HANKOOK
driving emotion

## HANKOOK TIRE TRUCK AND BUS TYRE

# TECHNICAL MANUAL


HANKOOK
driving emotion

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210710_TRUCK AND BUS TYRE TECHNICAL MANUAL

# PREFACE

This manual provides information about truck and bus tyres that can help Hankook Tire customers achieve safe and economical use of our products and maximise tyre life.

The purchase of truck and bus tyres should be looked at as an investment to be protected by thorough maintenance and care in order to produce the best return on your investment and fleet operating efficiency.

Information covered in this manual includes how to achieve the best efficiency through a program of regular tyre inspection, servicing, repairing and so on. Specific safety related information regarding mounting and demounting tyres is also included.

Careful attention on a regular basis can provide you with added safety and economy.
We hope the information is helpful to all tyre service men and fleet operators.

# CONTENTS



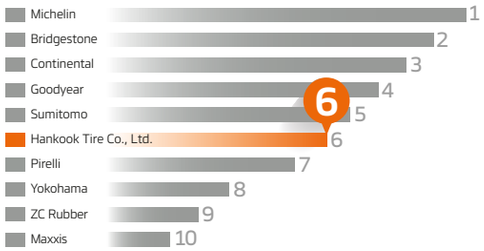

# INTRODUCTION

# About Hankook Tire

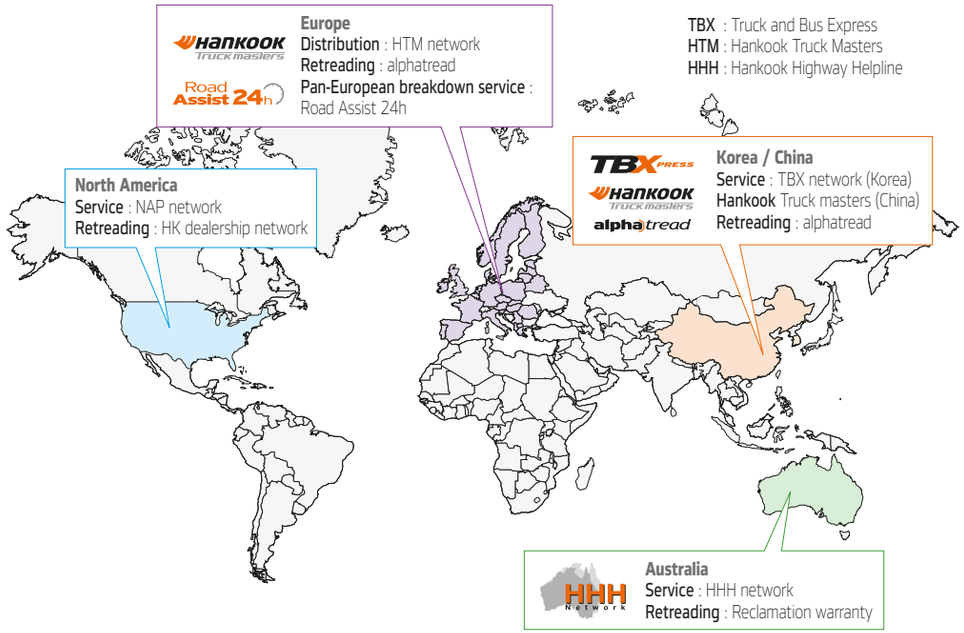
## HISTORY OF HANKOOK

1941 Founded
1979 Built Daejeon (Korea) plant
1982 Established the main R&D Centre
1997 Built Geumsan (Korea) plant
1999 Built Jiangsu (China) and Jiaxing (China) plant
2005 Built G'Trac (proving ground) in Geumsan
2006 Ranked seventh largest tyre manufacturer in the world
2008 Begun production at Hungary plant
2008 Expanded Geumsan plant
2009 Launched 'e-cube', the environmentally friendly tyre
2013 Launched 'e-cube MAX', the second generation of our environmentally friendly tyre
2014 Supply to Mercedes-Benz Trucks OE
2015 Supply to MAN OE
2016 Launching of 'e-cube Blue'
2016 Supply to Scania OE
2018 Supply to MB Bus

## GLOBAL RANKING




Tyrepress - 3 July 2021



## Discover our Hankook Truck and Bus Premium Tyre Range

At Hankook we offer you a broad range of premium performance tyres. Using the latest technologies and high quality materials, we produce tyres that are specifically designed for the individual needs of fleets.

With our 'no compromise' approach we make sure that our tyres deliver top performance in all areas without compromising any significant features. Our constant investments into R&D and state-of-the-art technologies provide you with a high driving performance that is kept from the first to last milimeter of wear.

Extra strong carcasses and additional built in rubber make the tyres suitable for multiple regrooving and retreading, benefitting your budget as well as the environment.

We at Hankook strive to closely work with all our partners in order to offer the most suitable tyre packages, advice on potential cost savings and establish a long-lasting partnership.
For more information, please get in touch with your local Hankook sales representative.

Smartec
HANKOOK TBR Technology


From research to development throughout production, all Hankook commerial tyres are based on the SmartTec technology system and aim to provide all partners with the best and safest driving experiences.

Smart Life
Solutions

**Up to 250% Mileage Life from 1 new tyre**

Cost competitiveness, safety and respect for the environment are all major issues faced by European Transport professionals.

The Hankook SmartLife Solutions can

- save money
- reduce emissions
- improve safety

by extracting the value Hankook built into our Premium TBR tyres through regrooving and retreading.

# Load index and speed symbol

## SIZE MARKINGS

| Markings | 295/80R 22.5 152/147L |
|---|---|
| 295 | Tyre section width (mm) |
| 80 | Aspect ratio [(section height / section width) x 100] |
| R | Radial structure |
| 22.5 | Rim diameter (inch) |
| 152 | Max. load index when mounting single wheels (3,550kg) |
| 147 | Max. load index when mounting dual wheels (3,075kg) |
| L | Tyre max driving speed symbol (120km/h) |

## SPEED SYMBOLS [km/h and mph]

| Symbol | G | J | K | L | M |
|---|---|---|---|---|---|
| km/h | 90 | 100 | 110 | 120 | 130 |
| mph | 56 | 62 | 68 | 75 | 81 |

## VARIATION IN LOAD CARRYING CAPACITY

| Speed (km/h) | Variation in load carrying capacity | | | | | | Inflation pressure compensation (%)* |
|---|---|---|---|---|---|---|---|
| | Speed symbol | | | | | | |
| | F | G | J | K | L | M | |
| Static | +150.0 | +150.0 | +150.0 | +150.0 | +150.0 | +150.0 | +40 |
| 5 | +110.0 | +110.0 | +110.0 | +110.0 | +110.0 | +110.0 | +40 |
| 10 | +80.0 | +80.0 | +80.0 | +80.0 | +80.0 | +80.0 | +30 |
| 15 | +65.0 | +65.0 | +65.0 | +65.0 | +65.0 | +65.0 | +25 |
| 20 | +50.0 | +50.0 | +50.0 | +50.0 | +50.0 | +50.0 | +21 |
| 25 | +35.0 | +35.0 | +35.0 | +35.0 | +35.0 | +35.0 | +17 |
| 30 | +25.0 | +25.0 | +25.0 | +25.0 | +25.0 | +25.0 | +13 |
| 35 | +19.0 | +19.0 | +19.0 | +19.0 | +19.0 | +19.0 | +11 |
| 40 | +15.0 | +15.0 | +15.0 | +15.0 | +15.0 | +15.0 | +10 |
| 45 | +13.0 | +13.0 | +13.0 | +13.0 | +13.0 | +13.0 | +9 |
| 50 | +12.0 | +12.0 | +12.0 | +12.0 | +12.0 | +12.0 | +8 |
| 55 | +11.0 | +11.0 | +11.0 | +11.0 | +11.0 | +11.0 | +7 |
| 60 | +10.0 | +10.0 | +10.0 | +10.0 | +10.0 | +10.0 | +6 |
| 65 | +7.5 | +8.5 | +8.5 | +8.5 | +8.5 | +8.5 | +4 |
| 70 | +5.0 | +7.0 | +7.0 | +7.0 | +7.0 | +7.0 | +2 |
| 75 | +2.5 | +5.5 | +5.5 | +5.5 | +5.5 | +5.5 | +1 |
| 80 | 0 | +4.0 | +4.0 | +4.0 | +4.0 | +4.0 | 0 |
| 85 | | +2.0 | +3.0 | +3.0 | +3.0 | +3.0 | 0 |
| 90 | | 0 | +2.0 | +2.0 | +2.0 | +2.0 | 0 |
| 95 | | | +1.0 | +1.0 | +1.0 | +1.0 | 0 |
| 100 | | | 0 | 0 | 0 | 0 | 0 |
| 110 | | | | 0 | 0 | 0 | 0 |
| 120 | | | | | 0 | 0 | 0 |
| 130 | | | | | | 0 | 0 |

* Increments to be applied in the absence of any specific agreement with the tyre manufacturer

## CONVERSION OF LOAD INDEX (LI) INTO LOAD CAPACITIES PER TYRE

| LI | kg | lbs |
|---|---|---|
| 110 | 1060 | 2335 |
| 111 | 1090 | 2405 |
| 112 | 1120 | 2470 |
| 113 | 1150 | 2535 |
| 114 | 1180 | 2600 |
| 115 | 1215 | 2680 |
| 116 | 1250 | 2755 |
| 117 | 1285 | 2835 |
| 118 | 1320 | 2910 |
| 119 | 1360 | 3000 |
| 120 | 1400 | 3085 |
| 121 | 1450 | 3195 |
| 122 | 1500 | 3305 |
| 123 | 1550 | 3415 |
| 124 | 1600 | 3525 |
| 125 | 1650 | 3640 |
| 126 | 1700 | 3750 |
| 127 | 1750 | 3860 |
| 128 | 1800 | 3970 |
| 129 | 1850 | 4080 |
| 130 | 1900 | 4190 |
| 131 | 1950 | 4300 |
| 132 | 2000 | 4410 |
| 133 | 2060 | 4540 |
| 134 | 2120 | 4675 |
| 135 | 2180 | 4805 |
| 136 | 2240 | 4940 |
| 137 | 2300 | 5070 |
| 138 | 2360 | 5205 |
| 139 | 2430 | 5355 |
| 140 | 2500 | 5510 |

| LI | kg | lbs |
|---|---|---|
| 141 | 2575 | 675 |
| 142 | 2650 | 5840 |
| 143 | 2725 | 6010 |
| 144 | 2800 | 6175 |
| 145 | 2900 | 6395 |
| 146 | 3000 | 6615 |
| 147 | 3075 | 6780 |
| 148 | 3150 | 6945 |
| 149 | 3250 | 7165 |
| 150 | 3350 | 7385 |
| 151 | 3450 | 7605 |
| 152 | 3550 | 7825 |
| 153 | 3650 | 8045 |
| 154 | 3750 | 8265 |
| 155 | 3875 | 8545 |
| 156 | 4000 | 8820 |
| 157 | 4125 | 9095 |
| 158 | 4250 | 9370 |
| 159 | 4375 | 9645 |
| 160 | 4500 | 9920 |
| 161 | 4625 | 10195 |
| 162 | 4750 | 10470 |
| 163 | 4875 | 10745 |
| 164 | 5000 | 11025 |
| 165 | 5150 | 11355 |
| 166 | 5300 | 11685 |
| 167 | 5450 | 12015 |
| 168 | 5600 | 12345 |
| 169 | 5800 | 12785 |
| 170 | 6000 | 13230 |

# Truck tyre markings

## TYRE SIZE MARKINGS

All truck tyres are marked to represent their structure, construction type, dimensions and manufacturer / brand. In addition they should carry the U.S. Department of Transport code and/or ISO symbols. Below is a typical Hankook tyre that illustrates ISO markings.

### Safety Warning

Serious injury may result from: Tyre failure due to under inflation or overloading - follow the tyre placard instructions on the vehicle and check inflation pressures frequently.
Only specially trained people should mount tyres. Follow all safety procedures and inflate using a safety cage and a remote clip-on extension hose.

# EU tyre labelling system

## What is the EU tyre labelling regulation?

### What is the aim of the tyre labelling regulations?

- Reduce $CO^2$ emissions
- Reduce external vehicle noise
- Improve safety
- Improve customer awareness

It supports customers to make better informed choices taking into consideration their type of driving, the climate and road conditions they are likely to encounter.

### When was the labelling system introduced?

The original label was introduced on the 1st November 2012. From the 1st of May 2021, the 2nd version of label will be implemented.

### What are the changes on the new label?

It is now also mandatory to use the label for commercial tyres. In addition to information about the rolling resistance, wet grip and tyre noise, the 3PMSF marking will be added. The noise system will be changed from a (-classification to an A/B/C system.
A QR code is added to provide easy access to additional tyre info.

### Are all tyres included in the scope of the new tyre labelling?

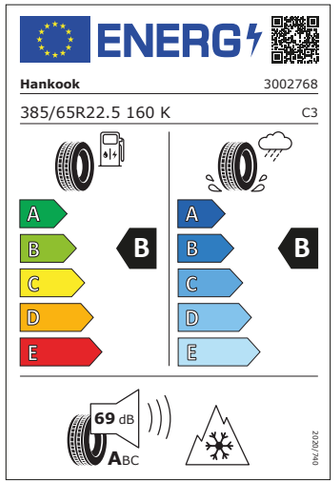
The rules apply to passenger car tyres (C1), light truck tyres (C2) and heavy-duty vehicle tyres (C3).
The following categories are excluded from the scope:

- Retreaded tyres
- Professional Off-Road tyres
- Racing tyres
- Studded tyres (studdable tyres if supplied without studs are covered)
- Temporary use spare tyres

### Can tyres with the old label still be used or sold after the 1st May 2021?

Yes, if the DOT code for your tyres is before the 1st May 2021 then old labels can be used.

## Who has to give the label information?




**Tyre manufacturer:** All tyres within the scope must provide the information in technical promotional literature and on the manufacturers website.

**Tyre retailers:** Must ensure tyres which are visible to consumers at the point of sale carry a sticker or have a label in their close proximity which is shown to the end user before the sale. They also must give the information during the purchase process when the tyres are offered for sale and are not visible to the end user.

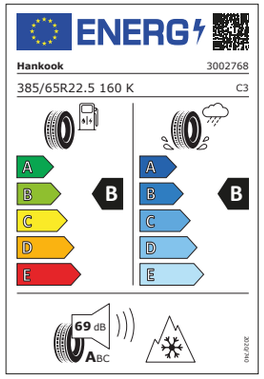
### What is Hankook's positioning on the label?

We fully support the labelling system and also the amends in 2021.
However, we think that the current label does not give a complete image to the enduser as the label only focusses on the new tyre's performance and it does not feature any information on the mileage, longevity or worn tyre performance.

# EU tyre labelling system

## The EU Tyre Labelling System - Overview

Reduce $CO^2$ emissions | Reduce external noise | Improve safety | Increase customer awareness




### Fuel efficiency

Tyres account for 20-30% of the fuel consumption of vehicles.
A reduction of the rolling resistance of tyres may therefore contribute significantly to the energy efficiency of road transport and thus to the reduction of emissions.

A — Low fuel consumption
B
C
D
E — High fuel consumption

Difference between A and E label grades can lead to savings of up to €20K/year in fuel*

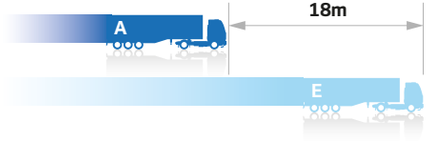
*Based on a Tractor unit and trailer at 44T weight covering 130k km per year at 27,5l/100km and fuel cost of 1,25€ per liter.

### Wet grip

Wet grip indicates the braking performance of tyres on wet road surfaces and is related to the safety performance of vehicles.

A — Short braking distance
B
C
D
E — Long braking distance

An A-labelled and an E-labelled tyre can make a braking distance difference of up to 18m, severely impacting the driving safety.




### Tyre Noise

The exterior noise levels are measured in decibels (dB) and are indicated in three categories

**A** Low tyre noise
**B** Average tyre noise
**C** Higher tyre noise

Smartec
HANKOOK TBR Technology

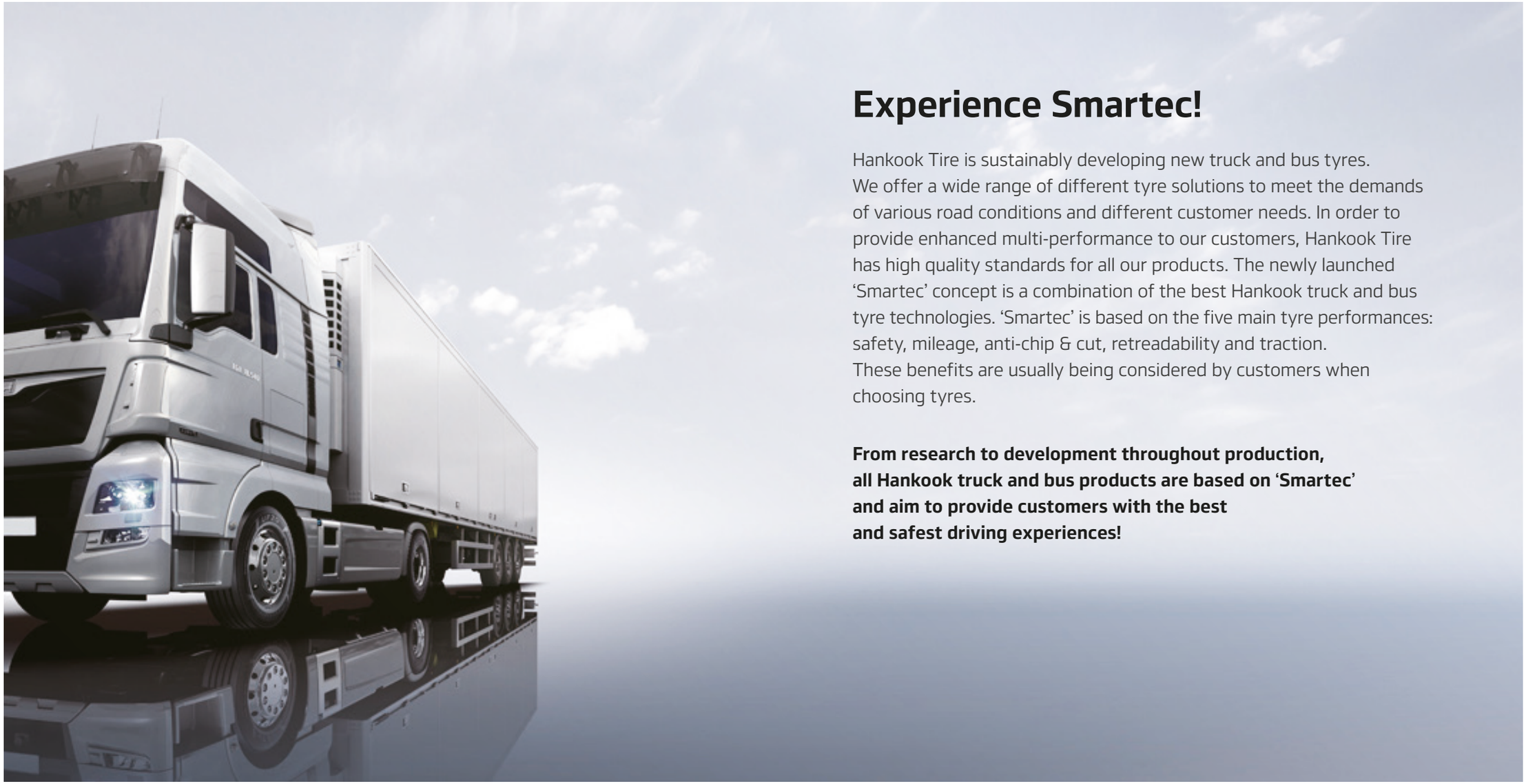

**Safety**
Robust structure

**Mileage**
Cover more distance


**Anti chip & cut**
Sturdy compound


**Retreadability**
Saving costs


**Tration**
Enhanced safety



# Experience Smartec!

Hankook Tire is sustainably developing new truck and bus tyres.
We offer a wide range of different tyre solutions to meet the demands of various road conditions and different customer needs. In order to provide enhanced multi-performance to our customers, Hankook Tire has high quality standards for all our products. The newly launched 'Smartec' concept is a combination of the best Hankook truck and bus tyre technologies. 'Smartec' is based on the five main tyre performances: safety, mileage, anti-chip & cut, retreadability and traction.
These benefits are usually being considered by customers when choosing tyres.

**From research to development throughout production, all Hankook truck and bus products are based on 'Smartec' and aim to provide customers with the best and safest driving experiences!**


TRUCK AND BUS TYRE I **TECHNICAL MANUAL**

# PRODUCT INFORMATION

# Truck and bus tyre range

This chart will help you choose the most appropriate tyre for your driving conditions and the region. If you have any questions, please contact your nearest Hankook representative.

