HANKOOK TIRE TRUCK AND BUS TYRE

TECHNICAL MANUAL

Introduction | Product information | Regrooving guide
Rim and accessories | Maintenance and care

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190218_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.

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TRUCK AND BUS TYRE | **TECHNICAL MANUAL**

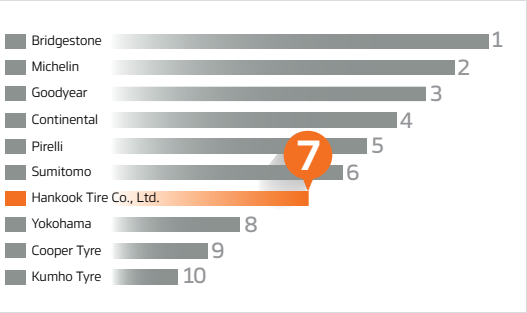
INTRODUCTION

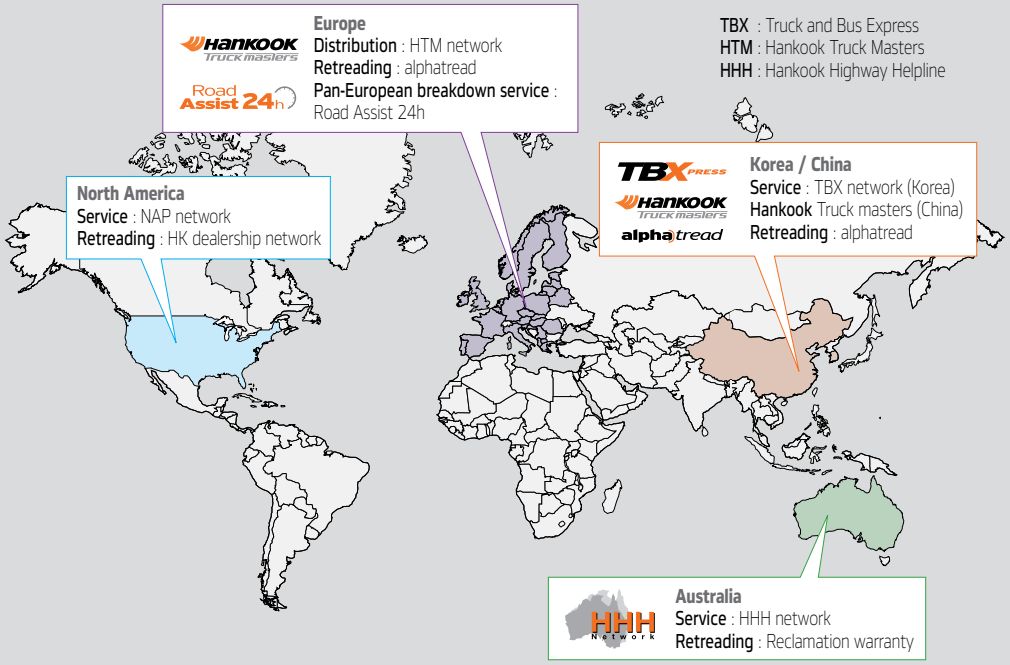
About Hankook Tire

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





Hankook Tire segmentation

e-cube Blue AL20

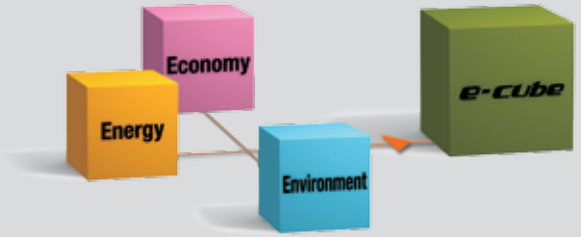
Product brand | Position | Circumstance | Sequence No.

Position	Long haul	Regional haul	Urban	Mixed service, off-road	Winter
A	AL	AH	AU	AM	AW
D	DL	DH		DM	DW
T	TL	TH		TM	TW

L Long haul	Long distance driving	–
H Regional haul	Medium distance driving	SEVERITY
U Urban	City bus, urban traffic	
M Mixed service, off-road	On and off-road construction	
W Winter	Winter road conditions	+

e-cube

Environmentally friendly tyre enhanced with fuel efficiency and high mileage attributes.



e-cube (e³) = energy x economy x environment

energy	Improved fuel efficiency.
economy	The highest economic efficiency, through lower fuel consumption and high mileage.
environment	Reduced harmful emissions through improved fuel efficiency.

E-CUBE SERIES (LONG HAUL PRODUCT)

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.

T.W.I mark
Brand tyre here
DOT code
Country name
Safety warning
Material
Province

Brand name
E mark and No
Korean industrial standard mark
Regroovable
Tubeless
Radial tyre
Pattern name
Tyre size
Test pressure
Load and speed symbol
Load and inflation pressure
Load range

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.

Due to Improper mounting - only specially trained persons should mount tyres. Follow all safety procedures, inflate using a safety cage and a remote clip-on extension hose.

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 | **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+ / AL10 AL20 / AL20w	DL10+ / DL10 DL20 / DL20w	TL10+ / TL10 / TL20
Coach	AL22	DL22	
National and regional transport (below 500km)	AH11 / AH22 AH31 / AH35 / AH33	DH03 / DH05 / DH16 DH31 / DH35 / DH33+	TH22 / TH31
Mixed service (Below 10% off-road)	AM06 / 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 (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 Tire 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 / 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 / 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-kerfs 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.

e-cube Blue

Premium long haul line up with extra low rolling resistance and superb fuel efficieny.

Segment L LONG HAUL

AL10 e-cube

All position tyre for long haul trucking applications with high fuel efficiency.

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

Drive axle tyre for long haul trucks and buses with extra high fuel efficiency.

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

M + S

TL10 e-cube

Trailer tyre for long haul trucks with extra high fuel efficiency.

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 kerf and lateral groove detail improve winter performance.

Segment H REGIONAL HAUL

The regional haul tyre is designed for a reliable driving experience whilst providing excellent traction and grip.

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 kerfs(S.R. kerfs) 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 kerf 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.

Segment H REGIONAL HAUL

M + S

TH22

Regional haul trailer tyre with enhanced driving performance.

M + S

DH16

Regional drive position tyre for exceptional traction and mileage performance.

AH22

All position tyre for regional haul with extra long mileage.

AH11

All position tyre for regional haul application with high mileage.

M + S

DH05

Drive axle tyre with superior grip and outstanding traction.

M + S

DH03

Drive axle tyre for regional haul application with excellent traction 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 kerf 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 kerf design without chipping or cutting.

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 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 conditions :

- 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.

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.

AM06

All position for on and off-road operations.

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

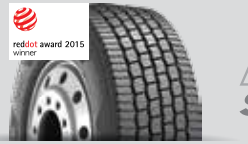
Drive axle tyre for off road conditions.

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 kerfs 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 kerfs 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 kerfs 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 kerfs 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

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.

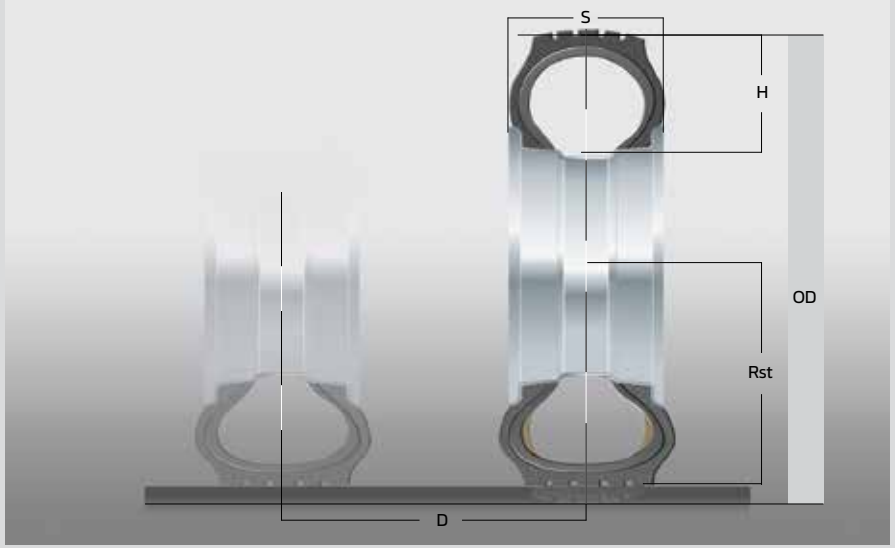
(OD) OVERALL DIAMETER (mm)
The diameter of an inflated tyre at the outermost surface of the tread.

