooving depth*	Regrooving width	Blade	Diagram No.
255/100 R 16 (9.00 R 16)	3 mm	10 to 12 mm	R4	1
10.00 R 20	4 mm	10 to 12 mm	R4	
11.00 R 20	4 mm	11 to 13 mm	R3	
12.00 R 20	4 mm	10 to 12 mm	R4	
** 14.00 R 20	3 mm	10 to 12 mm	R4	
16.00 R 20	4 mm	10 to 12 mm	R4	
365/85 R 20				
395/85 R 20				
13 R 22.5				
445/65 R 22.5	4 mm	A = 20 mm B = 8 to 10 mm	R3 or R4	2
24 R 21	4 mm	10 to 12 mm	R4	3

*The regrooving depth should always be checked before regrooving, see details on page 103.

X FORCE™

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

XS



Dimension	Theoretical regrooving depth*	Regrooving width	Blade
24 R 20.5	4 mm	8 to 10 mm	R3 or R4
525/65 R 20.5 (20.5 R 20.5)			

*The regrooving depth should always be checked before regrooving, see details on page 103.

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.
We do not recommend mounting MICHELIN Remix tyres on the first steering axle of motor vehicles; including tread Z. It is possible to mount MICHELIN Remix tyres on the second front axle of a 8 x 4 truck.

WHY RETREAD?

■ Reduce your running costs

- Reduction in the cost per kilometre.
- Regroovability is assured.
- Excellent retreadability:
  – MICHELIN Remix retreaded tyres guarantee levels of performance similar to new tyres.
  – Constant regrooving thickness.
- Benefit from our pledge of quality and reliability as MICHELIN Remix retreading is carried out:
  – Exclusively on MICHELIN casings, the MICHELIN casing is an asset to exploit right down to the last kilometre.
  – With the same materials used for the production of new tyres.

■ Protect the environment by reducing your waste

- Nearly 9 out of 10 MICHELIN casings are retreaded, which limits the number of worn tyres.
- Less waste to be processed.
- 45 kg(*) of raw materials saved per tyre.
- Assured traceability, simplified management

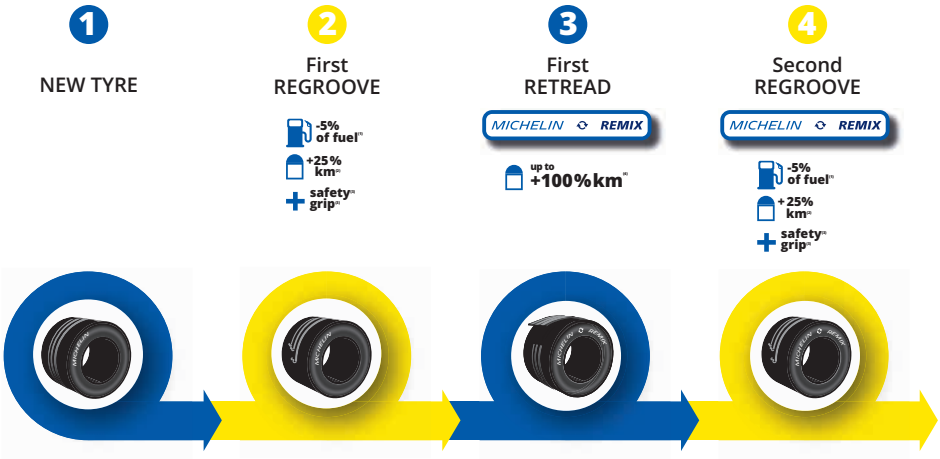
– The casing represents about 70% of the weight of a tyre. By retreading it, the raw materials used are considerably reduced, as a large proportion of the original materials is kept.

– Possible to request the retreading of your casings identified by a unique number (serial number).

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

MICHELIN

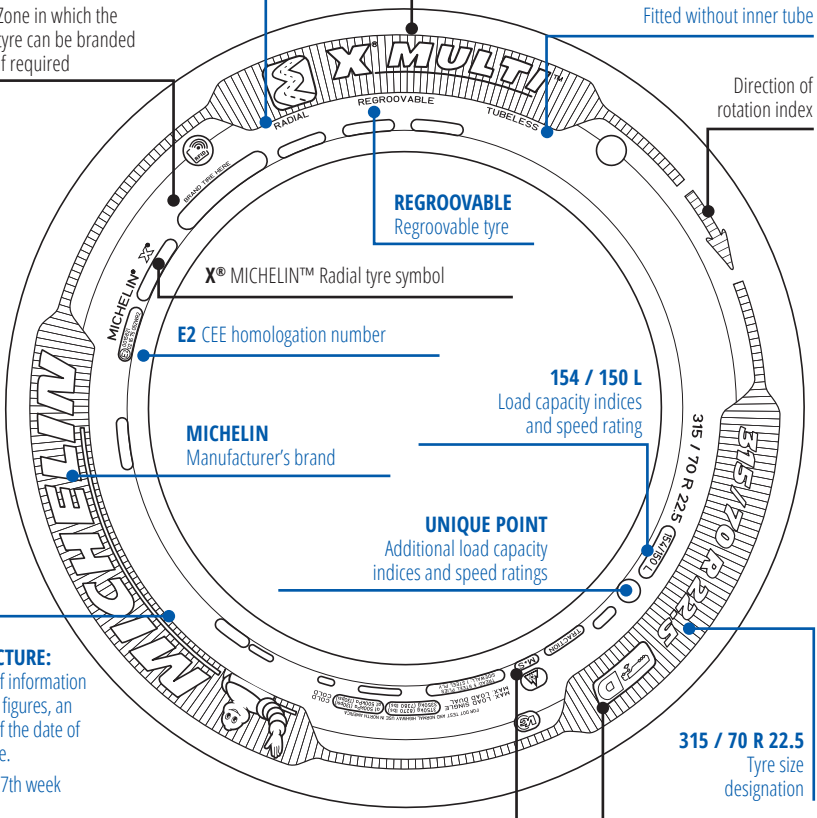
THE BENEFITS OF MICHELIN MULTI-LIFE



(1) 5,6% fuel consumption gain: Internal study performed at Ladoux (France), May 2021, carried out under DEKRA supervision, comparing 315/70 R 22.5 MICHELIN X® LINE™ ENERGY™ Z2 & D2 new tyres vs. regrooved tyres (R5mm). Results may vary depending on weather conditions, road type, tyre size and driving style. (2) Compared to a worn non-regrooved MICHELIN tyre. Based on a 4-mm average regrooving. Information taken from recommendations made by the French tyre manufacturers' federation TNPF in 2013 according to which regrooving of worn tyres increases tyre lifetime by using all available rubber. (3) On wet ground, regrooved tyres offer approx. 10% greater transverse grip and traction compared to the same worn tyres. Internal study carried out by Michelin in 2010 at Ladoux on a polished concrete track; results may vary depending on the conditions of use. (4) The tread compound and pattern of the MICHELIN Remix tyres are largely the same as those used for new MICHELIN tyres. 90% of the range of MICHELIN Remix tyres uses the same mould and the same materials as new MICHELIN tyres which may lead to up to equivalent performance between MICHELIN Remix tyres and new Michelin tyres. Internal evaluations carried out by the Michelin Research and Technology Center based on customer testimonials collected in Europe since 2015.

Technical specifications and Michelin tyre pressure advice

TRUCK TYRE MARKINGS



RADIAL
Indication of the structure

BRAND TYRE ZONE
Zone in which the tyre can be branded if required

X® MULTI™
Indication of the tread patter

TUBELESS
Fitted without inner tube

Direction of rotation index

REGROOVABLE
Regroovable tyre

X® MICHELIN™ Radial tyre symbol

E2 CEE homologation number

154 / 150 L
Load capacity indices and speed rating

MICHELIN
Manufacturer's brand

UNIQUE POINT
Additional load capacity indices and speed ratings

DATE OF MANUFACTURE:
Sequence of information ends with 4 figures, an indication of the date of manufacture.
Eg.: 2710 (27th week of 2010)

315 / 70 R 22.5
Tyre size designation

CATEGORY OF USE
3PMSF/M+S: "snow" category tyre according to regulation "R54" (CE)
661/2009: "snow" category tyre according to regulation "R117".
Traction: tyre for traction use according to regulation "R117"

D
Tyre position code
D: drive axle

BLUE TEXT, mandatory markings

NAMES OF MICHELIN TYRES

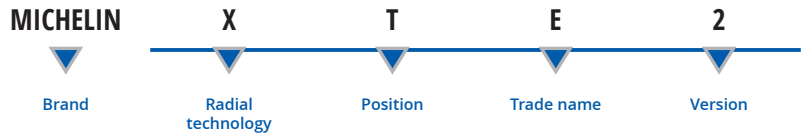
■ **MICHELIN uses the following naming convention for its tyres**

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:

Ranges	Options	Positions
LINE™	ENERGY™: fuel efficiency	F: Front (steering)
MULTI™	GRIP: all-season grip	D: Drive
WORKS™	WINTER: winter conditions	T: Trailer
FORCE™	ICEGRIP : grip on ice	Z: All positions
INCITY™	HD: "Heavy Duty "	
COACH™	HL: "Heavy Load"	

List is subject to change.

■ **Older MICHELIN naming convention:**



■ **Older trade name:**

A: Motorways
E: Regional
Y: On-Off road
L: Off road
U: Urban

MICHELIN

LOAD CAPACITY INDICES AND SPEED RATINGS

■ Load capacity indices

LI	kg	LI	kg	LI	kg	LI	kg
95	690	**119**	1360	**143**	2725	**167**	5450
96	710	**120**	1400	**144**	2800	**168**	5600
97	730	**121**	1450	**145**	2900	**169**	5800
98	750	**122**	1500	**146**	3000	**170**	6000
99	775	**123**	1550	**147**	3075	**171**	6150
100	800	**124**	1600	**148**	3150	**172**	6300
101	825	**125**	1650	**149**	3250	**173**	6500
102	850	**126**	1700	**150**	3350	**174**	6700
103	875	**127**	1750	**151**	3450	**175**	6900
104	900	**128**	1800	**152**	3550	**176**	7100
105	925	**129**	1850	**153**	3650	**177**	7300
106	950	**130**	1900	**154**	3750	**178**	7500
107	975	**131**	1950	**155**	3875	**179**	7750
108	1000	**132**	2000	**156**	4000	**180**	8000
109	1030	**133**	2060	**157**	4125	**181**	8250
110	1060	**134**	2120	**158**	4250	**182**	8500
111	1090	**135**	2180	**159**	4375	**183**	8750
112	1120	**136**	2240	**160**	4500	**184**	9000
113	1150	**137**	2300	**161**	4625	**185**	9250
114	1180	**138**	2360	**162**	4750	**186**	9500
115	1215	**139**	2430	**163**	4875	**187**	9750
116	1250	**140**	2500	**164**	5000	**188**	10000
117	1285	**141**	2575	**165**	5150	**189**	10300
118	1320	**142**	2650	**166**	5300	**190**	10600

■ Speed ratings

SI	km/h	SI	km/h
D	65	**L**	120
E	70	**M**	130
F	80	**N**	140
G	90	**P**	150
J	100	**Q**	160
K	110	**R**	170

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.

