General information

Nokian Heavy Tyres is passionate in developing high quality solutions for the most extreme conditions found in forests, modern day farming, municipal contracting, transportation terminals and underground applications. In addition to tyre and supplementary item information, this manual focuses on the special necessities and requirements in each product category. The forestry section, for example, has a detailed guide on the right tyre and inflation pressure choice by application.

This technical manual will be your tool in finding the right tyre for your work, with a promise on carefree working hours.

General information includes:


nokian


Photo: Sandvik

Red giant in wolves' nest

Jari Pinomäki, foreman, Kone-Rauhansuu Ltd

Tyre Pressure LED pressure watch adds reliability and efficiency to working hours

Pulp wood falls down. Forestry machine leaves behind a row of neat stacks. Intermediate felling is under way in Yläne, Pöytyä in southern Finland. Jari Pinomäki sits behind the wheel of Valmet 901.4 harvester. The new machine was fitted with wide Nokian Forest King F tyres mounted on a 22.5" rim. This was to make the crane reach even further.

– Tyres should not be on the driver's mind all the time; they should offer non-stop reliability, one working hour after another. Tyre maintenance should not disturb the machine's operating time, Pinomäki comments.

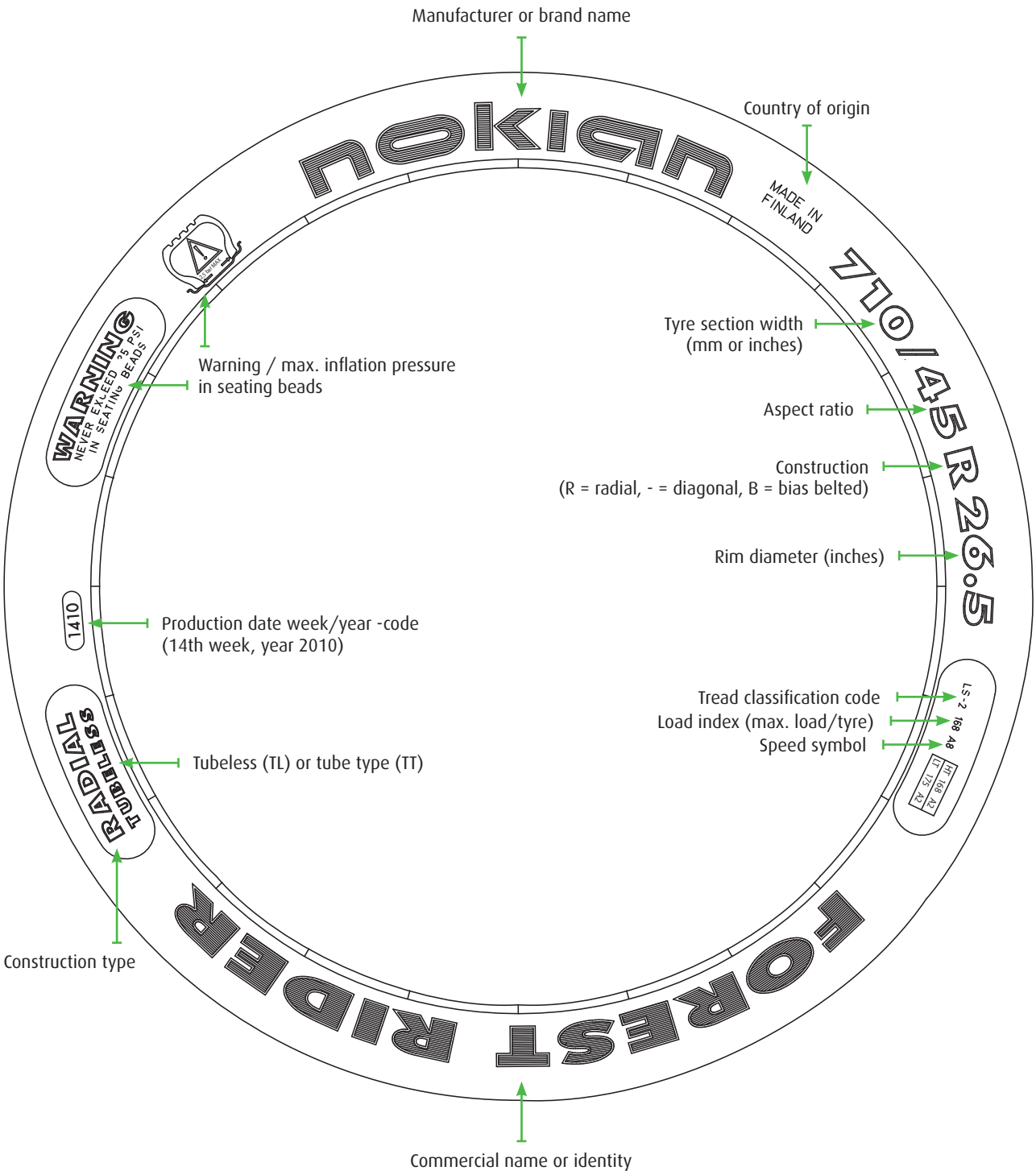
Pressure drop alarm helps avoid tyre break-ups

The most recent device introduced is the Tyre Pressure LED warning system. It is a monitoring device replacing the valve cap. When inflation pressure drops below critical level a bright LED light starts to flash, indicating a need for an air fill.

– It's important to keep track of the tyre pressure. If the tyre pressure is too low, it puts a considerable strain on the tyre and in time will cause tyre failure. Thanks to this pressure watch, a drop in tyre pressure will not go unnoticed. The blinking light is easy to see when you walk around the machine before your work shift begins.