(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/cm²	1.01972
kg/cm²	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																
							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)	
10.00R20	AH11	147/143L	TT	C	C	W1 67	7.50	316	286	1074		283	1055	495	3238	147	S		4220	4555	4885	5205	5525	5840	6150			L=120
	DH05	147/143L	TT	D	C	W2 75										143	D		7480	8075	8655	9230	9795	10350	10900			
11.00R20	AH11	150/146L	TT	C	C	W1 67	8.00	329	297	1104		298	1084	504	3300	150	S		4380	4725	5070	5405	5735	6060	6380	6700		L=120
	DH05	150/146L	TT	D	C	W2 75										146	D		7845	8470	9080	9680	10270	10855	11430	12000		K=110
12.00R20	AM06	154/150K (156/150G)	TT	D	C	W2 72	8.50	360	319	1146		314	1124	522	3430	156	S		5230	5645	6050	6450	6845	7235	7620	8000		K=110
	DM09	154/150K	TT	E	C	W2 75										154	S		4905	5290	5675	6050	6420	6785	7140	7500		G=90
	DM04	154/150G	TT													150	D		8760	9455	10140	10810	11470	12120	12765	13400		
8R17.5	AH11	117/116L	TL	D	C	W1 67	6.00	234	216	797		200	784	369	2395	117	S	2040	2220	2395	2570							L=120
	DH05	117/116L	TL	D	C	W2 75										116	D	3970	4320	4660	5000							
8.5R17.5	AH35	131/129L	TL	D	C	W1 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	W1 70										120	D	4170	4535	4895	5250	5600						
9.5R17.5	AH35	131/129L	TL	D	C	W1 67	6.75	270	250	857		235	842	390	2570	143	S		3490	3760	4040	4300	4560	4820	5080	5205	5450	L=120
	DH05	131/129L	TL	E	C	W2 75										131	S	2460	2675	2885	3095	3300	3500	3700	3900			J=100
	DH35	131/129L	TL	D	C	W1 70										127	D	4650	5060	5460	5855	6240	6620	7000				
	TH22	143/141J	TL	D	B	W1 70										129	S	2455	2675	2885	3095	3295	3500	3700				
																129	D	4535	4933	5324	5708	6086	6457	6824				
																141	D		6590	7110	7620	8130	8620	9110	9590	9835	10300	
																129	D	4535	4933	5324	5708	6086	6457	6824	7185	7400		
																127	D	4650	5060	5460	5855	6240	6620	7000				
8R19.5	AH35	124/122L	TL	D	C	W1 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	5351	5678	6000				
10R22.5	AH11	141/139M	TL	C	C	W1 67	7.50	286	264	1038		258	1020	480	3090	142	D	6685	7275	7850	8420	8975	9525	10065	10600			M=130
	AM09	144/142K	TL	C	B	W1 70										144	S	3530	3840	4145	4445	4740	5030	5315	5600			K=110
	AH33	141/139M	TL	C	C	W1 70										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	AL10	148/145M	TL	C	B	W1 66	8.25	314	290	1070		282	1053	493	3225	148	S	3785	4120	4445	4765	5080	5390	5695	6000	6300		K=110
	DL02	148/145M	TL	D	C	W2 74										146	D		8040	8680	9310	9920	10530	11120	11710	12000		
	AH22	148/145L	TL	C	B	W1 70										145	D	6970	7585	8185	8775	9355	9930	10490	11050	11600		
	DH03	148/145M	TL	D	C	W2 75																						

TUBELESS CONVENTIONAL

Tyre Size	Tread Pattern	Load Index & Speed Symbol	TT/ TL	Tyre Labelling Class			Rim		Tyre Dimensions			Tyre Dimensions				Load Index (LI)	Tyre fitment (S,D)	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)			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)	
11R22.5	DH05	148/145L	TL	D	C	W2 75	8.25	314	290	1070		282	1053	493	3225													
	AM09	148/145K	TL	D	B	W1 67																						G=90
	DM04	148/145G	TL																									J=100
	DM09	148/145K	TL	E	C	W1 70																						L=120
	DM09	148/145K	TL	E	C	W1 70						282	1046	493	3105	148	S	3785	4120	4445	4765	5080	5390	5695	6000	6300		L=120
	AU03	148/145J	TL	C	B	W1 71										145	D	6970	7585	8185	8775	9355	9930	10490	11050	11600		
	TH22	148/146L	TL	C	B	W2 70						282	1063	493	3220	148	S	3785	4120	4445	4765	5080	5390	5695	6000	6300		
	AH33	148/145L	TL	C	B	W1 70										145	D	6970	7585	8185	8775	9355	9930	10490	11050	11600		
	TH31	148/145L	TL	C	C	W1 70																						
	AU04	148/145J	TL	D	B	W1 70																						
12R22.5	AL10	152/148L	TL	C	C	W1 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	W2 74										149	D	7815	8500	9175	9835	10485	11125	11760	12380	13000		K=110
	AH22	152/148L	TL	C	C	W1 70										148	D	7575	8240	8890	9535	10165	10785	11395	12000	12600		
	DH05	152/148L	TL	D	C	W2 75																						
	DH16	152/148L	TL	D	C	W2 71																						
	DH05	152/148L	TL	D	C	W2 75																						
	DH16	152/148L	TL	D	C	W2 71																						
	AM09	152/149K	TL	D	B	W1 69																						
	DM04	152/148K	TL																									
	DM09	152/148K	TL	E	B	W1 70																						
	DW07	152/148L	TL	D	C	W1 72																						
	AH33	152/148L	TL	C	C	W1 70																						
	DH33+	152/149L	TL	E	C	W1 70																						
	AH31	152/149L	TL	C	B	W1 71																						
13R22.5	AH11	156/150L	TL	C	C	W1 67	9.75	360	326	1146		320	1120	520	3405	156	S	4590	4995	5390	5780	6165	6540	6910	7280	7640	8000	L=120
	AM09	156/150K	TL	D	C	W1 70										154	S	4505	4905	5290	5675	6050	6420	6785	7140	7500		K=110
	DM09	156/150K	TL	D	C	W2 75										150	D	8055	8760	9455	10140	10810	11470	12120	12765	13400		G=90
	DM04	154/150G	TL																									
	AH33	156/150L	TL	C	C	W1 70	9.75	360	326	1146																		
205/65R17.5	TH22	129/127K (132/132F)	TL	C	C	W1 70	6.00	240	213	721		206	717	334	2132	129	S		2310	2495	2675	2850	3025	3195	3365	3530	3700	K=110
																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	