■ Variation of the load capacity according to speed

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 (km/h)	Load capacity variation (%)						Pressure compensation (%)
	F (80 km/h)	G (90 km/h)	J (100 km/h)	K (110 km/h)	L (120 km/h)	M (130 km/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	+7	+7	+7	+7	+7	+2
75	+2.5	+5.5	+5.5	+5.5	+5.5	+5.5	+1
80	[0]	+4	+4	+4	+4	+4	0
85		+2	+3	+3	+3	+3	0
90		[0]	+2	+2	+2	+2	0
95			+1	+1	+1	+1	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 bars (145 PSI).

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

MICHELIN

Unique point

A number of truck tyre dimensions have 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 is given in the technical specification tables on pages 146 to 177.

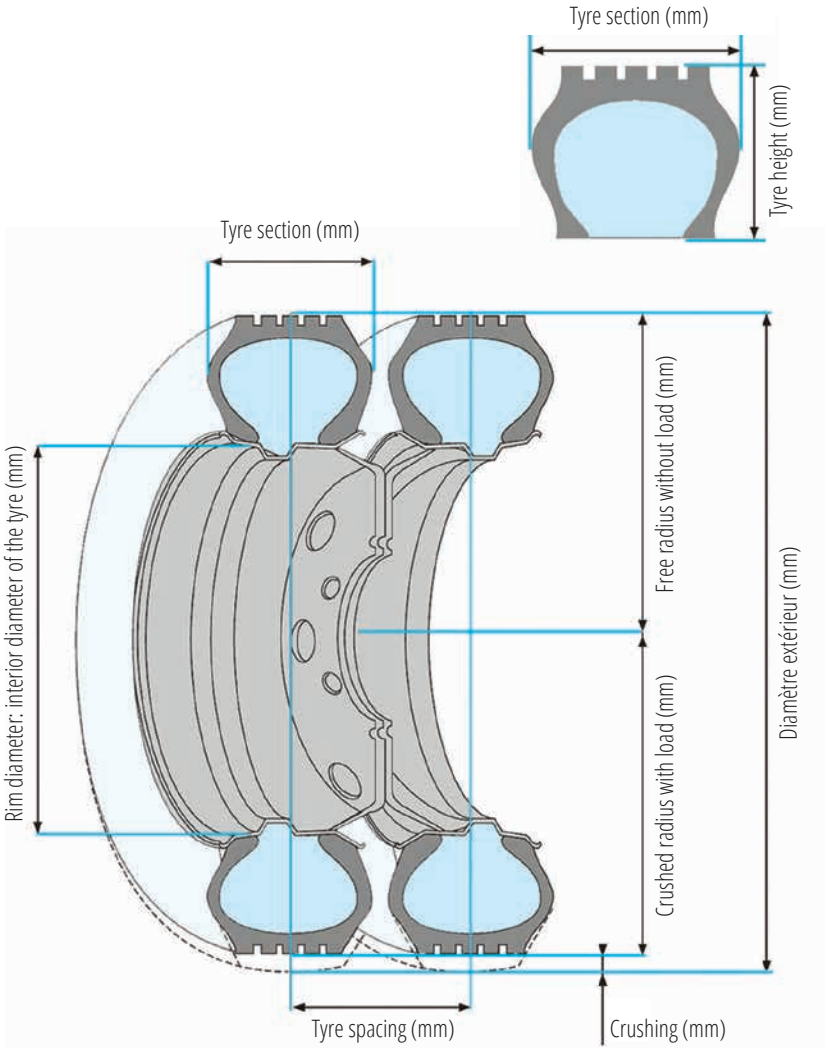
IMPORTANT: load variances based on speed only apply to the main load index in single formation.

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

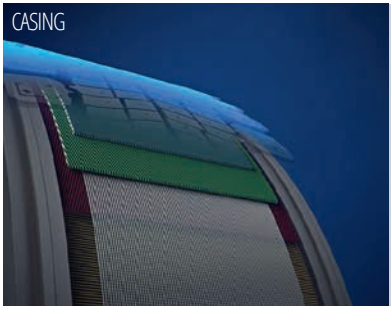
Example of load and speed indices:

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

■ Dimensional tyre data



MICHELIN TYRE TECHNOLOGIES



INFINICOIL: reinforced casing for greater stability and safety.

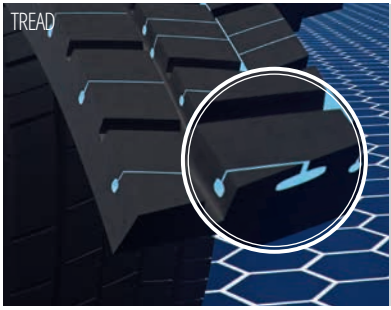
Steel wire which wraps around the casing (can measure up to 400 metres) and also provides better mileage performance

POWERCOIL: improved casing endurance.

New generation of cables which are more robust and resistant to oxidation.

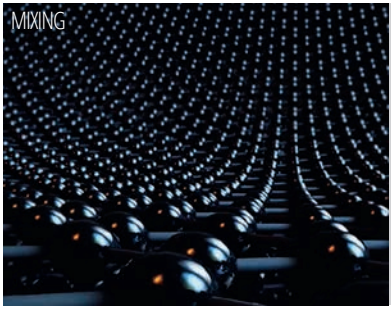
DURACOIL: reinforced heel for better endurance.

High-quality nylon which protects the structure of the area of the tyre in contact with the wheel.



REGENION: grip throughout the tyre's service life.

Self-regenerating tread from our moulds using 3D metal printing technology.



FORCION: rubber which is more resistant for more kilometres.

New material which reinforces the rubber and increases the mileage performance.

CARBION: improves the mileage longevity.

Innovative industrial process which improves the quality of the rubber mixing.

MICHELIN

Dimension	Tread pattern * = preliminary data	TT/TL	LI/SI	European labelling				M+S	3PMSF (d)	Crushed section (mm) (e)	Free section (mm) (e)	Diameter (mm) (e)	Crushed radius (mm) (e)	Rolling circumference (mm) (e)
				(a)	(b)	(c)	dB							
SEAT 9														
6.00 R 9	**XTA**	TT	109/108F	NA	NA	NA	NA			179	163	530	244	1610
SEAT 15														
8.25 R 15	**XTA**	TT	143/141G	C	B	A	66			260	232	834	381	2547
SEAT 16														
7.00 R 16	**AGILIS LT**	TL	117/116N	C	C	A	68	✓		217	195	782	365	2388
7.50 R 16	**AGILIS LTVG**	TL	122/121L	D	B	A	67	✓		248	226	824	386	2450
SEAT 17.5														
8.5 R 17.5	**XZA**	TL	121/120N	C	B	A	69			221	200	802	372	2447
8.5 R 17.5	**XZT**	TL	121/120L	F	C	B	72	✓		222	200	806	374	2459
9.5 R 17.5	**XZY**	TL	129/127L	D	C	B	72			250	228	840	388	2559
9.5 R 17.5	**XTE 2**	TL	143/141J	C	B	A	67			257	230	846	386	2560
10 R 17.5	**XZA**	TL	134/132L	D	C	A	66			266	241	861	397	2620
205/65 R 17.5	**X MULTI T2**	TL	132/130J	C	C	A	68	✓	✓	225	208	716	331	2194
205/75 R 17.5	**X MULTI Z**	TL	124/122M	D	B	A	70	✓	✓	232	210	755	350	2304
205/75 R 17.5	**X MULTI D**	TL	124/122M	D	C	A	70	✓	✓	230	210	755	351	2295
215/75 R 17.5	**X MULTI Z**	TL	126/124M	D	B	A	68	✓	✓	237	217	770	357	2346
215/75 R 17.5	**X MULTI D**	TL	126/124M	D	C	A	69	✓	✓	236	216	775	359	2350

These values are for guidance only and under no circumstances may be used for judicial or legal motives. (a) Fuel efficiency class (from A to E). (b) Wet grip class (from A to E).
(c) External rolling noise class (from A to C) and measured value in decibels (dB). (d) 3PMSF: Tyre for use in severe snow conditions. (e) Michelin dimensions, measured value on rim recommended by Michelin.

Minimum spacing (mm) (*)	Recommended wheels (inches)	MAXIMUM LOAD PER AXLE (Kg) according to pressure (bar / PSI) Nominal loads in bold.											
		SG or TW configuration	4.0 bar	4.5 bar	5.0 bar	5.5 bar	6.0 bar	6.5 bar	7.0 bar	7.5 bar	8.0 bar	8.5 bar	9.0 bar
			58 PSI	65 PSI	73 P I	80 PSI	87 PSI	94 PSI	102 PSI	109 PSI	116 PSI	123 PSI	131 PSI
185	4.00E	SG			1350	1470	1590	1710	1820	1940	**2060**		
		TW			2630	2860	3090	3310	3540	3770	**4000**		
263	6.50	SG				3680	3980	4280	4560	4860	5160	**5450**	
		TW				6960	7520	8080	8640	9200	9760	**10300**	
221	5.50F	SG	1810	2000	2190	2380	**2570**						
			3520	3890	4260	4630	**5000**						
256	6.00G	SG	1840	2040	2220	2420	2620	2800	**3000**				
		TW	3560	3920	4320	4680	5040	5440	**5800**				
227	5.25	SG	1970	2180	2380	2590	**2800**						
			3800	4200	4600	5000	5400						
227	5.25	SG	1970	2180	2380	2590	**2800**						
		TW	3800	4200	4600	5000	5400						
258	6.00	SG	2270	2510	2750	2980	3220	3460	**3700**				
		TW	4280	4760	5200	5640	6080	6560	**7000**				
260	6.75	SG				3680	3980	4280	4560	4860	5160	**5450**	
		TW				6960	7520	8080	8640	9200	9760	**10300**	
273	6.75	SG		2700	2960	3210	3470	3730	3980	**4240**			
		TW		5090	5580	6060	6550	7030	7520	**8000**			
	6.00	SG					2760	2980	3180	3380	3580	3800	**4000**
		TW					5280	5640	6040	6440	6840	7200	**7600**
238	6.00	SG		2120	2320	2520	2720	2920	3120				
		TW		3960	4320	4720	5080	5480	5840				
238	6.00	SG		2120	2320	2520	2720	2920	3120				
		TW		3960	4320	4720	5080	5480	5840				
245	6.00	SG	2110	2330	2560	2780	3000	3220					
		TW	3970	4390	4810	5230	5650	6070					
245	6.00	SG	2110	2330	2560	2780	3000	3220					
			3970	4390	4810	5230	5650	6070					

* Provisional data. 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 detailed list of technical specifications for all our products at: business.michelin.co.uk