**EU :** Europe

| Driving conditions / Axle | All-Position | Drive | Trailer |
|---|---|---|---|
| Long distance transport (above 500km) | AL10+ AL20 / AL20w | DL10+ DL20 / DL20w | TL10+ / TL20 |
| Coach | AL22 | DL22 | |
| National and regional transport (below 500km) | AH51/ AH31 / AH35 AH33 | DH51 / DH31 / DH35 DH33+ / DH16 | TH22 / TH31 |
| Mixed service (Below 10% off-road) | AM09 / AM15 / AM15+ / AM11 | DM06 / DM09 DM11 | TM15 / TM11 |
| Off-road | | DM04 / DM07 | |
| Urban, multistop, transport (in the city) | AU03 / AU03+ AU04/AU04+ | | |
| Winter | AW02/AW02+ | DW07 / DW06 | TW01 |

**Note** : The tyres for front axle can be used for all position. However, if you want to use them on drive or trailer axle, please contact your nearest Hankook representative.

## NOTES

T/T : Tube type
T/L : Tubeless type
M+S : Mud and snow
3PMSF : 3PMSF (Three Peak Mountain Snowflake)
This data can be changed by manufacturer without prior notice.

**Fuel efficiency** rolling resistance (R.R)
**Wet grip** braking performance
**Noise level** exterior noise

**The Tyre Labelling Regulation introduces :**
- Fuel efficiency / wet grip / external rolling noise of tyres.

**Its aim is to :**
- Improve safety.
- Improve environmental and economic efficiency of road transport by promoting fuel efficient and safe tyres.
- Lower noise levels.

**Actual fuel saving and road safety depends heavily on the behaviour of drivers, and in particular the following :**
- Eco-driving can significantly reduce fuel consumption.
- Tyre pressure should be regularly checked to optimise wet grip and fuel efficiency performance.
- Stopping distances should always be strictly respected.

## No matter how far you drive, Hankook Tyre has the solution.

# Segment L LONG HAUL

The long haul tyre is ideally suited for long distance driving on express motorways and good road conditions. It not only saves fuel but also provides excellent riding comfort and handling performance.

M+S

## e-cube Blue AL20 / e-cube MAX AL20 W

**Long haul all-position tyre with extra low rolling resistance and superb fuel efficiency.**

Enhanced block stiffness results in better rolling resistance performance. Thanks to smart shoulder block design abnormal tread wear is being reduced.

M+S

## e-cube Blue DL20 / e-cube MAX DL20 W

**Long haul drive axle tyre with extra low rolling resistance and superb fuel efficiency.**

Solid 4 block centered design ensures improved rolling resistance. Centre zigzag grooves create a binding effect on each tread block contributing to better rolling resistance and traction.

## e-cube Blue TL20

**Long haul trailer tyre with extra low rolling resistance and superb fuel efficiency.**

The low rolling resistance compound reduces the loss of energy and results in increased fuel efficiency. Multi-sipes prevent irregular wear from external forces and provide rib stiffness.

## AL10 + e-cube MAX

**All-position tyre for long haul usage with excellent fuel efficiency and a high mileage capability.**

An enhanced eco-friendly product designed with e-cube technology for long haul steer service without compromising mileage, durability or safety.

M+S

## DL10 + e-cube MAX

**Long haul drive tyre for superior traction and greater fuel efficiency.**

A specially designed product for long haul driving conditions, providing excellent traction, higher mileage, uniform tread wear and greater fuel efficiency.

## TL10 + e-cube MAX

**Trailer tyre with superb fuel efficiency and traction.**

e-cube trailer product with a high mileage capability and significant fuel savings for long haul operations.

# Segment L COACH

M + S

## SMART Touring AL22

**Long distance coach tyre for excellent handling performance and a high driving comfort on highways.**

A combination of zigzag and straight grooves provides excellent traction on highways whilst the centre rib ensures high mileage and supreme handling performance.

M + S

## SMART Touring DL22

**Long distance coach drive axle tyre for excellent handling performance and a high driving comfort on highways.**

- Main 4 zigzag grooves improve block stiffness and traction.
- Square and interlocking centre blocks enable longer mileage, and improve riding and handling.
- Centre V-shaped 3D sipes and lateral groove detail improve winter performance.

# Segment H REGIONAL HAUL

M + S

## SMART FLEX AH51

**Steer axle delivering premium performance in all conditions during the whole tyre life**

Hidden grooves appear as the tyre wears. This creates new water channels and gripping surfaces, giving better wet grip traction. Small step-shaped blocks provide even wearing and prevents stone trapping, resulting in a long tyre life while wide tread blocks improve the mileage and a low rolling resistance.

M + S

## SMART FLEX DH51

**Drive axle delivering premium performance in all conditions during the whole tyre life**

Hidden grooves appear as the tyre wears. This creates new water channels and gripping surfaces, giving better wet grip traction. Self-regenerating sipes prevent cracks, provide enhanced wet grip and keep up the maximum performance even at the later stages of wear.

# Segment H **REGIONAL HAUL**

M + S

## SMART FLEX AH31

**All-season steer axle tyre for variable road conditions.**

Wide tread and wide shoulders for a long mileage and an excellent handling performance.


M + S

## SMART FLEX DH31

**All-season drive axle tyre for variable road conditions.**

Self-Regenerating sipes(S.R. sipes) control the tearing and wearing with the help of hidden grooves whilst maintaining traction even at the end of the groove wear.

M + S

## SMART FLEX TH31

**All-season trailer axle tyre for variable road conditions.**

Provides excellent traction and water drainage under various road conditions.

M + S

## AH33

**Premium regional tyre developed for superior control and extended tread life.**

Combined pattern with straight and zigzag grooves provides better traction and driving performance and reduces stone retention.

- Waved sipes pattern for Hankook's premium regional haul steer tyre

M + S

## DH33+

**Drive tyre which provides improved mileage and excellent braking performance.**

Directional pattern provides better traction and braking performance.

- Optimised block size and shape sustain block stiffness and provide better driving stability.

M + S

## SMART FLEX AH35

**All-season steer axle tyre for variable road conditions.**

The special tread pattern design with a combination of 4 wavy and straight grooves provide outstanding traction and drainage performance on long and regional haul multi-applications.

- Wide tread width offers high pattern volume resulting in a high mileage performance.


M + S

## SMART FLEX DH35

**All-season drive axle tyre for variable road conditions.**

Rib type tread pattern design and multi 3 dimensional sipes ensure low rolling resistance and excellent driving performance.

- Wide tread with 4 zigzag grooves enables high mileage and excellent driving performance in variable conditions.


M + S

## TH22

**Regional haul trailer tyre with enhanced driving performance.**

M + S

## DH16

**Regional drive position tyre for exceptional traction and mileage performance.**

# Segment M ON and OFF-ROAD

M + S

## SMART WORK AM11

**All-position tyre for mild on and off-road conditions.**

Improves traction and braking performance by expanding the point of intersection through 3 zigzag grooves and an optimised unique sipe design without chipping or cutting.

M + S

## SMART WORK DM11

**Drive axle tyre for mild on and off-road conditions.**

The directional pattern is adopted for excellent handling meaning better traction performance is provided even in wet and muddy conditions.

M + S

## SMART WORK TM11

**Trailer axle tyre for mild on and off-road conditions.**

Improves traction and braking performance by expanding the point of intersection through 3 zigzag grooves and an optimised unique sipe design without chipping or cutting.

# Segment M ON and OFF-ROAD

M + S

## SMART WORK AM15 / AM15+

**Wide based single tyre for mixed operation with high mileage.**

All-wheel-position wide base tyre designed to deliver high mileage and traction in mixed operations. The tyre has outstanding casing durability and retreadability due to its low heating tread compound application. Thick shoulders help to provide added sidewall protection and minimise casing damage from impacts. Square shoulder shape and ideal contact pressure / contact shape also help prevent irregular wear:

- Realisation of improved durability through the open shouldered structure and increased inner volume of tyres.
- Improved tyre durability by applying a compounding technology for tread rubber.
- Optimum hydroplaning and traction performance supported under various road conditions.

M + S

## SMART WORK AM09

**All-position tyre for mixed usage and enhanced on/off-road performance.**

- Polygonal blocks and zigzag grooves for excellent traction and braking performance.
- Wide shoulder design for improved handling performance.
- Stone ejector for reduced stone drilling.
- Closed shoulder design with lugs for driving stability and an even wear

M + S

## SMART WORK DM09

**Designed for mixed usage and enhanced on/off performance.**

The directional pattern is adopted for excellent handling. The best traction performance is provided even in wet and muddy cconditions:

- The first directional type tyre for on and off-road application.
- Improved performance for on and off-road.
- Increased resistance to cuts and chips on the tread and sidewalls.
- Adopted new technology of less stone retention.
- Best durability realised through an optimised casing design.

# Segment M ON and OFF-ROAD

The on and off-road tyre shows distinguished traction on an unpaved road and it boasts high performance and resists cutting and chipping.

M + S

## SMART WORK TM15

**Trailer tyre for on and off-road usage.**

Trailer tyre designed for demanding on and off-road conditions.
- Remarkable groove width for enhanced traction performance.
- Stone ejector rib in the middle of the grooves prevents stone drilling.
- Adoption of linear grooves for maximum stability and performance with excellent water dispersal.

M + S

## DM06

**Structural design for on and off-road conditions featuring excellent traction and durability.**

## DM04

**Drive axle tyre for off-road conditions with excellent traction and durability.**

M + S

## DM07

**Drive axle tyre for off-road conditions.**

# Segment W WINTER

The winter tyre gives road hugging traction on snowy and icy roads to provide secure control. Its braking performance is unbeatable due to its excellent grip and traction. It delivers precise handling and prevents skidding on slippery roads.

M + S

## SMART CONTROL AW02 / AW02+


**All-position winter tyre for severe weather conditions.**
- Zig-zag 5 groove design supports excellent water abrasion.
- 3D sipes provide even wear and a high mileage as well as superb traction on snowy and icy roads.
- Tie bars ensure a high block stiffness and a reliable handling performance.
- Unique semi-open shoulder design.

M + S

## SMART CONTROL DW07

**Drive tyre for maximum grip on snowy and icy conditions.**
- Drive axle tyre for severe winter conditions.
- Large amount of multi 3D sipes with jaggy edge design for excellent grip and traction on snow.
- Pentagon block design and special new tread compound for high mileage.

M + S

## DW06

**Wide-based single tyre for mixed operation with high mileage.**
- Zigzag and 5-groove pattern provide excellent traction on snow and ice.
- 3D sipes provide reliable traction and even wear.

M + S

## SMART CONTROL TW01

**Winter tyre for severe snow conditions.**

4 groove zig-zag design provides excellent traction on snow and ice. Wide shoulder rib provides excellent wet grip performance and high mileage.

# Segment U URBAN BUS

The urban tyre is primarily used for driving through city streets. With greater wear resistance, the urban tyre has a long life and is designed to show great braking and driving performance.

M+S * partly PMSF

## AU03 / AU03+

**All-position tyre for urban service with extra long mileage.**

Optimised design technology for urban operations involving frequent stop and go driving. Uneven wear is minimised by optimised kerf arrangement:

- Expanded shoulder width and adoption of pitch allocation increase stiffness on shoulder area.
- Horizontal sipes are inserted at the tread rib. These kerfs offer equilibrium in the centre of the tyre and shoulder block stiffness.

M+S

## SMART City AU04 / AU04+

**All-position tyre for urban transport.**

Optimised design technology for urban operations involving frequent stop and go driving:

- Special pattern design for economic benefit of reduced downtime and easy fitting performance

# European Winter Tyre regulations

| County | Tyre regulations | Snow chain regulations | Stud tyres | Remarks |
|---|---|---|---|---|
| Albania | No general winter tyre regulation | Obligation to carry and use snow chains on the drive axle if signposting or weather condition require it | ⊘ | |
| Austria | Winter tyre obligation from 1st November - 15th April. Vehicles >3.5 t GVW must be equipped on at least one drive axle with M+S tyres and/or the Alpine symbol (3PMSF) with 6 mm skid depth and 5mm skid depth in general. For buses (M2 and M3) the winter tyre obligation from 1st November- 15th March. | Obligation to carry along from 1st November until 15th April for at least two driven wheels. Exceptions exist for public buses. Usage on snow and ice covered roads. | ⊘ (for vehicles heavier than 3.5 t GVW) | |
| Belarus | No general winter tyre regulation | Snow chains are only allowed on snow and ice covered roads | ✓ | |
| Belgium | No general winter tyre regulation. Symmetrical usage of M+S / winter tyres per axle required | Snow chains are allowed on snow and ice covered roads | ⊘ | |
| Bosnia and Herzegovina | From 15th November to 15th April two options obligatory for vehicles with more than 8 seats and for vehicles > 3.5 t GVW. Option 1: tyres with a winter tread at least 4 mm skid depth on the drive axle. Option 2: tyres with a standard tread and at least 4mm skid depth and at winterly conditions (snow and freezy rain) snow chains to be equipped on the drive axle. | Obligation to carry snow chains between 15th November and 15th April | ⊘ | Snow shovel & a bag of sand (25 to 50 kg) must be carried. |
| Bulgaria | From 15th November to 1st March summer or winter tyres with a skid depth of 4mm are required. | Obligation to carry along from 1st November until 31st March. On mountain roads signpostings might display a snow chain obligation. | ⊘ | |
| Croatia | Winter tyre obligation from 15th November until 15th April. For vehicles > 3.5 t GVW M+S tyre are obligatory on the drive axle. | Under certain circumstances snow chains are required (when the vehicle is equipped with summer tyres. Snow chain obligation in some regions (Lika / Gorski Kotar) | ⊘ | Commercially used vehicles must carry snow shovel |
| Cyprus | No general winter tyre regulations for trucks are known | No general winter tyre regulations for trucks are known | | |
| Czech Republic | Between 1st November and 31st March situative winter tyre obligation during winterly conditions or if indicated by signposting. Vehicles heavier > 3.5 t GVW must be equipped with M+S at least on the the drive axle; at least 6mm skid depth. | If signpostings say so, triaxial and multiaxial vehicles must be equipped with snow chains on at least two tyres on the drive axles | ✓ | |
| Denmark | No general winter tyre regulations | Snow chains allowed from 1st November to 15th April | ✓ | |
| Estonia | Winter tyres are obligatory for vehicles < 3.5 t GVW (radial tyres with 3 mm minimum skid depth) from 1st December until 1st March (also from October until April, depending on weather conditions). Heavier vehicles don't require winter tyres but min. skid depth of 3mm. | Snow chains are allowed on snow and ice covered roads | ✓ 1st November until 31st March | |

| | | | | |
|---|---|---|---|---|
| Finland | From December until February vehicles > 3.5 t GVW must have skid depth of at least 5mm on drive axle and all other axles at least 3mm. Winter tyres are obligatory on the drive and steer axles but the laws don't define them in detail. In explanations winter tyres are defined as M+S tyres. | Snow chains are allowed on snow and ice covered roads | ✓ 15th Oct until 31st March | |
| France | No general winter tyre regulations. Exceptions are displayed by signpostings. Winter equipment is obligatory on roads with signposting B26. | Snow chain usage when signposting displays | ✓ | |
| Germany | Situative at winterly conditions. Vehicles < 3.5 t GVW to be equipped with tyres with 3PMSF on all axles from 1st January 2018. Vehicles > 3.5 t GVW to be equipped with tyres with 3PMSF on the permanently driven axles. Since 1st July 2020 the 3PMSF regulation also applies to front steer axles. Under winterly conditions this is also valid for tyres produced after 1st January 2018. A transition period until 30th September 2024 is granted for M+S tyres that were produced before 1st January 2018. | Snow chains allowed in case of signposting. Stud tyres forbidden. Exception: Kleines Deutsches Eck / "Small German corner" (a small territory near the Austrian border) | | Penalties: 60 for using inappropriate tyres. 80 for traffic interference due to inappropriate tyres. 100 for endangerment due to inappropriate tyres. 120 for accidents due to inappropriate tyres. Each violation leads to penalty points on the driving licence. |
| Greece | No general winter tyre regulations for trucks are known | No general winter tyre regulations for trucks are known | | |
| Hungary | No general winter tyre regulation | Snow chains only allowed on snow and ice covered roads. Usage can be obligatory (maximum speed 50 km/h). At winterly conditions the entry without snow chains can be denied. | ⊘ | |
| Iceland | There is no winter tyre regulation yet but is expected soon. | | | |
| Ireland | No general winter tyre regulation | Snow chains are only allowed on snow and ice covered roads | ✓ | Speed limits for studs 96 km/h and 112 km/h (National primary roads and motorways) |
| Italy | No general winter tyre regulation. Exceptions are displayed by signpostings. | Obligation to carry snow chains | | Local regulations in case of snow and ice. The winter regulation RU/1580 only applies for the vehicle classes M1, N1 and O1. In case of snow the local police can impose a transit ban for some highways. |
| Kosovo | No general winter tyre regulation | Snow chains must be carried for drive axles. Usage if ordered by signposting and depending on weather conditions | ⊘ | Buses and trucks must carry snow shovel |
| Latvia | Winter tyres (M+S) obligatory for vehicles lighter than 3.5 t GVW from 1st December until 1st March. Minimum skid depth 4mm. Heavier vehicles don't require winter tyres but a minimum skid depth of 3mm is obligatory. | Snow chains are only allowed on snow and ice covered roads | ✓ allowed from 1st October to 30th April for vehicles <3.5t GVW | |

| | | | |
|---|---|---|---|
| Liechtenstein | No general winter tyre regulation. The vehicles have to be equipped according to weather conditions, liability can be applied. | Carrying along snow chains is recommended. The usage on mountain roads can be ordered by signposting. | ✓ Vehicles < 7.5t GVW allowed from 1st November until 30th April, (exception of highways.) Speed limit 80 km/h. All tyres must be equipped with studs & vehicles be marked with sticker. | |
| Lithuania | Winter tyres are obligatory for vehicles lighter than 3.5 t GVW from 1st November until 1st April. Vehicles lighter than 3.5t GVW the tread depth should be not less than 3 mm to be considered suitable tyre for winter season. Heavier vehicles don't require winter tyres, a minimum skid depth of 1.6mm is obligatory. | Snow chains are only allowed on snow and ice covered roads | ✓ allowed between 1st November and 1st April | |
| Luxembourg | At winterly conditions trucks and buses must be equipped with winter tyres (M+S mark sufficient) on the drive axles | Snow chains are only allowed on snow and ice covered roads | ⊘ | |
| Malta | No general winter tyre regulations for trucks are known | No general winter tyre regulations for trucks are known | | |
| Montenegro | Between November and April on specific roads (announced by the police ministry) vehicles must be equipped with winter tyres or tyres with M+S marking (at least 4mm ski depth) | Snow chains must be carried for drive axles. Usage if ordered by signposting and depending on weather conditions | ⊘ | Buses and trucks must carry a snow shovel |
| Netherlands | No general winter tyre regulation | Snow chains are only not allowed on public roads | ⊘ | Buses |
| North Macedonia | No general winter tyre regulation | Obligation to carry along snow chains from 15th October until 15th March if the vehicle is only equipped with standard tyres. | ⊘ | Buses and trucks must carry a snow shovel |
| Norway | Vehicles heavier than 3.5 t GVW must have at least 5 mm between 1st November until the 1st Monday after Easter (Southern Norway) or from 16th October until 30th April (Northern Norway: Nordland, Troms and Finnmark). For vehicles heavier than 3.5 t GVW it's obligatory to use tyres with the alpine symbol (3PMSF) on the drive axle and the front steer axle from 15th November until 31st March. On all other axles for the same period the usage of tyres with M+S or the alpine symbol (3PMSF) is obligatory. | Obligation for vehicles heavier than 3.5 t GVW to carry along snow chains for the period when the usage of stud tyres is allowed. A truck with a trailer must carry along seven snow chains. | ✓ Studs with average protrusion of 1.7mm allowed from 1st November until the 1st Monday after Easter. In Nordland, Troms and Finnmark from 16th October until 30th April. | Tractors and trailers: Studs on all tyres of an axle, in case of a dual mounting one tyre is enough. Stud tyres can only be used with M+S or 3PMSF marking. |
| Poland | No general winter tyre regulation | Snow chains are only allowed on snow and ice covered roads. Roads on which snow chains are obligatory are displayed by signposting. | ✓ | |
| Portugal | No general winter tyre regulation | Snow chain usage when signposting displays (only in high altitudes). | ✓ | |
| Romania | At winterly conditions all vehicles heavier than 3.5 t GVW and buses with more than 9 seats must be equipped with M+S tyres or winter tyres on the drive axle | Obligation for vehicles heavier than 3.5 t GVW to carry along snow chains if ordered by signposting | ⊘ | In vehicles heavier > 3.5 t GVW snow chains and sand must be carried along. |