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)	
205/75R17.5	AH35	124/122M	TL	C	C	W1 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	W1 66										122	D	3985	4335	4680	5015	5350	5675	6000				
215/75R17.5	AH35	126/124M	TL	D	C	W1 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	W1 65										126	S	2385	2595	2800	3005	3200	3400					J=100
	DH35	126/124M	TL	D	C	W1 66						214	774.2	360	2363	128	S	2390	2600	2805	3010	3210	3405	3600				M=130
	TH22	135/133J	TL	D	B	W1 70										126	D	4515	4915	5305	5685	6060	6430	6800				J=100
	TL10+	135/133J	TL	C	B	W1 69										133	D		5385	5815	6235	6645	7050	7450	7845	8240		
																124	D	4490	4885	5275	5655	6030	6400					
225/75R17.5	AH35	129/127M	TL	C	C	W1 67	6.75	254	235	797		228	790	371	2420	129	S	2455	2675	2885	3095	3295	3500	3700				M=130
	DH35	129/127M	TL	D	C	W1 70										127	D	4650	5060	5460	5855	6240	6620	7000				
235/75R17.5	AH35	132/130M	TL	C	C	W1 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	W1 73										132	S	2520	2745	2960	3175	3385	3590	3795	4000			J=100
	TH22	143/141J	TL	C	B	W1 70										141	D		6435	6945	7445	7935	8420	8900	9370	9835	10300	
	TL10+	143/141J	TL	B	B	W1 69										130	D	4795	5215	5630	6035	6435	6825	7215	7600			
245/70R17.5	AH35	136/134M	TL	C	C	W1 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	W1 73										136	S	2690	2930	3160	3390	3610	3835	4050	4265	4480		J=100
	TH22	143/141J	TL	C	B	W1 70										141	D		6435	6945	7445	7935	8420	8900	9370	9835	10300	F=80
	TL10+	143/141J	TL	B	B	W1 69										134	D	5095	5545	5985	6415	6840	7260	7670	8075	8480		
245/70R19.5	AH35	136/134M	TL	C	C	W1 67	7.50	279	258	853		244	844	391	2580		S	3095	3365	3635	3895	4155	4405	4655	4905	5150		M=130
	DH35	136/134M	TL	D	C	W1 73											S	2760	3000	3240	3470	3700	3930	4150	4370	4590		J=100
	TH22	141/140J	TL	C	B	W1 67										136	S	2690	2930	3160	3390	3610	3835	4050	4265	4480		
	AU03	136/134M	TL	D	C	W1 71										140	D	6010	6540	7055	7565	8065	8560	9045	9525	10000		
																134	D	5095	5545	5985	6415	6840	7260	7670	8075	8480		
255/70R22.5	AL10	140/137M	TL	C	B	W1 70	7.50	287	265	944		250	929	437	2476	140	S	3155	3430	3700	3970	4230	4490	4745	5000			M=130
																137	D	5805	6315	6815	7305	7790	8265	8735	9200			
265/70R17.5	AH35	140/136M	TL	C	C	W1 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	W1 73										136	D		6160	6640	7120	7590	8060	8510	8960			
265/70R19.5	AH35	140/138M	TL	D	B	W1 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	W2 74	7.50	295	272	881						140	S	3155	3430	3700	3970	4230	4490	4745	5000			J=100
	AM15	143/141J	TL	C	B	W1 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	W1 69										138	D	5955	6480	6995	7495	7995	8480	8960	9440			
	TL10+	140/138M	TL	D	C	W1 71																						
275/80R22.5	AH22	149/146L	TL	C	C	W1 70	8.25	311	287	1038		283	1027	479	3154	149	S	3905	4250	4585	4915	5240	5560	5880	6190	6500		J=100

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)		
275/80R22.5	AU03	149/146J	TL	D	C	W1 72	8.25	311	287	1038		283	1027	479	3154	146	D	7210	7845	8470	9080	9680	10270	10855	11430	12000			
275/70R22.5	AL10	148/145M	TL	C	C	W1 70	8.25	311	287	974		279	962	447	2959	152	S	4075	4435	4785	5130	5470	5805	6135	6460	6780	7100		M=130
	DL10	148/145M	TL	D	C	W2 75										150	S	3845	4185	4515	4840	5160	5475	5790	6095	6400	6700		K=110
	TL10	152/148J	TL	C	B	W1 69										148	S		3940	4250	4560	4860	5160	5450	5740	6020	6300		J=100
	AH31	148/145M	TL	C	C	W1 69						277	962	440	2954	148	S	3615	3935	4245	4550	4855	5150	5440	5730	6015	6300		M=130
	DH31	148/145M	TL	D	C	W2 75										145	D	6660	7245	7820	8385	8940	9485	10025	10555	11080	11600		
	TH31	152/148J	TL	C	C	W1 69																							
	AM15	148/145K	TL	D	B	W2 74																							
	AW02	150/145J	TL	D	C	W1 70																							
	DW07	148/145J	TL	D	C	W1 72																							
	AU03+	150/145J (154/148E)	TL	D	C	W1 71																							
	AU04+	150/145J (152/149F)	TL	D	B	W1 67																							
285/70R19.5	AH35	146/144M	TL	C	B	W1 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	W1 70										146	S		3750	4050	4340	4630	4910	5190	5470	5740	6000		J=100
	TH22	150/148J	TL	C	B	W1 70										148	D		7870	8495	9105	9710	10305	10885	11465	12035	12600		
																144	D		7000	7560	8100	8640	9170	9680	10200	10700	11200		
295/55R22.5	DL10+	147/145K	TL	C	C	W1 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	W1 70	9.00	329	304	940		288	919	426	2835	150	S	3845	4185	4515	4840	5160	5475	5790	6095	6400	6700		L=120
	DL10+	150/147L	TL	C	C	W1 73										149	S	3730	4060	4380	4695	5010	5315	5615	5915	6205	6500		K=110
	DH31	150/147K	TL	D	C	W2 75										147	D	7060	7685	8290	8890	9480	10055	10630	11190	11750	12300		
																146	D	6890	7495	8090	8675	9245	9810	10370	10920	11460	12000		
295/80R22.5	AL10	152/148M (154/149L)	TL	C	C	W1 70	9.00	335	310	1062		305	1051	490	3226	154	S	4505	4905	5290	5675	6050	6420	6785	7140	7500			M=130
	DL10	152/148M	TL	C	C	W2 75										152	S	4265	4640	5010	5370	5725	6075	6420	6760	7100			L=120
	AL22	154M	TL	C	B	W1 71										149	D	7815	8500	9175	9835	10485	11125	11760	12380	13000			K=110
	DL22	154/149M	TL	C	C	W1 70										148	D	7575	8240	8890	9535	10165	10785	11395	12000	12600			J=100
	AH31	154/149M	TL	C	B	W1 73						306	1056	490	3220	152	S	4265	4640	5010	5370	5725	6075	6420	6760	7100			J=100
	AH31	152/148M (154/149L)	TL	C	B	W1 73										148	D	7575	8240	8890	9535	10165	10785	11395	12000	12600			
	DH03	152/148M	TL	D	C	W2 75																							
	DH05	152/148M	TL	E	C	W2 75																							
	DH31	152/148M	TL	D	C	W2 75																							
	AM09	152/148K(154/150J)	TL	C	B	W1 70																							
	DM09	152/148K	TL	E	B	W1 70																							

TUBELESS LOW SECTION

Tyre Size	Tread Pattern	Load Index & Speed Symbol	TT/ TL	Tyre Labelling Class			Rim		Tyre Dimensions			Tyre Dimensions				Load Index (LI)	Tyre fitment (S,D)	Load capacity (kg) per axle at tyre pressure (bar/psi)										Speed symbol (km/h)
							Rim width	Distance between rim centres (D)	Max. Standard Value in service			Actual Value						4.5	5	5.5	6	6.5	7	7.5	8	8.5	9	
									Width (S)	Outer diameter (OD)		Width (S)	Overall diameter (OD)	Static radius (Rst)	Rolling circumference (Rc)			(65)	(73)	(80)	(87)	(94)	(102)	(109)	(116)	(123)	(131)	
									+1%			+1%	±1%	±1.5%	±2%													
295/80R22.5	AW02	154/149M	TL	D	C	W1 70	9.00	335	310	1062		306	1056	490	3220													
	DW06	152/148L	TL	D	C	W2 76																						
	DW07	152/148L	TL	D	C	W1 69																						
	AU03	152/148J	TL	C	C	W1 71																						
	AU04	152/148J	TL	D	B	W1 67																						
305/70R19.5	AH35	148/145M	TL	C	C	W1 71	9.00	343	317	941		304	920	423	2820	148	S	3785	4120	4445	4765	5080	5390	5695	6000	6300		M=130
	DH35	148/145M	TL	D	B	W1 73										145	D	6970	7585	8185	8775	9355	9930	10490	11050	11600		
305/70R22.5	AL10	152/148L	TL	C	C	W1 70	9.00	343	317	1018		304	1000	465	3030	152	S	4075	4435	4785	5130	5470	5805	6135	6460	6780	7100	M=130
																150	S	4025	4380	4725	5070	5405	5735	6060	6380	6700		L=120
																148	D	7575	8240	8890	9535	10165	10785	11395	12000	12600		
315/45R22.5	* DL10+	147/145L	TL	D	C	W2 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	
						W2 74						300	856	400	2640	147	S					4740	5025	5315	5590	5875	6150	L=120
																145	D					8940	9485	10025	10555	11080	11600	
315/60R22.5	AL10+	154/148L	TL	C	B	W1 70	9.75	352	326	966		320	952	442	2940	154	S	4305	4685	5055	5420	5780	6130	6480	6825	7160	7500	L=120
	DL10+	152/148L	TL	C	C	W2 75										152	S	4075	4435	4785	5130	5470	5805	6135	6460	6780	7100	
	AH31	154/148L	TL	C	B	W1 70										148	D	7235	7870	8495	9105	9710	10305	10885	11465	12035	12600	
	DH31	152/148L	TL	D	C	W2 75										152	S	4075	4435	4785	5130	5470	5805	6135	6460	6780	7100	L=120
																148	D	7235	7870	8495	9105	9710	10305	10885	11465	12035	12600	
	AU04+	154/148J	TL	C	B	W1 73																						J=100
315/70R22.5	AL10+	156/150L	TL	B	B	W1 70	9.00	351	318	1032		314	1012	468	3120	156	S	4590	4995	5390	5780	6165	6540	6910	7280	7640	8000	M=130
	DL10+	154/150L	TL	C	C	W1 73										154	S	4305	4685	5055	5420	5780	6130	6480	6825	7160	7500	L=120
	DL20	154/150L	TL	A	C	W1 72										152	S	4265	4640	5010	5370	5725	6075	6420	6760	7100		
	DL22w	154/150L	TL	B	C	W1 70										150	D	7695	8370	9035	9685	10325	10955	11580	12195	12800	13400	
	AH31	156/150L	TL	C	B	W1 73										148	D	7575	8240	8890	9535	10165	10785	11785	12000	12600		
	DH05	154/150L	TL	E	B	W2 75																						
	DH31	154/150L	TL	D	C	W2 75																						
	DW06	154/150L	TL	D	C	W2 76																						
	AW02	154/150L	TL	D	C	W1 70																						
	DW07	154/150L	TL	D	C	W1 71																						
315/80R22.5	AL10+	156/150L (154/150M)	TL	B	B	W1 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	W1 71										154	S	4505	4905	5290	5675	6050	6420	6785	7140	7500		K=110
	DL20w	156/150L (154/150M)	TL	C	C	W2 75										150	D	8055	8760	9455	10140	10810	11470	12120	12765	13400		