Tyre markings

TYRE MARKINGS



TYRE CLASSIFICATION CODES

Optional marking

TRA Code	Tread type
Agricultural tractor drive wheel tyres	
R-1	Regular service (tread)
R-1W	Wet traction service
R-1S	Sprayer / spreader service
R-2	Cane and rice service (deep tread)
R-3	Flotation service (shallow tread)
R-4	Industrial service (construction application)
Agricultural tractor steering wheel tyres (non-traction pattern)	
F-1	Single rib tread
F-2	Multiple rib tread
F-3	Industrial service (construction application)
Agricultural implement tyres	
I-1	Multi-rib tread
I-2	Moderate traction service
I-3	Traction tread
I-4	Plough tail wheel service
I-5	Steering service
I-6	Smooth tread
Garden tractor tyres (implement tyres)	
G-1	Traction service
G-2	Flotation traction service
G-3	Maximum flotation service
Grader tyres (Motor graders)	
G-2	Traction regular
G-3	Rock Regular
Logging and forestry service tyres	
LS-1	Regular tread
LS-2	Intermediate tread
LS-3	Deep tread
LS-4	Shallow tread
High flotation tyres for off-the-road service	
HF-1	Shallow tread
HF-2	Regular tread
HF-3	Deep tread
HF-4	Extra deep tread
Earthmover tyres (Dump trucks and scrapers)	
E-1	Rib regular
E-2	Traction regular
E-3	Rock regular
E-4	Rock deep tread
E-7	Flotation

TRA Code	Tread type
Loader and dozer tyres (Front-end loaders and dozers)	
L-2	Traction regular
L-3	Rock regular
L-4	Rock deep tread
L-5	Rock extra deep tread
L-4S	Smooth deep tread
L-5S	Smooth extra deep tread
Compactor tyres	
C-1	Smooth
Industrial tyres (Straddle carriers, transfer cranes, towing tractors, reach stackers and fork lifts	
IND-3	Traction regular
IND-4	Deep tread
IND-5	Extra deep tread

Nokian TRI 2: R-4

Nokian Forest King TRS L-2: LS-2

Photo: Sandvik

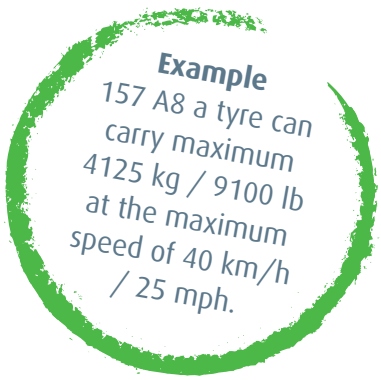
Nokian Mine: L-5S

Notice!
TRA = Tire and Rim Association Inc.

LOAD INDEX

The LOAD INDEX (LI) is a numerical code associated with the maximum load a tyre can carry.