Dimension	Tread pattern * = preliminary data	TT/TL	LI/SI	European labelling				M+S	3PMSF (d)	Crushed section (mm) (e)	Free section (mm) (e)	Diameter (mm) (e)	Crushed radius (mm) (e)	Rolling circumference (mm) (e)
				(a)	(b)	(c)	dB							
215/75 R 17.5	X LINE ENERGY T	TL	135/133J	B	B	A	68			238	215	772	357	2368
215/75 R 17.5	X MULTI T2	TL	136/134J	C	C	A	68	✓	✓	226	208	766	354	2353
225/75 R 17.5	X MULTI Z	TL	129/127M	D	B	A	68	✓	✓	255	233	787	365	2407
225/75 R 17.5	X MULTI D	TL	129/127M	D	C	A	69	✓	✓	257	234	790	366	2400
235/75 R 17.5	X MULTI Z	TL	132/130M	D	B	A	69	✓	✓	243	241	799	371	2439
235/75 R 17.5	X MULTI D	TL	132/130M	D	C	A	69	✓	✓	263	240	801	370	2433
235/75 R 17.5	X LINE ENERGY T	TL	143/141J	B	B	A	68			270	246	793	363	2424
235/75 R 17.5	X MULTI T2	TL	143/141J	C	C	A	68	✓	✓	264	240	797	365	2445
245/70 R 17.5	X MULTI Z	TL	136/134M	D	B	A	69	✓	✓	269	246	793	366	2417
245/70 R 17.5	X MULTI D	TL	136/134M	D	C	A	69	✓	✓	268	246	795	368	2415
245/70 R 17.5	X LINE ENERGY T	TL	143/141J	B	B	A	68			270	246	793	363	2424
245/70 R 17.5	X MULTI T2	TL	143/141J	C	C	A	68	✓	✓	264	240	798	365	2444
265/70 R 17.5	X MULTI Z	TL	140/138M	D	B	A	72	✓	✓	289	266	816	376	2487
265/70 R 17.5	X MULTI D	TL	140/138M	D	C	A	72	✓	✓	290	266	814	374	2472
SEAT 19.5														
245/70 R 19.5	X MULTI Z	TL	136/134M	D	B	A	68	✓	✓	246	243	845	393	2583

These values are for guidance only and under no circumstances may be used for judicial or legal motives. (a) Fuel efficiency class (from A to E). (b) Wet grip class (from A to E).
(c) External rolling noise class (from A to C) and measured value in decibels (dB). (d) 3PMSF: Tyre for use in severe snow conditions. (e) Michelin dimensions, measured value on rim recommended by Michelin.

Minimum spacing (mm) [e]	Recommended wheels (inches)	MAXIMUM LOAD PER AXLE (Kg) according to pressure (bar / PSI) Nominal loads in bold.											
		SG or TW configuration	4.0 bar	4.5 bar	5.0 bar	5.5 bar	6.0 bar	6.5 bar	7.0 bar	7.5 bar	8.0 bar	8.5 bar	9.0 bar
			58 PSI	65 PSI	73 PSI	80 PSI	87 PSI	94 PSI	102 PSI	109 PSI	116 PSI	123 PSI	131 PSI
243	6.00	SG				2950	3180	3420	3650	3890	4120	**4360**	
		TW				5570	6010	6460	6900	7350	7790	**8240**	
244	6.00	SG					3100	3340	3560	3800	4020	4260	**4480**
		TW					5880	6320	6760	7160	7600	8040	**8480**
264	6.75	SG		2440	2680	2900	3140	3380	3600				
		TW		4640	5080	5520	5960	6400	6840				
265	6.75	SG		2440	2680	2900	3140	3380	3600				
		TW		4640	5080	5520	5960	6400	6840				
273	6.75	SG		2520	2760	3000	3240	3480	3720	3960			
		TW		4760	5240	5680	6160	6600	7040	7520			
272	6.75	SG		2520	2760	3000	3240	3480	3720	3960			
		TW		4760	5240	5680	6160	6600	7040	7520			
278	6.75	SG					3980	4270	4570	4860	5160	**5450**	
		TW					7520	8070	8630	9190	9740	**10300**	
272	6.75	SG					3780	4060	4340	4620	4900	5180	**5450**
		TW					7120	7640	8200	8720	9240	9760	**10300**
278	6.75	SG				3100	3340	3580	3840	4080	4340		
		TW				5840	6320	6800	7280	7720	8200		
278	6.75	SG			2850	3090	3340	3590	3840	4080	4330		
		TW			5390	5860	6320	6790	7260	7730	8200		
278	6.75	SG					3980	4270	4570	4860	5160	**5450**	
		TW					7520	8070	8630	9190	9740	**10300**	
272	6.75	SG					3780	4060	4340	4620	4900	5180	**5450**
		TW					7120	7640	8200	8720	9240	9760	**10300**
301	7.50	SG			3320	3620	3900	4200	4480	4760			
		TW			6280	6840	7360	7920	8440	9000			
301	7.50	SG			3320	3620	3900	4200	4480	4760			
		TW			6280	6840	7360	7920	8440	9000			
275	6.75	SG			2980	3240	3500	3750	4010	4400			
		TW			5640	6130	6620	7110	7600	8090			

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Dimension	Tread pattern * = preliminary data	TT/TL	LI/SI	European labelling				M+S	3PMSF (d)	Crushed section (mm) (e)	Free section (mm) (e)	Diameter (mm) (e)	Crushed radius (mm) (e)	Rolling circumference (mm) (e)
				(a)	(b)	(c)	dB							
245/70 R 19.5	X MULTI D	TL	136/134M	D	C	A	70	✓	✓	264	241	847	394	2580
245/70 R 19.5	XTE 2	TL	141/140J	C	B	A	67			269	246	849	392	2580
255/60 R 19.5	X MAXI TRAILER	TL	143/141J	C	C	A	67	✓		277	256	805	373	2469
265/70 R 19.5	X MULTI Z	TL	140/138M	D	B	A	69	✓	✓	287	259	864	400	2642
265/70 R 19.5	X MULTI D	TL	140/138M	D	C	A	71	✓	✓	286	262	868	402	2638
265/70 R 19.5	XDW ICE GRIP	TL	140/138L	E	C	A	72	✓	✓	288	264	875	405	2670
265/70 R 19.5	X LINE ENERGY T	TL	143/141J	B	B	A	68			290	265	862	399	2646
265/70 R 19.5	XTE 2	TL	143/141J	D	B	A	68	✓		286	265	870	403	2650
265/70 R 19.5	XTY 2	TL	143/141J	D	B	A	70	✓	✓	285	263	873	403	2660
285/70 R 19.5	X MULTI Z	TL	146/144L	C	B	A	70	✓	✓	299	273	893	410	2721
285/70 R 19.5	X MULTI D	TL	146/144L	D	C	A	72	✓	✓	276	273	897	412	2720
285/70 R 19.5	XTA 2 ENERGY	TL	150/148J	C	B	A	69			309	285	890	409	2723
285/70 R 19.5	XTE 2	TL	150/148J	C	B	A	68	✓		311	285	894	409	2732
305/70 R 19.5	XZE 2+	TL	147/145M	D	C	A	70	✓	✓	327	301	924	424	2800
445/45 R 19.5	X LINE ENERGY T	TL	160K	A	C	B	71			457	430	896	411	2754

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(c) External rolling noise class (from A to C) and measured value in decibels (dB). (d) 3PMSF: Tyre for use in severe snow conditions. (e) Michelin dimensions, measured value on rim recommended by Michelin.

Minimum spacing (mm) (*)	Recommended wheels (inches)	MAXIMUM LOAD PER AXLE (Kg) according to pressure (bar / PSI) Nominal loads in bold.											
		SG or TW configuration	4.0 bar	4.5 bar	5.0 bar	5.5 bar	6.0 bar	6.5 bar	7.0 bar	7.5 bar	8.0 bar	8.5 bar	9.0 bar
			58 PSI	65 PSI	73 PSI	80 PSI	87 PSI	94 PSI	102 PSI	109 PSI	116 PSI	123 PSI	131 PSI
273	6.75	SG			2980	3240	3500	3750	4010	4400			
		TW			5640	6130	6620	7110	7600	8090			
278	6.75	SG				3480	3760	4040	4310	4590	4870	**5150**	
		TW				6760	7300	7840	8380	8920	9460	**10000**	
290	7.50	SG					3770	4050	4330	4610	4890	5170	**5450**
		TW					7130	7660	8190	8720	9240	9770	**10300**
293	7.50	SG		3140	3440	3740	4040	4340	4640	4940			
		TW		5920	6520	7080	7640	8200	8760	9320			
297	7.50	SG		3140	3440	3740	4040	4340	4640	4940			
		TW		5920	6520	7080	7640	8200	8760	9320			
299	7.50	SG		3140	3440	3740	4040	4340	4640	4940			
		TW		5920	6520	7080	7640	8200	8760	9320			
300	7.50	SG				3680	3980	4270	4570	4860	5160	**5450**	
		TW				6960	7520	8070	8630	9190	9740	**10300**	
300	7.50	SG				3680	3980	4270	4570	4860	5160	**5450**	
		TW				6960	7520	8070	8630	9190	9740	**10300**	
298	7.50	SG				3680	3980	4270	4570	4860	5160	**5450**	
		TW				6960	7520	8070	8630	9190	9740	**10300**	
309	7.50	SG			3810	4140	4480	4810	5140	5470	5800		
		TW			7120	7730	8350	8970	9590	10210	10830		
309	7.50	SG			3810	4140	4480	4810	5140	5470	5800		
		TW			7120	7730	8350	8970	9590	10210	10830		
323	8.25	SG					4640	4980	5330	5670	6010	6360	**6700**
		TW					8720	9370	10020	10660	11310	11950	**12600**
323	8.25	SG					4640	4980	5330	5670	6010	6360	**6700**
		TW					8720	9370	10020	10660	11310	11950	**12600**
341	8.25	SG			4040	400	4740	5100	5440	5800	**6150**		
		TW			7640	8280	8960	9600	10280	10920	**11600**		
	14.00	SG					6230	6690	7150	7620	8080	8540	**9000**
		TW											

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Dimension	Tread pattern * = preliminary data	TT/TL	LI/SI	European labelling				M+S	3PMSF (d)	Crushed section (mm) (e)	Free section (mm) (e)	Diameter (mm) (e)	Crushed radius (mm) (e)	Rolling circumference (mm) (e)
				(a)	(b)	(c)	dB							
445/45 R 19.5	X MULTI HL T	TL	164J	B	C	A	70	✓	✓	477	446	900	411	2763
SEAT 22.5														
10 R 22.5	XZY	TL	144/142K	D	B	A	69			271	244	1017	473	3110
11 R 22.5	X MULTI Z2	TL	148/145L	C	C	A	71	✓		299	272	1044	488	3200
11 R 22.5	XZY 3	TL	148/145K	D	B	A	69	✓		303	275	1060	493	3236
11 R 22.5	X INCITY Z	TL	148/145J	D	C	A	69	✓	✓	308	282	1054	492	3221
11 R 22.5	X MULTI D+*	TL	148/145L	E*	C*	B*	74*	✓	✓	314*	284*	1067*	498*	3233*
12 R 22.5	X MULTI Z	TL	152/149L	D	B	A	68			323	296	1082	504	3314
12 R 22.5	X MULTI Z2*	TL	152/149L	C*	C*	A*	70*	✓		319*	289*	1076*	500*	3294*
12 R 22.5	X MULTI D	TL	152/149L	E	C	A	72	✓	✓	325	298	1096	511	3328
12 R 22.5	X MULTI D2	TL	152/149L	D	C	A	73	✓	✓	331	299	1092	509	3316
13 R 22.5	X WORKS Z	TL	156/150K	C	B	A	72	✓	✓	342	307	1113	517	3405
13 R 22.5	X WORKS HD Z	TL	156/151K	D	B	A	69	✓	✓	340	307	1122	523	3425
13 R 22.5	X WORKS D	TL	156/150K	C	B	B	74	✓	✓	342	307	1120	520	3400
13 R 22.5	X WORKS HD D	TL	156/151K	D	B	B	73	✓	✓	341	305	1126	523	3430
275/70 R 22.5	X MULTI Z	TL	148/145L	D	B	A	69			302	278	959	448	2942

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(c) External rolling noise class (from A to C) and measured value in decibels (dB). (d) 3PMSF: Tyre for use in severe snow conditions. (e) Michelin dimensions, measured value on rim recommended by Michelin.