TUBELESS LOW SECTION

Tyre Size	Tread Pattern	Load Index & Speed Symbol	TT/ TL	Tyre Labelling Class			Rim		Tyre Dimensions			Tyre Dimensions				Load Index (LI)	Tyre fitment (S,D)	Load capacity (kg) per axle at tyre pressure (bar/psi)										Speed symbol (km/h)
									Max. Standard Value in service			Actual Value						4.5	5	5.5	6	6.5	7	7.5	8	8.5	9	
							Rim width	Distance between rim centres (D)	Width (S)	Outer diameter (OD)		Width (S)	Overall diameter (OD)	Static radius (Rst)	Rolling circumference (Rc)			(65)	(73)	(80)	(87)	(94)	(102)	(109)	(116)	(123)	(131)	
												+1%	±1%	±1.5%	±2%													
315/80R22.5	DL22w	156/150L	TL	B	C	W1 70	9.00	351	318	1106		320	1075	500	3300	156	S	4805	5230	5645	6050	6450	6845	7235	7620	8000		L=120
																150	D	8055	8760	9455	10140	10810	11470	12120	12765	13400		
	AH31	156/150L (154/150M)	TL	C	B	W1 73																						
	DH05	154/150M (156L)	TL	E	B	W2 75																						
	DH31	156/150L (154/150M)	TL	D	C	W2 72																						
	AM09	156/150K	TL	D	B	W1 67																						
	DM09	156/150K	TL	D	C	W1 70																						
	DM04	156/150K (156L)	TL																									
	DW06	156/150L	TL	D	C	W2 76																						
	AW02	156/150L	TL	D	C	W1 70																						
	DW07	156/150L	TL	D	C	W1 72																						
	AM11	156/150K	TL	C	B	W1 72																						
	DM11	156/150K	TL	C	B	W1 74																						
325/95R24	DM06	162/160K	TL	D	C	W2 73	9.00	374	332	1264		320	1232	570	3776	162	S	5710	6210	6705	7185	7665	8130	8590	9050	9500		K=110
																160	D	10820	11770	12705	13620	14520	15410	16280	17145	18000		
	DM07	162/160G	TL				9.00	374	332	1266		322	1242	570	3776	162	S	5710	6210	6705	7185	7665	8130	8590	9050	9500		G=90
																160	D	10820	11770	12705	13620	14520	15410	16280	17145	18000		
355/50R22.5	AL10+	156L	TL	B	B	W2 76	11.75	-	375	942		355	935	432	2887	156	S	4590	4995	5390	5780	6165	6540	6910	7280	7640	8000	L=120
	AH31	156L	TL	B	B	W1 69																						
385/55R22.5	AL20	160K	TL	A	C	W1 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	W1 66						386				158	S	5110	5555	6000	6430	6855	7275	7690	8095	8500		K=110
	AH31	160K (158L)	TL	C	B	W1 69						383	1000	460	3095													J=100
	TH22	160K (158L)	TL	W	B	W1 71																						
	AW02	160K	TL	C	C	W1 70																						
	TW01	160K	TL	C	C	W1 69																						
	TH31	160K (158L)	TL	B	C	W2 73																						
385/65R22.5	AH31	164K	TL	C	B	W1 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	W1 69										160	S	5165	5620	6065	6505	6935	7360	7775	8190	8595	9000	K=110
	AL10+	160K(158L)	TL	B	B	W1 70										158	S	5110	5555	6000	6430	6855	7275	7690	8095	8500		J=100
	TL10+	160K (158L)	TL	B	B	W1 69																						
	TH31	160K	TL	B	B	W1 69																						
	TL20	160K	TL	A	C	W1 66																						
	AM15+	158L	TL	C	C	W2 74																						

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)	
385/65R22.5	TM15	160K	TL	D	C	W1 69	11.75	-	405	1092		382	1082	502	3330													
	AW02	160K(158L)	TL	C	C	W1 70																						
	TW01	160K(158L)	TL	B	C	W1 69																						
	TM11	160K(158L)	TL	C	B	W2 73																						
	AW02+	160K (158L)	TL	C	C	W1 70																						
425/65R22.5	TH22	165K	TL	C	B	W1 67	13.00	-	447	1146		423	1124	520	3400	165	S	6190	6735	7270	7795	8310	8815	9315	9810	10300		K=110
	AM15	165K	TL	C	C	W2 75						412	1131	520	3400	165	S	6190	6735	7270	7795	8310	8815	9315	9810	10300		K=110
	TH31	165K	TL	C	B	W2 73	12.25	-	439	1146																		
435/50R19.5	TL10+	160J	TL	B	B	W2 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	W2						435	924	420	2840	160	S	5165	5620	6065	6505	6935	7360	7775	8190	8595	9000	J=100
	TL20	160J	TL	A	C	W1 70																						
445/65R22.5	AM15	169K	TL	C	C	W2 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	W2 73																						
445/45R19.5	TL10	160J	TL	B	B	W2 73	14.00	-	454	911		434	905	416	2712	160	S	5165	5620	6065	6505	6935	7360	7775	8190	8595	9000	J=100
	TW01	160J	TL	C	C	W2 75	14.00	-	464	911		448	905	415	2802	160	S	5165	5620	6065	6505	6935	7360	7775	8190	8595	9000	J=100
	TL20	160K	TL	A	C	W1 70	15.00	-	464	911		445	900	410	2720	160	S	5165	5620	6065	6505	6935	7360	7775	8190	8595	9000	K=110
455/40R22.5	TL10+	160J	TL	B	B	W2 71	15.00	-	471	950		453	936	439	2850	160	S		5630	6070	6510	6940	7370	7780	8200	8600	9000	J=100

TRUCK AND BUS TYRE | **TECHNICAL MANUAL**

REGROOVING GUIDE

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.

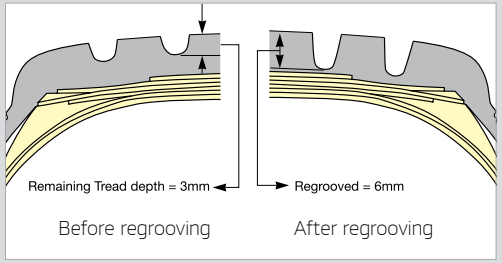
Inspection :
- Before regrooving check there is no damage on any part of the tyre.
- Remove stones and any other foreign objects such as nails from the tread which may have embedded into the grooves. Repair if necessary.
- Particular care should be exercised in selecting a tyre for regrooving where the 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.