LI	kg	lb	LI	kg	lb	LI	kg	lb	LI	kg	lb	LI	kg	lb	LI	kg	lb	LI	kg	lb
0	45	99	40	140	310	80	450	990	120	1 400	3 080	160	4 500	9 900	200	14 000	30 900	240	45 000	99 000
1	46.2	102	41	145	320	81	462	1 020	121	1 450	3 200	161	4 625	10 200	201	14 500	32 000	241	46 250	102 000
2	47.5	105	42	150	330	82	475	1 050	122	1 500	3 300	162	4 750	10 500	202	15 000	33 100	242	47 500	104 500
3	48.7	107	43	155	340	83	487	1 070	123	1 550	3 420	163	4 875	10 700	203	15 500	34 200	243	48 750	107 500
4	50	110	44	160	355	84	500	1 100	124	1 600	3 520	164	5 000	11 000	204	16 000	35 300	244	50 000	110 000
5	51.5	114	45	165	365	85	515	1 140	125	1 650	3 640	165	5 150	11 400	205	16 500	36 400	245	51 500	113 500
6	53	117	46	170	375	86	530	1 170	126	1 700	3 740	166	5 300	11 700	206	17 000	37 500	246	53 000	117 000
7	54.5	120	47	175	385	87	545	1 200	127	1 750	3 860	167	5 450	12 000	207	17 500	38 600	247	54 500	120 000
8	56	123	48	180	395	88	560	1 230	128	1 800	3 960	168	5 600	12 300	208	18 000	39 700	248	56 000	123 500
9	58	128	49	185	410	89	580	1 280	129	1 850	4 080	169	5 800	12 800	209	18 500	40 800	249	58 000	128 000
10	60	132	50	190	420	90	600	1 320	130	1 900	4 180	170	6 000	13 200	210	19 000	41 900	250	60 000	132 500
11	61.5	136	51	195	430	91	615	1 360	131	1 950	4 300	171	6 150	13 600	211	19 500	43 000	251	61 500	135 500
12	63	139	52	200	440	92	630	1 390	132	2 000	4 400	172	6 300	13 900	212	20 000	44 100	252	63 000	139 000
13	65	143	53	206	455	93	650	1 430	133	2 060	4 540	173	6 500	14 300	213	20 600	45 400	253	65 000	143 500
14	67	148	54	212	465	94	670	1 480	134	2 120	4 680	174	6 700	14 800	214	21 200	46 700	254	67 000	147 500
15	69	152	55	218	480	95	690	1 520	135	2 180	4 800	175	6 900	15 200	215	21 800	48 100	255	69 000	152 000
16	71	157	56	224	495	96	710	1 570	136	2 240	4 940	176	7 100	15 700	216	22 400	49 400	256	71 000	156 500
17	73	161	57	230	505	97	730	1 610	137	2 300	5 080	177	7 300	16 100	217	23 000	50 700	257	73 000	161 000
18	75	165	58	236	520	98	750	1 650	138	2 360	5 200	178	7 500	16 500	218	23 600	52 000	258	75 000	165 500
19	77.5	170	59	243	535	99	775	1 710	139	2 430	5 360	179	7 750	17 100	219	24 300	53 600	259	77 500	171 000
20	80	175	60	250	550	100	800	1 760	140	2 500	5 520	180	8 000	17 600	220	25 000	55 100	260	80 000	176 500
21	82.5	180	61	257	565	101	825	1 820	141	2 575	5 680	181	8 250	18 200	221	25 750	56 800	261	82 500	182 000
22	85	185	62	265	585	102	850	1 870	142	2 650	5 840	182	8 500	18 700	222	26 500	58 400	262	85 000	187 500
23	87.5	195	63	272	600	103	875	1 930	143	2 725	6 000	183	8 750	19 300	223	27 250	60 000	263	87 500	193 000
24	90	200	64	280	615	104	900	1 980	144	2 800	6 150	184	9 000	19 800	224	28 000	61 500	264	90 000	198 500
25	92.5	205	65	290	640	105	925	2 040	145	2 900	6 400	185	9 250	20 400	225	29 000	64 000	265	92 500	204 000
26	95	210	66	300	660	106	950	2 090	146	3 000	6 600	186	9 500	20 900	226	30 000	66 000	266	95 000	209 500
27	97.5	215	67	307	675	107	975	2 150	147	3 075	6 800	187	9 750	21 500	227	30 750	68 000	267	97 500	215 000
28	100	220	68	315	695	108	1 000	2 200	148	3 150	6 950	188	10 000	22 000	228	31 500	69 500	268	100 000	220 500
29	103	225	69	325	715	109	1 030	2 270	149	3 250	7 150	189	10 300	22 700	229	32 500	71 500	269	103 000	227 000
30	106	235	70	335	740	110	1 060	2 340	150	3 350	7 400	190	10 600	23 400	230	33 500	74 000	270	106 000	233 500
31	31	240	71	345	760	111	1 090	2 400	151	3 450	7 600	191	10 900	24 000	231	34 500	76 000	271	109 000	240 500
32	112	245	72	355	785	112	1 120	2 470	152	3 550	7 850	192	11 200	24 700	232	35 500	78 500	272	112 000	247 000
33	115	255	73	365	805	113	1 150	2 540	153	3 650	8 050	193	11 500	25 400	233	36 500	80 500	273	115 000	253 500
34	118	260	74	375	825	114	1 180	2 600	154	3 750	8 250	194	11 800	26 000	234	37 500	82 500	274	118 000	260 000
35	121	265	75	387	855	115	1 215	2 680	155	3 875	8 550	195	12 150	26 800	235	38 750	85 500	275	121 000	267 000
36	125	275	76	400	880	116	1 250	2 760	156	4 000	8 800	196	12 500	27 600	236	40 000	88 000	276	125 000	275 500
37	128	280	77	412	910	117	1 285	2 830	157	4 125	9 100	197	12 850	28 300	237	41 250	91 000	277	128 500	283 500
38	132	290	78	425	935	118	1 320	2 910	158	4 250	9 350	198	13 200	29 100	238	42 500	93 500	278	132 000	291 000
39	136	300	79	437	965	119	1 360	3 000	159	4 375	9 650	199	13 600	30 000	239	43 750	96 500	279	136 000	300 000



UNITS

Quantity	S.I. units	Other units
Length	m (metre)	1 inch (“) = 0.0254 m (or 25.4 mm)
		1 mile = 1 609 m (or 1.609 km)
Mass	kg (kilogram)	1 pound (lb) = 0.4536 kg
Pressure	Pa (Pascal)	1 bar = 100 kPa
		1 pound per square inch (p.s.i. or lb/in^2) = 6.895 kPa
		1 kg/cm^2 = 98.066 kPa
Speed	m/s	1 km per hour (km/h) = 0.27778 m/s
	(metre per second)	1 mile per hour (mph) = 0.4470 m/s
		(or 1.60935 km/h)

SPEED SYMBOL

The SPEED SYMBOL (SS) indicates the maximum speed at which the tyre can carry a load corresponding to its Load Index.

SS	km/h	mph
A1	5	2,5
A2	10	5
A3	15	10
A4	20	12,5
A5	25	15
A6	30	20
A7	35	22,5
A8	40	25
B	50	30
C	60	35
D	65	40
E	70	43
F	80	50
G	90	55
J	100	62
K	110	68
L	120	75
M	130	81
N	140	87
P	150	93
Q	160	99
R	170	106
S	180	112
T	190	118

PICTOGRAM

Marked on both tyre sidewalls

Explicts the maximum inflation pressure not to be exceeded for bead seating during tyre mounting. The value of inflation pressure (2.5 bar in the example) must be the same as specified by the tyre manufacturer.