Minimum spacing (mm) (e)	Recommended wheels (inches)	MAXIMUM LOAD PER AXLE (Kg) according to pressure (bar / PSI) Nominal loads in bold.												
		SG or TW configuration	4.0 bar	4.5 bar	5.0 bar	5.5 bar	6.0 bar	6.5 bar	7.0 bar	7.5 bar	8.0 bar	8.5 bar	9.0 bar
			58 PSI	65 PSI	73 PSI	80 PSI	87 PSI	94 PSI	102 PSI	109 PSI	116 PSI	123 PSI	131 PSI
	14.00 / 15.00	SG					6920	7440	7940	8460	8980	9480	**10000**
		TW											
276	7.50	SG			3680	4000	4320	4640	4960	5280	**5600**		
		TW			6970	7570	8180	8780	9390	9990	**10600**		
	7.50	SG				4260	4600	4940	5280	5620	5960	**6300**	
		TW				7840	8480	9080	9720	10360	10960	**11600**	
311	7.50	SG			4140	4500	4860	5220	5580	5940	**6300**		
		TW			7620	8290	8950	9610	10270	10940	**11600**		
320	8.25	SG				4350	4700	5050	5400	5740	6090		
		TW				8010	8650	9290	9930	10570	11220		
	8.25	SG				4350	4700	5050	5400	5740	6090		
		TW				8010	8650	9290	9930	10570	11220		
338	8.25	SG				4800	5180	5560	5950	6330	6720	**7100**	
		TW				8780	9490	10190	10890	11590	12300	**13000**	
327*	8.25 / 9.00*	SG				4800	5180	5560	5950	6330	6720	**7100**	
		TW				8780	9490	10190	10890	11590	12300	**13000**	
	9.00	SG				4900	5300	5690	6080	6470	6860	**7100**	
		TW				8980	9700	10410	11130	11850	12570	**13000**	
	9.00	SG				4900	5300	5690	6080	6470	6860	**7100**	
		TW				8980	9700	10410	11130	11850	12570	**13000**	
	9.00 / 9.75	SG					5680	6100	6520	6940	7360	7780	
		TW					9520	10240	10920	11640	12360	13040	
349	9.00	SG					5680	6110	6530	6950	7370	7790	
		TW					9810	10530	11260	11980	12710	13440	
347	9.00	SG				5340	5780	6200	6640	7060	7480	7920	
		TW				8960	9680	10400	11120	11840	12560	13240	
	9.00	SG					5680	6100	6520	6940	7360	7780	
		TW					9800	10520	11240	12000	12720	13440	
311	7.50	SG					4360	4680	5010	5330	5650	5980	**6300**
		TW					8030	8630	9220	9820	10410	11010	**11600**

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Dimension	Tread pattern * = preliminary data	TT/TL	LI/SI	European labelling				M+S	3PMSF (d)	Crushed section (mm) (e)	Free section (mm) (e)	Diameter (mm) (e)	Crushed radius (mm) (e)	Rolling circumference (mm) (e)
				(a)	(b)	(c)	dB							
275/70 R 22.5	X INCITY XZU	TL	148/145J	D	B	A	69	✓	✓	301	278	967	450	2950
275/70 R 22.5	X INCITY HL Z	TL	150/145J	D	C	A	70	✓	✓	305	277	968	448	2953
275/70 R 22.5	X INCITY EV Z	TL	152/149J	C	C		71	✓	✓	302	274	968	448	2949
275/70 R 22.5	X MULTI D	TL	148/145L	D	C	A	72	✓	✓	298	274	958	446	2929
275/70 R 22.5	XDW ICE GRIP	TL	148/145L	E	C	A	72	✓	✓	299	276	970	452	2970
275/70 R 22.5	XTA 2 ENERGY	TL	152/148J	C	B	A	69			298	271	954	440	2924
275/70 R 22.5	XTY 2	TL	148/145J	D	B	A	70	✓	✓	298	276	970	450	2960
275/80 R 22.5	X MULTI Z	TL	149/146L	D	C	A	69			306	278	1019	474	3113
275/80 R 22.5	X MULTI D	TL	149/146L	E	C	A	72	✓		305	278	1035	482	3162
295/60 R 22.5	X LINE ENERGY Z	TL	150/147L	B	B	A	70	✓	✓	320	299	917	425	2822
295/60 R 22.5	X LINE ENERGY D	TL	150/147K	B	B	A	70	✓	✓	323	298	920	425	2824
295/60 R 22.5	X MULTI D	TL	150/147L	D	C	B	74	✓	✓	323	300	928	432	2829
295/80 R 22.5	XZA 2 ENERGY	TL	152/148M	C	C	A	67			327	299	1048	486	3212
295/80 R 22.5	X MULTIWAY 3D XZE	TL	152/148M	C	B	A	72	✓	✓	328	297	1054	488	3221
295/80 R 22.5	X MULTI Z2	TL	154/150L	C	C	A	72	✓	✓	325	296	1045	484	3198
295/80 R 22.5	X MULTI GRIP Z	TL	154/150L	D	C	B	76	✓	✓	325	296	1054	488	3203

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(c) External rolling noise class (from A to C) and measured value in decibels (dB). (d) 3PMSF: Tyre for use in severe snow conditions. (e) Michelin dimensions, measured value on rim recommended by Michelin.

Minimum spacing (mm) (e)	Recommended wheels (inches)	MAXIMUM LOAD PER AXLE (Kg) according to pressure (bar / PSI) Nominal loads in bold.											
		SG or TW configuration	4.0 bar	4.5 bar	5.0 bar	5.5 bar	6.0 bar	6.5 bar	7.0 bar	7.5 bar	8.0 bar	8.5 bar	9.0 bar
			58 PSI	65 PSI	73 PSI	80 PSI	87 PSI	94 PSI	102 PSI	109 PSI	116 PSI	123 PSI	131 PSI
315	7.50	SG					4360	4680	5010	5330	5650	5980	**6300**
		TW					8040	8640	9240	9800	10400	11000	**11600**
314	7.50	SG					4640	4980	5320	5660	6020	6360	**6700**
		TW					8040	8640	9240	9800	10400	11000	**11600**
	7.50 / 8.25	SG					4920	5280	5640	6010	6370	6740	**7100**
		TW					9120	9770	10420	11060	11710	12350	**13000**
310	7.50	SG					4360	4680	5010	5330	5650	5980	**6300**
		TW					8030	8630	9220	9820	10410	11010	**11600**
311	7.50	SG					4360	4680	5010	5330	5650	5980	**6300**
		TW					8030	8630	9220	9820	10410	11010	**11600**
307	7.50	SG					4920	5280	5640	6010	6370	6740	**7100**
		TW					8720	9370	10020	10660	11310	11950	**12600**
312	7.50	SG					4360	4680	5000	5340	5660	5980	**6300**
		TW					8480	9080	9720	10360	10960	**11600**	**12240**
315	7.50	SG				4390	4740	5090	5450	5800	6150	**6500**	
		TW				8110	8760	9410	10050	10700	11350	**12000**	
315	7.50	SG				4390	4740	5090	5450	5800	6150	**6500**	
		TW				8110	8760	9410	10050	10700	11350	**12000**	
338	9.00	SG					4640	4980	5320	5660	6020	6360	**6700**
		TW					8520	9160	9760	10400	11040	11680	**12300**
337	9.00	SG					4640	4980	5320	5660	6020	6360	**6700**
		TW					8520	9160	9760	10400	11040	11680	**12300**
339	9.00	SG					4640	4980	5320	5660	6020	6360	**6700**
		TW					8520	9160	9760	10400	11040	11680	**12300**
338	8.25	SG				4800	5180	5560	5940	6340	6720	**7100**	
		TW				8520	9200	9880	10560	11240	11920	**12600**	
336	8.25	SG				4900	5300	5680	6080	6480	6860		
		TW				9000	9720	10440	11160	11880	**12600**		
335	9.00	SG				5060	5480	5880	6280	6880	7100	**7500**	
		TW				9040	9760	10520	11240	11960	12680	**13000**	
	9.00	SG				5060	5480	5880	6280	6880	7100	**7500**	
		TW				9040	9760	10520	11240	11960	12680	**13000**	

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Dimension	Tread pattern * = preliminary data	TT/TL	LI/SI	European labelling				M+S	3PMSF (d)	Crushed section (mm) (e)	Free section (mm) (e)	Diameter (mm) (e)	Crushed radius (mm) (e)	Rolling circumference (mm) (e)
				(a)	(b)	(c)	dB							
295/80 R 22.5	X WORKS Z	TL	152/149K	D	B	A	68	✓		327	298	1060	493	3239
295/80 R 22.5	X COACH Z	TL	154/150M	C	B	A	71	✓	✓	328	298	1052	487	3213
295/80 R 22.5	X INCITY Z	TL	154/149J	C	C	A	72	✓	✓	338	307	1040	484	3194
295/80 R 22.5	XDA 2+ ENERGY	TL	152/148M	D	C	A	73	✓	✓	327	300	1055	491	3215
295/80 R 22.5	X MULTIWAY 3D XDE	TL	152/148L	D	C	B	75	✓	✓	328	297	1061	492	3228
295/80 R 22.5	X MULTI GRIP D	TL	154/150L	D	C	B	76	✓	✓	329	296	1049	486	3196
295/80 R 22.5	XDW ICE GRIP	TL	152/149L	E	C	A	72	✓	✓	329	300	1066	496	3260
295/80 R 22.5	X WORKS D	TL	152/148K	D	B	B	75	✓	✓	330	300	1060	492	3237
295/80 R 22.5	X COACH XD	TL	152/148M	E	C	A	72	✓	✓	329	300	1062	494	3223
305/70 R 22.5	X MULTI HL Z	TL	154/150L	C	C	A	72	✓	✓	328	308	998	462	3048
305/70 R 22.5	X MULTI D	TL	154/150L	D	C	A	73	✓	✓	326	299	1006	464	3061
315/45 R 22.5	X MULTI D	TL	147/145L	D	C	B	75	✓	✓	321	308	862	402	2636
315/60 R 22.5	X LINE ENERGY Z	TL	154/148L	B	B	A	70	✓	✓	336	312	946	436	2908
315/60 R 22.5	X MULTI Z	TL	154/148L	C	B	A	72	✓	✓	336	312	950	438	2910
315/60 R 22.5	X LINE ENERGY D	TL	152/148L	B	C	A	72	✓	✓	339	312	949	441	2907
315/60 R 22.5	X MULTI D	TL	152/148L	D	C	B	74	✓	✓	336	313	956	444	2916

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(c) External rolling noise class (from A to C) and measured value in decibels (dB). (d) 3PMSF: Tyre for use in severe snow conditions. (e) Michelin dimensions, measured value on rim recommended by Michelin.