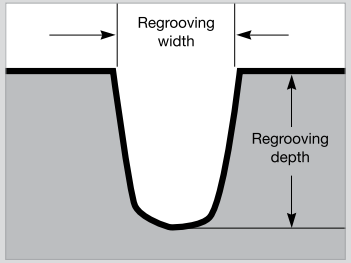
It is recommended that the minimum remaining tread depth be between 2mm and 3mm before regrooving. The tread depth should be measured around the circumference at 4 places to find the minimum remaining depth. Set the cutter blade for the recommendations as shown in this publication.

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

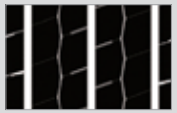




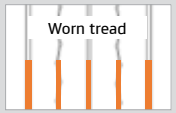
Regrooving technical data

LONG HAUL

e-cube Blue AL20 / AL20w



New tread

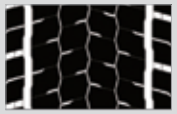


Regrooved tread

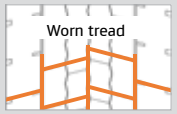
SRS	Size	LI/SS	Type		Tread Depth	Regrooving	
			T/T	T/L	m/m	Depth	Width
TUBELESS							
55	385/55R22.5	160K		*	11.6	3	6~9
AL20w							
TUBELESS							
60	295/60R22.5 *			*			
	315/60R22.5 *			*			

* Available in Q2/2019

e-cube Blue DL20 / DL20w



New tread



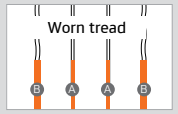
Regrooved tread

SRS	Size	LI/SS	Type		Tread Depth	Regrooving	
			T/T	T/L	m/m	Depth	Width
TUBELESS							
70	315/70R22.5	154/150L		*	14.6	3	6
DL20w							
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 **			*			
	315/60R22.5 **			*			

** Available in Q3/2019

e-cube Blue TL20

New tread

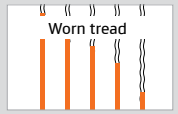


Regrooved tread

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

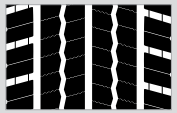


Regrooved tread

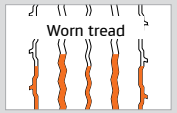
SRS	Size	LI/SS	Type		Tread Depth	Regrooving	
			T/T	T/L	m/m	Depth	Width
TUBELESS							
80	315/80R22.5	156/150L (154/150M)		*	13.5	3	8~10
70	315/70R22.5	156/150L		*	14.5	3	8~10
65	385/65R22.5	160K		*	12.2	3	6~9
60	295/60R22.5	150/147L		*	13.6	3	8~10
	315/60R22.5	154/148L		*	13.5	3	8~10
50	355/50R22.5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

LONG HAUL

DL10+ e-cube MAX



New tread

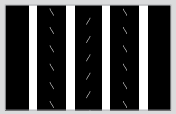


Regrooved tread

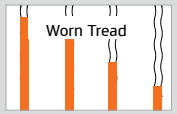
SRS	Size	LI/SS	Type		Tread Depth	Regrooving	
			T/T	T/L	m/m	Depth	Width
TUBELESS							
80	315/80R22.5	156/150L (154/150M)		*	17.7	3	8~10
60	295/60R22.5	150/147K		*	18.9	3	5~7
	315/60R22.5	152/148L		*	19.5	3	8~10
55	295/55R22.5	147/145K		*	10.4	3	7~9
45	315/45R22.5 ***	147/145L		*	17.5	3	6~8

*** Available in Q1/2020

TL10+ e-cube MAX



New Tread

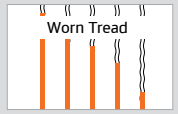


Regrooved Tread

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

AL10 e-cube

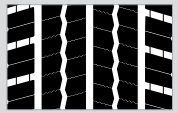
New Tread



Regrooved Tread

SRS	Size	LI/SS	Type		Tread Depth	Regrooving	
			T/T	T/L	m/m	Depth	Width
TUBELESS							
	12R22.5	152/148L		*	14.5	3	6~8
80	295/80R22.5	152/148M		*	13.5	3	8~10
70	255/70R22.5	140/137M		*	13.1	3	8~10
	275/70R22.5	148/145M		*	15.0	3	8~10
	305/70R22.5	152/148L		*	13.5	3	8~10

DL10 e-cube



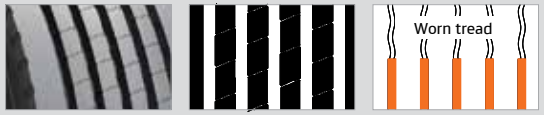
New Tread

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		*	17.5	3	10~12
70	275/70R22.5	148/145M		*	18.5	3	10~12

LONG HAUL

TL10 e-cube



SRS	Size	LI/SS	Type		Tread Depth	Regrooving	
			T/T	T/L	m/m	Depth	Width
TUBELESS							
70	275/70R22.5	152/148J		*	12.6	3	10~12
65	445/65R22.5	169K		*	16.5	3	12~14
45	445/45R19.5	160J		*	13.5	3	8~10

COACH

SMART Touring AL22

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

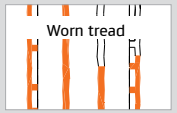
SMART Touring DL22

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

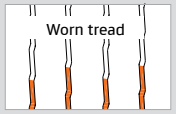
Regrooved tread

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

**Available in Q3/2018

SMART FLEX TH31

New tread



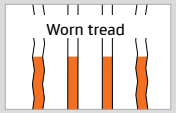
Regrooved tread

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
55	385/55R22.5	160K (158L)		*	14.6	3	6~8
50	435/50R19.5	160J		*	12.5	3	6~8
40	455/40R22.5 *	160J					

* available in Q2/2019

AH33

New tread

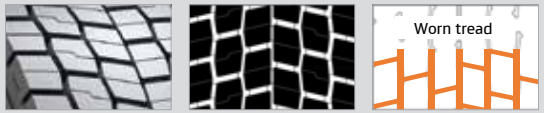


Regrooved tread

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

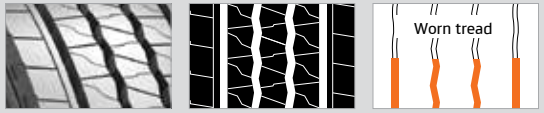
REGIONAL HAUL

DH33+



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

SMART FLEX AH35

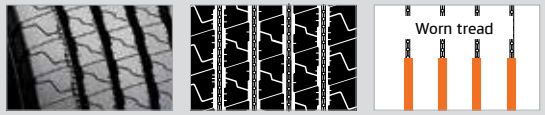


SRS	Size	LI/SS	Type		Tread Depth	Regrooving	
			T/T	T/L	m/m	Depth	Width
TUBELESS							
	8.5R17.5	121/120L		*	12.1	3	4~6
	9.5R17.5	131/129L		*	13.6	3	4~6
	8R19.5	124/122L		*	12.5	3	4~6
75	205/75R17.5	124/122M		*	12.1	3	5~7
	215/75R17.5	126/124M		*	12.6	3	5~7
	215/75R17.5	128/126M		*	12.6	3	5~7
	225/75R17.5	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

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

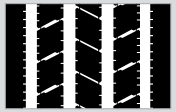
AH11



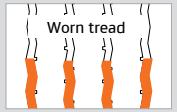
SRS	Size	LI/SS	Type		Tread Depth	Regrooving	
			T/T	T/L	m/m	Depth	Width
TUBELESS							
	8R17.5	117/116L		*	13.0	3	8~10
	10R22.5	141/139L		*	13.5	3.5	11~13
	13R22.5	156/150L		*	16.5	3.5	11~13
TUBE TYPE							
	1000R20	147/143L	*		16.0	3	8~10
	1100R20	150/146L	*		16.0	4	8~10

REGIONAL HAUL

AH22



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		*	16.5	3	8~10
	12R22.5	152/148L		*	16.5	3	8~10

DH03

New tread

Regrooved tread

SRS	Size	LI/SS	Type		Tread Depth	Regrooving	
			T/T	T/L	m/m	Depth	Width
TUBELESS							
	11R22.5	148/145M		*	16.5	3	11~13
80	295/80R22.5	152/148M		*	13.5	3	11~13