| | | | |
|---|---|---|---|
| Russia | In the winter months (December, January and February) trucks and buses must be equipped on all drive axles with M+S tyres or 3PMSF tyres and have a skid depth of at least 4mm. | It's recommended to carry snow chains but not mandatory | ⊘ in summer months (June, July and August) |
| Serbia | Between November and April vehicles must be equipped with winter tyres or tyres with M+S marking. At least 4mm skid depth. Usage if ordered by signposting and depending on weather conditions | Snow chains must be carried for drive axles. Usage if ordered by signposting and depending on weather conditions | ⊘ Buses and trucks must carry a snow shovel |
| Slovakia | Winter tyre obligation (M+S tyres) on drive axles for vehicles heavier than 3.5 t GVW between 15th November and 31st March (at least 3mm skid depth) | Obligation to carry along and to use if ordered by signposting and depending on weather conditions | ⊘ |
| Slovenia | From 15th November until 15th April vehicles heavier than 3.5 t GVW two options are obligatory. Option 1: winter tyres at least on the drive axle with at least 3 mm skid depth. Option 2: Standard tyres but snow chains must be carried along in the vehicle that must equipped on the drive axle tyres during winterly conditions. | Obligation to carry along for vehicles heavier than 3.5 t GVW if the vehicle is not equipped with winter tyres | ⊘ Buses and trucks must carry a snow shovel |
| Spain | High altitude mountain roads in level red (15/TV-87): Buses must be equipped with 3PMSF marked tyres on all axles with at least 4mm skid depth. Vehicles with a GVW between 3.5 t and 7.5 t with applications waste disposal, groceries and flux transportation and accident assistance can drive on these roads with winter tyres on all axle positions and at least 4mm skid depth. Other commercial vehicles are not allowed. | High altitude mountain roads in level red (15/TV-87): Snow chains on vehicles with a GVW between 3.5 t and 7.5 t if winter tyres are not mounted. | ✓ Usage of stud tyres with a protusion of up to 2 mm are allowed on snowy roads. |
| Sweden | At winterly conditions the skid depth on all tyres except the trailer tyres has to be 5 mm. 3PMSF or stud tyres tyres are obligatory on the drive axles of vehicles lighter than 3.5 t GVW from 1st December until 31st March. Vehicles heavier than 3.5 t GVW must be equipped with 3PMSF or POR marking or stud tyres on the front and drive axles. On the other axles also M+S tyres are allowed. Until 30th November 2024 the usage of M+S (particularly especially developped for winter) is allowed for all axles. For trailers lighter than 3.5 t GVW M+S tyres (especially developed for winter) are allowed until 30th November 2028. | It's recommended to carry snow chains | ✓ from 1st October until 15th April; period can be extended depending on the weather conditions. Maximum 50 studs per tyre if the tyre is produced after 1st July 2013. For certain roads bans must be considered. |
| Switzerland | No generally valid winter tyre regulations. Regional regulations are possible under winterly road conditions (e.g. on Alps mountain roads). Consider that in case of an accident summer tyres are held liable during winterly conditions. Only 3PMSF tyres are considered appropriate during winterly road conditions. The minimum winter tyre skid depth is 1.6mm and the recommended depth 4mm. | Snow chain usage when signposting displays so and winterly conditions require it. Vehicles with four-wheel-drive can be excluded. When the authorities make snow chains obligatory, only driving on snow chains is allowed. Snow chains are to be used when signposting or conditions require it. | ✓ vehicles > 7.5 t GVG from 1st November until 30th April on snow covered roads with a max speed of 80 km/h. Stud tyres must have a sticker with the marking 80 km/h. |
| Turkey | From 1st December until 1st April there is a winter tyre obligation for long haul commercial vehicles. In cities, local authorities determine the winter tyre obligation period and announce important news in dependence of local average temperatures. All kinds of trucks, tractors, buses and taxis must be equipped with winter tyres on the drive axles that have either M+S, M+S and 3PMSF or just 3PMSF. All kinds by vans, light trucks, pick-ups and passenger cars must be equipped by tyres with M+S tyres, M+S tyres with 3PMSF or just 3PMSF on all axles. Any tyre that is replaced during operation must be exchanged by a winter tyre. Retreaded tyres must have a winter tread. The skid depth of winter tyres of all kinds for trucks, tractors and buses must be 4mm and 1.6mm for all kinds of vans, light trucks, pick-ups and passenger cars. | Carrying or using snow chains is allowed but doesn't liberate drivers from the winter tyre obligation | ✓ Only stud tyres that can be used on ice covered roads can subsitute winter tyres. The skid depth should be measured from the centre of the tread. |

| | | | |
|---|---|---|---|
| United Kingdom (Great Britain) | No general winter tyre regulation | | |
| Ukraine | No general winter tyre regulation | | |
| Snow chains are only allowed on snow and ice covered roads. | | ✓ allowed on snowy and iced roads and only when the tyre surface is not damaged by them. Otherwise a recourse is possible. | |
| Snow chains are only allowed on snow and ice covered roads | | ✓ | In vehicles heavier > 3.5 t GVW snow chains and sand must be carried along. |

GVW = gross vehicle weight

**Despite careful research, we cannot guarantee that the information is correct and complete.**

# Technical table legend

## VALUE AND QUALITY TO CUSTOMERS!

**(S) SECTION WIDTH (mm)**
The linear distance between the outsides of the sidewalls of an inflated tyre excluding elevations due to labeling (marking), decorations, protective bands or ribs.

**(H) SECTION HEIGHT (mm)**
Half the difference between the overall diameter and the nominal rim diameter.

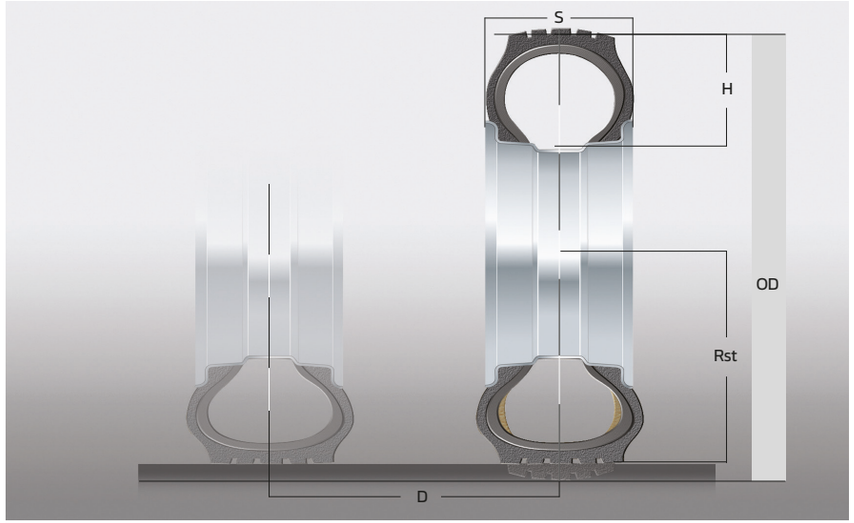
**(OD) OVERALL DIAMETER (mm)**
The diameter of an inflated tyre at the outermost surface of the tread.

**(RST) STATIC LOADED RADIUS (mm)**
The distance between the wheel centre and road surface referring to a tyre inflated and loaded at the values shown in the table under static conditions.

**(RC) ROLLING CIRCUMFERENCE (mm)**
The distance covered in one complete revolution of the tyre under load and pressure conditions indicated in the tables.

**(D) MINIMUM DUAL SPACING FOR TWIN FITMENTS (mm)**
Dual spacing is the distance between the centre lines of the twin tyres.

The “ D min” values refer to tyres without chains and may also be applied in the case of the fitment of chains for twin tyres. If chains are fitted on one tyre only, the "D min" values must be increased so that the sidewalls of the tyre under load do not trap the chain and become damaged.




The values in the tables are approximate and may vary in practice, including a possible growth in service. They do not, however, exceed the following limits :

| CONVERSION FACTORS | | |
|---|---|---|
| TO CONVERT FROM | INTO | MULTIPLY BY |
| mm | inch | 0.03937 |
| inch | mm | 25.4 |
| kg | lbs. | 2.2046 |
| lbs. | kg | 0.4536 |
| bar | $kg/cm^2$ | 1.01972 |
| $kg/cm^2$ | bar | 0.98066 |
| bar | lbs./sq. inch (psi) | 14.5033 |
| lbs./sq. inch (psi) | bar | 0.06895 |
| bar | kPa | 100 |
| lbs./sq. inch (psi) | kPa | 6.895 |
| km/h | m.p.h | 0.62137 |
| m.p.h | km/h | 1.60935 |

# Technical data of all tyres

## TUBE TYPE

| Tyre Size | Tread Pattern | Load Index & Speed Symbol | TT/ TL | Tyre Labelling Class | | | Rim | | Tyre Dimensions | | | Tyre Dimensions | | | | | | Load capacity (kg) per axle at tyre pressure (bar/psi) | | | | | | | | | | | Speed symbol (km/h) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Max. Standard Value in service | | | Actual Value | | | | Load Index (LI) | Tyre fitment (S,D) | | | | | | | | | | | | |
| | | | | | | | Rim width | Distance between rim centres (D) | Width (S) | Outer diameter (OD) | | Width (S) | Overall diameter (OD) | Static radius (Rst) | Rolling circumference (Rc) | | | 4.5 | 5 | 5.5 | 6 | 6.5 | 7 | 7.5 | 8 | 8.5 | 9 | | |
| | | | | | | | | | | | | | | | | | | (65) | (73) | (80) | (87) | (94) | (102) | (109) | (116) | (123) | (131) | | |
| | | | | | | | | | | | | +1% | ±1% | ±1.5% | ±2% | | | | | | | | | | | | | | |
| 12.00R20 | DM09 | 154/150K | TT | E | C | B 75 | | | | | | | | | | 154 | S | | 4905 | 5290 | 5675 | 6050 | 6420 | 6785 | 7140 | 7500 | | K=110 |
| | DM04 | 154/150G | TT | | | | | | | | | | | | | 150 | D | | 8760 | 9455 | 10140 | 10810 | 11470 | 12120 | 12765 | 13400 | | G=90 |
| 8.5R17.5 | AH35 | 131/129L | TL | D | C | A 67 | 6.00 | 242 | 224 | 817 | | 210 | 802 | 374 | 2450 | 121 | S | 2160 | 2350 | 2535 | 2720 | 2900 | | | | | | L=120 |
| | DH35 | 121/120L | TL | D | C | A 70 | | | | | | | | | | 120 | D | 4170 | 4535 | 4895 | 5250 | 5600 | | | | | | |
| 9.5R17.5 | AH35 | 131/129L | TL | D | C | A 67 | 6.75 | 270 | 250 | 857 | | 235 | 842 | 390 | 2570 | 143 | S | | 3490 | 3760 | 4040 | 4300 | 4560 | 4820 | 5080 | 5205 | 5450 | L=120 |
| | DH35 | 131/129L | TL | D | C | A 70 | | | | | | | | | | 131 | S | 2460 | 2675 | 2885 | 3095 | 3300 | 3500 | 3700 | 3900 | | | J=100 |
| | TH22 | 143/141J | TL | D | B | A 70 | | | | | | | | | | 129 | S | 2455 | 2675 | 2885 | 3095 | 3295 | 3500 | 3700 | | | | |
| | TH31 | 143/141J | TL | B | C | A 69 | | | | | | | | | | 129 | D | 4535 | 4933 | 5324 | 5708 | 6086 | 6457 | 6824 | | | | |
| | | | | | | | | | | | | | | | | 141 | D | | 6590 | 7110 | 7620 | 8130 | 8620 | 9110 | 9590 | 9835 | 10300 | |
| 8R19.5 | AH35 | 124/122L | TL | D | C | A 67 | 6.00 | 234 | 203 | 859 | | 200 | 854 | 404 | 3006 | 124 | S | 2127 | 2314 | 2497 | 2677 | 2854 | 3028 | 3200 | | | | L=120 |
| | | | | | | | | | | | | | | | | 122 | D | 3987 | 4338 | 4682 | 5019 | 5353 | 5678 | 6000 | | | | |
| 10R22.5 | AM09 | 144/142K | TL | C | B | A 70 | | | | | | 258 | 1020 | 480 | 3090 | 142 | D | 6685 | 7275 | 7850 | 8420 | 8975 | 9525 | 10065 | 10600 | | | M=130 |
| | AH33 | 141/139M | TL | C | C | A 70 | | | | | | | | | | 144 | S | 3530 | 3840 | 4145 | 4445 | 4740 | 5030 | 5315 | 5600 | | | K=110 |
| | | | | | | | | | | | | | | | | 141 | S | 3095 | 3365 | 3635 | 3895 | 4155 | 4405 | 4655 | 4905 | 5150 | | L=120 |
| | | | | | | | | | | | | | | | | 139 | D | 5840 | 6355 | 6860 | 7355 | 7840 | 8320 | 8790 | 9555 | 9720 | | |
| 11R22.5 | AM09 | 148/145K | TL | D | B | A 67 | 8.25 | 314 | 290 | 1070 | | 282 | 1053 | 493 | 3225 | 148 | S | 3785 | 4120 | 4445 | 4765 | 5080 | 5390 | 5695 | 6000 | 6300 | | K=110 |
| | DM04 | 148/145G | TL | | | | | | | | | | 1046 | 493 | 3105 | 145 | D | 6970 | 7585 | 8185 | 8775 | 9355 | 9930 | 10490 | 11050 | 11600 | | G=90 |
| | DM09 | 148/145K | TL | E | C | A 70 | | | | | | | 1063 | 493 | 3220 | 148 | S | 3785 | 4120 | 4445 | 4765 | 5080 | 5390 | 5695 | 6000 | 6300 | | J=100 |
| | DM09 | 148/145K | TL | E | C | A 70 | | | | | | | | | | 145 | D | 6970 | 7585 | 8185 | 8775 | 9355 | 9930 | 10490 | 11050 | 11600 | | L=120 |
| | AU03 | 148/145J | TL | C | B | A 71 | | | | | | | | | | | | | | | | | | | | | | |
| | AH33 | 148/145L | TL | C | B | A 70 | | | | | | | | | | | | | | | | | | | | | | |
| | TH31 | 148/145L | TL | C | C | A 70 | | | | | | | | | | | | | | | | | | | | | | |
| | AU04 | 148/145J | TL | D | B | A 70 | | | | | | | | | | | | | | | | | | | | | | |

## TUBELESS CONVENTIONAL

| Tyre Size | Tread Pattern | Load Index & Speed Symbol | TT/ TL | Tyre Labelling Class | | | Rim | | Tyre Dimensions | | | Tyre Dimensions | | | | | | Load capacity (kg) per axle at tyre pressure (bar/psi) | | | | | | | | | | | Speed symbol (km/h) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Max. Standard Value in service | | | Actual Value | | | | | | | | | | | | | | | | | |
| | | | | | | | Rim width | Distance between rim centres (D) | Width (S) | Outer diameter (OD) | | Width (S) | Overall diameter (OD) | Static radius (Rst) | Rolling circumference (Rc) | Load Index (LI) | Tyre fitment (S,D) | 4.5 | z5 | 5.5 | 6 | 6.5 | 7 | 7.5 | 8 | 8.5 | 9 | | |
| | | | | | | | | | | | | +1% | ±1% | ±1.5% | ±2% | | | (65) | (73) | (80) | (87) | (94) | (102) | (109) | (116) | (123) | (131) | | |
| 12R22.5 | AL10 | 152/148L | TL | C | C | A 68 | 9.00 | 338 | 312 | 1104 | | 298 | 1085 | 504 | 3307 | 152 | S | 4265 | 4640 | 5010 | 5370 | 5725 | 6075 | 6420 | 6760 | 7100 | | L=120 |
| | DL02 | 152/148L | TL | D | C | B 74 | | | | | | | | | | 149 | D | 7815 | 8500 | 9175 | 9835 | 10485 | 11125 | 11760 | 12380 | 13000 | | K=110 |
| | AH22 | 152/148L | TL | C | C | A 70 | | | | | | | | | | 148 | D | 7575 | 8240 | 8890 | 9535 | 10165 | 10785 | 11395 | 12000 | 12600 | | |
| | DH05 | 152/148L | TL | D | C | B 75 | | | | | | | | | | | | | | | | | | | | | | |
| | DH16 | 152/148L | TL | D | C | B 71 | | | | | | | | | | | | | | | | | | | | | | |
| | DH05 | 152/148L | TL | D | C | B 75 | | | | | | | | | | | | | | | | | | | | | | |
| | DH16 | 152/148L | TL | D | C | B 71 | | | | | | | | | | | | | | | | | | | | | | |
| | AM09 | 152/149K | TL | D | B | A 69 | | | | | | | | | | | | | | | | | | | | | | |
| | DM04 | 152/148K | TL | | | | | | | | | | | | | | | | | | | | | | | | | |
| | DM09 | 152/148K | TL | E | B | A 70 | | | | | | | | | | | | | | | | | | | | | | |
| | DW07 | 152/148L | TL | D | C | A 72 | | | | | | | | | | | | | | | | | | | | | | |
| | AH33 | 152/148L | TL | C | C | A 70 | | | | | | | | | | | | | | | | | | | | | | |
| | DH33+ | 152/149L | TL | E | C | A 70 | | | | | | | | | | | | | | | | | | | | | | |
| | AH31 | 152/149L | TL | C | B | A 71 | | | | | | | | | | | | | | | | | | | | | | |
| 13R22.5 | AM09 | 156/150K | TL | D | C | A 70 | 9.75 | 360 | 326 | 1146 | | 320 | 1085 | 520 | 3405 | 156 | S | 4590 | 4995 | 5390 | 5780 | 6165 | 6540 | 6910 | 7280 | 7640 | 8000 | L=120 |
| | AM11 | 156/150K | TL | C | B | A 71 | | | | | | | | | | 154 | S | 4505 | 4905 | 5290 | 5675 | 6050 | 6420 | 6785 | 7140 | 7500 | | K=110 |
| | DM09 | 156/150K | TL | D | C | B 75 | | | | | | | | | | 150 | D | 8055 | 8760 | 9455 | 10140 | 10810 | 11470 | 12120 | 12765 | 13400 | | G=90 |
| | DM11 | 156/150K | TL | C | B | A 73 | | | | | | | | | | | | | | | | | | | | | | |
| | DM04 | 154/150G | TL | | | | | | | | | | | | | | | | | | | | | | | | | |
| | AH33 | 156/150L | TL | C | C | A 70 | | | | | | | | | | | | | | | | | | | | | | |
| 205/65R17.5 | TH22 | 129/127K (132/132F) | TL | C | C | A 70 | 6.00 | 240 | 213 | 721 | | 206 | 717 | 334 | 2132 | 129 | S | | 2310 | 2495 | 2675 | 2850 | 3025 | 3195 | 3365 | 3530 | 3700 | K=110 |
| | TH31 | 129/127J | TL | C | C | A 70 | | | | | | | | | | 132 | S | | 2495 | 2695 | 2890 | 3080 | 3270 | 3455 | 3640 | 3820 | 4000 | F=80 |
| | | | | | | | | | | | | | | | | 127 | D | | 4370 | 4720 | 5060 | 5395 | 5725 | 6045 | 6370 | 6685 | 7000 | |
| | | | | | | | | | | | | | | | | 132 | D | | 4995 | 5390 | 5780 | 6165 | 6540 | 6910 | 7280 | 7640 | 8000 | |
| 205/75R17.5 | AH35 | 124/122M | TL | C | C | A 65 | 6.00 | 231 | 213 | 765 | | 203 | 761 | 359 | 2325 | 124 | S | 2125 | 2310 | 2495 | 2675 | 2850 | 3025 | 3200 | | | | M=130 |
| | DH35 | 124/122M | TL | D | C | A 66 | | | | | | | | | | 122 | D | 3985 | 4335 | 4680 | 5015 | 5350 | 5675 | 6000 | | | | |
| 215/75R17.5 | AH35 | 126/124M | TL | D | C | A 65 | 6.00 | 239 | 220 | 779 | | 209 | 775 | 363 | 2360 | 135 | S | | 2850 | 3075 | 3295 | 3515 | 3730 | 3940 | 4150 | 4360 | | M=130 |
| | AH35 | 128/126M | TL | D | C | A 65 | | | | | | 214 | 774.2 | 360 | 2363 | 126 | S | 2385 | 2595 | 2800 | 3005 | 3200 | 3400 | | | | | J=100 |
| | DH35 | 126/124M | TL | D | C | A 66 | | | | | | | | | | 128 | S | 2390 | 2600 | 2805 | 3010 | 3210 | 3405 | 3600 | | | | |
| | TH22 | 135/133J | TL | D | B | A 70 | | | | | | | | | | 126 | D | 4515 | 4915 | 5305 | 5685 | 6060 | 6430 | 6800 | | | | |
| | TH31 | 135/133J | TL | B | C | A 70 | | | | | | | | | | 133 | D | | 5385 | 5815 | 6235 | 6645 | 7050 | 7450 | 7845 | 8240 | | |
| | TL10+ | 135/133J | TL | C | B | A 69 | | | | | | | | | | 124 | D | 4490 | 4885 | 5275 | 5655 | 6030 | 6400 | | | | | |
| 225/75R17.5 | AH35 | 129/127M | TL | C | C | A 67 | 6.75 | 254 | 235 | 797 | | 228 | 790 | 371 | 2420 | 129 | S D | 2455 | 2675 | 2885 | 3095 | 3295 | 3500 | 3700 | | | | M=130 |
| | DH35 | 129/127M | TL | D | C | A 70 | | | | | | | | | | 127 | | 4650 | 5060 | 5460 | 5855 | 6240 | 6620 | 7000 | | | | |