Minimum spacing (mm) (*)	Recommended wheels (inches)	MAXIMUM LOAD PER AXLE (Kg) according to pressure (bar / PSI) Nominal loads in bold.											
		SG or TW configuration	4.0 bar	4.5 bar	5.0 bar	5.5 bar	6.0 bar	6.5 bar	7.0 bar	7.5 bar	8.0 bar	8.5 bar	9.0 bar
			58 PSI	65 PSI	73 PSI	80 PSI	87 PSI	94 PSI	102 PSI	109 PSI	116 PSI	123 PSI	131 PSI
326	8.25	SG				4800	5180	5560	5950	6330	6720	**7100**	
		TW				8780	9490	10190	10890	11590	12300	**13000**	
338	8.25	SG				5060	5480	5880	6280	6680	7100	**7500**	
		TW				9040	9760	10520	11240	11960	12680	**13400**	
348	8.25	SG				5060	5480	5880	6280	6680	7100	**7500**	
		TW				8800	9480	10200	10880	11600	12280	**13000**	
339	8.25	SG				4800	5180	5560	5940	6340	6720	**7100**	
		TW				8520	9200	9880	10560	11240	11920	**12600**	
336	8.25	SG				4900	5300	5680	6080	6480	6860		
		TW				9000	9720	10440	11160	11880	**12600**		
339	8.25	SG				5060	5480	5880	6280	6680	7100	**7500**	
		TW				9040	9760	10520	11240	11960	12680	**13400**	
339	8.25	SG				4800	5180	5560	5950	6330	6720	**7100**	
		TW				8780	9490	10190	10890	11590	12300	**13000**	
	8.25	SG				4800	5180	5560	5950	6330	6720	**7100**	
		TW				8780	9490	10190	10890	11590	12300	**13000**	
339	8.25	SG				4800	5180	5560	5940	6340	6720	**7100**	
		TW				8510	9190	9880	10560	11240	11920	**12600**	
349	8.25	SG					5200	5580	5960	6340	6740	7120	**7500**
		TW					9280	9960	10640	11320	12040	12720	**13400**
	8.25 / 9.00	SG					5200	5580	5960	6340	6740	7120	**7500**
		TW					9280	9960	10640	11320	12040	12720	**13400**
	9.75	SG					4260	4580	4880	5200	5520	5840	**6150**
		TW					8040	8640	9240	9800	10400	11000	**11600**
353	9.00	SG					5200	5580	5960	6340	6740	7120	**7500**
		TW					9200	9880	10560	11240	11920	**12600**	
	9.00	SG					5200	5580	5960	6340	6740	7120	**7500**
		TW					9200	9880	10560	11240	11920	**12600**	
352	9.00	SG					4920	5280	5640	6010	6370	6740	**7100**
		TW					8720	9360	10000	10680	11320	11960	**12600**
354	9.00	SG					4920	5280	5640	6000	6380	6740	**7100**
		TW					9200	9880	10560	11240	11920	**12600**	

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Dimension	Tread pattern * = preliminary data	TT/TL	LI/SI	European labelling				M+S	3PMSF (d)	Crushed section (mm) (e)	Free section (mm) (e)	Diameter (mm) (e)	Crushed radius (mm) (e)	Rolling circumference (mm) (e)
				(a)	(b)	(c)	dB							
315/70 R 22.5	X LINE ENERGY Z2	TL	156/150L	A	B	A	72	✓	✓	342	316	1007	468	3085
315/70 R 22.5	XFN 2 (Antisplash)	TL	154L	D	C	B	72	✓	✓	345	318	1018	471	3106
315/70 R 22.5	X MULTI ENERGY Z	TL	156/150L	B	B	A	72	✓	✓	346	317	1015	469	3100
315/70 R 22.5	X MULTI Z	TL	156/150L	C	B	A	72	✓	✓	345	318	1014	468	3097
315/70 R 22.5	X MULTI HD Z	TL	156/150L	C	C	A	69	✓	✓	346	318	1018	472	3118
315/70 R 22.5	X MULTI GRIP Z	TL	156/150L	C	C	A	73	✓	✓	347	316	1019	471	3109
315/70 R 22.5	X LINE ENERGY D2	TL	154/150L	A	B	A	70	✓	✓	343	316	1012	470	3094
315/70 R 22.5	X MULTI ENERGY D	TL	154/150L	C	C	A	72	✓	✓	343	317	1012	471	3094
315/70 R 22.5	X MULTI D	TL	154/150L	D	C	B	75	✓	✓	338	316	1017	475	3103
315/70 R 22.5	X MULTI HD D	TL	154/150L	D	C	A	73	✓	✓	343	318	1018	473	3100
315/70 R 22.5	X MULTI GRIP D	TL	154/150L	D	C	B	74	✓	✓	345	317	1022	475	3110
315/70 R 22.5	XDW ICE GRIP	TL	154/150L	D	C	A	72	✓	✓	339	318	1018	473	3110
315/80 R 22.5	X LINE ENERGY Z	TL	156/150L	B	B	A	69			346	315	1075	496	3357
315/80 R 22.5	X MULTI ENERGY Z	TL	156/150L	B	C	B	74	✓	✓	349	315	1080	500	3302
315/80 R 22.5	X MULTI Z	TL	156/150L	C	B	A	72	✓	✓	349	315	1080	500	3302
315/80 R 22.5	X MULTI HD Z*	TL	156/150L	C	B	A*	72	✓	✓	349*	316*	1082*	501*	3302*

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(c) External rolling noise class (from A to C) and measured value in decibels (dB). (d) 3PMSF: Tyre for use in severe snow conditions. (e) Michelin dimensions, measured value on rim recommended by Michelin.

Minimum spacing (mm) (e)	Recommended wheels (inches)	MAXIMUM LOAD PER AXLE (Kg) according to pressure (bar / PSI) Nominal loads in bold.											
		SG or TW configuration	4.0 bar	4.5 bar	5.0 bar	5.5 bar	6.0 bar	6.5 bar	7.0 bar	7.5 bar	8.0 bar	8.5 bar	9.0 bar
			58 PSI	65 PSI	73 PSI	80 PSI	87 PSI	94 PSI	102 PSI	109 PSI	116 PSI	123 PSI	131 PSI
	9.00	SG					5540	5940	6360	6760	7180	7580	**8000**
		TW					9280	9960	10640	11320	12040	12720	**13400**
350	9.00	SG					5200	5580	5960	6340	6740	7120	**7500**
		TW											
359	9.00	SG					5540	5940	6360	6760	7180	7580	**8000**
		TW					9280	9960	10640	11320	12040	12720	**13400**
360	9.00	SG					5540	5940	6360	6760	7180	7580	**8000**
		TW					9280	9960	10640	11320	12040	12720	**13400**
360	9.00	SG					5540	5940	6360	6760	7180	7580	**8000**
		TW					9280	9960	10640	11320	12040	12720	**13400**
360	9.00	SG					5540	5940	6360	6760	7180	7580	**8000**
		TW					9280	9960	10640	11320	12040	12720	**13400**
358	9.00	SG					5200	5580	5960	6340	6740	7120	**7500**
		TW					9280	9960	10640	11320	12040	12720	**13400**
	9.00	SG					5200	5580	5960	6340	6740	7120	**7500**
		TW					9280	9960	10640	11320	12040	12720	**13400**
358	9.00	SG					5200	5580	5960	6340	6740	7120	**7500**
		TW					9280	9960	10640	11320	12040	12720	**13400**
358	9.00	SG					5200	5580	5960	6340	6740	7120	**7500**
		TW					9280	9960	10640	11320	12040	12720	**13400**
359	9.00	SG					5200	5580	5960	6340	6740	7120	**7500**
		TW					9280	9960	10640	11320	12040	12720	**13400**
350	9.00	SG					5200	5580	5960	6340	6740	7120	**7500**
		TW					9280	9960	10640	11320	12040	12720	**13400**
356	9.00	SG				5410	5840	6270	6700	7140	7570	**8000**	
		TW				9570	10340	11100	11870	12630	**13400**		
	9.00	SG				5400	5840	6280	6700	7140	7560	**8000**	
		TW				9040	9760	10520	11240	11960	12680	**13400**	
357	9.00	SG				5400	5840	6280	6700	7140	7560	**8000**	
		TW				9040	9760	10520	11240	11960	12680	**13400**	
359*	9.00	SG				5400	5840	6280	6700	7140	7560	**8000**	
		TW				9040	9760	10520	11240	11960	12680	**13400**	

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Dimension	Tread pattern * = preliminary data	TT/TL	LI/SI	European labelling				M+S	3PMSF (d)	Crushed section (mm) (e)	Free section (mm) (e)	Diameter (mm) (e)	Crushed radius (mm) (e)	Rolling circumference (mm) (e)
				(a)	(b)	(c)	dB							
315/80 R 22.5	X MULTI GRIP Z	TL	156/150L	D	C	B	76	✓	✓	349	315	1088	503	3304
315/80 R 22.5	X WORKS Z	TL	156/150K	C	B	A	72	✓	✓	343	311	1065	494	3259
315/80 R 22.5	X WORKS HD Z	TL	156/150K	C	B	A	68	✓	✓	349	317	1080	501	3380
315/80 R 22.5	X LINE ENERGY D	TL	156/150L	B	C	A	69	✓	✓	350	316	1080	499	3363
315/80 R 22.5	X MULTI ENERGY D	TL	156/150L	C	C	B	75	✓	✓	350	316	1080	499	3291
315/80 R 22.5	X MULTI D	TL	156/150L	D	B	B	75	✓	✓	350	316	1082	500	3291
315/80 R 22.5	X MULTI HD D	TL	156/150L	E	B	A	73	✓	✓	347	315	1094	507	3313
315/80 R 22.5	X MULTI GRIP D	TL	156/150L	D	C	B	76	✓	✓	349	316	1078	501	3298
315/80 R 22.5	X WORKS D	TL	156/150K	C	B	B	75	✓	✓	342	312	1072	498	3253
315/80 R 22.5	X WORKS HD D	TL	156/150K	D	B	B	73	✓	✓	348	317	1091	507	3312
315/80 R 22.5	XDW ICE GRIP	TL	156/150L	E	C	A	72	✓	✓	348	315	1090	504	3320
315/80 R 22.5	XTA	TL	154/150M	C	B	A	69			347	316	1080	497	3296
355/50 R 22.5	X LINE ENERGY Z	TL	156K	B	B	A	70	✓	✓	379	360	935	434	2876
355/50 R 22.5	X MULTI Z	TL	156K	C	C	A	73	✓	✓	383	360	942	471	2893
385/55 R 22.5	X LINE ENERGY F (Antisplash)	TL	160K	A	B	A	70	✓	✓	414	390	990	456	3047
385/55 R 22.5	X MULTI F	TL	160K	B	B	B	72	✓	✓	406	380	996	458	3054

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(c) External rolling noise class (from A to C) and measured value in decibels (dB). (d) 3PMSF: Tyre for use in severe snow conditions. (e) Michelin dimensions, measured value on rim recommended by Michelin.