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

DH05

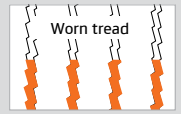
New tread

Regrooved tread

SRS	Size	LI/SS	Type		Tread Depth	Regrooving	
			T/T	T/L	m/m	Depth	Width
TUBELESS							
	8R17.5	117/116L		*	14.0	3	6~8
	11R22.5	148/145L		*	21.0	3	10~12
	12R22.5	152/148L		*	22.5	3	10~12
80	295/80R22.5	152/148M		*	23.0	3	10~12
	315/80R22.5	154/150M (156L)		*	23.5	3	10~12
70	315/70R22.5	154/150L		*	19.5	3	10~12
TUBE TYPE							
	1000R20	147/143L	*		22.5	3	8~10
	1100R20	150/146L	*		22.5	3	10~12

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+

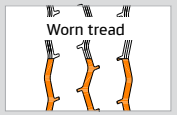
New tread

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



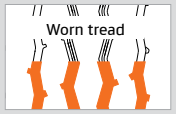
Regrooved tread

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

* available in Q2/2019

SMART WORK AM09

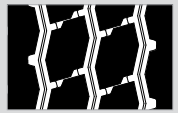
New tread



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
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

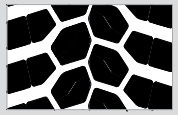


New tread

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

* available in Q2/2019

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

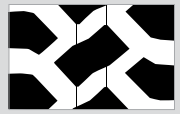
DM06

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

DM07



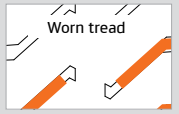
New tread

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

MIXED SERVICE (ON AND OFF-ROAD)

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

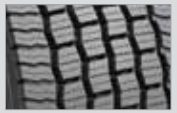
Regrooved tread

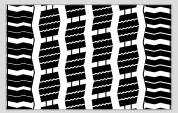
SRS	Size	LI/SS	Type		Tread Depth	Regrooving	
			T/T	T/L	m/m	Depth	Width
TUBELESS							
65	385/65R22.5 *	160K(158L)		*	16.5	3	10~12

* available in Q2/2019

WINTER

SMART CONTROL AW02



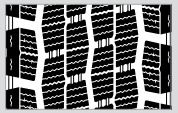


New tread

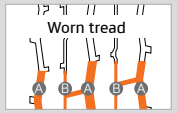
Regrooved tread

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

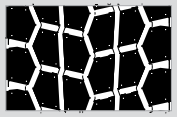


Regrooved tread

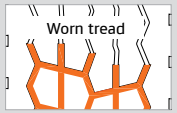
SRS	Size	LI/SS	Type		Tread Depth	Regrooving	
			T/T	T/L	m/m	Depth	Width
TUBELESS							
	12R22.5	152/148L		*	19.5	3	A4~6 / B4~6
80	315/80R22.5	156/150L		*	20.5	3	A5~7 / B4~6
	295/80R22.5	152/148L		*	20.5	3	A5~7/ B4~6
70	275/70R22.5	150/145J		*	18.4	3	3.5~5
	315/70R22.5	154/150L		*	17.5	3	A6~8 / B4~6

WINTER

DW06



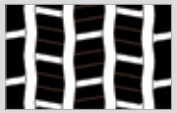
New tread



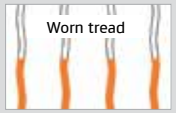
Regrooved tread

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



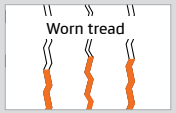
Regrooved tread

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

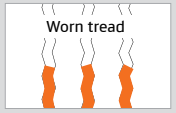
SRS	Size	LI/SS	Type		Tread Depth	Regrooving	
			T/T	T/L	m/m	Depth	Width
TUBELESS							
	11R22.5	148/145J		*	19.0	3	9~11
80	275/80R22.5	149/146J		*	19.0	3	9~11
	295/80R22.5	152/148J		*	19.0	3	9~11
70	245/70R19.5	136/134M		*	15.5	3	7~9
	265/70R19.5	140/138M		*	15	3	8~10

AU03+

SRS	Size	LI/SS	Type		Tread Depth	Regrooving	
			T/T	T/L	m/m	Depth	Width
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

SRS	Size	LI/SS	Type		Tread Depth	Regrooving	
			T/T	T/L	m/m	Depth	Width
TUBELESS							
	11R22.5	148/145J		*	20.2	3	9~11
80	295/80R22.5	152/148J		*	16.5	3	9~11

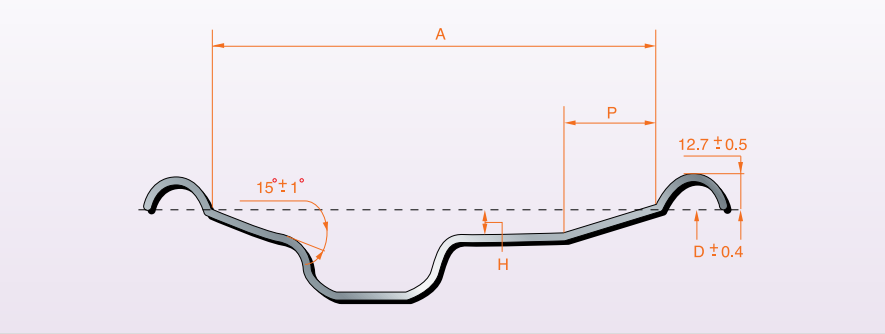
TRUCK AND BUS TYRE | **TECHNICAL MANUAL**

RIM AND ACCESSORIES

Technical data of rims

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

Drop-centre rims with 15° tapered bead seats



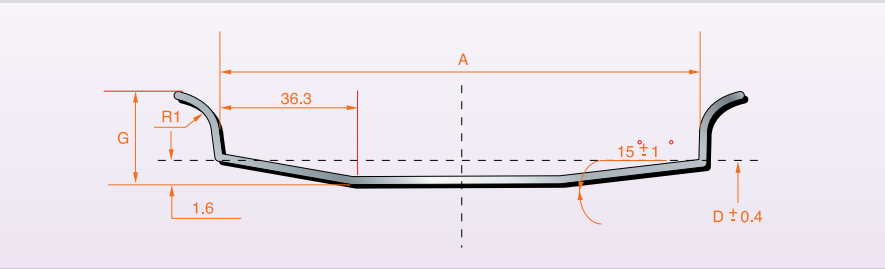
DIMENSIONS(MM)	
Rim	A±3.2
5.25	133.4
6.00	152.4
6.75	171.5
7.50	190.5
8.25	209.6
9.00	228.6
9.75	247.6

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.



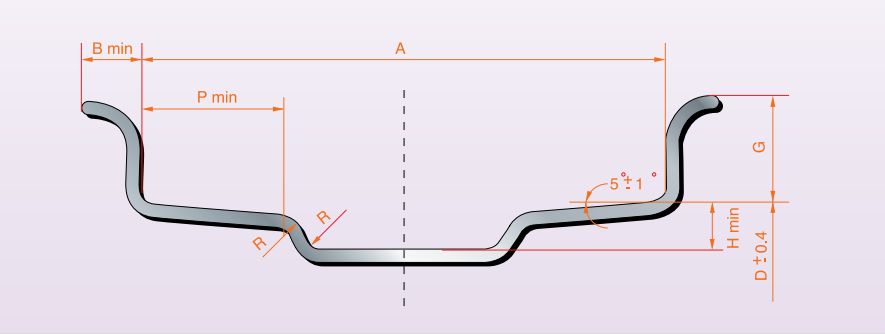
DIMENSIONS(mm)		BASIC		OPTIONAL	
Rim	A±3.2	G±1.2	R1± 2.5	G±1.2	R1± 2.5
5.0	127.0 ± 3.2	27.9	14.0		
5.5	139.7 ± 3.2	30.5	15.2	33.0	16.5
6.0	152.4 ± 3.2	33.0	16.5		
6.5	165.1 ± 3.2	35.6	17.8	36.8	18.4
7.0	177.8 ± 3.2	38.1	19.0	36.8	18.4
7.5	190.5 ± 3.2	40.6	20.3	42.0	21.0
8.0	203.2 ± 3.2	43.2	21.6	42.0	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