## TUBELESS CONVENTIONAL

| Tyre Size | Tread Pattern | Load Index & Speed Symbol | TT/ TL | Tyre Labelling Class | | | Rim | | Tyre Dimensions | | | Tyre Dimensions | | | | | | Load capacity (kg) per axle at tyre pressure (bar/psi) | | | | | | | | | | | Speed symbol (km/h) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Max. Standard Value in service | | | Actual Value | | | | | | | | | | | | | | | | | |
| | | | | | | | Rim width | Distance between rim centres (D) | Width (S) | Outer diameter (OD) | | Width (S) | Overall diameter (OD) | Static radius (Rst) | Rolling circumference (Rc) | Load Index (LI) | Tyre fitment (S,D) | 4.5 | 5 | 5.5 | 6 | 6.5 | 7 | 7.5 | 8 | 8.5 | 9 | | |
| | | | | | | | | | | | | +1% | ±1% | ±1.5% | ±2% | | | (65) | (73) | (80) | (87) | (94) | (102) | (109) | (116) | (123) | (131) | | |
| 235/75R17.5 | AH35 | 132/130M | TL | C | C | A 69 | 6.75 | 262 | 242 | 811 | | 238 | 806 | 373 | 2445 | 143 | S | | 3405 | 3675 | 3940 | 4200 | 4455 | 4710 | 4955 | 5205 | 5450 | M=130 |
| | DH35 | 132/130M | TL | D | C | A 73 | | | | | | | | | | 132 | S | 2520 | 2745 | 2960 | 3175 | 3385 | 3590 | 3795 | 4000 | | | J=100 |
| | TH22 | 143/141J | TL | C | B | A 70 | | | | | | | | | | 141 | D | | 6435 | 6945 | 7445 | 7935 | 8420 | 8900 | 9370 | 9835 | 10300 | |
| | TH31 | 143/141J | TL | B | C | A 70 | | | | | | | | | | 130 | D | 4795 | 5215 | 5630 | 6035 | 6435 | 6825 | 7215 | 7600 | | | |
| | TL10+ | 143/141J | TL | B | B | A 69 | | | | | | | | | | | | | | | | | | | | | | |
| 245/70R17.5 | AH35 | 136/134M | TL | C | C | A 69 | 7.50 | 279 | 258 | 803 | | 250 | 796 | 369 | 2461 | 143 | S | | 3405 | 3675 | 3940 | 4200 | 4455 | 4710 | 4955 | 5205 | 5450 | M=130 |
| | DH35 | 136/134M | TL | D | C | A 73 | | | | | | | | | | 136 | S | 2690 | 2930 | 3160 | 3390 | 3610 | 3835 | 4050 | 4265 | 4480 | | J=100 |
| | TH22 | 143/141J | TL | C | B | A 70 | | | | | | | | | | 141 | D | | 6435 | 6945 | 7445 | 7935 | 8420 | 8900 | 9370 | 9835 | 10300 | F=80 |
| | TH31 | 143/141J | TL | B | C | A 71 | | | | | | | | | | | | | | | | | | | | | | |
| | TL10+ | 143/141J | TL | B | B | A 69 | | | | | | | | | | 134 | D | 5095 | 5545 | 5985 | 6415 | 6840 | 7260 | 7670 | 8075 | 8480 | | |
| 245/70R19.5 | AH35 | 136/134M | TL | C | C | A 67 | 7.50 | 279 | 258 | 853 | | 244 | 844 | 391 | 2580 | 136 | S | 3095 | 3365 | 3635 | 3895 | 4155 | 4405 | 4655 | 4905 | 5150 | | M=130 |
| | DH35 | 136/134M | TL | D | C | A 73 | | | | | | | | | | 140 | S | 2760 | 3000 | 3240 | 3470 | 3700 | 3930 | 4150 | 4370 | 4590 | | J=100 |
| | TH22 | 141/140J | TL | C | B | A 67 | | | | | | | | | | 134 | S | 2690 | 2930 | 3160 | 3390 | 3610 | 3835 | 4050 | 4265 | 4480 | | |
| | TH31 | 141/140J | TL | B | C | A 72 | | | | | | | | | | | D | 6010 | 6540 | 7055 | 7565 | 8065 | 8560 | 9045 | 9525 | 10000 | | |
| | AU03 | 136/134M | TL | D | C | A 71 | | | | | | | | | | | D | 5095 | 5545 | 5985 | 6415 | 6840 | 7260 | 7670 | 8075 | 8480 | | |
| 265/70R17.5 | AH35 | 140/136M | TL | C | C | A 65 | 7.50 | 295 | 272 | 831 | | 262 | 817 | 376 | 2492 | 140 | S | | 3530 | 3810 | 4080 | 4350 | 4610 | 4880 | 5000 | | | M=130 |
| | DH35 | 140/138M | TL | D | B | A 73 | | | | | | | | | | 136 | D | | 6160 | 6640 | 7120 | 7590 | 8060 | 8510 | 8960 | | | |
| 265/70R19.5 | AH35 | 140/138M | TL | D | B | A 73 | 7.50 | 295 | 272 | 881 | | 260 | 870 | 400 | 2675 | 143 | S | | 3560 | 3845 | 4120 | 4395 | 4665 | 4930 | 5190 | 5450 | | M=130 |
| | DH35 | 143/141J | TL | D | B | B 74 | 7.50 | 295 | 272 | 881 | | | | | | 140 | S | 3155 | 3430 | 3700 | 3970 | 4230 | 4490 | 4745 | 5000 | | | J=100 |
| | AM15 | 143/141J | TL | C | B | A 70 | 7.50 | 295 | 272 | 881 | | 260 | 870 | 400 | 2675 | 141 | D | | 6735 | 7270 | 7795 | 8310 | 8815 | 9315 | 9810 | 10300 | | |
| | TH22 | 143/141J | TL | B | B | A 69 | | | | | | | | | | 138 | D | 5955 | 6480 | 6995 | 7495 | 7995 | 8480 | 8960 | 9440 | | | |
| | TH31 | 143/141J | TL | C | C | A 73 | | | | | | | | | | | | | | | | | | | | | | |
| | TL10+ | 140/138M | TL | D | C | A 71 | | | | | | | | | | | | | | | | | | | | | | |
| 275/80R22.5 | AH22 | 149/146L | TL | C | C | A 70 | 8.25 | 311 | 287 | 1038 | | 283 | 1027 | 479 | 3154 | 149 | S | 3905 | 4250 | 4585 | 4915 | 5240 | 5560 | 5880 | 6190 | 6500 | | J=100 |
| | AU04 | 149/146J | TL | D | C | B 71 | | | | | | | | | | | D | 7210 | 7845 | 8470 | 9080 | 9680 | 10270 | 10855 | 11430 | 12000 | | |
| | AU03 | 149/146J | TL | D | C | A 72 | | | | | | | | | | | | | | | | | | | | | | |
| 275/70R22.5 | AH31 | 148/145M | TL | C | C | A 69 | 8.25 | 311 | 287 | 974 | | 279 | 962 | 447 | 2959 | 152 | S | 4075 | 4435 | 4785 | 5130 | 5470 | 5805 | 6135 | 6460 | 6780 | 7100 | M=130 |
| | DH31 | 148/145M | TL | D | C | B 75 | | | | | | | | | | 150 | S | 3845 | 4185 | 4515 | 4840 | 5160 | 5475 | 5790 | 6095 | 6400 | 6700 | K=110 |
| | TH31 | 152/148J | TL | C | C | A 69 | | | | | | | | | | 148 | S | | 3940 | 4250 | 4560 | 4860 | 5160 | 5450 | 5740 | 6020 | 6300 | J=100 |
| | AM15 | 148/145K | TL | D | B | B 74 | | | | | | 277 | 962 | 440 | 2954 | 148 | S | 3615 | 3935 | 4245 | 4550 | 4855 | 5150 | 5440 | 5730 | 6015 | 6300 | M=130 |
| | AW02 | 150/145J | TL | D | C | A 70 | | | | | | | | | | 145 | D | 6660 | 7245 | 7820 | 8385 | 8940 | 9485 | 10025 | 10555 | 11080 | 11600 | |
| | DW07 | 148/145J | TL | D | C | A 72 | | | | | | | | | | | | | | | | | | | | | | |
| | AU03+ | 150/145J (154/148E) | TL | D | C | A 71 | | | | | | | | | | | | | | | | | | | | | | |
| | AU04+ | 150/145J (152/149F) | TL | D | B | A 67 | | | | | | | | | | | | | | | | | | | | | | |

## TUBELESS LOW SECTION

| Tyre Size | Tread Pattern | Load Index & Speed Symbol | TT/ TL | Tyre Labelling Class | | | Rim | | Tyre Dimensions | | | Tyre Dimensions | | | | | | Load capacity (kg) per axle at tyre pressure (bar/psi) | | | | | | | | | | | Speed symbol (km/h) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Max. Standard Value in service | | | Actual Value | | | | | | | | | | | | | | | | | |
| | | | | | | | Rim width | Distance between rim centres (D) | Width (S) | Outer diameter (OD) | | Width (S) | Overall diameter (OD) | Static radius (Rst) | Rolling circumference (Rc) | Load Index (LI) | Tyre fitment (S,D) | 4.5 | 5 | 5.5 | 6 | 6.5 | 7 | 7.5 | 8 | 8.5 | 9 | | |
| | | | | | | | | | | | | +1% | ±1% | ±1.5% | ±2% | | | (65) | (73) | (80) | (87) | (94) | (102) | (109) | (116) | (123) | (131) | | |
| 285/70R19.5 | AH35 | 146/144M | TL | C | B | A 67 | 8.25 | 318 | 294 | 911 | | 280 | 895 | 415 | 2745 | 150 | S | | 4185 | 4515 | 4840 | 5160 | 5475 | 5790 | 6095 | 6400 | 6700 | M=130 |
| | DH35 | 146/144M | TL | D | B | A 70 | | | | | | | | | | 146 | S | | 3750 | 4050 | 4340 | 4630 | 4910 | 5190 | 5470 | 5740 | 6000 | J=100 |
| | TH22 | 150/148J | TL | C | B | A 70 | | | | | | | | | | 148 | D | | 7870 | 8495 | 9105 | 9710 | 10305 | 10885 | 11465 | 12035 | 12600 | |
| | TH31 | 152/148J | TL | B | C | A 70 | | | | | | | | | | 144 | D | | 7000 | 7560 | 8100 | 8640 | 9170 | 9680 | 10200 | 10700 | 11200 | |
| 295/55R22.5 | DL10+ | 147/145K | TL | C | C | A 73 | 9.00 | 329 | 304 | 908 | | 292 | 896 | 420 | 2733 | 147 | S | | 3850 | 4150 | 4450 | 4750 | 5030 | 5320 | 5600 | 5880 | 6150 | K=110 |
| | | | | | | | | | | | | | | | | 145 | D | | 7250 | 7830 | 8390 | 8950 | 9490 | 10030 | 10560 | 11090 | 11600 | |
| 295/60R22.5 | AL10+ | 150/147L | TL | C | B | A 70 | 9.00 | 329 | 304 | 940 | | 288 | 919 | 426 | 2835 | 150 | S | 3845 | 4185 | 4515 | 4840 | 5160 | 5475 | 5790 | 6095 | 6400 | 6700 | L=120 |
| | AL20W | 150/147L | TL | B | C | A 70 | | | | | | | | | | 149 | S | 3730 | 4060 | 4380 | 4695 | 5010 | 5315 | 5615 | 5915 | 6205 | 6500 | K=110 |
| | DL10+ | 150/147L | TL | C | C | A 73 | | | | | | | | | | 147 | D | 7060 | 7685 | 8290 | 8890 | 9480 | 10055 | 10630 | 11190 | 11570 | 12300 | J=100 |
| | DL20W | 150/147L | TL | B | C | A 72 | | | | | | | | | | 146 | D | 6890 | 7495 | 8090 | 8675 | 9245 | 9810 | 10370 | 10920 | 11460 | 12000 | |
| | DH31 | 150/147K | TL | D | C | B 75 | | | | | | | | | | 152 | S | 4075 | 4435 | 4785 | 5130 | 5470 | 5805 | 6135 | 6460 | 6780 | 7100 | |
| | TH31 | 150/147K (152J) | TL | C | C | A 70 | | | | | | | | | | | | | | | | | | | | | | |
| 295/80R22.5 | AL22 | 154M | TL | C | B | A 71 | 9.00 | 335 | 310 | 1062 | | 305 | 1051 | 490 | 3226 | 154 | S | 4505 | 4905 | 5290 | 5675 | 6050 | 6420 | 6785 | 7140 | 7500 | | M=130 |
| | DL22 | 154/149M | TL | C | C | A 70 | | | | | | 306 | 1056 | 490 | 3220 | 152 | S | 4265 | 4640 | 5010 | 5370 | 5725 | 6075 | 6420 | 6760 | 7100 | | L=120 |
| | AH31 | 154/149M | TL | C | B | A 73 | | | | | | | | | | 149 | D | 7815 | 8500 | 9175 | 9835 | 10485 | 11125 | 11760 | 12380 | 13000 | | K=110 |
| | AH31 | 152/148M (154/149L) | TL | C | B | A 73 | | | | | | | | | | 148 | D | 7575 | 8240 | 8890 | 9535 | 10165 | 10785 | 11395 | 12000 | 12600 | | J=100 |
| | DH16 | 152/148M | TL | D | B | A 70 | | | | | | | | | | 152 | S | 4265 | 4640 | 5010 | 5370 | 5725 | 6075 | 6420 | 6760 | 7100 | | |
| | DH31 | 152/148M | TL | D | C | B 75 | | | | | | | | | | 148 | D | 7575 | 8240 | 8890 | 9535 | 10165 | 10785 | 11395 | 12000 | 12600 | | |
| | AM09 | 152/148K(154/150J) | TL | C | B | A 70 | | | | | | | | | | | | | | | | | | | | | | |
| | DM09 | 152/148K | TL | E | B | A 70 | | | | | | | | | | | | | | | | | | | | | | |
| | DM11 | 154/150L | TL | D | C | A 73 | | | | | | | | | | | | | | | | | | | | | | |
| | AW02 | 154/149M | TL | D | C | A 70 | | | | | | | | | | | | | | | | | | | | | | |
| | DW06 | 152/148L | TL | D | C | B 76 | | | | | | | | | | | | | | | | | | | | | | |
| | DW07 | 152/148L | TL | D | C | A 69 | | | | | | | | | | | | | | | | | | | | | | |
| | AU04 | 152/148J | TL | D | B | A 67 | | | | | | | | | | | | | | | | | | | | | | |
| 305/70R19.5 | AH35 | 148/145M | TL | C | C | A 71 | 9.00 | 343 | 317 | 941 | | 304 | 920 | 423 | 2820 | 148 145 | S | 3785 | 4120 | 4445 | 4765 | 5080 | 5390 | 5695 | 6000 | 6300 | | M=130 |
| | DH35 | 148/145M | TL | D | B | A 73 | | | | | | | | | | | D | | 7585 | 8185 | 8775 | 9355 | 9930 | 10490 | 11050 | 11600 | | |
| | TH35 | 150/148J | TL | | | | | | | | | | | | | | | | | | | | | | | | | |
| 315/45R22.5 | DL10+ | 147/145L | TL | D | C | B 75 | 9.75 | 345 | 319 | 868 | | 307 | 856 | 405 | 2594 | 147 | S | | | | | 4740 | 5025 | 5315 | 5590 | 5875 | 6150 | L=120 |
| | | | | | | | | | | | | | | | | 145 | D | | | | | 8940 | 9485 | 10025 | 10555 | 11080 | 1160 | |
| 315/60R22.5 | AL10+ | 154/148L | TL | C | B | A 70 | 9.75 | 352 | 326 | 966 | | 320 | 952 | 442 | 2940 | 154 | S | 4305 | 4685 | 5055 | 5420 | 5780 | 6130 | 6480 | 6825 | 7160 | 7500 | L=120 |
| | AL20W | 154/148L | TL | B | C | A 70 | | | | | | | | | | 152 | S | 4075 | 4435 | 4785 | 5130 | 5470 | 5805 | 6135 | 6460 | 6780 | 7100 | J=100 |
| | DL10+ | 152/148L | TL | C | C | B 75 | | | | | | | | | | 148 | D | 7235 | 7870 | 8495 | 9105 | 9710 | 10305 | 10885 | 11465 | 12035 | 12600 | |
| | DL20W | 152/148L | TL | B | C | A 72 | | | | | | | | | | 152 | S | 4075 | 4435 | 4785 | 5130 | 5470 | 5805 | 6135 | 6460 | 6780 | 7100 | |
| | AH31 | 154/148L | TL | C | B | A 70 | | | | | | | | | | 148 | D | 7235 | 7870 | 8495 | 9105 | 9710 | 10305 | 10885 | 11465 | 12035 | 12600 | |
| | DH31 | 152/148L | TL | D | C | B 75 | | | | | | | | | | | | | | | | | | | | | | |
| | AU04+ | 154/148J | TL | C | B | A 73 | | | | | | | | | | | | | | | | | | | | | | |

## TUBELESS LOW SECTION

| Tyre Size | Tread Pattern | Load Index & Speed Symbol | TT/ TL | Tyre Labelling Class | | | Rim | | Tyre Dimensions | | | Tyre Dimensions | | | | | | Load capacity (kg) per axle at tyre pressure (bar/psi) | | | | | | | | | | | Speed symbol (km/h) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Max. Standard Value in service | | | Actual Value | | | | Load Index (LI) | Tyre fitment (S,D) | | | | | | | | | | | | |
| | | | | | | | Rim width | Distance between rim centres (D) | Width (S) | Outer diameter (OD) | | Width (S) | Overall diameter (OD) | Static radius (Rst) | Rolling circumference (Rc) | | | 4.5 | 5 | 5.5 | 6 | 6.5 | 7 | 7.5 | 8 | 8.5 | 9 | | |
| | | | | | | | | | | | | +1% | ±1% | ±1.5% | ±2% | | | (65) | (73) | (80) | (87) | (94) | (102) | (109) | (116) | (123) | (131) | | |
| 315/70R22.5 | AL10+ | 156/150L | TL | B | B | A 70 | 9.00 | 351 | 318 | 1032 | | 314 | 1012 | 468 | 3120 | 156 | S | 4590 | 4995 | 5390 | 5780 | 6165 | 6540 | 6910 | 7280 | 7640 | 8000 | | M=130 |
| | AL20W | 156/150L | TL | B | C | A 68 | | | | | | | | | | 154 | S | 4305 | 4685 | 5055 | 5420 | 5780 | 6130 | 6480 | 6825 | 7160 | 7500 | | L=120 |
| | DL10+ | 154/150L | TL | C | C | A 73 | | | | | | | | | | 152 | S | 4265 | 4640 | 5010 | 5370 | 5725 | 6075 | 6420 | 6760 | 7100 | | | |
| | DL20 | 154/150L | TL | A | C | A 72 | | | | | | | | | | 150 | D | 7695 | 8370 | 9035 | 9685 | 10325 | 10955 | 11580 | 12195 | 12800 | 13400 | | |
| | DL22W | 154/150L | TL | B | C | A 70 | | | | | | | | | | 148 | D | 7575 | 8240 | 8890 | 9535 | 10165 | 10785 | 11785 | 12000 | 12600 | | | |
| | AH31 | 156/150L | TL | C | B | A 73 | | | | | | | | | | | | | | | | | | | | | | | |
| | AH51 | 156/150L | TL | C | B | A 72 | | | | | | | | | | | | | | | | | | | | | | | |
| | DH31 | 154/150L | TL | D | C | B 75 | | | | | | | | | | | | | | | | | | | | | | | |
| | DH51 | 154/150L | TL | D | B | B 76 | | | | | | | | | | | | | | | | | | | | | | | |
| | DM11 | 154/150L | TL | D | B | A 73 | | | | | | | | | | | | | | | | | | | | | | | |
| | DW06 | 154/150L | TL | D | C | B 76 | | | | | | | | | | | | | | | | | | | | | | | |
| | AW02 | 154/150L | TL | D | C | A 70 | | | | | | | | | | | | | | | | | | | | | | | |
| | DW07 | 154/150L | TL | D | C | A 71 | | | | | | | | | | | | | | | | | | | | | | | |
| 315/80R22.5 | AL10+ | 156/150L (154/150M) | TL | B | B | A 70 | 9.00 | 351 | 318 | 1106 | | 320 | 1075 | 500 | 3299 | 156 | S | 4805 | 5230 | 5645 | 6050 | 6450 | 6845 | 7235 | 7620 | 8000 | | | L=120 |
| | AL22 | 156/150L | TL | C | B | A 71 | | | | | | | | | | 154 | S | 4505 | 4905 | 5290 | 5675 | 6050 | 6420 | 6785 | 7140 | 7500 | | | K=110 |
| | DL20w | 156/150L (154/150M) | TL | C | C | B 75 | | | | | | | | | | 150 | D | 8055 | 8760 | 9455 | 10140 | 10810 | 11470 | 12120 | 12765 | 13400 | | | |
| | DL22w | 156/150L | TL | B | C | A 70 | 9.00 | 351 | 318 | 1106 | | 320 | 1075 | 500 | 3320 | 156 | S | | | | | | | | | | | | |
| | AH31 | 156/150L (154/150M) | TL | C | B | A 73 | | | | | | | | | | 150 | D | | | | | | | | | | | | |
| | AH51 | 156/150L(154/150M) | TL | C | B | A 72 | | | | | | | | | | | | | | | | | | | | | | | |
| | DH05 | 154/150M (156L) | TL | E | B | B 75 | | | | | | | | | | | | | | | | | | | | | | | |
| | DH31 | 156/150L (154/150M) | TL | D | C | B 72 | | | | | | | | | | | | | | | | | | | | | | | |
| | DH51 | 156/150L(154/150M) | TL | D | B | B 76 | | | | | | | | | | | | | | | | | | | | | | | |
| | AM09 | 156/150K | TL | D | B | A 67 | | | | | | | | | | | | | | | | | | | | | | | |
| | DM09 | 156/150K | TL | D | C | A 70 | | | | | | | | | | | | | | | | | | | | | | | |
| | DM04 | 156/150K (156L) | TL | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | DW06 | 156/150L | TL | D | C | B 76 | | | | | | | | | | | | | | | | | | | | | | | |
| | AW02 | 156/150L | TL | D | C | A 70 | | | | | | | | | | | | | | | | | | | | | | | |
| | DW07 | 156/150L | TL | D | C | A 72 | | | | | | | | | | | | | | | | | | | | | | | |
| | AM11 | 156/150K | TL | C | B | A 72 | | | | | | | | | | | | | | | | | | | | | | | |
| | DM11 | 156/150K | TL | C | B | A 74 | | | | | | | | | | | | | | | | | | | | | | | |
| 325/95R24 | DM06 | 162/160K | TL | D | C | B 73 | 9.00 | 374 | 332 | 1264 | | 320 | 1232 | 570 | 3776 | 162 | S | 5710 | 6210 | 6705 | 7185 | 7665 | 8130 | 8590 | 9050 | 9500 | | | K=110 |
| | AM09 | 162/160K | TL | D | C | A 69 | 9.00 | 374 | 332 | 1266 | | 322 | 1242 | 570 | 3776 | 160 | D | 10820 | 11770 | 12705 | 13620 | 14520 | 15410 | 16280 | 17145 | 18000 | | | |
| | DM07 | 162/160G | TL | | | | | | | | | | | | | 162 | S | 5710 | 6210 | 6705 | 7185 | 7665 | 8130 | 8590 | 9050 | 9500 | | | G=90 |
| | | | | | | | | | | | | | | | | 160 | D | 10820 | 11770 | 12705 | 13620 | 14520 | 15410 | 16280 | 17145 | 18000 | | | |