Minimum spacing (mm) [e]	Recommended wheels (inches)	MAXIMUM LOAD PER AXLE (Kg) according to pressure (bar / PSI) Nominal loads in bold.											
		SG or TW configuration	4.0 bar	4.5 bar	5.0 bar	5.5 bar	6.0 bar	6.5 bar	7.0 bar	7.5 bar	8.0 bar	8.5 bar	9.0 bar
			58 PSI	65 PSI	73 PSI	80 PSI	87 PSI	94 PSI	102 PSI	109 PSI	116 PSI	123 PSI	131 PSI
359	9.00	SG				5400	5840	6280	6700	7140	7560	**8000**	
		TW				9040	9760	10520	11240	11960	12680	**13400**	
353	9.00	SG				5400	5840	6280	6700	7140	7560	**8000**	
		TW				9040	9760	10520	11240	11960	12680	**13400**	
359	9.00	SG				5410	5840	6270	6700	7140	7570	**8000**	
		TW				9040	9760	10520	11240	11960	12680	**13400**	
360	9.00	SG				5410	5840	6270	6700	7140	7570	**8000**	
		TW				9570	10340	11100	11870	12630	**13400**		
357	9.00	SG				5400	5840	6280	6700	7140	7560	**8000**	
		TW				9040	9760	10520	11240	11960	12680	**13400**	
357	9.00	SG				5400	5840	6280	6700	7140	7560	**8000**	
		TW				9040	9760	10520	11240	11960	12680	**13400**	
357	9.00	SG				5520	5960	6400	6860	7300	7740		
		TW				9240	10000	10720	11480	12200	12960		
	9.00	SG				5400	5840	6280	6700	7140	7560	**8000**	
		TW				9040	9760	10520	11240	11960	12680	**13400**	
353	9.00	SG				5410	5840	6270	6700	7140	7570	**8000**	
		TW				9040	9760	10520	11240	11960	12680	**13400**	
359	9.00	SG				5410	5840	6270	6700	7140	7570	**8000**	
		TW				9040	9760	10520	11240	11960	12680	**13400**	
350	9.00	SG				5410	5840	6270	6700	7140	7570	**8000**	
		TW				9570	10340	11100	11870	12630	**13400**		
358	9.00	SG				5070	5470	5880	6280	6690	7090	**7500**	
		TW				9570	10340	11100	11870	12630	**13400**		
	11.75	SG					5540	5940	6360	6760	7180	7580	**8000**
		TW											
	11.75	SG					5540	5940	6360	6760	7180	7580	**8000**
		TW											
	11.75	SG					6240	6700	7160	7620	8080	8540	**9000**
		TW											
	11.75	SG					6240	6700	7160	7620	8080	8540	**9000**
		TW											

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Dimension	Tread pattern * = preliminary data	TT/TL	LI/SI	European labelling				M+S	3PMSF (d)	Crushed section (mm) (e)	Free section (mm) (e)	Diameter (mm) (e)	Crushed radius (mm) (e)	Rolling circumference (mm) (e)
				(a)	(b)	(c)	dB							
385/55 R 22.5	XFN 2 (Antisplash)	TL	160K	C	B	B	72	✓	✓	407	380	998	459	3060
385/55 R 22.5	X MULTI GRIP Z (Antisplash)	TL	160K	C	B	A	73	✓	✓	403	375	998	459	3051
385/55 R 22.5	X LINE ENERGY T	TL	160K	A	B	A	70			403	376	996	458	3060
385/55 R 22.5	X MULTI T2	TL	160K	B	B	A	70	✓	✓	410	381	1001	461	3071
385/65 R 22.5	X LINE ENERGY F (Antisplash)	TL	160K	B	B	A	69			406	376	1066	494	3270
385/65 R 22.5	X MULTI F	TL	158L	C	B	A	69	✓		404	376	1073	497	3288
385/65 R 22.5	X MULTI Z	TL	160K	B	B	A	71	✓	✓	410	376	1067	493	3271
385/65 R 22.5	XFN 2 (Antisplash)	TL	158L	D	C	B	72	✓	✓	409	380	1074	498	3274
385/65 R 22.5	X MULTI GRIP Z (Antisplash)	TL	160K	C	B	A	71	✓	✓	412	378	1073	498	3278
385/65 R 22.5	X MULTI HL Z	TL	164K	C	B	B	73	✓	✓	415	381	1073	494	3287
385/65 R 22.5	XZY 3	TL	160K	C	B	B	73	✓	✓	409	379	1078	499	3280
385/65 R 22.5	X WORKS HL Z	TL	164J	C	B	A	73	✓	✓	416	383	1076	494	3291
385/65 R 22.5	X LINE ENERGY T	TL	160K	A	B	A	69			406	377	1066	494	3272
385/65 R 22.5	XTE 3	TL	160J	C	B	B	71	✓	✓	407	378	1074	497	3292
385/65 R 22.5	X MULTI T	TL	160K	B	B	A	69	✓	✓	404	377	1070	496	3286

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(c) External rolling noise class (from A to C) and measured value in decibels (dB). (d) 3PMSF: Tyre for use in severe snow conditions. (e) Michelin dimensions, measured value on rim recommended by Michelin.

Minimum spacing (mm) [e]	Recommended wheels (inches)	SG or TW configuration	MAXIMUM LOAD PER AXLE (Kg) according to pressure (bar / PSI) Nominal loads in bold.										
			4.0 bar	4.5 bar	5.0 bar	5.5 bar	6.0 bar	6.5 bar	7.0 bar	7.5 bar	8.0 bar	8.5 bar	9.0 bar
			58 PSI	65 PSI	73 PSI	80 PSI	87 PSI	94 PSI	102 PSI	109 PSI	116 PSI	123 PSI	131 PSI
	11.75	SG					6240	6700	7160	7620	8080	8540	**9000**
		TW											
	11.75	SG					6240	6700	7160	7620	8080	8540	**9000**
		TW											
	11.75	SG					6240	6700	7160	7620	8080	8540	**9000**
		TW											
	11.75	SG					6240	6700	7160	7620	8080	8540	**9000**
		TW											
	11.75	SG					6240	6700	7160	7620	8080	8540	**9000**
		TW											
	11.75	SG				5740	6200	6660	7120	7580	8040	**8500**	
		TW											
	11.75	SG					6240	6700	7160	7620	8080	8540	**9000**
		TW											
	11.75	SG				5740	6200	6660	7120	7580	8040	**8500**	
		TW											
	11.75	SG					6240	6700	7160	7620	8080	8540	**9000**
		TW											
	11.75	SG					6920	7440	7940	8460	8980	9480	**10000**
		TW											
	11.75	SG					6240	6700	7160	7620	8080	8540	**9000**
		TW											
	11.75	SG					6920	7440	7940	8460	8980	9480	**10000**
		TW											
	11.75	SG					6240	6700	7160	7620	8080	8540	**9000**
		TW											
	11.75	SG					6240	6700	7160	7620	8080	8540	**9000**
		TW											
	11.75	SG					6240	6700	7160	7620	8080	8540	**9000**
		TW											

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Dimension	Tread pattern * = preliminary data	TT/TL	LI/SI	European labelling				M+S	3PMSF (d)	Crushed section (mm) (e)	Free section (mm) (e)	Diameter (mm) (e)	Crushed radius (mm) (e)	Rolling circumference (mm) (e)
				(a)	(b)	(c)	dB							
385/65 R 22.5	X MULTI WINTER T	TL	160K	C	A	A	70	✓	✓	409	380	1070	495	3274
385/65 R 22.5	X MULTI HL T	TL	164K	C	C	A	70	✓	✓	412	378	1075	495	3293
385/65 R 22.5	X WORKS T	TL	160K	C	B	B	71	✓	✓	403	373	1073	495	3283
425/65 R 22.5	XZY 3	TL	165K	C	B	B	73	✓		453	421	1136	523	3460
445/65 R 22.5	XZY 3	TL	169K	D	B	B	73	✓		486	451	1164	536	3540
455/45 R 22.5	X ONE XDU	TL	166J	D	C	B	73	✓	✓	491	466	980	451	2997
455/45 R 22.5	X ONE MAXITRAILER	TL	160J	B	D	A	70	✓		482	458	980	456	3022
495/45 R 22.5	X ONE MULTI D	TL	169K	D	B	B	75	✓	✓	527	504	1025	471	3123
495/45 R 22.5	X ONE INCITY D	TL	169K	D	C	A	73	✓	✓	546	510	1025	468	3120
SEAT 24														
325/95 R 24	X WORKS Z2	TL	162/160K	C	B	A	70	✓		349	314	1217	562	3727
325/95 R 24	X WORKS D2	TL	162/160K	D	C	B	76	✓		350	313	1229	569	3746

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(c) External rolling noise class (from A to C) and measured value in decibels (dB). (d) 3PMSF: Tyre for use in severe snow conditions. (e) Michelin dimensions, measured value on rim recommended by Michelin.