PRESSURE UNIT, CONVERSION TABLE

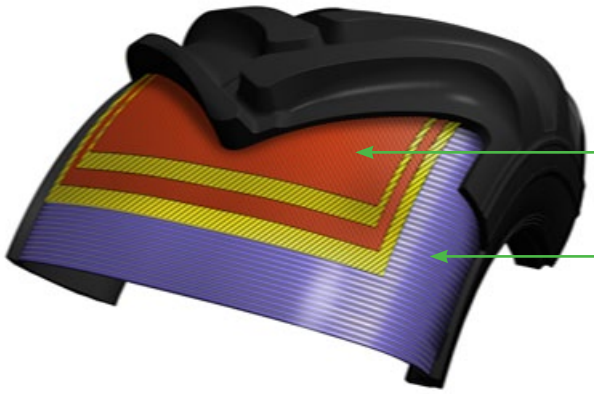
kPa	bar	* lb/in² (p.s.i.)	* kg/cm²
10	0.1	1	0.1
20	0.2	3	0.2
30	0.3	4	0.3
40	0.4	6	0.4
50	0.5	7	0.5
60	0.6	9	0.6
70	0.7	10	0.7
80	0.8	12	0.8
90	0.9	13	0.9
100	1.0	15	1.0
110	1.1	16	1.1
120	1.2	17	1.2
130	1.3	19	1.3
140	1.4	20	1.4
150	1.5	22	1.5
160	1.6	23	1.6
170	1.7	25	1.7
180	1.8	26	1.8
190	1.9	28	1.9
200	2.0	29	2.0
210	2.1	30	2.1
220	2.2	32	2.2
230	2.3	33	2.3
240	2.4	35	2.4
250	2.5	36	2.5
260	2.6	38	2.7
270	2.7	39	2.8
280	2.8	41	2.9
290	2.9	42	3.0
300	3.0	44	3.1
310	3.1	45	3.2
320	3.2	46	3.3
330	3.3	48	3.4
340	3.4	49	3.5
350	3.5	51	3.6
360	3.6	52	3.7
370	3.7	54	3.8
380	3.8	55	3.9
390	3.9	57	4.0
400	4.0	58	4.1
410	4.1	59	4.2
420	4.2	61	4.3
430	4.3	62	4.4
440	4.4	64	4.5
450	4.5	65	4.6
460	4.6	67	4.7
470	4.7	68	4.8
480	4.8	70	4.9
490	4.9	71	5.0
500	5.0	73	5.1
510	5.1	74	5.2
520	5.2	75	5.3
530	5.3	77	5.4
540	5.4	78	5.5
550	5.5	80	5.6

kPa	bar	* lb/in² (p.s.i.)	* kg/cm²
560	5.6	81	5.7
570	5.7	83	5.8
580	5.8	84	5.9
590	5.9	86	6.0
600	6.0	87	6.1
610	6.1	88	6.2
620	6.2	90	6.3
630	6.3	91	6.4
640	6.4	93	6.5
650	6.5	94	6.6
660	6.6	96	6.7
670	6.7	97	6.8
680	6.8	99	6.9
690	6.9	100	7.0
700	7.0	102	7.1
710	7.1	103	7.2
720	7.2	104	7.3
730	7.3	106	7.4
740	7.4	107	7.5
750	7.5	109	7.6
760	7.6	110	7.7
770	7.7	112	7.9
780	7.8	113	8.0
790	7.9	115	8.1
800	8.0	116	8.2
810	8.1	117	8.3
820	8.2	119	8.4
830	8.3	120	8.5
840	8.4	122	8.6
850	8.5	123	8.7
860	8.6	125	8.8
870	8.7	126	8.9
880	8.8	128	9.0
890	8.9	129	9.1
900	9.0	131	9.2
910	9.1	132	9.3
920	9.2	133	9.4
930	9.3	135	9.5
940	9.4	136	9.6
950	9.5	138	9.7
960	9.6	139	9.8
970	9.7	141	9.9
980	9.8	142	10.0
990	9.9	144	10.1
1000	10.0	145	10.2
1010	10.1	146	10.3
1020	10.2	148	10.4
1030	10.3	149	10.5
1040	10.4	151	10.6
1050	10.5	152	10.7
1060	10.6	154	10.8
1070	10.7	155	10.9
1080	10.8	157	11.0
1090	10.9	158	11.1
1100	11.0	160	11.2

* Values in p.s.i. and kg/cm² rounded to the nearest practical unit.

Tyre structures

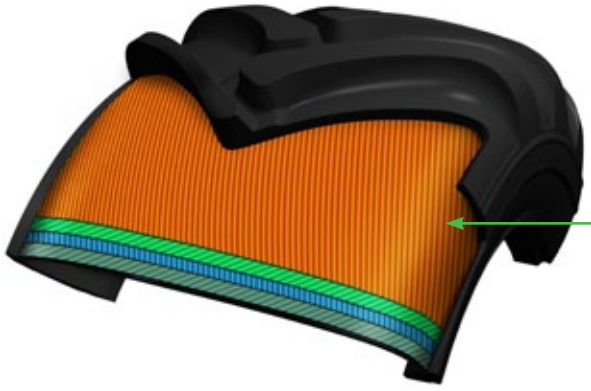
RADIAL TYRE



The tyre carcass is stabilized by an inextensible circumferential belt.

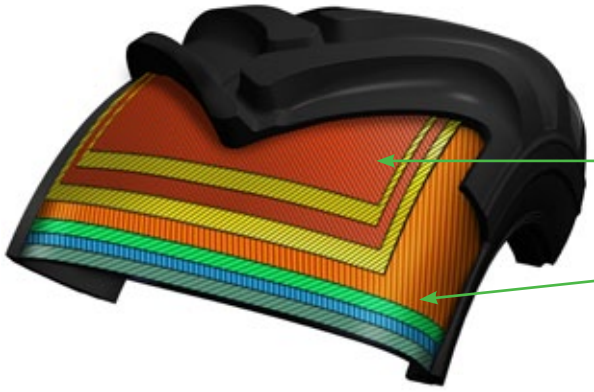
The ply cords are laid substantially at 90° to the centerline of the tread.