## TUBELESS LOW SECTION

| Tyre Size | Tread Pattern | Load Index & Speed Symbol | TT/ TL | Tyre Labelling Class | | | Rim | | Tyre Dimensions | | | Tyre Dimensions | | | | | | Load capacity (kg) per axle at tyre pressure (bar/psi) | | | | | | | | | | Speed symbol (km/h) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Max. Standard Value in service | | | Actual Value | | | | Load Index (LI) | Tyre fitment (S,D) | | | | | | | | | | | |
| | | | | | | | Rim width | Distance between rim centres (D) | Width (S) | Outer diameter (OD) | | Width (S) | Overall diameter (OD) | Static radius (Rst) | Rolling circumference (Rc) | | | 4.5 | 5 | 5.5 | 6 | 6.5 | 7 | 7.5 | 8 | 8.5 | 9 | |
| | | | | | | | | | | | | | | | | | | (65) | (73) | (80) | (87) | (94) | (102) | (109) | (116) | (123) | (131) | |
| | | | | | | | | | | | | +1% | ±1% | ±1.5% | ±2% | | | | | | | | | | | | | |
| 355/50R22.5 | AL10+ | 156L | TL | B | B | B 76 | 11.75 | | 375 | 942 | | 355 | 935 | 432 | 2887 | 156 | S | 4590 | 4995 | 5390 | 5780 | 6165 | 6540 | 6910 | 7280 | 7640 | 8000 | L=120 |
| | AL20W | 156L | TL | B | C | A 72 | | | | | | | | | | | | | | | | | | | | | | |
| | AH31 | 156L | TL | B | B | A 69 | | | | | | | | | | | | | | | | | | | | | | |
| 385/55R22.5 | AL20 | 160K | TL | A | C | A 72 | 11.75 | | 396 | 1012 | | 381 | 996 | 463 | 3093 | 160 | S | 5165 | 5620 | 6065 | 6505 | 6935 | 7360 | 7775 | 8190 | 8595 | 9000 | L=120 |
| | TL20 | 160K | TL | A | B | A 66 | | | | | | 386 | | | | 158 | S | 5110 | 5555 | 6000 | 6430 | 6855 | 7275 | 7690 | 8095 | 8500 | | K=110 |
| | AH31 | 160K (158L) | TL | C | B | A 69 | | | | | | 383 | 1000 | 460 | 3095 | | | | | | | | | | | | | J=100 |
| | TH22 | 160K (158L) | TL | W | B | A 71 | | | | | | | | | | | | | | | | | | | | | | |
| | TH31 | 160K (158L) | TL | B | C | B 73 | | | | | | | | | | | | | | | | | | | | | | |
| | AW02 | 160K | TL | C | C | A 70 | | | | | | | | | | | | | | | | | | | | | | |
| 385/55R19.5 | TH31 | 156J | TL | B | B | A 70 | 12.25 | | 401 | 935 | | 380 | 924 | 424 | 2850 | 156 | S | 4590 | 4995 | 5390 | 5780 | 6165 | 6540 | 6910 | 7280 | 7640 | 8000 | J=100 |
| 385/65R22.5 | AH31 | 164K | TL | C | B | A 69 | 11.75 | | 405 | 1092 | | 382 | 1082 | 502 | 3330 | 164 | S | 5740 | 6245 | 6740 | 7225 | 7705 | 8175 | 8640 | 9100 | 9550 | 10000 | L=120 |
| | | 160K | TL | C | B | A 69 | | | | | | | | | | 160 | S | 5165 | 5620 | 6065 | 6505 | 6935 | 7360 | 7775 | 8190 | 8595 | 9000 | K=110 |
| | AL10+ | 160K(158L) | TL | B | B | A 70 | | | | | | | | | | 158 | S | 5110 | 5555 | 6000 | 6430 | 6855 | 7275 | 7690 | 8095 | 8500 | | J=100 |
| | TL10+ | 160K (158L) | TL | B | B | A 69 | | | | | | | | | | | | | | | | | | | | | | |
| | AH51 (20P) | 160K(158L) | TL | B | B | A 72 | | | | | | | | | | | | | | | | | | | | | | |
| | AH51(24P) | 164K | TL | B | B | A 71 | | | | | | | | | | | | | | | | | | | | | | |
| | TH31 | 160K | TL | B | B | A 69 | | | | | | | | | | | | | | | | | | | | | | |
| | TL20 | 160K | TL | A | C | A 66 | | | | | | | | | | | | | | | | | | | | | | |
| | AM15+ | 158L | TL | C | C | B 74 | | | | | | | | | | | | | | | | | | | | | | |
| | TM15 | 160K | TL | D | C | A 69 | | | | | | | | | | | | | | | | | | | | | | |
| | AW02 | 160K(158L) | TL | C | C | A 70 | | | | | | | | | | | | | | | | | | | | | | |
| | TW01 | 160K(158L) | TL | B | C | A 69 | | | | | | | | | | | | | | | | | | | | | | |
| | TM11 | 160K(158L) | TL | C | B | B 73 | | | | | | | | | | | | | | | | | | | | | | |
| | AW02+ | 160K (158L) | TL | C | C | A 70 | | | | | | | | | | | | | | | | | | | | | | |
| 425/65R22.5 | TH22 | 165K | TL | C | B | A 67 | 13.00 | | 447 | 1146 | | 423 | 1124 | 520 | 3400 | 165 | S | 5165 | 5620 | 6065 | 6505 | 6935 | 7360 | 7775 | 8190 | 8595 | 9000 | K=110 |
| | AM15 | 165K | TL | C | C | B 75 | | | | | | 412 | 1131 | 520 | 3400 | 165 | S | | | | | | | | | | | K=110 |
| | TH31 | 165K | TL | C | B | B 73 | 12.25 | | 439 | 1146 | | | | | | | | | | | | | | | | | | |
| 435/50R19.5 | TL10+ | 160J | TL | B | B | B 73 | 14.00 | | 456 | 949 | | 440 | 931 | 422 | 2840 | 160 | S | 5165 | 5620 | 6065 | 6505 | 6935 | 7360 | 7775 | 8190 | 8595 | 9000 | J=100 |
| | TH31 | 160J | TL | B | B | B | | | | | | 435 | 924 | 420 | 2840 | 160 | S | 5165 | 5620 | 6065 | 6505 | 6935 | 7360 | 7775 | 8190 | 8595 | 9000 | J=100 |
| | TL20 | 160J | TL | A | C | A 70 | | | | | | | | | | | | | | | | | | | | | | |
| 445/65R22.5 | AM15 | 169K | TL | C | C | B 67 | 13.00 | | 472 | 1174 | | 454 | 1162 | 535 | 3485 | 169 | S | 6660 | 7245 | 7820 | 8385 | 8940 | 9485 | 10025 | 10555 | 11080 | 11600 | K=110 |
| | TL10 | 169K | TL | C | B | B 73 | | | | | | | | | | | | | | | | | | | | | | |
| | TH31 | 169K | TL | B | B | A 69 | | | | | | | | | | | | | | | | | | | | | | |

## TUBELESS LOW SECTION

| Tyre Size | Tread Pattern | Load Index & Speed Symbol | TT/ TL | Tyre Labelling Class | | | Rim | | Tyre Dimensions | | | Tyre Dimensions | | | | | | Load capacity (kg) per axle at tyre pressure (bar/psi) | | | | | | | | | | Speed symbol (km/h) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Max. Standard Value in service | | | Actual Value | | | | | | | | | | | | | | | | |
| | | | | | | | Rim width | Distance between rim centres (D) | Width (S) | Outer diameter (OD) | | Width (S) | Overall diameter (OD) | Static radius (Rst) | Rolling circumference (Rc) | Load Index (LI) | Tyre fitment (S,D) | 4.5 | 5 | 5.5 | 6 | 6.5 | 7 | 7.5 | 8 | 8.5 | 9 | |
| | | | | | | | | | | | | | | | | | | (65) | (73) | (80) | (87) | (94) | (102) | (109) | (116) | (123) | (131) | |
| | | | | | | | | | | | | +1% | ±1% | ±1.5% | ±2% | | | | | | | | | | | | | |
| 445/45R19.5 | TL10 | 160J | TL | B | B | B 73 | 14.00 | | 454 | 911 | | 434 | 905 | 416 | 2712 | 160 | S | 5165 | 5620 | 6065 | 6505 | 6935 | 7360 | 7775 | 8190 | 8595 | 9000 | J=100 |
| | TH31 | 160J | TL | B | B | A 69 | 15.0 | | 464 | 911 | | 444 | 904 | 421 | 2800 | 160 | S | | | | | | | | | | | |
| | TW01 | 160J | TL | C | C | B 75 | 14.00 | | 464 | 911 | | 448 | 905 | 415 | 2802 | 160 | S | | | | | | | | | | | J=100 |
| | TL20 | 160K | TL | A | C | A 70 | 15.00 | | 464 | 911 | | 445 | 900 | 410 | 2720 | 160 | S | | | | | | | | | | | K=110 |
| 455/40R22.5 | TL10+ | 160J | TL | B | B | B 71 | 15.00 | | 471 | 950 | | 453 | 936 | 439 | 2850 | 160 | S | | 5630 | 6070 | 6510 | 6940 | 7370 | 7780 | 8200 | 8600 | 9000 | J=100 |
| | TH31 | 160J | TL | B | B | B 73 | | | | | | | | | | | | | | | | | | | | | | |
| 455/45R22.5 | TH31 | 160J | TL | C | B | A 69 | 15.0 | - | 471 | 998 | | 458 | 984 | 412 | 3058 | 160 | S | 5165 | 5620 | 6065 | 6505 | 6935 | 7360 | 7775 | 8190 | 8595 | 9000 | J=100 |


TRUCK AND BUS TYRE I **TECHNICAL MANUAL**

# REGROOVING GUIDE

Regrooving introduction
Regrooving technical data

# SmartLife Solutions

## PREMIUM • VISION • PARTNERSHIP

**Up to 250% Mileage Life from 1 new tyre**

Cost competitiveness, safety and respect for the environment are all major issues faced by European Transport professionals.

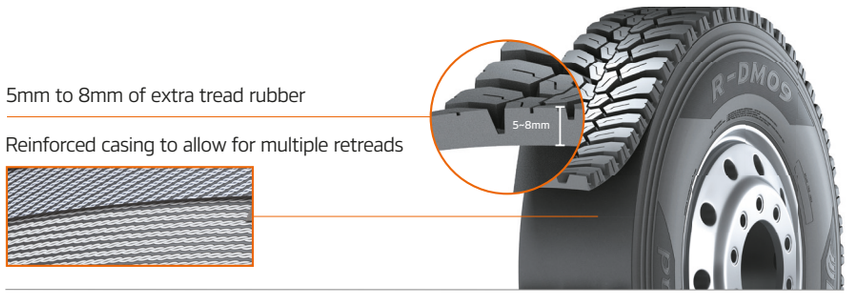
The Hankook SmartLife Solutions can

save money | reduce emissions | improve safety

by extracting the value Hankook built into our premium TBR tyres through regrooving and retreading.

### The Hankook SmartLife Solutions

**Delivering "built in" value to dealer & fleet partners**
- All Hankook TBR tyres are designed and built to be regrooved and retreaded.
- We add 5-8mm more tread rubber under the tread pattern for regrooving.
- We build tyre casings to withstand multiple retreads.



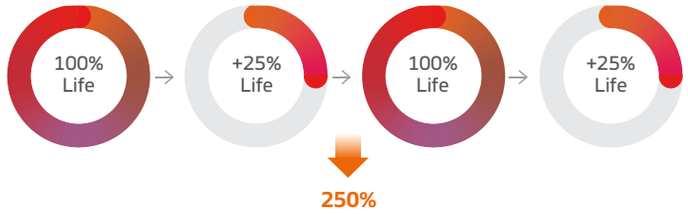

### SmartLife Solutions - Extend your tyre life

Premium tyres and casings that deliver up to 250% tyre life

| 1st Life | 2nd Life | 3rd Life | 4th Life |
|---|---|---|---|
| New Tyre | Regrooved Tyre | Retreaded Tyre | Regrooved Tyre |
| new Tyre + used Tyre | regrooved Tyre | retreaded Tyre + used Tyre | regrooved Tyre |
| 100% 0% | 25% | 100% 0% | 25% |

Belt

1 tyre = 1 casting = 250% tyre life




Be SMART and regroove your premium Hankook tyres you will save resources, preserve the environment and save money on tyres and fuel

**SAFETY**
Regrooved tyres can provide 10% more grip and traction[1]

**EFFICIENCY**
Up to 25% more km of wear 2L of fuel saved per 100km of driving[3]

**ENVIRONMENT**
1.6 tons less $CO^2$ per vehicle set per year[2]
70kg raw materials saved with 4 regrooved tyres

1. When compared to a Hankook tyre at legal minimum tread depth
2. Vehicle with 4 regrooved tyres covering 120k km per year
3. Tyres improve fuel efficiency as they wear. When a tyre is regrooved you extend the tyre life when it is at its most fuel efficient state

# Regrooving introduction

## INTRODUCTION

A regrooved tyre means a tyre, either new or retreaded, on which a tread pattern has been produced by cutting into the tread in accordance with the tyre manufacturer's recut tread pattern. Recut tread patterns for Hankook tyres are contained in this manual.

**Regrooving of truck tyres requires fully trained operators:**
- Use only regrooving tools with electrically heated blades.
- Determine the blade setting depth for each individual tyre by referring to the following tables.
- Set the blade in the cutter head to the specified depth.
- While regrooving, hold the cutter so that the underside of the cutting head is flat against the tread surface. Heating of the blade starts automatically as the blade penetrates the rubber.

**A minimum depth of remaining undertread rubber is required to avoid:**
- Damage of the top steel belt
- Rib tearing caused by groove cracking
- Stone damage

After regrooving, the tyre should be free of any defects (cracks, separations exposed ply or cord) visible on either the mounted or demounted tyre.

## TECHNICAL REQUIREMENTS

The tyre must be demounted from the rim before regrooving.

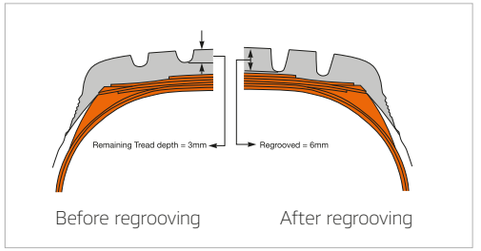
**Inspection :**
- Before regrooving check there is no damage on any part of the tyre.
- Remove stones and any other foreign objects such as nails from the tread which may have embedded into the grooves. Repair if necessary.
- Particular care should be exercised in selecting a tyre for regrooving where the tread area is damaged in anyway (eg: chipping, tearing and cutting due to abnormal operating conditions)
- Where a tyre has worn abnormally it may be possible to regroove that part of the worn tyre, provided that a sufficient amount of the original groove is visible before regrooving.

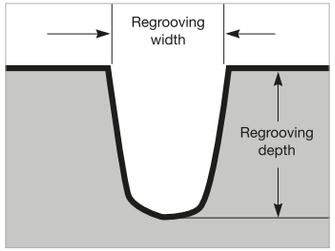
It is recommended that the minimum remaining tread depth be between 2mm and 3mm before regrooving. The tread depth should be measured around the circumference at 4 places to find the minimum remaining depth. Set the cutter blade for the recommendations as shown in this publication.

Please make sure that you regroove Hankook tyres steel radials to the patterns, depths and widths recommended in this manual to ensure good service from your tyres.

After regrooving, your tyre should be free from defects. It is most important to ensure that the belts under the tread have not been exposed.