Minimum spacing (mm) (*)	Recommended wheels (inches)	SG or TW configuration	MAXIMUM LOAD PER AXLE (Kg) according to pressure (bar / PSI) Nominal loads in bold.										
			4.0 bar	4.5 bar	5.0 bar	5.5 bar	6.0 bar	6.5 bar	7.0 bar	7.5 bar	8.0 bar	8.5 bar	9.0 bar
			58 PSI	65 PSI	73 PSI	80 PSI	87 PSI	94 PSI	102 PSI	109 PSI	116 PSI	123 PSI	131 PSI
	11.75	SG					6240	6700	7160	7620	8080	8540	**9000**
		TW											
	11.75	SG					6920	7440	7940	8460	8980	9480	**10000**
		TW											
	11.75	SG					6240	6700	7160	7620	8080	8540	**9000**
		TW											
	13.00	SG				6960	7520	8080	8620	9180	9740	**10300**	
		TW											
	14.00	SG					8040	8620	9220	9820	10420	11000	**11600**
		TW											
	15.00	SG					7340	7880	8430	8970	9510	10060	**10600**
		TW											
	15.00	SG					6230	6690	7150	7620	8080	8540	**9000**
		TW											
	17.00	SG					8030	8630	9220	9820	10410	11010	**11600**
		SG											
	17.00	SG					8040	8620	9220	9820	10420	11000	**11600**
		TW											
355	8.50	SG				6420	6940	7440	7960	8480	8980	**9500**	
		TW				12160	13120	14120	15080	16040	17040	**18000**	
354	8.50	SG				6420	6940	7440	7960	8480	8980	**9500**	
		TW				12160	13120	14120	15080	16040	17040	**18000**	

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Dimension	Tread pattern	TT/TL	LI/SI	Ply Rating	Unique point	M+S	Crushed section (mm)[1]	Free section (mm)[1]	Diameter (mm)[1]	Crushed radius (mm)[1]	Rolling circumference (mm)[1]	Minimum spacing (mm)[1]	Recommended wheels (inches)
SEAT 16													
7.50 R16	X FORCE S	TL	116/114N			✓	235	212	824	384	2520	240	6.00G
7.50 R 16	XZL	TL	116N			✓		217	804	376			6.00J
255/100 R 16 (9.00 R 16)	XZL	TL	126K		134 J	✓	286	255	923	426	2810		6.50H
11.00 R 16	XZL	TL	135K			✓	319	287	984	455	3000	242	6.50H
325/85 R 16	XML	TL	137J		134K	✓	364	327	984	449	2980		9.00
325/85 R 16	X FORCE Z	TL	140K			✓	363	329	983	448	2973		9.00
SEAT 20													
275/80 R 20 (10.5 R 20)	X FORCE ZL MPT	TL	128K			✓		277	940	433	2857		9.00
335/80 R 20 (12.5 R 20)	X FORCE ZL MPT	TL	150K			✓		341	1037	478	3160		11.00
10.00 R 20	XZL	TT	146/143K	16		✓	311	281	1060	493	3240	318	7.5
365/80 R 20 (14.5 R 20)	XZL MPT	TL	152K			✓	410	372	1096	501	3330		11.00
365/80 R 20 (14.5 R 20)	X FORCE ZL MPT	TL	158K	14		✓	415	372	1102	499	3342		11.00
11.00 R 20	XZL	TL	150/146K	16		✓	330	299	1092	508	3340	338	8.00
12.00 R 20	XML	TL	149/146J	18		✓	339	308	1131	526	3443	349	8.50
12.00 R 20	XZL	TL	154/149K	18		✓	344	311	1131	527	3460	352	8.50
365/85 R 20	XZL	TL	164G			✓	411	368	1144	520	3460		10.00W

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Tube	Flap	Seal	Axle load (Kg) Single Axle load (Kg) Twinned	Nominal pressure (bar)	Road			Track			Sand / Mud		
					Single Load (Kg/KPa)	Single pressure (bar)	Single maximum speed (km/h)	Single Load (Kg/KPa)	Single pressure (bar)	Single maximum speed (km/h)	Single Load (Kg/KPa)	Single pressure (bar)	Single maximum speed (km/h)
16J	16x 6.00		SG 2500 TW 4720	5.5	1250	5.5	140	1250	3.4	65	1250	1.9	20
16J13			SG 2500	5.25	1250	5.25	140	1250	3.4	65	1250	2.1	20
16J	16x6.00 E M	LR SPRAT R1014	SG 3700	4.5	1700	4.5	110	1700	2.9	70	1700	1.7	30
16P	16x6.00 E M	LR R1967	SG 4360	5.5	2180	5.5	110	2180	3.2	65	2180	1.7	20
			SG 4600	4.5	2300	4.5	100	2300	3.1	70	2300	1.6	30
			SG 5000	5.0	2500	5.0	110	2500	3,6	70	2500	1,9	30
20P15			SG 3600	4.2	1800	4.2	110	1800	2.7	70	1800	2.0	30
20P15			SG 6700	6.5	3350	6.5	110	3350	5.7	70	3350	2.8	30
20N	20x8.50 E		SG 6000 TW 10900	7.8	3000	7.8	110	1950	2.9	65	1950	1.5	20
20P15			SG 7100	6.0	3550	6.0	110	3550	4.7	65	3550	2.4	20
20P15			SG 8500	6.5	4250	6.5	110	4250	5.7	70	4250	3.4	30
20P	20x8.50 E		SG 6700 TW 12000	8.0	3350	8.0	110	2200	2.9	65	2200	1.5	20
20Q	20x8.50 E		SG 6700 TW 12000	7.2	3250	7.2	100	3250	4.1	70	3250	2.3	30
20Q	20x8.50 E		SG 7500 TW 13000	8.5	3750	8.5	110	2450	2.8	65	2450	1.5	20
20S	20x10.00 E	TYRAN	SG 10000	7.5	5000	7.5	90	3250	3.8	70	3250	2.1	30

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Dimension	Tread pattern	TT/TL	LI/SI	Ply Rating	Unique point	M+S	Crushed section (mm)[1]	Free section (mm)[1]	Diameter (mm)[1]	Crushed radius (mm)[1]	Rolling circumference (mm)[1]	Minimum spacing (mm)[1]	Recommended wheels (inches)
395/85 R 20	XML	TL	161G	14		✓	418	385	1187	543	3590		10.00
395/85 R 20	XZL	TL	168G		161J	✓	425	388	1189	542	3600		10.00W
395/85 R 20	XZL 2	TL	168K		164 L	✓	429	388	1176	534	3584		10.00
14.00 R 20	XZL+	TL	164/160J	20	166G	✓	428	386	1258	578	3832	436	10.00W
14.00 R 20	X FORCE ZL	TL	168/165K	20		✓	419	381	1261	579	3825	436	10.00W
475/80 R 20	XML	TL	166G			✓	526	480	1272	581	3860		14.0V
16.00 R 20	XZL	TL	173/170G			✓	488	438	1343	609	4090	495	10.00W
16.00 R 20	X FORCE ZL	TL	174/171J	22		✓	482	420	1353	615	4111	475	10.00W
SEAT 20.5													
525/65 R 20.5 (20.5 R 20.5)	XS	TL	173F	20		✓	558	521	1200	548	3640		16.00
24 R 20.5	XS	TL	176F			✓	661	602	1374	620	4150		18.00
SEAT 21													
24 R 21	XZL	TL	176G	16		✓	663	608	1388	631	4200		18.00
SEAT 22.5													
315/80 R 22.5	X FORCE ZH	TL	156/150G			✓		317	1088	503	3318	359	9.00
13 R 22.5	XZL	TL	154/150K	18		✓	338	307	1130	525	3450	347	9.00

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Tube	Flap	Seal	Axle load (Kg) Single Axle load (Kg) Twinned	Nominal pressure (bar)	Road			Track			Sand / Mud		
					Single Load (Kg/KPa)	Single pressure (bar)	Single maximum speed (km/h)	Single Load (Kg/KPa)	Single pressure (bar)	Single maximum speed (km/h)	Single Load (Kg/KPa)	Single pressure (bar)	Single maximum speed (km/h)
20S	20x10.00 E	TYRAN	SG 9250	7.0	4625	7.0	90	4625	4.8	70	4625	2.8	30
20S	20x10.00 E	TYRAN	SG 11200	8.5	5600	8.5	90	3650	3.6	70	3650	2.1	30
20S	20x10.00 E	TYRAN	SG 11200	8.5	5600	8.5	110	3640	3.6	70	3640	2.1	30
20S	20x10.00 E		SG 10000	7.6	5000	7.6	100	5000	5.5	70	5000	3.3	30
20S	20.10.00 E		SG 11200	8.6	5600	8.6	110	5600	6.2	70	5600	4.1	30
20V			SG 10600	6.0	5300	6.0	90	4000	2.9	70	4000	1.6	30
20V	20x10.00 E		SG 13000	7.5	6500	7.5	90	4500	3.4	70	4500	1.8	30
20V	20x10.00 E		SG 13400	7.6	6700	7.6	100	6700	6.1	70	6700	4.6	30
19,5/20,5 UD			SG 13000	8.0	6500	8.0	80	4300	3.8	70	4300	2.2	30
20,5 WAMD			SG 14200	6.0	7100	6.0	80	5500	3.4	70	5500	1.9	30
21 WAM			SG 14200	6.0	7100	6.0	90	5500	3.1	65	5500	1.6	20
20PD			SG 8000 TW 13400	8.5	4000	8.5	90	2600	3.8	70	2600	2.2	30
20S			SG 7500 TW 13400	8.0	3750	8.0	110	2450	3.3	70	2450	1.7	30

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Dimension	Tread pattern	TT/TL	LI/SI	Ply Rating	Unique point	M+S	Crushed section (mm)[1]	Free section (mm)[1]	Diameter (mm)[1]	Crushed radius (mm)[1]	Rolling circumference (mm)[1]	Minimum spacing (mm)[1]	Recommended wheels (inches)
13 R 22.5	X FORCE ZH	TL	154/150G		156/150F	✓		316	1134	528	3451	358	9.00
445/65 R 22.5	XZL	TL	168G			✓	486	448	1168	537	3550		14.00
SEAT 24													
325/95 R 24	X FORCE ZH	TL	167/164F			✓	345	313	1242	571	3769	354	10.00
SEAT 560 MM													
395/90 R 560 TR	X FORCE ML	TL	158G	16	156J	✓		392	1256	579	3823		240 TR
395/90 R 560 TR	XML	TL	154K	14	156 F	✓	417	392	1256	582	3835		240 TR
SEAT 685 MM													
415/80R685 TR	XML	TL	160K			✓	435	404	1330	613	4072		230 - 685TR
415/80R685 TR	X FORCE ZL	TL	168K			✓	431	402	1329	615	4071		230 - 685TR

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Tube	Flap	Seal	Axle load (Kg) Single Axle load (Kg) Twinned	Nominal pressure (bar)	Road			Track			Sand / Mud		
					Single Load (Kg/KPa)	Single pressure (bar)	Single maximum speed (km/h)	Single Load (Kg/KPa)	Single pressure (bar)	Single maximum speed (km/h)	Single Load (Kg/KPa)	Single pressure (bar)	Single maximum speed (km/h)
20S			SG 7500 TW 13400	8.0	3750	8.0	90	2500	3.3	70	2500	1.6	30
22.5 U AMD			SG 11200	8.0	5600	8.0	90	3800	4.0	65	3800	2.3	20
			SG 10900 TW 20000	9.0	5450	9.0	80	3500	4.2	65	3500	2.3	20
			SG 8500	6.6	4250	6.6	90	4250	3.8	70	4250	1.9	30
			SG 7500	6.4	3750	6.4	110	3750	3.5	70	3750	1.7	30
			SG 9000	6.7	4500	6.7	110	4500	3.9	70	4500	2.5	30
			SG 11200	8.5	5600	8.5	110	5600	5.0	70	5600	3.3	30

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BASIC PRESSURE CHART

The cold tyre inflation pressures indicated in the tables 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 on your vehicles.