DIAGONAL (OR BIAS PLY) TYRE



The ply cords are laid at alternate angles substantially less than 90° to the centerline of the tread.

BIAS BELTED



The tyre carcass is stabilized by an inextensible circumferential belt.

Tyre structure of diagonal tyre.

Inflation pressure

CHOOSING THE RIGHT INFLATION PRESSURE

Maintaining the proper tyre inflation pressure

The inflation pressures of tyres should be checked carefully at regular intervals. Perform a visual check daily and repeatedly when operating. A slow leak can cause damage to the tyre sidewall or lead to tube failure before the under-inflation can be felt in the handling of the machine.

Repairable damage should be repaired immediately in order to help obtain regular tyre life. When operating machinery in winter conditions, it should be kept in mind that when temperatures decrease, so do tyre inflation pressures. Consequently, when inflating a tyre indoors in winter, it should be inflated slightly over the recommended pressure. The diagram below should prove of assistance in determining the correct pressure.

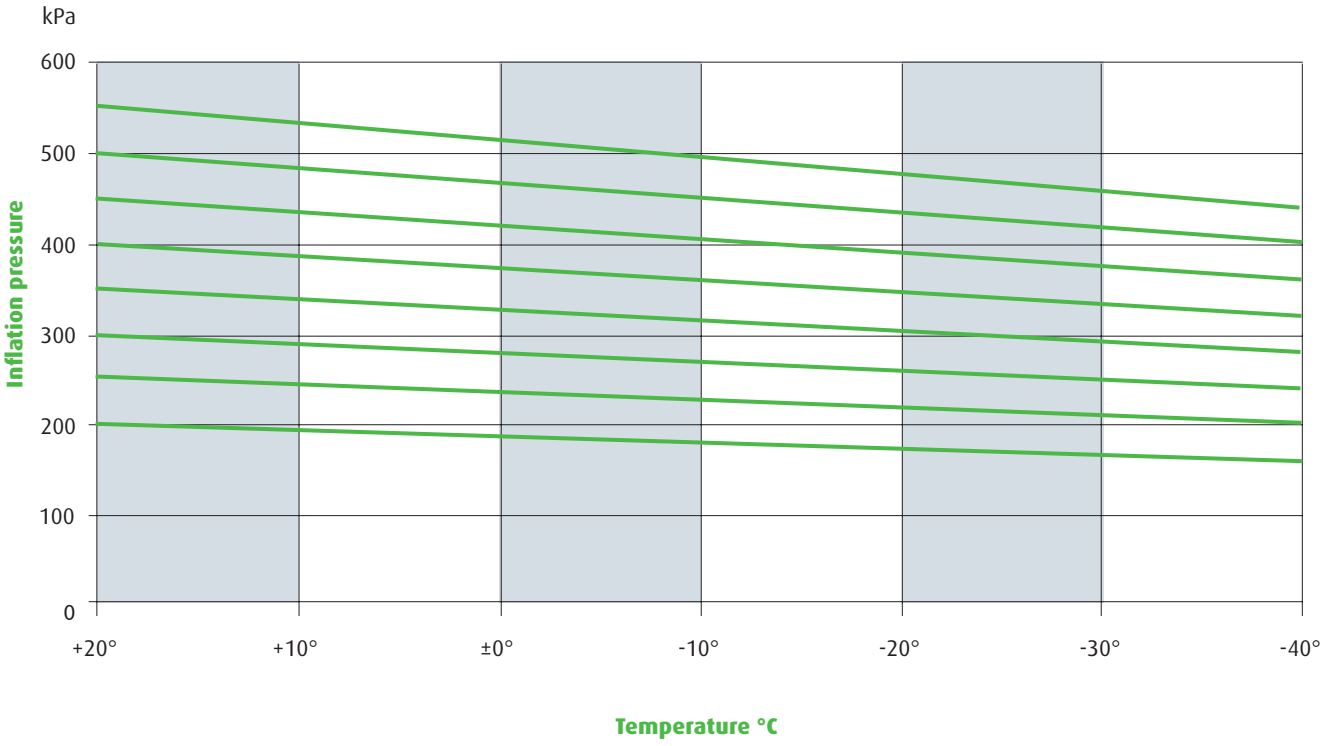
Ground disturbance

Ground disturbance is more pronounced when operating in soft soil conditions. When the tyre gets in contact with the ground on a hard surface, it is the tyre that gets depressed, whereas when operating on soft soil, the ground gets depressed. The inflation pressure used does not have much of an effect on the size of the footprint. The inflation pressure should be less than the ground pressure between the ground and the tyre, in case approx. 55 kPa, for it to reduce the depth of the footprint.

Consequently, it is not advisable to reduce tyre inflation pressures in order to improve the machine's footprint, as it has a negative impact on the tyre's service life. The use of wider tyres will serve this purpose better.

Notice!
Use always recommended inflation pressure i.e. winter ambient avarage -25°C or in summer time +30°C.

The relationship between tyre inflation pressure and air temperature



Accessories

Non-skid chains

NON-SKID CHAINS

Nowadays, the general tendency is to work increasingly without chains. This is turn places additional demands on forestry tyre selection in order to ensure access to difficult terrain while, at the same time, minimising ground disturbance. In practise, however, there are situations when the use of chains cannot be avoided. In such cases, it is important to pay attention to some basic considerations.