## REGROOVING RECOMMENDATIONS

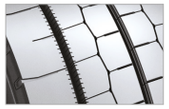


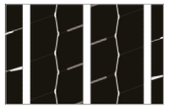



# Regrooving technical data

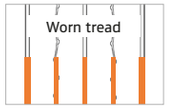
## LONG HAUL

e-cube Blue AL20 / e-cube MAX AL20w





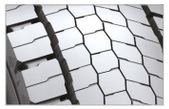
New tread



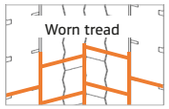

Regrooved tread

| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| 55 | 385/55R22.5 | 160K | | * | 11.6 | 3 | 6~9 |
| **AL20w** | | | | | | | |
| TUBELESS | | | | | | | |
| 50 | 355/50R22.5 | 156L | | * | 10.6 | 3 | 7~9 |
| 60 | 295/60R22.5 | 150/147L | | * | 11 | 3 | 6~8 |
| | 315/60R22.5 | 154/148L | | * | 10.5 | 3 | 6~8 |
| 70 | 315/70R22.5 | 156/150L | | * | 11.6 | 3 | 7~9 |

e-cube MAX DL20w



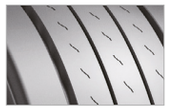
New tread



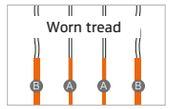

Regrooved tread

| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| 80 | 315/80R22.5 | 156/150L | | * | 15.0 | 3 | 5~7 |
| 70 | 315/70R22.5 | 154/150L | | * | 14.6 | 3 | 6 |
| 60 | 295/60R22.5 | 150/147L | | * | 13 | 3 | 6~8 |
| | 315/60R22.5 | 152/148L | | * | 13,4 | 3 | 6~8 |

e-cube Blue TL20



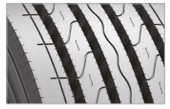
New tread



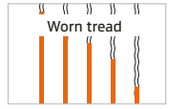

Regrooved tread

| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| 65 | 385/65R22.5 | 160K | | * | 12.2 | 3 | 9~11 |
| 55 | 385/55R22.5 | 160K | | * | 11.4 | 3 | A6~8 / B12~14 |
| 50 | 435/50R19.5 | 160J | | * | 8.7 / 10.2 | 3 | A2.5 / B7~9 |
| 45 | 445/45R19.5 | 160K | | * | 8.7 / 10.2 | 3 | A2.5 / B7~9 |

AL10+ e-cube MAX



New tread

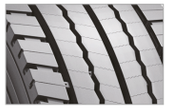


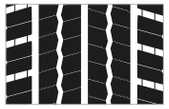

Regrooved tread

| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| 80 | 315/80R22.5 | 156/150L (154/150M) | | * | 13.5 | 3 | 8~10 |
| 70 | 315/70R22.5 | 156/150L | | * | 14.5 | 3 | 8~10 |
| 65 | 385/65R22.5 | 160K | | * | 12.2 | 3 | 6~9 |
| 60 | 295/60R22.5 | 150/147L | | * | 13.6 | 3 | 8~10 |
| | 315/60R22.5 | 154/148L | | * | 13.5 | 3 | 8~10 |
| 50 | 355/50R22.5 | 156L | | * | 13.5 | 3 | 9~11 |

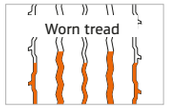
## LONG HAUL

### DL10+ e-cube MAX





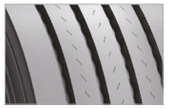
New tread



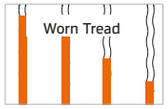

Regrooved tread

| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| **80** | 315/80R22.5 | 156/150L (154/150M) | | * | 17.7 | 3 | 8~10 |
| **60** | 295/60R22.5 | 150/147K | | * | 18.9 | 3 | 5~7 |
| | 315/60R22.5 | 152/148L | | * | 19.5 | 3 | 8~10 |
| **55** | 295/55R22.5 | 147/145K | | * | 10.4 | 3 | 7~9 |
| **45** | 315/45R22.5 | 147/145L | | * | 17.5 | 3 | 6~8 |

### TL10+ e-cube MAX



New Tread



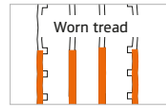

Regrooved Tread

| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| **75** | 215/75R22.5 | 135/133J | | * | 10.2 | 3 | 9 |
| | 235/75R22.5 | 143/141J | | * | 10.7 | 3 | 10 |
| **70** | 245/70R17.5 | 143/141J (146/146F) | | * | 10.7 | 3 | 10 |
| | 265/70R19.5 | 143/141J | | * | 10.7 | 3 | 10 |
| **65** | 385/65R22.5 | 160K | | * | 14.5 | 3 | 10~12 |
| **50** | 435/50R19.5 | 160J | | * | 12.6 | 3 | 12~14 |
| **40** | 455/40R22.5 | 160J | | * | 13.5 | 3 | 10~12 |

## COACH

### SMART Touring AL22

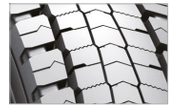
New tread



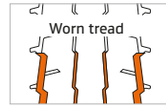

Regrooved tread

| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| **80** | 295/80R22.5 | 154M | | * | 14.1 | 3 | 8~10 |
| | 315/80R22.5 | 156/150L | | * | 14.6 | 3 | 8~10 |

### SMART Touring DL22



New tread



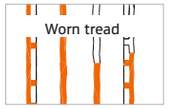

Regrooved tread

| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| **80** | 295/80R22.5 | 154/149M | | * | 17.9 | 3 | 6~8 |

## REGIONAL HAUL

### SMART FLEX AH31

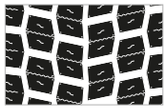
New tread




Regrooved tread

| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| | 12R22.5 | 152/149L | | * | 16.0 | 3 | 9~11 |
| 80 | 295/80R22.5 | 152/148M(154/149L) | | * | 17.5 | 3 | 9~11 |
| | 315/80R22.5 | 156/150L | | * | 17.5 | 3 | 9~11 |
| 70 | 315/70R22.5 | 156/150L | | * | 15.5 | 3 | 9~11 |
| | 275/70R22.5 | 148/145M | | * | 15.0 | 3 | 7~11 |
| 65 | 385/65R22.5 | 164K | | * | 15.5 | 3 | 9~11 |
| | 385/65R22.5 | 160K(158L) | | * | 15.5 | 3 | 9~11 |
| 60 | 315/60R22.5 | 154/148L | | * | 13.1 | 3 | 8~10 |
| 55 | 385/55R22.5 | 160K | | * | 15.0 | 3 | 6~8 |
| 50 | 335/50R22.5 | 156L | | * | 13.6 | 3 | 6~8 |

### SMART FLEX DH31



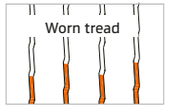
New tread


Regrooved tread

| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| 80 | 295/80R22.5 | 152/148M | | * | 20.5 | 3 | 6~8 |
| | 315/80R22.5 | 156/150L | | * | 20.5 | 3 | 6~8 |
| 70 | 315/70R22.5 | 154/150L | | * | 19.5 | 3 | 9~11 |
| | 275/70R22.5 | 148/145M | | * | 17.7 | 3 | 6~8 |
| 60 | 295/60R22.5 | 150/147K | | * | 18.9 | 3 | 4~6 |
| | 315/60R22.5 | 152/148L | | * | 19.4 | 3 | 5~7 |

### SMART FLEX TH31

New tread



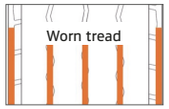

Regrooved tread

| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| | 11R22.5 | 148/145L | | * | 11.5 | 3 | 6~8 |
| 70 | 275/70R22.5 | 152/148J | | * | 12.6 | 3 | 6 |
| 65 | 425/65R22.5 | 165K | | * | 15.5 | 3 | 6~8 |
| | 385/65R22.5 | 160K | | * | 16.0 | 3 | 7.66 |
| | 445/65R22.5 | 169K | | * | 15 | 3 | 12 |
| 60 | 295/60R22.5 | 150/147K (152J) | | * | 13,6 | 3 | 10 |
| 55 | 385/55R22.5 | 160K (158L) | | * | 14.6 | 3 | 6~8 |
| | 385/55R19.5 | 156J | | * | 14,5 | 3 | 10 |
| 50 | 435/50R19.5 | 160J | | * | 12.5 | 3 | 6~8 |
| 45 | 445/45R19.5 | 160J | | * | 13 | 3 | 9 |
| | 455/45R22.5 | 160J | | * | 15 | 3 | 10 |
| 40 | 455/40R22.5 | 160J | | * | 13,6 | 3 | 10 |

## REGIONAL HAUL

### SMART FLEX AH51

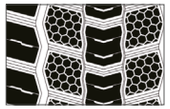
New tread




Regrooved tread

| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| **80** | 315/80R22.5 | 156/150L(154/150M) | | * | 16.5 | 3 | 6~8 |
| **75** | 315/70R22.5 | 156/150L | | * | 15 | 3 | 7~9 |
| **65** | 385/65R22.5 20P | 160K(158L) | | * | 14 | 3 | 8~10 |
| | 385/65R22.5 24P | 164K | | * | 14 | 3 | 8~10 |

### SMART FLEX DH51



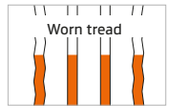
New tread


Regrooved tread

| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| **80** | 315/80R22.5 | 156/150L (154/150M) | | * | 17.5 | 3 | 5~7 |
| **70** | 315/70R22.5 | 154/150L | | * | 19.7 | 3 | 5~7 |

### AH33

New tread

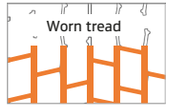



Regrooved tread

| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| | 10R22.5 | 141/139M | | * | 13.5 | 3 | 6~8 |
| | 11R22.5 | 148/145L | | * | 16 | 3 | 6~8 |
| | 12R22.5 | 152/148L | | * | 16.5 | 3 | 7~9 |
| | 13R22.5 | 156/150L | | * | 16.5 | 3 | 6~8 |

### DH33+

New tread

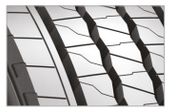



Regrooved tread

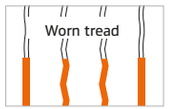
| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| | 12R22.5 | 152/149L | | * | 24 | 3 | 4~5 |

## REGIONAL HAUL

### SMART FLEX AH35



New tread

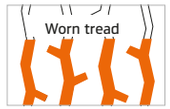



Regrooved tread

| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| | 8.5R17.5 | 121/120L | | * | 12.1 | 3 | 4~6 |
| | 9.5R17.5 | 131/129L | | * | 13.6 | 3 | 4~6 |
| | 8R19.5 | 124/122L | | * | 12.5 | 3 | 4~6 |
| 75 | 205/75R17.5 | 124/122M | | * | 12.1 | 3 | 5~7 |
| | 215/75R17.5 | 126/124M | | * | 12.6 | 3 | 5~7 |
| | 215/75R17.5 | 128/126M | | * | 12.6 | 3 | 5~7 |
| | 225/75R17.5 | 129/127M | | * | 12.1 | 3 | 6~8 |
| | 235/75R17.5 | 132/130M | | * | 12.1 | 3 | 7~9 |
| 70 | 245/70R17.5 | 136/134M | | * | 12.1 | 3 | 7~9 |
| | 265/70R17.5 | 140/136M | | * | 12.6 | 3 | 7~9 |
| | 245/70R19.5 | 136/134M | | * | 13.6 | 3 | 7~9 |
| | 265/70R19.5 | 140/138M | | * | 13.1 | 3 | 7~9 |
| | 285/70R19.5 | 146/144M | | * | 13.1 | 3 | 5~7 |
| | 305/70R19.5 | 148/145M | | * | 14.6 | 3 | 6~8 |

### SMART FLEX DH35

New tread




Regrooved tread

| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| | 8.5R17.5 | 121/120L | | * | 12.1 | 3 | 5~7 |
| | 9.5R17.5 | 131/129L | | * | 15.0 | 3 | 5~7 |
| 75 | 205/75R17.5 | 124/122M | | * | 13.1 | 3 | 5~7 |
| | 215/75R17.5 | 126/124M | | * | 13.0 | 3 | 6~8 |
| | 225/75R17.5 | 129/127M | | * | 12.6 | 3 | 6~8 |
| | 235/75R17.5 | 132/130M | | * | 12.6 | 3 | 6~8 |
| 70 | 245/70R17.5 | 136/134M | | * | 13.1 | 3 | 6~8 |
| | 265/70R17.5 | 139/136M | | * | 15.0 | 3 | 5~7 |
| | 245/70R19.5 | 136/134M | | * | 13.1 | 3 | 5~7 |
| | 265/70R19.5 | 140/138M | | * | 13.0 | 3 | 5~7 |
| | 285/70R19.5 | 146/144M | | * | 14.1 | 3 | 6~8 |
| | 305/70R19.5 | 148/145M | | * | 15.5 | 3 | 6~8 |

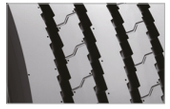
### DH16

New tread

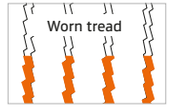

Regrooved tread

| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| | 12R22.5 | 152/149K | | * | 18.9 | 3 | 8~10 |
| 80 | 295/80R22.5 | 152/148M | | * | 21.4 | 3 | 7~8 |

### TH22



New tread




Regrooved tread

| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| | 9.5R17.5 | 143/141J | | * | 13.5 | 3 | 5~7 |
| | 11R22.5 | 148/146L | | * | 12.6 | 3 | 6~8 |
| 75 | 215/75R17.5 | 135/133J | | * | 12.0 | 3 | 6~8 |
| | 235/75R17.5 | 143/141J | | * | 12.5 | 3 | 6~8 |
| 70 | 245/70R17.5 | 143/141J (146/146F) | | * | 12.5 | 3 | 6~8 |
| | 245/70R19.5 | 141/140J | | * | 14.0 | 3 | 6~8 |
| | 265/70R19.5 | 143/141J | | * | 13.5 | 3 | 7~9 |
| | 285/70R19.5 | 150/148J | | * | 14.0 | 3 | 6~8 |
| 65 | 205/65R17.5 | 129/127K(132/132F) | | * | 11.6 | 3 | 6~8 |
| | 425/65R22.5 | 165K | | * | 16.5 | 3 | 8~10 |
| 55 | 385/55R22.5 | 160K (158L) | | * | 15.0 | 3 | 12~14 |

## MIXED SERVICE (ON AND OFF-ROAD)

### SMART WORK AM15 / AM15+



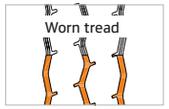
New tread


Regrooved tread

| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| 70 | 265/70R19.5 | 143/141J | | * | 16.0 | 3 | 8~10 |
| | 275/70R22.5 | 148/145K | | * | 18.0 | 3 | 8~10 |
| 65 | 425/65R22.5 | 165K | | * | 18.5 | 3 | 10~12 |
| | 445/65R22.5 | 169K | | * | 18.9 | 3 | 10~12 |
| AM15+ | | | | | | | |
| TUBELESS | | | | | | | |
| 65 | 385/65R22.5 | 160K (158L) | | * | 18.0 | 3 | 12~14 |

### SMART WORK AM11



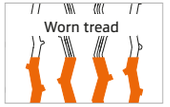
New tread


Regrooved tread

| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| 80 | 315/80R22.5 | 156/150K | | * | 16.3 | 3 | 10~12 |
| | 13R22.5 | 156/150K | | * | 16,8 | 3 | 11~13 |

### SMART WORK AM09

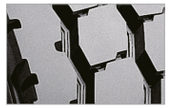


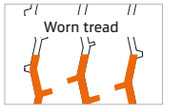
New tread


Regrooved tread

| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| | 10R22.5 | 144/142K | | * | 15.0 | 3 | A9~11 / B8~10 |
| | 11R22.5 | 148/145K | | * | 22.5 | 3 | 12~14 |
| | 12R22.5 | 152/149K | | * | 18.9 | 3 | 8~10 |
| | 13R22.5 | 156/150K | | * | 18.0 | 3 | A13~15 / B10~12 |
| 95 | 325/95R24 | 162/160K | | * | 18.2 | 3 | 8~10 |
| 80 | 295/80R22.5 | 152/148K (154/150J) | | * | 17.0 | 3 | A11~13 / B8~10 |
| | 315/80R22.5 | 156/150K | | * | 17.0 | 3 | A12~14 / B9~11 |

### AM06

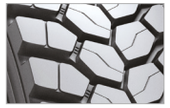


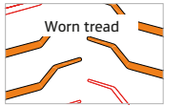
New tread


Regrooved tread

| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| 95 | 325/95R24 | 162/160K | | * | 18.4 | 4 | 7~9 |

### SMART WORK DM11



New tread


Regrooved tread

| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| 80 | 315/80R22.5 | 156/150K | | * | 19.7 | 3 | 5~13 |
| | 295/80R22.5 | 154/150L | | * | 11 | 3 | 6~12 |
| | 13R22.5 | 156/150K | | * | 20 | 3 | 7~12 |
| 70 | 315/70R22.5 | 154/150L | | * | 18,7 | 3 | 6~14 |

## MIXED SERVICE (ON AND OFF-ROAD)

SMART WORK DM09

New tread


Regrooved tread

| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| | 11R22.5 | 148/145K | | * | 23.5 | 3 | 7~11 |
| | 12R22.5 | 152/148K | | * | 22.5 | 3 | 7~11 |
| | 13R22.5 | 156/150K | | * | 23.0 | 3 | 7~12 |
| | 1200R20 | 154/150K | * | | 23.0 | 2 | 7~12 |
| 80 | 295/80R22.5 | 152/148K | | * | 23.8 | 3 | 5~10 |
| | 315/80R22.5 | 156/150K | | * | 21.8 | 3 | 6~12 |

DM06

New tread


Regrooved tread

| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| 95 | 325/95R24 | 162/160K | | * | 19.4 | 3 | 12~22 |

SMART WORK TM15

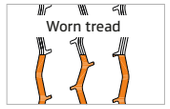
New tread


Regrooved tread

| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| 65 | 385/65R22.5 | 160K (158L) | | * | 17.5 | 3 | 7~9 |

SMART WORK TM11

New tread

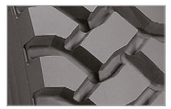



Regrooved tread

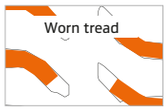
| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| 65 | 385/65R22.5 | 160K(158L) | | * | 16.5 | 3 | 10~12 |

## OFF-ROAD

### DM07



New tread

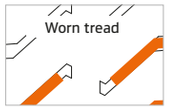



Regrooved tread

| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| 95 | 1100R20 | 152/148K | | * | 20.0 | 3 | 10~12 |
| 95 | 325/95R24 | 162/160G | | * | 23.3 | 3 | 10~12 |

### DM04

New tread

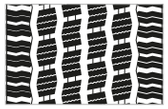



Regrooved tread

| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| | 11R22.5 | 148/145G | | * | 25.0 | 4 | 14~16 |
| | 12R22.5 | 152/148G | | * | 25.0 | 4 | 14~16 |
| | 13R22.5 | 154/150K | | * | 24.0 | 4 | 14~16 |
| 80 | 315/80R22.5 | 156/150K | | * | 22.5 | 4 | 15~17 |
| TUBE TYPE | | | | | | | |
| | 1200R20 | 154/150G | * | | 24.0 | 4 | 14~16 |
| | 1200R24 | 156/153G | * | | 20.9 | 4 | 14~16 |

## WINTER

### SMART CONTROL AW02

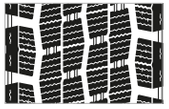


New tread

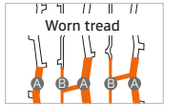

Regrooved tread

| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| 80 | 295/80R22.5 | 154/149M | | * | 16.5 | 3 | 9~11 |
| | 315/80R22.5 | 156/150L | | * | 17.0 | 3 | 8~10 |
| 70 | 275/70R22.5 | 150/145J | | * | 18 | 3 | 5~6 |
| | 315/70R22.5 | 154/150L | | * | 16.0 | 3 | 8~10 |
| 65 | 385/65R22.5 | 160K | | * | 15.5 | 3 | 8~10 |
| 55 | 385/55R22.5 | 160K (158L) | | * | 15.0 | 3 | 8~10 |
| AW02+ | | | | | | | |
| TUBELESS | | | | | | | |
| 65 | 385/65R22.5 | 160K (158L) | | * | 15.5 | 3 | 8~10 |

### SMART CONTROL DW07



New tread

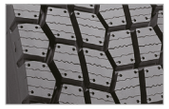


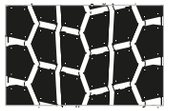

Regrooved tread

| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| | 12R22.5 | 152/148L | | * | 19.5 | 3 | A4~6 / B4~6 |
| 80 | 315/80R22.5 | 156/150L | | * | 20.5 | 3 | A5~7 / B4~6 |
| | 295/80R22.5 | 152/148L | | * | 20.5 | 3 | A5~7/ B4~6 |
| 70 | 275/70R22.5 | 150/145J | | * | 18.4 | 3 | 3.5~5 |
| | 315/70R22.5 | 154/150L | | * | 17.5 | 3 | A6~8 / B4~6 |

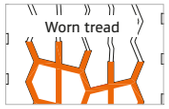
## WINTER

### DW06





New tread

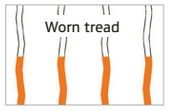



Regrooved tread

| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| **80** | 295/80R22.5 | 152/148L | | * | 21.3 | 3 | 10~12 |
| | 315/80R22.5 | 156/150L | | * | 21.3 | 3 | 10~12 |
| **70** | 315/70R22.5 | 154/150L | | * | 21.3 | 3 | 10~12 |

### SMART CONTROL TW01

New tread



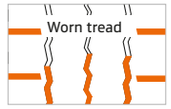

Regrooved tread

| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| **65** | 385/65R22.5 | 160K (158L) | | * | 12.1 | 3 | 9.5 |
| **55** | 385/55R22.5 | 160K/158L | | * | 14.1 | 3 | 9 |
| **45** | 445/45R19.5 | 160J | | * | 13.6 | 3 | 9 |

## URBAN

### AU03 / AU03+

New tread

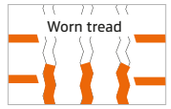



Regrooved tread

| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| | 11R22.5 | 148/145J | | * | 19.0 | 3 | 9~11 |
| **80** | 275/80R22.5 | 149/146J | | * | 19.0 | 3 | 9~11 |
| | 295/80R22.5 | 152/148J | | * | 19.0 | 3 | 9~11 |
| **70** | 245/70R19.5 | 136/134M | | * | 15.5 | 3 | 7~9 |
| | 265/70R19.5 | 140/138M | | * | 15 | 3 | 8~10 |
| **AU03+** | | | | | | | |
| TUBELESS | | | | | | | |
| **70** | 275/70R22.5 | 150/145J (152/148) | | * | 20.5 | 3 | 9~11 |

### SMART CITY AU04 / AU04+

New tread




Regrooved tread

| SRS | Size | LI/SS | Type | | Tread Depth | Regrooving | |
|---|---|---|---|---|---|---|---|
| | | | T/T | T/L | m/m | Depth | Width |
| TUBELESS | | | | | | | |
| **70** | 275/70R22.5 | 150/148J (152/148F) | | * | 19 | 3 | 7~8 |
| **60** | 315/60R22.5 | 154/148J (156/152F) | | * | 13.1 | 3 | 7~8 |
| **AU04** | | | | | | | |
| TUBELESS | | | | | | | |
| | 11R22.5 | 148/145J | | * | 20.2 | 3 | 9~11 |
| **80** | 295/80R22.5 | 152/148J | | * | 16.5 | 3 | 9~11 |

TRUCK AND BUS TYRE | **TECHNICAL MANUAL**

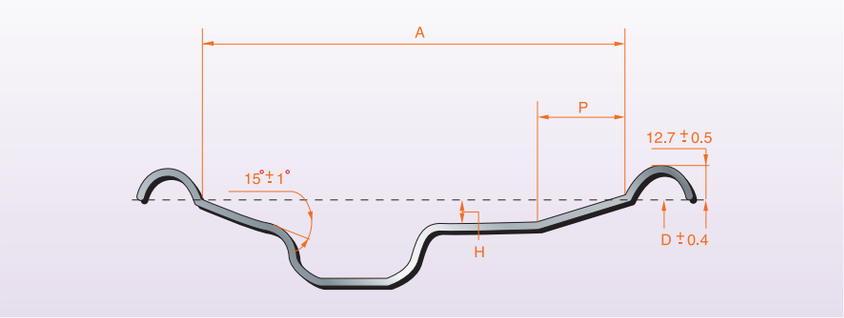
# RIM AND ACCESSORIES

Technical data of rims
Demounting and mounting
Tubeless tyre demounting and mounting
Tubeless rim valve mounting
About dual spacing

# Technical data of rims

The rim is part of the wheel which supports the tyre.