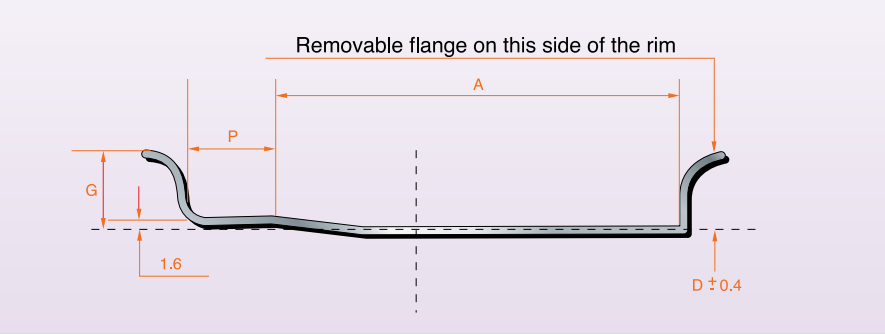
DIMENSIONS (mm)			
Rim	A ±1.5	G +3.2 -0.4	H mim
4.00B	101.6	14.0	15.0
4.50B	114.3	14.0	15.0
5.00B	127.0	14.0	15.0
5.50B	139.7	14.0	15.0
6.00B	152.4	14.0	15.0
4.00C	101.6	15.9	16.8
4.50C	114.3	15.9	16.8
4J	101.6	17.3	17.3
4½J	114.3	17.3	17.3
5J	127.0	17.3	17.3
5½J	139.7	17.3	17.3
6J	152.4	17.3	17.3
6½J	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)	

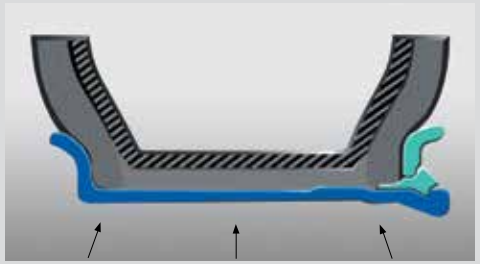
Demounting and mounting

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

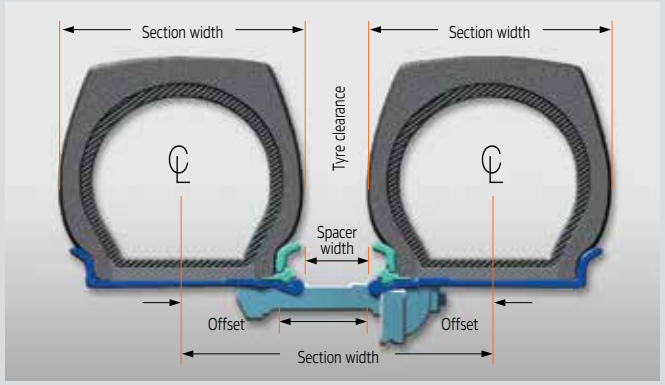


Use of A GG ring indicates correct mounting

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

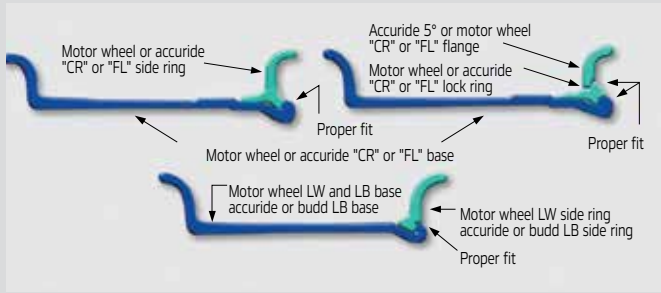


Figure 3.12
Correct and incorrect matching of rim parts

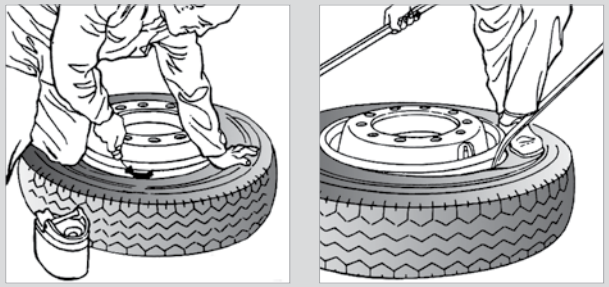
Tubeless tyre demounting

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.

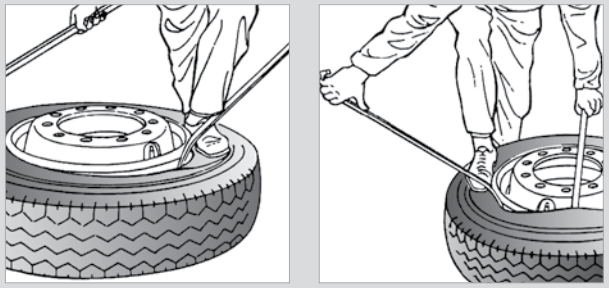
Bead demounting



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.

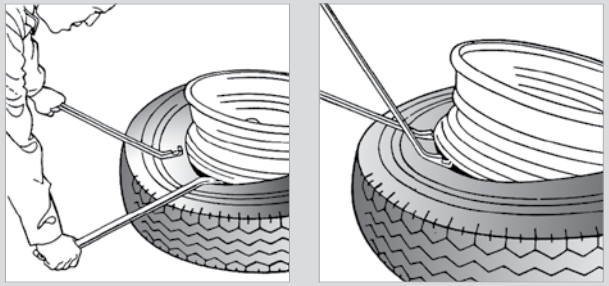
Outside bead demounting



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



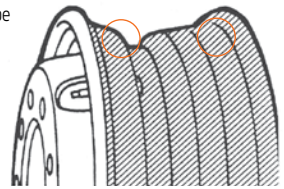
Tubeless tyre mounting

RIM PREPARATION

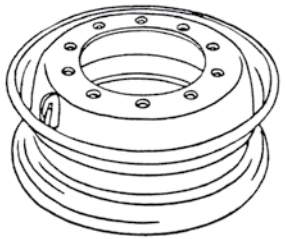
Rims must not be broken or damaged.
Remove the rubber bushing from the valve stem hole and inspect the valve stem for any signs of damage or wear.
Remove rust, dirt and any foreign materials from the rim. Clean and sand smooth the area marked "///" in the picture below. If rusted, clean and repaint the 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



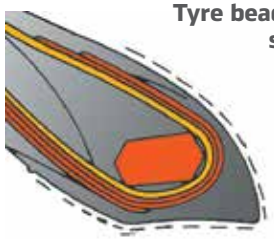
Base part of tubeless rim



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.

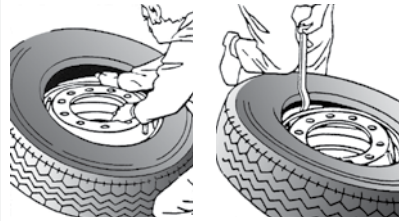
Tyre bead cross section



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.

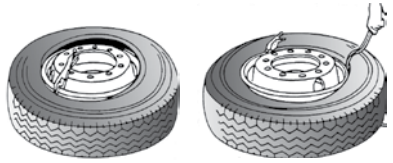
Inside bead assembly



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

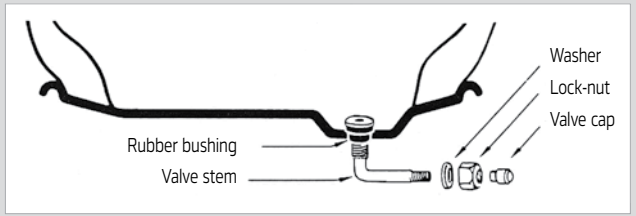
Use an inflation gauge, suitable remote air hose nozzle and a safety cage when inflating the newly mounted tyre. The lubricated bead should sit firmly to the rim flange at about 10 PSI inflation. Do not stand near or in front of tyre while inflating. Use the safety cage and stand a safe distance for 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.

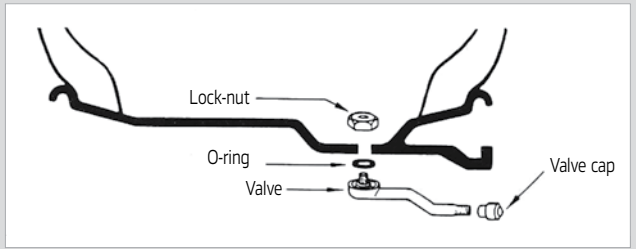
A-type rim valve



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.

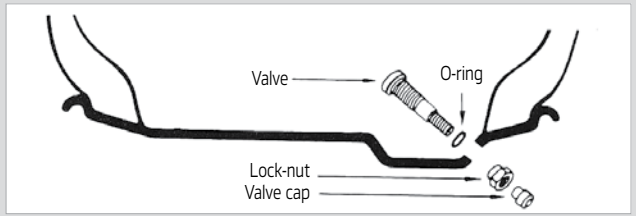
B-type rim valve



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).