Use of chains

Before installing new chains, it is recommended that they be inspected for sharp edges or welding burrs. When installing chains on a tyre, it is important to ensure that the chains are sufficiently tight. Chains that are too loose can slip on the tyre causing excessive wear. Checking the functioning of old and worn chains is recommended from time to time as well. It is important to check that no chain rings are broken and that none of these individual rings have turned, so that their calks cut into the tyre. The same damage can occur with severely worn and thus overstretched chains.

Tracks

TRACKS

Track manufacturers give their recommendations in slightly different ways. The practice, that is becoming increasingly common, is where track manufacturers specify their products according to the tyre manufacturer, the tread design and the tyre size. The minimum requirement is that the track manufacturer provide the tyre size and the tread design for each track type.

When acquiring tracks, it is extremely important for the user to select the correct track type which is suitable for the tyre and that the operating pressure, in particular, meets the recommendations of track manufacturers. When selecting tracks, it is recommended that the user contacts the track manufacturer.

When using tracks the correct pressure level is the maximum permitted inflation pressure for each tyre size.

Notice!
Contact the track manufacturer for the correct track for your tyre.

RECOMMENDED INFLATION PRESSURES WHEN USING TRACKS

Tyre size	PR	LI / SS		
500/60-22.5	16		430 kPa	62 p.s.i.
600/50-22.5	16	151 A8/ 158 A2	430 kPa	62 p.s.i.
700/45-22.5	16		390 kPa	57 p.s.i.
710/40-22.5	16	154 A8 / 161 A2	390 kPa	57 p.s.i.
710/40-24.5	20	163 A8 / 170 A2	550 kPa	80 p.s.i.
600/55-26.5	16		460 kPa	67 p.s.i.
700/45-26.5	16		460 kPa	67 p.s.i.
710/45-26.5	16	161 A8 / 168 A2	460 kPa	67 p.s.i.
600/55-26.5	20	165 A8 / 172 A2	550 kPa	80 p.s.i.
650/65-26.5	20	172 A8 / 179 A2	550 kPa	80 p.s.i.
700/50-26.5	20		550 kPa	80 p.s.i.
710/45-26.5	20	168 A8 / 175 A2	550 kPa	80 p.s.i.
750/55-26.5	20	177 A8 / 184 A2	550 kPa	80 p.s.i.
780/55-26.5	20	179 A8 / 186 A2	550 kPa	80 p.s.i.
800/40-26.5	20	170 A8 / 177 A2	500 kPa	73 p.s.i.
650/45R24.5		161 A8 / 168 A2	550 kPa	80 p.s.i.
600/55R26.5		165 A8 / 172 A2	550 kPa	80 p.s.i.
710/45R26.5		168 A8 / 175 A2	550 kPa	80 p.s.i.
800/50R26.5		180 A8 /187 A2	550 kPa	80 p.s.i.

Tire Pressure LED™

TYRE PRESSURE DROP WARNING SYSTEM

Tire Pressure LED

Easy tyre pressure check available on all Nokian tyres

- Easy to use
- Reduces tyre maintenance
- Reduces tyre break-ups
- Saves money

How to use

- First adjust the tyre pressure to the recommended value.
- Screw the Tire Pressure LED tight by hand, using the anti-theft tool provided with the kit.
- The Tire Pressure LED is now calibrated and is constantly monitoring the tyre pressure.

What to do when LED starts flashing

- Unscrew the Tire Pressure LED with the anti-theft tool.
- Adjust the tyre pressure to the recommended value.
- Reinstall the Tire Pressure LED.

Benefits

- Constant pressure control.
- No need for regular pressure gauge checks anymore.
- The led indicates the need for pressure adjustment.
- Increase in tyre and tube lifespan due to right operating pressure.
- No more tyre break-ups due to running tyres underinflated.

Technical properties

- Led activated when a drop from the calibrated value exceeds 0.3 bar / 4.4 p.s.i. (T845503) or 0.6 bar / 8.7 p.s.i. (T845504 and T845505).
- Battery used only when led is activated (pressure drop).

Pressure
OK

Warning!
Low pressure

Notice!
The LED value caps are an aid in monitoring tyre pressure. The instructions on tyre pressure maintenance in vehicle owners manual should still be followed.

Tire Pressure LED™

For Agricultural vehicles / 4 pcs / pack

Product code	Manufacturer code	Pressure range
T845503	SSVC-4 NA	0.7–5.0 bar 10–70 p.s.i.

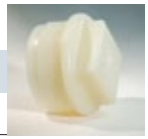
For Forestry vehicles / 4 pcs / pack

Product code	Manufacturer code	Pressure range
T845504	TSVC-4 NF	4–12 bar 60 –175 p.s.i.

For Large Bore Valve Vehicles / 2 pcs / pack

Product code	Manufacturer code	Pressure range
T845505	TSVC-2 NL	4–12 bar 60 –175 p.s.i.