## Drop-centre rims with 15° tapered bead seats



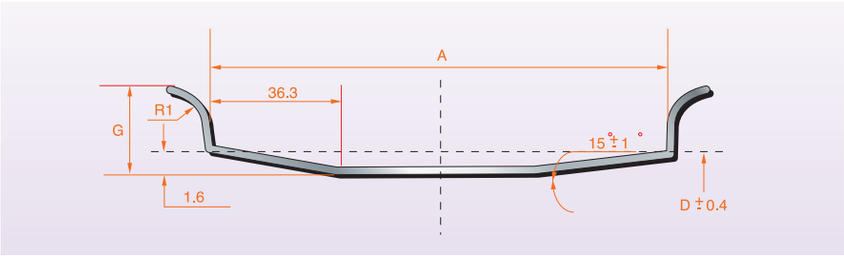

| DIMENSIONS(MM) | |
|---|---|
| Rim | A ± 3.2 |
| 5.25 | 133.4 |
| 6.00 | 152.4 |
| 6.75 | 171.5 |
| 7.50 | 190.5 |
| 8.25 | 209.6 |
| 9.00 | 228.6 |
| 9.75 | 247.6 |

| DIMENSIONS(MM) | |
|---|---|
| Rim | A ± 3.2 |
| 10.50 | 266.7 |
| 11.75 | 298.5 |
| 12.25 | 311.0 |
| 13.00 | 330.2 |
| 14.00 | 355.6 |

| DIAMETERS | | | | |
|---|---|---|---|---|
| Nominal diameter code | 17.5 | 19.5 | 22.5 | 24.5 |
| Diameter D (mm) | 444.5 | 495.3 | 571.5 | 622.3 |

## Multi-piece rims with 5° tapered bead seats

Rims with detachable lateral rings are equipped with flange and bead seats which are removable on one side of the rim.



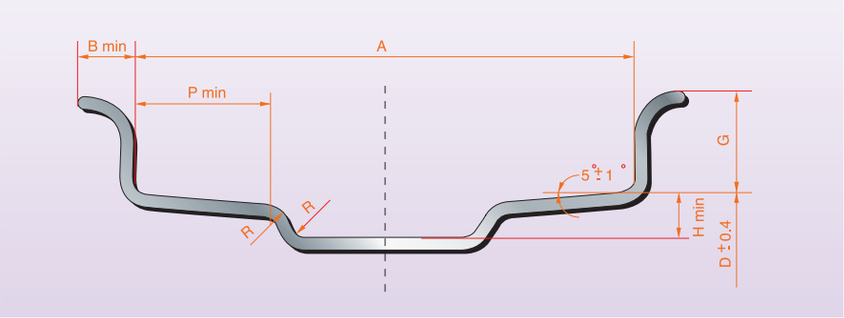

| DIMENSIONS(mm) | | BASIC | | OPTIONAL | |
|---|---|---|---|---|---|
| Rim | A ± 3.2 | G ± 1.2 | R1 ± 2.5 | G ± 1.2 | R1 ± 2.5 |
| 5.0 | 127.0 ± 3.2 | 27.9 | 14.0 | | |
| 5.5 | 139.7 ± 3.2 | 30.5 | 15.2 | 33.0 | 16.5 |
| 6.0 | 152.4 ± 3.2 | 33.0 | 16.5 | | |
| 6.5 | 165.1 ± 3.2 | 35.6 | 17.8 | 36.8 | 18.4 |
| 7.0 | 177.8 ± 3.2 | 38.1 | 19.0 | 36.8 | 18.4 |
| 7.5 | 190.5 ± 3.2 | 40.6 | 20.3 | 42.0 | 21.0 |
| 8.0 | 203.2 ± 3.2 | 43.2 | 21.6 | 42.0 | 21.0 |
| 8.0 V 5° | 203.2 ± 3.2 | 44.4 | 27.0 | 42.0 | 21.0 |
| 8.5 | 215.9 ± 3.6 | 45.7 | 22.9 | 43.2 | 21.6 |
| 9.0 | 228.6 ± 3.6 | 48.3 | 24.1 | 45.7 | 22.8 |
| 9.5 | 247.7 ± 3.6 | 38.1 | 19.0 | 8.25 | 8.25 |
| 10.0 | 254.0 ± 4.7 | 50.8 | 25.4 | 9.00 | 9.00 |
| 14.0 V 5° | 355.6 ± 4.7 | 44.4 | 27.0 | | |

| DIAMETERS | | | | |
|---|---|---|---|---|
| Nominal diameter code | 15 | 20 | 22 | 24 |
| Diameter D (mm) | 384.4 | 514.4 | 565.2 | 616.0 |

# Technical data of rims

The rim is part of the wheel which supports the tyre.

## Drop-centre rims with 5° tapered bead seats



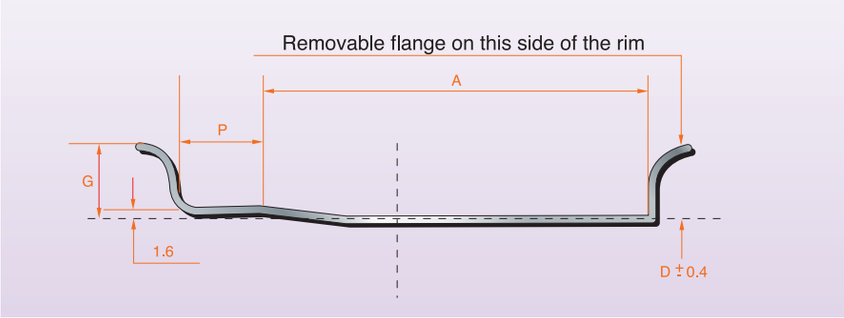

| DIMENSIONS (mm) | | | |
|---|---|---|---|
| Rim | A ±1.5 | G $^{+3.2}_{-0.4}$ | H mim |
| 4.00B | 101.6 | 14.0 | 15.0 |
| 4.50B | 114.3 | 14.0 | 15.0 |
| 5.00B | 127.0 | 14.0 | 15.0 |
| 5.50B | 139.7 | 14.0 | 15.0 |
| 6.00B | 152.4 | 14.0 | 15.0 |
| 4.00C | 101.6 | 15.9 | 16.8 |
| 4.50C | 114.3 | 15.9 | 16.8 |
| 4J | 101.6 | 17.3 | 17.3 |
| 4½J | 114.3 | 17.3 | 17.3 |
| 5J | 127.0 | 17.3 | 17.3 |
| 5½J | 139.7 | 17.3 | 17.3 |
| 6J | 152.4 | 17.3 | 17.3 |
| 6½J | 165.1 | 17.3 | 17.3 |
| 7J | 177.8 | 17.3 | 17.3 |
| 7½J | 190.5 | 17.3 | 17.3 |
| 6L | 152.4 | 21.6 | 28.5 |
| 6½L | 165.1 | 21.6 | 28.5 |

| DIMENSIONS (mm) | | | |
|---|---|---|---|
| Rim | A 3.2 | G ±1.2 | P mim |
| 4.50E | 114.3 | 19.8 | 22.2 |
| 5.00E | 127.0 | 19.8 | 22.2 |
| 5.50E | 139.7 | 22.2 | 23.9 |
| 6.00G | 152.4 | 27.9 | 31.8 |
| 6.50H | 165.1 | 33.7 | 36.3 |

| DIMENSIONS (mm) | | | | |
|---|---|---|---|---|
| Rim | A | H mim | G $^{+1.2}_{-0.4}$ | P mim |
| 11 | 279.4 ± 5.0 | 10.0 | 25.4 | 50.0 |
| 12 | 304.8 ± 5.0 | 10.0 | 25.4 | 50.0 |

| DIAMETERS | | | | | | |
|---|---|---|---|---|---|---|
| Nominal diameter code | 12 | 13 | 14 | 15 | 16 | 20 |
| Diameter D (mm) | 304.0 | 329.4 | 354.8 | 380.2 | 405.6 | 512.8 |

## Flat base rims




| DIMENSIONS (mm) | | | |
|---|---|---|---|
| Rim | A ±3.2 | G ±2.5 | R max |
| 5.00 S | 127.0 ± 3.2 | 33.3 | 20.0 |
| 6.00 T | 152.4 ± 3.2 | 38.1 | |
| 7.33 V | 186.2 ± 3.2 | 44.0 | |
| 9.00 V | 228.6 ± 3.6 | 44.0 | |
| 10.00 V | 254.0 ± 4.7 | 44.0 | |

| DIAMETERS | |
|---|---|
| Nominal diameter code | |
| Diameter D (mm) | |

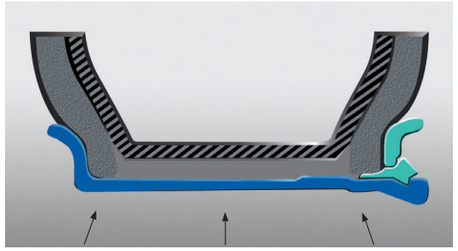
# Demounting and mounting

## SAFETY INSTRUCTIONS

Do not demount or mount tyres without proper training. Wall charts containing demounting and mounting instructions for all on-highway rims should be available through your normal rim supplier.

**Remove all cracked wheels from service**

**LUBRICATED areas shown by arrows**

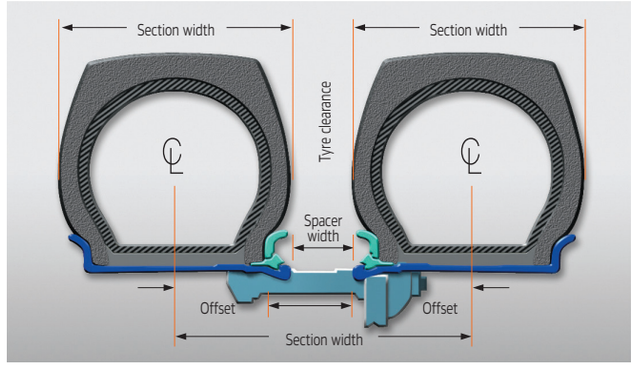


**Use of A GG ring indicates correct mounting**

**Proper sequence for tightening stud ruts on an 8 stud system**


NOTE :
Always use a securely held safety cage and extension hose with a clip on air chuck for airing the tyre. Rapid air loss can propel the assembly.

**Cross section through typical dual installation**




**Proper Matching of Rim Parts**

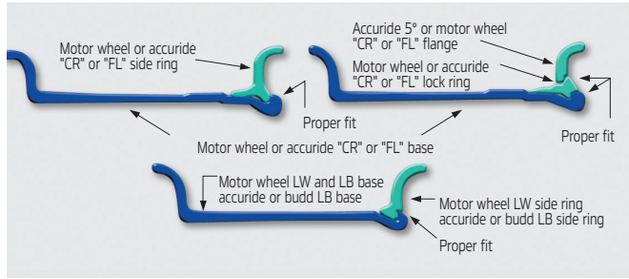



**Figure 3.12**
Correct and incorrect matching of rim parts

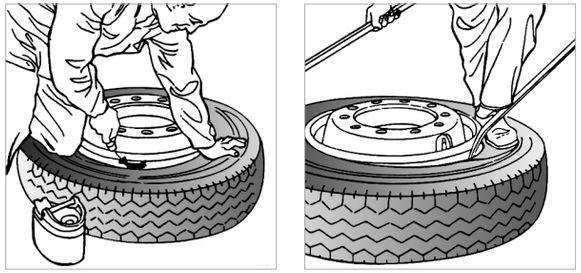
# Tubeless tyre demounting

The tyre should be completely deflated before demounting, which is done by loosening and removing the valve stem core. Be careful there is no foreign matter left in the valve and that the valve stem is not cracked or damaged.  Do not stand near the valve stem during the deflating process.

## BEAD DEMOUNTING

Place the tyre assembly on a clean and flat surface with the valve facing upwards using a tyre demounting leaver between the tyre bead and rim flange.

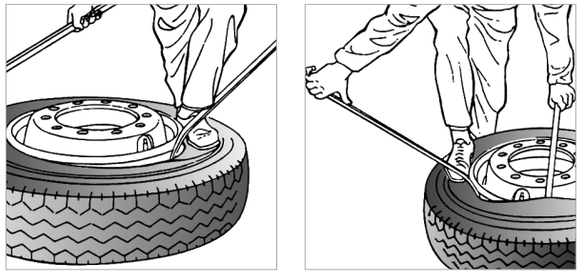
**Bead demounting**



## OUTSIDE BEAD DEMOUNTING

Lay the wheel on a clean flat surface with the valve facing upward. Work the bead over the rim flange, using your hands and knees as in the illustration to the right. If it is difficult to fit over the flange, use the proper tyre mounting lever as per the illustration.

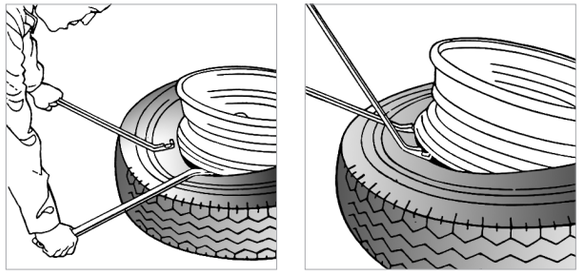
**Outside bead demounting**



## INSIDE BEAD DEMOUNTING

Turn the tyre assembly over, then lubricate between the bead and the rim. Insert the tip of the tyre between the tyre lever and rim, then add pressure. Use the second lever about 15cm away from the first lever to remove the rim from the tyre. Repeat this procedure until the bead is completely demounted.

**Inside bead demounting**



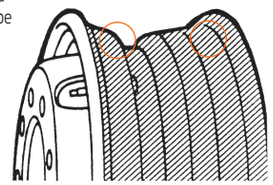
# Tubeless tyre mounting

## RIM PREPARATION

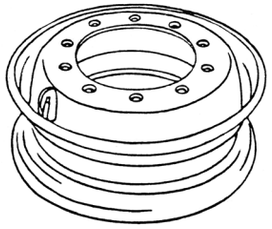
Rims must not be broken or damaged.
Remove the rubber bushing from the valve stem hole and inspect the valve stem for any signs of damage or wear.
Remove rust, dirt and any foreign materials from the rim. Clean and sand smooth the area marked "///" in the picture below. If rusted, clean and repaint the rim surface to protect it from rusting.
If required, replace any worn or damaged valve stem.
Lubricate the inner parts of the rim surface where the tyre mounts (marked "///").

**Base part of tubeless rim**

Parts marked "///" are to be cleaned and re-lubricated



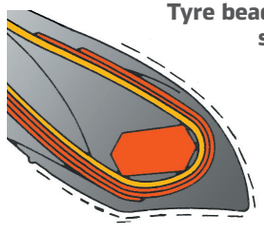
**Base part of tubeless rim**



## TYRE PREPARATION

In the case of new tyres, wipe the bead clean with a dry cloth, checking at the same time that there are no damage, kinks or breakages. Apply the recommended lubricant to the tyre bead as per the illustration to the right.

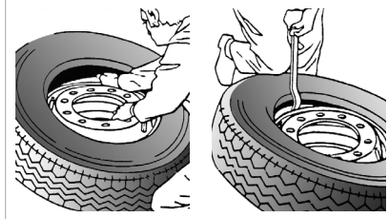
**Tyre bead cross section**



## INSIDE BEAD ASSEMBLY

Lay the wheel on a clean flat surface with the valve facing upward. Work the bead over the rim flange, using your hands and knees as in the illustration to the right. If it is difficult to fit over the flange, use the proper tyre mounting lever as per the illustration.

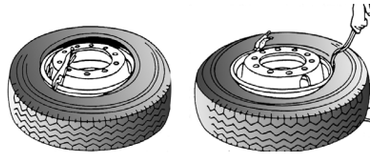
**Inside bead assembly**



## OUTSIDE BEAD ASSEMBLY

Start the outside bead placement over the outside rim flange by hand, beginning at the point where the valve stem is located.
Once hand placement becomes difficult, use the proper tubeless tyre bead mounting lever to complete the job as per the following illustrations.
When mounting tyres, do not use excessive force and avoid heavy tools or impact such as hammering on the rim.

**Outside bead assembly**



## TUBELESS TYRE INFLATION

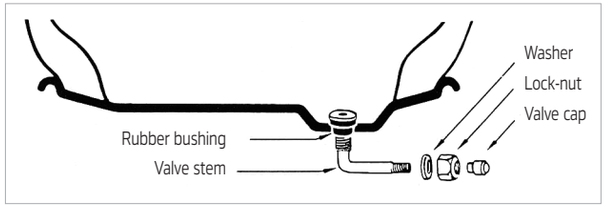
Use an inflation gauge, suitable remote air hose nozzle and a safety cage when inflating the newly mounted tyre. The lubricated bead should sit firmly to the rim flange at about 10 PSI inflation. Do not stand near or in front of tyre while inflating. Use the safety cage and stand a safe distance for your protection. If the bead fails to sit first, then rotate the tyre a few degrees around the rim, ensuring the bead and rim flange is lubricated and try again.
If for any reason the bead is not evenly seated with a comfortable fit, do not attempt to inflate further. Repeat the entire assembly process with more lubricant on the bead and rim areas.
Once it sits and you are assured the bead and rim flange are at a snug and even fit all the way around, inflate the tyre to the recommended inflation pressure to the axle load. Check that the tyre or valve are not leaking, if so, tighten the valve cap.

# Tubeless rim valve mounting

## A-TYPE RIM VALVE

The valve hole in the rim must be clean, smooth and not damaged. Apply a recommended lubricant to the rubber brushing off the valve and insert the valve stem through the rim hole which will assemble the washing and lock-nut on the inside. Tighten the lock-nut with a wrench so that the valve stem is secured into the rim.

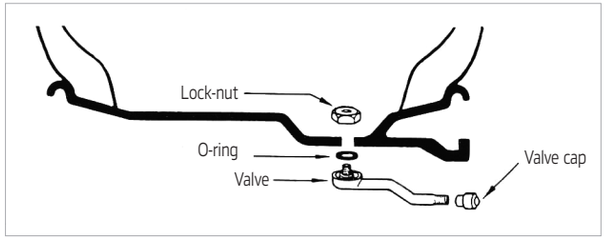
**A-type rim valve**




## B-TYPE RIM VALVE

The valve hole in the rim must be clean, smooth and not damaged, as per the illustration below. Place a lubricated O-ring on the valve stem and insert the stem into the valve stem hole so that the valve faces perpendicular to the rim. The valve stem hole can be found in the rim. Tighten the lock nut with a wrench from the opposite side of the rim until the valve stem is secure.

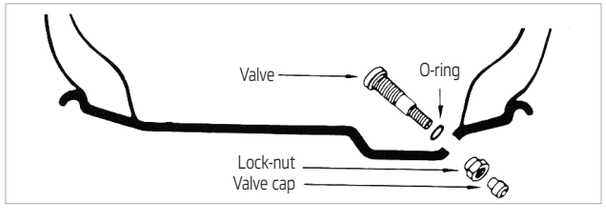
**B-type rim valve**




## C-TYPE RIM VALVE

The valve hole in the rim must be clean, smooth and not damaged, as per the illustration below. Lubricate the O-ring and insert a new valve stem going through the O-ring. This should go through the valve stem hole in the rim from the inside. From the other side securely hand tighten the lock-nut.