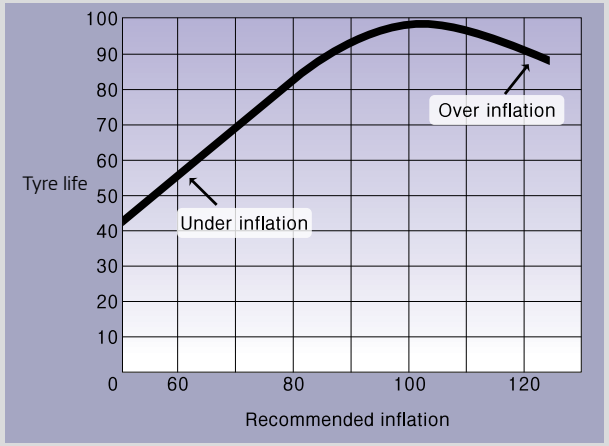
PROPER INFLATION SHOULD BE MAINTAINED AND CHECKED AT LEAST ONCE A WEEK AS WELL AS BEFORE A LONG DISTANCE DRIVE.

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

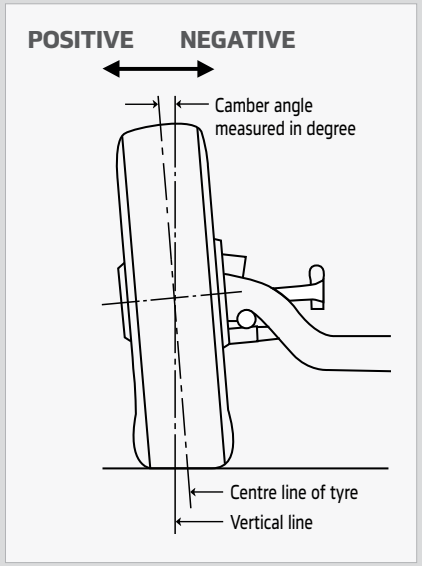
Definition :
- The process whereby the vehicle and all the tyres are travelling in the same direction.
- Steering axle alignment alone is not sufficient.

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.

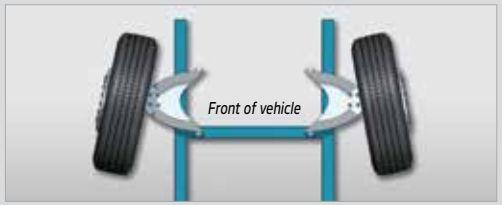


Positive camber

Negative camber

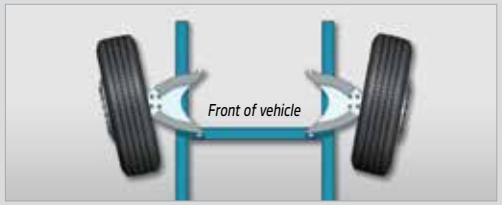
TOE

- 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.



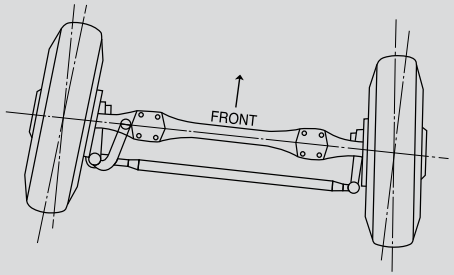
Toe-in refers to the inclination of the wheels of a vehicle so that the pair of front wheels (viewing from the front as per the illustration to the left), are closer together at the front than at the rear of the wheels.

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.



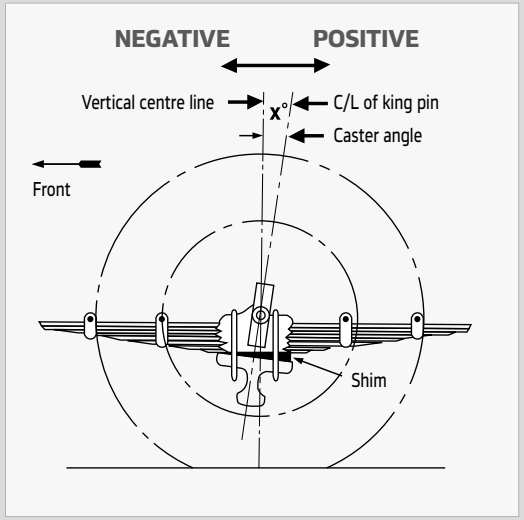
CASTER

- 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.

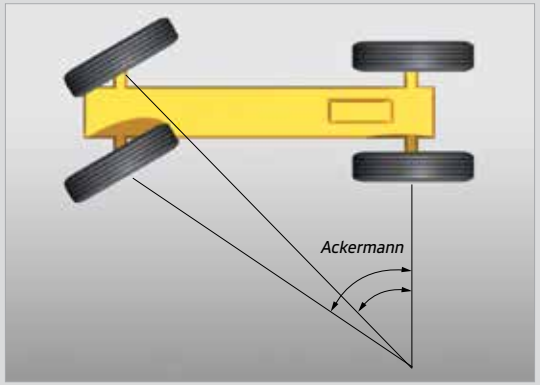
Too little caster makes steering become lighter but also unstable and can cause it to wonder. The caster angle should be checked as it can be distorted by impacts on the tyre or by driving in rough conditions.



Abnormal tread wear

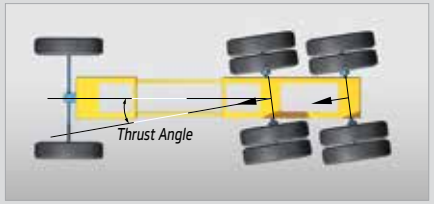
ACKERMANN

- 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.



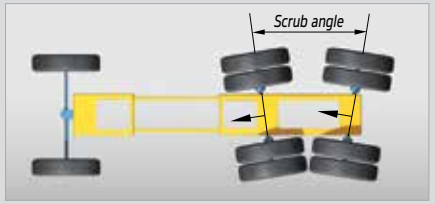
THRUST ANGLE

- 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.



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.

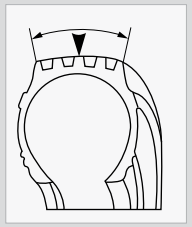
Care should be taken to avoid road debris, dirt or moisture penetrating any puncture or getting trapped inside the tyre, or between the wheel rim and tyre.
Damaged tyres should always be repaired or replaced at the earliest possible opportunity to avoid further tyre damage, possible tyre failure, vehicle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

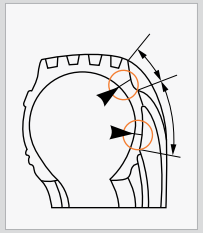
FLAT SPOTTING DUE TO LOCKED BRAKES



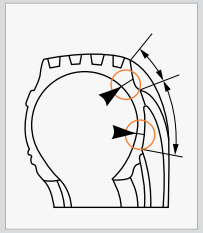
BEAD DAMAGE FROM CURBING

BURNT BEADS

RIPPED SIDEWALL



SIDEWALL DAMAGE DUE TO RUN FLAT OR SEVERE UNDER INFLATION



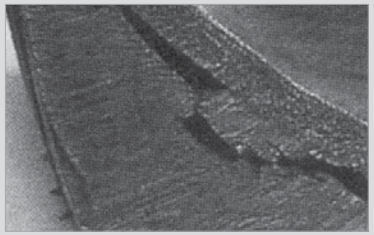
HEAT CAN DAMAGE TYRES

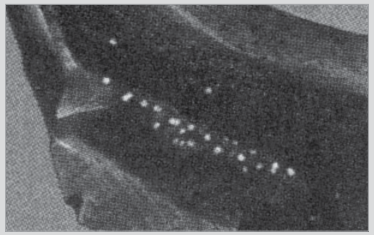
Under inflation, overloading or excessive speed can cause damage because of heat build up. Tyre parts such as cord, the bonding between carcasses, belts and treads can be easily damaged by excessive heat. Most tyre cords lose strength at temperatures above 120°C making the tyre more vulnerable to a failure.

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

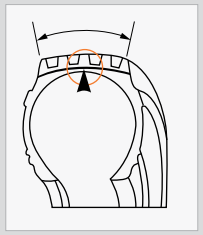
The following pictures show some of the possible damage conditions.

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