Transparent Cap for use with R2" valve protector (2.5.4 Valve protectors)



Product code
T445506

Rims

RIM MARKINGS

Disc wheels and demountable rims shall be marked with the following information:
a) Rim size designation

Rim marking		Rim contour		Nominal diameter code	Special features
		Width code	Profile		
6½J x 15 H2	or 15 x 6½J H2	6½	J	15	Asymmetrical drop-centre, double hump (H2). (if S=symmetrical)
22.5 x 7.50		7.5		22.5	
10.00 V -20	or 20 - 10.00 V	10	V	20	
DW16L x 26	or 26 x DW 16L	16	L	26	Secondary Well (DW)
8.00TG - 24 SDC	or 24 - 8.00TG SDC	8.00	TG	24	Semi-Drop Centre (SDC)
11.25 - 25/2.0	or 25 - 11.25/2.0	11.25		25	Flange Height Code (/2.0)

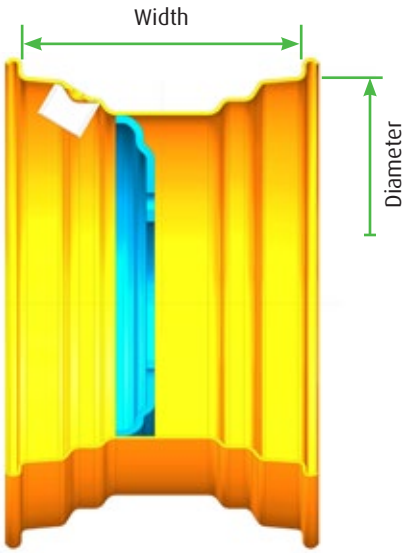
Notice!
- indicates multi-piece rim.
x indicates one-piece rim.

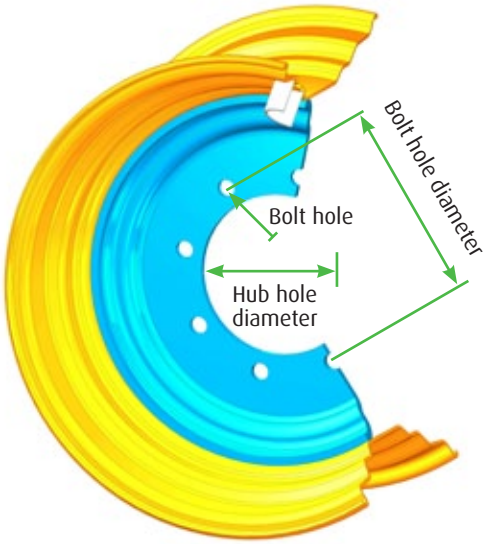
b) Wheel/rim manufacturer (name, symbol or trademark)
c) date of manufacture
d) part number or code

Rings shall be marked with the following information:
a) Identification of rim to which the part may be fitted
b) Identification of manufacturer
c) Date of manufacture
d) Flange height designation (on side rings for EM rims

Notice!
With recommended rim you get the best operational result from your tyre. You may use also permitted rim as an alternative.

WHEEL (DISC INCLUDED) MAIN DIMENSIONS





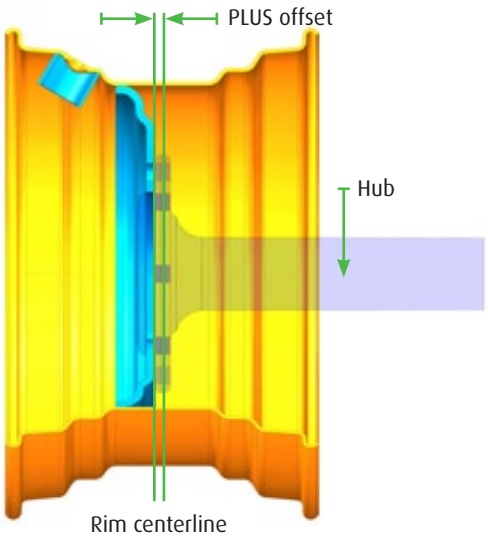
Disc hole definition (mm)

281-335-25,4-10 AR18-32

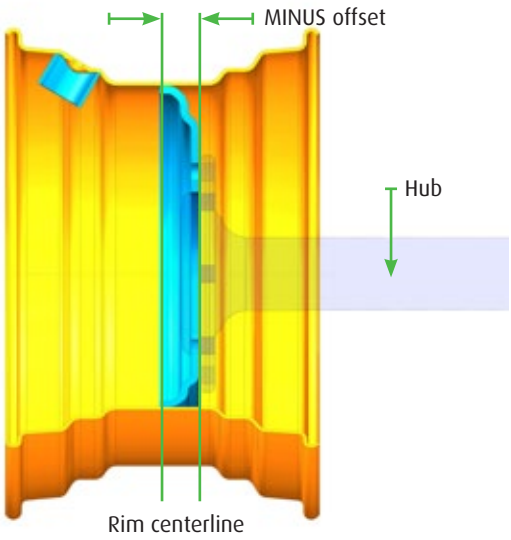
- Countersink
- N:o of holes
- Bolt hole
- Bolt hole diameter
- Hub hole diameter

Offset is the distance from the rim centerline to the hub mounting surface
+ offset decreases track width
- offset increases track width

+ offset decreases track width



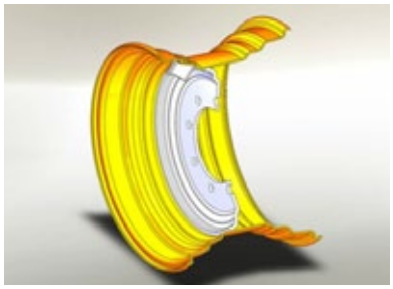
– offset increases track width



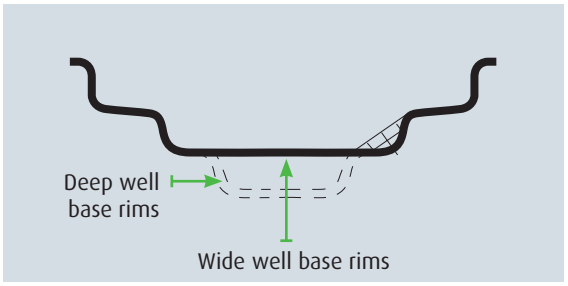
RIM CONTOURS

There are mainly two types of rims used with Nokian Heavy Tyres products. Wide well-base and flat-base contour designs.