**C-type rim valve**



# About dual spacing

Mismatched duals have the same effect on the life of tyres as low inflation or overload. An underinflated tyre on a dual assembly shifts its share of the load to the adjacent tyre, which then becomes overloaded and frequently fails prematurely.
When mounting duals on a truck, there will generally be some difference in the diameter of the 2 tyres (within the limits described below).
Mount the small tyre on the inside, the outside tyre wears faster than the inside tyre. As it wears its diameter will approach that of the inside tyre. Additionally, any crown on the road will favour the placement of the smaller diameter tyre on the inside.
The difference in dimensions of the tyres on a dual assembly should never exceed the figures shown in the table below. The measurement and pairing of duals is very important when mounting a new set of radial recaps.
All caps are on the same tyre type and all have the same overall diameter. The service they were subjected to prior to capping may have an effect on the size of the retreaded tyre.

| DUAL MATCHING TOLERANCE | | | |
|---|---|---|---|
| Tyre size | Diameter (in.) | Circumference (in.) | Radius (in.) |
| 8.25R20 and under | 0 to 1/4 | 0 to 3/4 | 0 to 1/8 |
| 9.00R20 and up | 0 to 1/2 | 0 to 1-1/2 | 0 to 1/4 |
| Twin screw (all sizes) | 0 to 1/4 | 0 to 3/4 | 0 to 1/8 |

## Rim width and tyre spacing

| RADIAL AND BIAS PLY TYRES | | | |
|---|---|---|---|
| Tyre size | Alternate rim (wide) is this correct? (narrow) | Tyre section width | Minimum dual spacing without chains |
| 7.50 | 6.5 | 8.65 | 9.9 |
| | 6.0* | 8.45 | 9.7 |
| | 5.5 | 8.25 | 9.5 |
| 8.25 | 7.0 | 9.50 | 10.8 |
| | 6.5* | 9.30 | 10.6 |
| | 6.0 | 9.10 | 10.4 |
| 9.00 | 7.50 | 10.40 | 11.9 |
| | 7.0* | 10.20 | 11.7 |
| | 6.5 | 10.00 | 11.5 |
| 10.00 | 8.0 | 11.15 | 12.7 |
| | 7.5* | 10.95 | 12.5 |
| | 7.0 | 10.75 | 12.3 |
| 11.00 | 8.5 | 11.75 | 13.2 |
| | 8.0* | 11.55 | 13.0 |
| | 7.5 | 11.35 | 12.8 |

| TUBELESS (HIGHWAY SERVICE) | | | |
|---|---|---|---|
| Tyre size | Alternate rim (wide) is this correct? (narrow) | Tyre section width | Minimum dual spacing without chains |
| 9 | 7.50 | 9.30 | 10.6 |
| | 6.75* | 9.00 | 10.3 |
| | 6.00 | 8.70 | 10.0 |
| 10 | 7.50* | 10.00 | 11.4 |
| | 6.75 | 9.70 | 11.1 |
| 11 | 8.25* | 11.00 | 12.6 |
| | 7.50 | 10.70 | 12.3 |
| 12 | 9.00* | 11.80 | 13.5 |
| | 8.25 | 11.50 | 13.2 |

| LOW PROFILE TUBELESS | | | |
|---|---|---|---|
| Tyre size | Alternate rim (wide) is this correct? (narrow) | Tyre section width | Minimum dual spacing without chains |
| 225/70 | 6.00 | 8.60 | 9.70 |
| | 6.75* | 8.90 | 10.00 |
| 244/70 | 6.75* | 9.46 | 10.68 |
| 245/75 | 7.50* | 9.76 | 10.98 |
| 255/70 | 7.50* | 10.04 | 11.30 |
| 265/70 | 7.50* | 10.31 | 11.61 |
| 265/75 | 8.25 | 10.61 | 11.91 |
| 275/70 | 8.25 | 10.86 | 12.24 |
| 285/70 | 7.50* | 10.84 | 12.22 |
| 285/75 | 8.25* | 11.14 | 12.52 |
| 296/75 | 8.25 | 11.43 | 12.89 |
| 9.00* | 11.73 | 13.19 | |

TRUCK AND BUS TYRE | **TECHNICAL MANUAL**

# MAINTENANCE AND CARE

About tyre inflation
Truck alignment and tyre wear
Tyre damage

# About tyre inflation

### ONE OF THE MOST IMPORTANT ASPECTS OF TYRE MAINTENANCE IS CORRECT INFLATION.

Correct inflation is needed to carry the load and avoid damage. Driving with improper inflation (particularly grossly under inflated or over inflated tyres) is dangerous and can cause critical damage or sudden failure of the tyre(s).

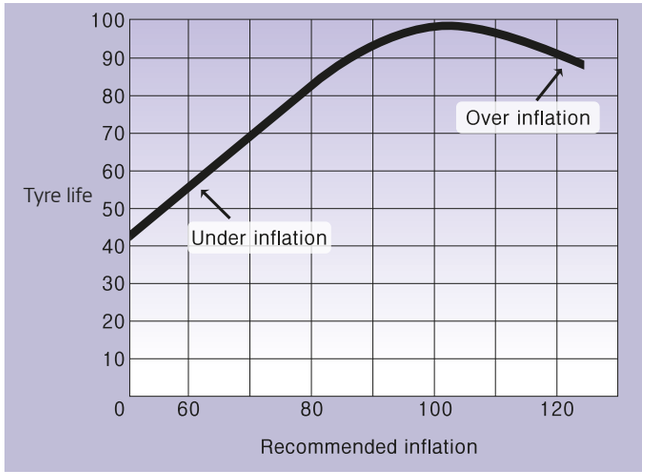
### PROPER INFLATION SHOULD BE MAINTAINED AND CHECKED AT LEAST ONCE A WEEK AS WELL AS BEFORE A LONG DISTANCE DRIVE.

It is also advisable to take into account the axle load and driving conditions when setting inflation pressures. Compensation for heavier loads can be made by increasing inflation pressures. Make sure to not exceed the maximum inflation rates for the tyre or maximum load axle.

### IN THE SPACE OF JUST ONE MONTH A TYRE CAN LOSE 10 POUNDS OF AIR PRESSURE.

It is important to check your air pressure regularly to make sure your tyres are neither under nor over inflated.

### INFLATION AND TYRE LIFE




### UNDER INFLATION

The worst enemy your tyre can have. It causes increased treadwear on the outside edges (or shoulders) of the tyre and generates excessive heat, reducing tyre durability.
Soft tyres make your vehicle work harder, meaning that fuel efficiency is reduced as there is an increased rolling resistance.

### OVER INFLATION

Is detrimental to the tyre as too much air pressure causes the centre of the tread to bear the majority of the truck's weight. This leads to faster deterioration and uneven wear. Any kind of uneven wear will also shorten the life span of your tyres.

# Truck alignment and tyre wear

The two major things that affect tyre wear are :
- Inflation pressure
- Wheel alignment

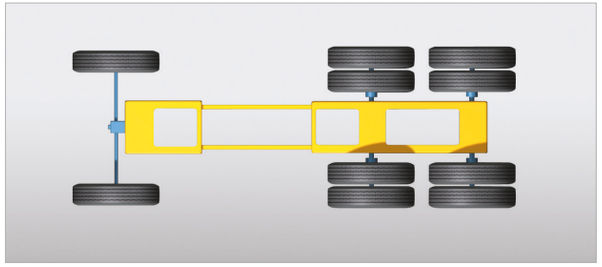
## COMPONENTS OF ALIGNMENT

- Toe
- Camber
- Caster
- Ackermann
- Axle parallelism
  - Thrust angle
  - Scrub angle

## TOTAL WHEEL ALIGNMENT

Definition :
- The process whereby the vehicle and all the tyres are travelling in the same direction.
- Steering axle alignment alone is not sufficient.

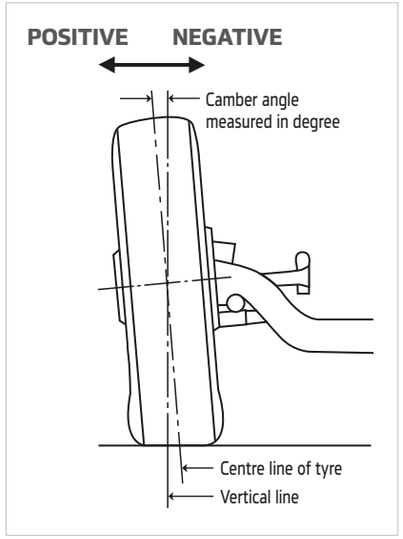
### ALIGNMENT AND WEAR



## CAMBER

- Camber is the inward or outward tilt of the steering axle tyres when viewed from the front.
- Positive camber is the top of the tyre tilted out.
- Camber becomes more negative as the load increases.

The angle that a centre line of the wheel is inclined from, the vertical centre line perpendicular to a flat road, is called camber angle. If the top of the wheel leans out from the perpendicular then it is positive camber. If the top of the wheel leans in from the perpendicular then it is negative camber.
Camber is meant to compensate for the downward forces of added loads. Correct camber settings help the tyre maintain a firm and even tread contact with the road while the vehicle is travelling under loaded conditions. Often wear at the outside or inside edge of the tyre may indicate incorrect camber setting.

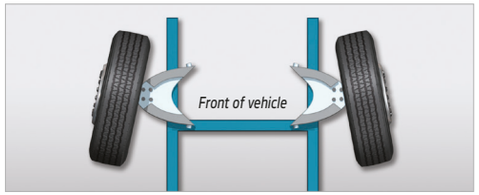



Positive
camber

Negative
camber

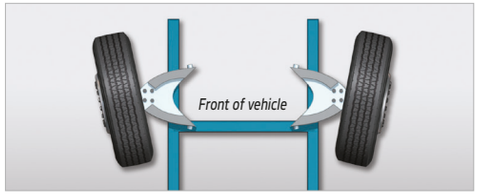
# TOE

- Toe is the inward or outward pointing of the wheels when viewed from the top of the vehicle.
- The goal is to have zero toe when the vehicle is loaded to its normal operating condition.



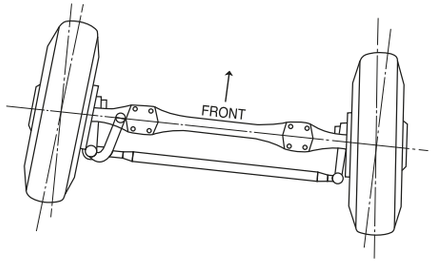

Toe-in refers to the inclination of the wheels of a vehicle so that the pair of front wheels (viewing from the front as per the illustration to the left), are closer together at the front than at the rear of the wheels.

The purpose of toe-in is to relieve or counteract some of the force which pulls wheels outwards as they roll along the road. Correct toe-in will ensure the rotation direction and direction of travel are as similar as possible at driving speed. Insufficient toe-in settings will result in steering instability.




The opposite is considered toe-out, see diagram as per the illustration to the left.

If toe-in or toe-out is insufficient or excessive the tyre wear will be effected and appear as feathering at the edges of the tread.



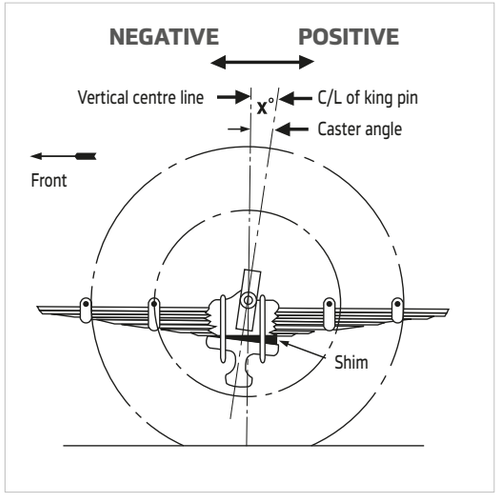

# CASTER

- Caster is the forward or rearward tilt of the king pin of the steering axle when viewed from the side.
- Caster is generally not considered to have a great effect on the tyre wear.

Caster is the condition where the king pin is inclined with the top of the pin angled rearward similar to the front forks of a bicycle. Caster angle is meant to compensate for the resistance which the tyre(s) encounter(s) as a result of drag forces against the road. Caster angle should be the same for both wheels on a given axle or the result will be vibration and abnormal tyre wear.

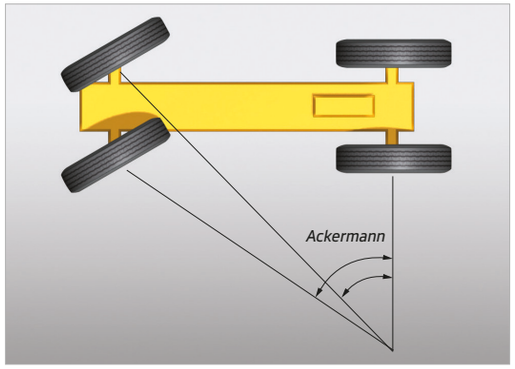
Too much caster will more than compensate for the amount of drag but it will also create additional difficulty in steering.

Too little caster makes steering become lighter but also unstable and can cause it to wonder. The caster angle should be checked as it can be distorted by impacts on the tyre or by driving in rough conditions.



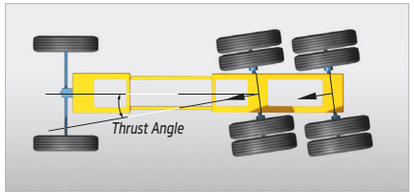
## ACKERMANN

- The Ackermann Principle shows that in any turn the inside tyre needs a sharper turn angle than the outside tyre.
- The difference in turn angles between the tyres is determined by the actual turn angle and the vehicle wheel base.
- Improper Ackermann causes side force, excessive scuffing and fast or irregular wear.



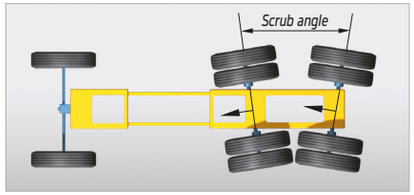

## THRUST ANGLE

- Thrust angle is the difference between the line perpendicular to the axle and vehicle centre line.
- Each drive axle has its own thrust angle.
- The target is to have zero thrust angle.




## TANDEM SCRUB

- Tandem scrub is the difference in the thrust angles of the drive axles.
- The target is zero.
- Tandem scrub errors cause constant side force on the steer tyres. This leads to irregular wear.



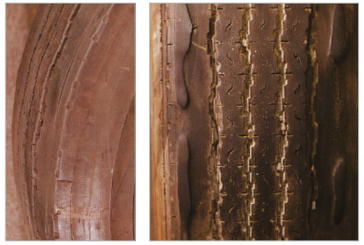

# Abnormal tread wear

Under inflation and over inflation of the tyre is the prime cause of tread wear. However there are other conditions that influence tread wear and produce irregular wear patterns.

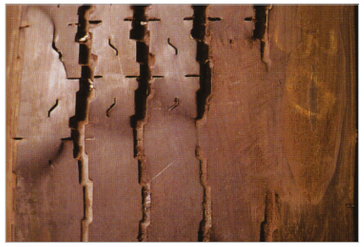
## COMPONENTS OF ALIGNMENT

- Imbalance of the tyre or tyre and wheel assembly.
- Improper wheel alignment.
- Breaking system problems that may cause the wheel to lock up or flat spotting.
- Bent or round rims.
- Worn or damaged bearings.
- Broken or worn shock absorbers, springs or steering components.

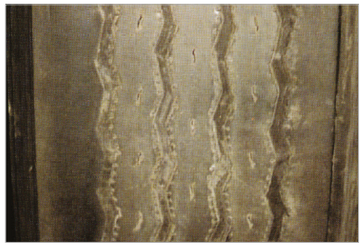
### ABNORMAL WEAR



### DIAGONAL WEAR



### SHOULDER WEAR CAUSED BY WRONG CAMBER OR MISALIGNMENT



# Tyre damage

With tubeless tyres it is often possible, even with a slow air leak, to use the tyre carefully enough to get to a service centre.

Small punctures in the tread area, if detected early enough, can usually be repaired as to avoid air loss and further problems.

However sufficient loss of air can cause a rapid heat build up which can damage the tyre.
This may result in tyre failure or separations between the tread and carcass piles.

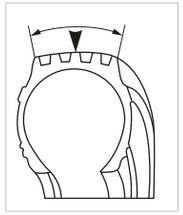
Care should be taken to avoid road debris, dirt or moisture penetrating any puncture or getting trapped inside the tyre, or between the wheel rim and tyre.
Damaged tyres should always be repaired or replaced at the earliest possible opportunity to avoid further tyre damage, possible tyre failure, vehicle or personal injury.

Check for and correct any of the following conditions :

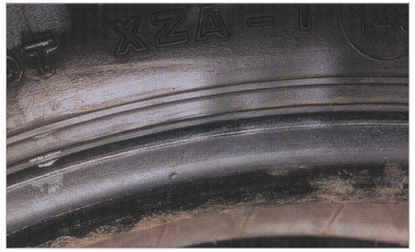
## DAMAGE DUE TO CONTACT WITH THE VEHICLE

- Improper tyre inflation.
- Overloading.
- Improper vehicle maintenance.
- Brake system abnormalities.
- Differences of tyres sizes or circumferences on the same axle.
- Improper mounting of tyre or wheel.
- Improper, worn or damaged valve.
- Improper use of tube or flap.

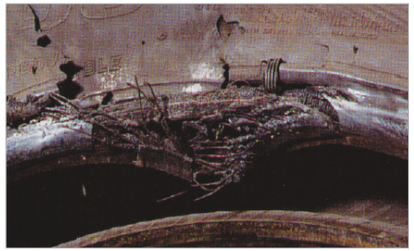
## FLAT SPOTTING DUE TO LOCKED BRAKES



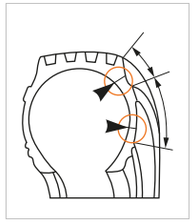
## BEAD DAMAGE FROM CURBING



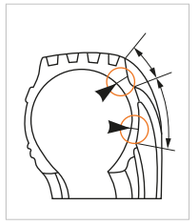
## BURNT BEADS

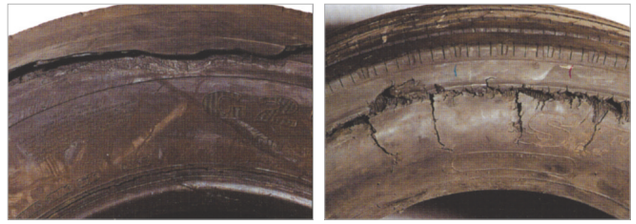


## RIPPED SIDEWALL



## SIDEWALL DAMAGE DUE TO RUN FLAT OR SEVERE UNDER INFLATION





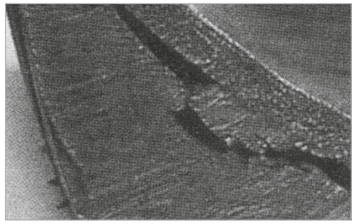
# HEAT CAN DAMAGE TYRES

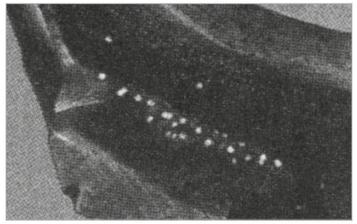
Under inflation, overloading or excessive speed can cause damage because of heat build up. Tyre parts such as cord, the bonding between carcasses, belts and treads can be easily damaged by excessive heat. Most tyre cords lose strength at temperatures above 120°C making the tyre more vulnerable to a failure.

Excessive heat can either weaken or damage cords and rubber compounds or even cause separation between the piles.

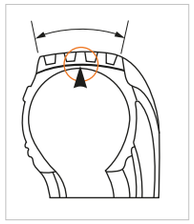
The following pictures show some of the possible damage conditions.

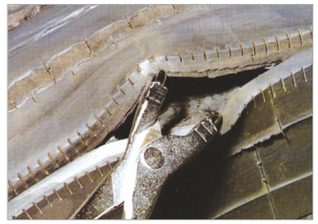
### SHOULDER SECTION DAMAGE OR SEPARATION DUE TO HEAT



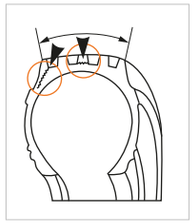


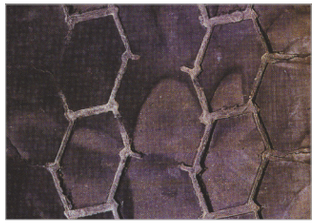
### TREAD DAMAGE DUE TO EXCESSIVE HEAT





### TREAD SEPARATION CAUSED BY EXCESSIVE HEAT





# MOISTURE DAMAGE

Moisture inside the tyre or penetrating through to the steel belts of a radial tyre can cause rust damage to the steel cord or rim.

Therefore always:
❶ Store tyres indoors in a dry place.
❷ Ensure all wheels, flaps, tubes, valves and the inner tyre surface are clean and dry before and during mounting.
❸ Use the recommended mounting lubricant on the rim and tyre bead during the mounting process.
❹ Maintain inflation and keep the valve stem capped or protected so as not to allow moisture to enter the tyre.

# Memo