For illustrative purposes, the theoretical advice given here is based on the main uses observed in France. Since every case is unique, please contact your Michelin Technical Advisor.

		Transportation of people									
		Coach					Bus				
		4x2		6x2			4x2		Articulated		
											
Tyre size		S	D	S	D	T*	S	D	S	D1	D2
205/75 R 17.5	124/122M	6.0	5.5								
215/75 R 17.5	126/124M	6.0	5.5								
225/75 R 17.5	129/127M	6.0	5.5								
235/75 R 17.5	132/130M	6.0	5.5								
245/70 R 19.5	136/134M	6.5	6.0								
265/70 R 19.5	140/138M	6.5	6.0								
305/70 R 19.5	147/145M						7.5	7.5			
275/70 R 22.5	148/145L	7.5	7.5								
275/70 R 22.5	148/145J - 150/145J						8.5	7.5	8.5	7.0	8.0
275/70 R 22.5	152/149J						8.5	7.5	8.5	7.0	7.0
295/80 R 22.5	154/150M - 152/148L-M	8.5	7.5	8.5	8.0	8.5					
295/80 R 22.5	154/149J						7.5	7.0	7.5	6.5	7.5
305/70 R 22.5	153/150J						8.0	7.5			
315/80 R 22.5	156/150L	8.5	7.5	8.0	7.5						
455/45 R 22.5	166J							9.0		9.0	9.0
495/45 R 22.5	169J									9.0	9.0

If used outside of the usual conditions of use, these pressure recommendations must be adapted: contact your Michelin advisor or distributor

* T= trailing axle

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Transportation of goods

Road

		Rigid trucks		Trailers and semi-trailers		
		4x2		1-2 or 3 axles	2-3 axles	
						
Tyre size		S	D	Multiple positions (SG or TW)	S	D
205/65 R 17.5	132/130J			9.0	9.0	9.0
205/75 R 17.5	124/122M	6.0	5.5			
215/75 R 17.5	126/124M	6.0	5.5			
215/75 R 17.5	136/134J			9.0	9.0	9.0
225/75 R 17.5	129/127M	6.5	6.0			
235/75 R 17.5	132/130M	6.5	6.0			
235/75 R 17.5	143/141J			9.0	9.0	9.0
245/70 R 17.5	136/134M	6.5	6.0			
245/70 R 17.5	143/141J			9.0	9.0	9.0
265/70 R 17.5	140/138M	7.0	6.5			
9.5 R 17.5 X	143/141J			8.5	8.5	8.5
245/70 R 19.5	136/134M	7.0	6.5			
245/70 R 19.5	141/140J			8.5	8.5	8.5
255/60 R 19.5	143/141J			9.0	9.0	9.0
265/70 R 19.5	140/138M	7.0	6.5			
265/70 R 19.5	143/141J			8.5	8.5	8.5
285/70 R 19.5	146/144L	7.0	6.5			
285/70 R 19.5	150/148J			8.5	8.5	8.5
305/70 R 19.5	147/145M	7.0	6.5			
445/45 R 19.5	160J - 164K			9.0	9.0	8.0 (B)

If used outside of the usual conditions of use, these pressure recommendations must be adapted: contact your Michelin advisor or distributor.
(B) For 2 axles REAR, if a single axle REAR: 9.0 bars.

MICHELIN

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Transportation of goods

Road

		Tractors					Semi-trailers
		4x2		6x2			1-2 or 3 axles
							
Tyre size		**S**	**D**	**S**	**D1**	**D2**	**Multiple positions** (SG or TW)
275/70 R 22.5	148/145L						8.5
275/70 R 22.5	152/148J						8.5
275/80 R 22.5	149/146L	7.5	7.5				8.0
12 R 22.5	152/149-L	7.0	7.5				8.5
295/60 R 22.5	150/147K-L	9.0	9.0				
295/80 R 22.5	154/150L - 152/148M	8.5	8.0	8.5	7.0	7.0	8.5
305/70 R 22.5	154/150L	8.5	7.5				
315/45 R 22.5	147/145L		9.0		9.0	9.0	
315/60 R 22.5	154/148L - 152/148L	9.0	8.5	9.0	8.0	8.0	
315/70 R 22.5	156/150L - 154/150L	8.5	7.5	8.5	7,0	7,0	
315/80 R 22.5	156/150L	8.0	7.0	8.0	6.5	6.5	8.5
355/50 R 22.5	156K	9.0		9.0			9.0
385/55 R 22.5	160K	7.5 (A)					9
385/65 R 22.5	158L-160J-K	7.5 (A)					9
385/65 R 22.5	164K	9.0 (B)					9.0 (B)
425/65 R 22.5	165K						8.5
445/65 R 22.5	169K						8.5
455/45 R 22.5	160J						9.0
495/45 R 22.5	169K		9.0				

If used outside of the usual conditions of use, these pressure recommendations must be adapted: contact your Michelin advisor or distributor.
(A) When fitting to the front steering axle: load on axle = pressure. Examples: 7.5 tonnes = 7.5 bar, 8 tonnes = 8.0 bar, 9 tonnes = 9.0 bars.
(B) For 10-tonne axle.
(SG): Single fitment
(TW): Twin fitment

Transportation of goods

Road

Rigid trucks							Trailers		
4x2		6x2			6x2x4		2-3 central axles	2-3 axles	
									
S	D	S	D1	D2	S	D	Multiple positions (SG or TW)	S	D
8.0	7.0								
							8.5	8.5	8.5
8.0	7.0								
8.0	7.5				8.0	7.5			
8.5	8.0	8.5	7.0 (TW)	8.5 (SG)					
8.5	8.0	8.5	7.0 (TW)	8.0 (SG)	8.5	8.0		8.5	8.5
8.5	8.0				8.5	8.0			
	9.0								
9.0	8.5	9.0	8.0	8.0	9.0	8.5			
8.5	8.0	8.5	8.0	8.0	8.5	8.0			
8.5	7.5	8.5	7.5	7.5	8.5	7.5		8.5	8.5
9.0		9.0			9.0		9.0	9.0	9.0
8.0 (A)		8.0 (A)		8.0	8.0 (A)			9.0	9.0
8.0 (A)		8.0 (A)		8.0	8.0 (A)			9.0	9.0
9.0 (B)		9.0 (B)		9.0 (B)	9.0 (B)		9.0 (B)	9.0 (B)	9.0 (B)
								8.5	8.5
								8.5	8.5
								9.0	8.0

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Material transportation

Mixed (Road / Worksite)

Tyre size		Tractors				Semi-trailers
		4x2		6x4		1-2 or 3 axles
						
		S	D	S	D	Multiple positions (SG or TW)
305/70 R 19.5	147/145M					
10 R 22.5	144/142K					
11 R 22.5	148/145K	7.0	7.5			8.0
12 R 22.5	152/148K	7.0	7.5			
13 R 22.5	156/154/ 151/150K	8.0	7.0	8.5	6.5	8.0
295/80 R 22.5	152/148K	7.0	7.5			
295/80 R 22.5	152/148J					
305/70 R 22.5	153/150J					
315/70 R 22.5	156/150L	8.0	7.0	8.5	6.5	
315/80 R 22.5	156/150K	8.0	7.0	8.5	6.5	8.5
385/65 R 22.5	160K	7.5 (A)				9.0
385/65 R 22.5	164J	9.0 (B)		9.0 (B)		9.0 (B)
425/65 R 22.5	165K					9.0
445/65 R 22.5	169K					9.0
325/95 R 24	162K					

If used outside of the usual conditions of use, these pressure recommendations must be adapted: contact your Michelin advisor or distributor.
(A) When fitting to the front steering axle: load on axle = pressure. Examples: 7.5 tonnes = 7.5 bar, 8 tonnes = 8.0 bar, 9 tonnes = 9.0 bars.
(B) For 10-tonne axle.

Material transportation									
Mixed (Road / Worksite)						Urban			
Rigid trucks						D.W.D			
4x2		6x4		8x4 / 10x4x4		4x2		6x2	
									
S	D	S	D	S	D	D	D	S	D
						7.0	6.5		
7.0	6.5					7.0	6.5		
7.5	7.0					7.5	7.0		
8.0	7.5	7.5	7.0	7.5	7.0				
8.0	7.5	7.0	6.5	7.0	6.5	7.5	7.5	7.5	7.5
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	7.5	7.0	6.5	7.0	6.5	7.5	7.5	7.5	7.5
8.0 (A)		8.0 (A)		8.0 (A)		8.0 (A)		8.0 (A)	
9.0 (B)		9.0 (B)		9.0 (B)		9.0 (B)		9.0 (B)	
		8.0	7.0	8.0	7.0				

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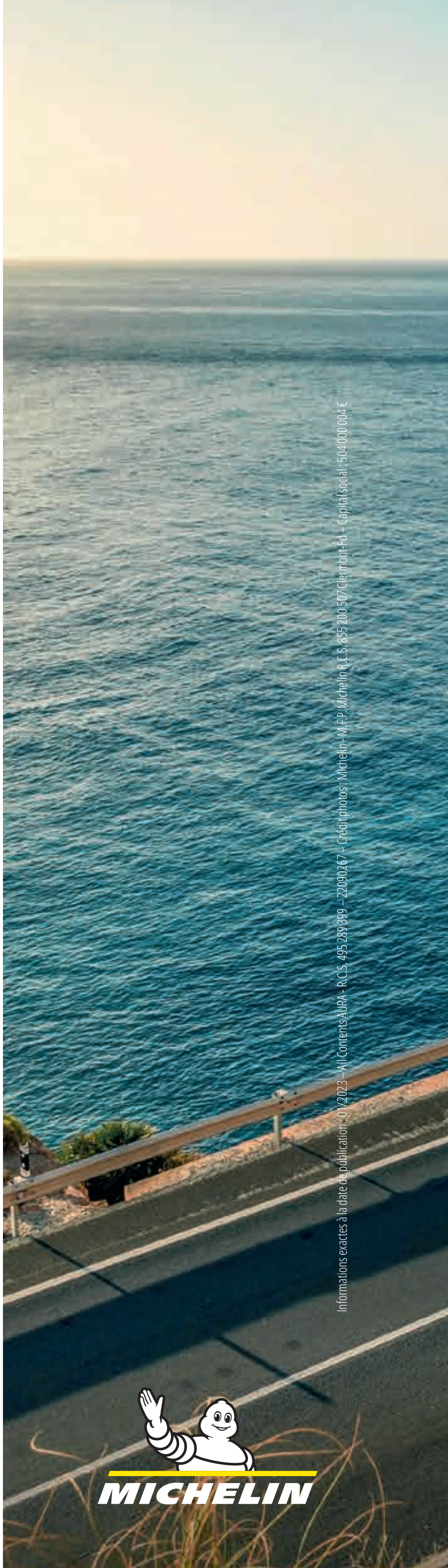

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