1. Wide well-base (W and DW)



DW rim



W (wide well) and DW (deep well) rim contours

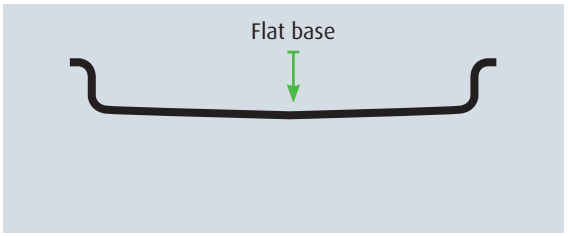
W or DW?

DW facilitates better the mounting of high PR (stiffer construction) tyres.
DW rims also have higher strength compared with W rims, due to more bends in the contour shape.

2. Flat base rims

Flat base rims are generally of divided contstruction or equipped with lock rings.

Flat base rim



Flat base rim contour

STANDARDS

Tyres are designed for use on rims that meet the industry standards. It is the responsibility of the vehicle manufacturers and vehicle users that rims used comply with these standards.

Tyre and rim standards manuals.

The right tyre and rim combination defined in these standards guarantees a proper mounting and fit of tyre on the rim. Standards manuals give the proper rim dimensions and the right rim contours for use on each tyre size and service condition.

Rims and wheels may be stamped with maximum load and maximum cold inflation ratings. If these are not identified consult the rim and wheel manufacturer for rim and wheel capacities for the intended service.

TRA: The Tire and Rim Association Inc.
ETRTO: The European Tyre and Rim Technical Organisation
JATMA: The Japan Automobile Tyre Manufacturers Association Inc.
STRO: The Scandinavian Tyre & Rim Organization

INFORMATION NEEDED FOR DEFINING A WHEEL

A wheel consists of a rim and a disc. Rim contours are standardised and differ from each other according to the service type. Wheel discs are characterised by the offset position, attachment and centre hole.

To define a wheel for a certain application, the following information is needed by the wheel manufacturer:

Information from the tyre manufacturer:

1. Tyre size, loading requirements and service type
2. Nominal width code (inch)
3. Diameter code (inch)
4. Tubeless or tube-type tyre

With this tyre information the rim contour can be designed.

Information from the vehicle manufacturer:

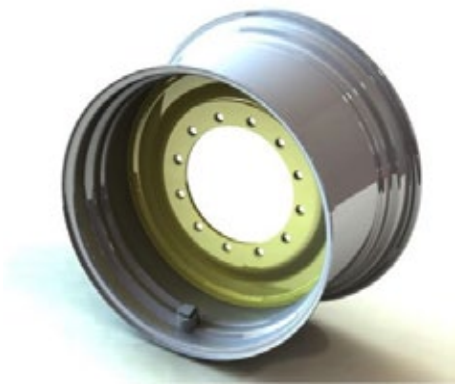
5. Offset
6. Disc centre hole
7. Attachment (bolt circle diameter, bolt hole size, bolt hole type)
8. Wheel loading and maximum speed requirements
9. Valve hole placement, type of valve preferred and need for valve protection
10. The wheel colour

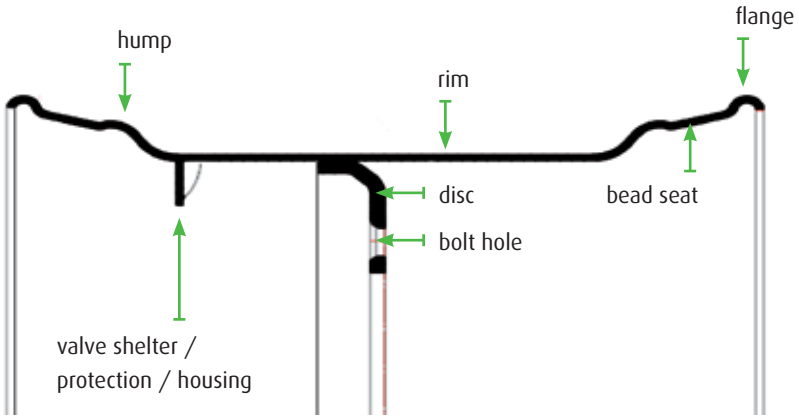
With this information a standard or a tailored wheel can be defined.

Notice!
When in doubt consult rim and wheel manufacturer for confirmation on the strenght of the rim/wheel for the intended service.

WHEEL PARTS / COMPONENTS

Single piece wheel





W rim with 2 humps (H2)

Multi-piece wheel (also referred to as industrial or lock ring wheel)

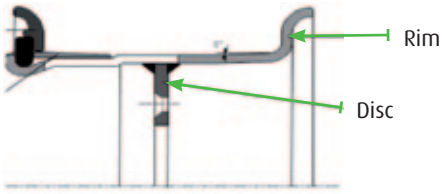
3-piece rim / bead seat ring, side ring and lock ring the same component

4-piece rim / bead seat ring and lock ring the same component

5-piece rim / all parts separate

The amount of separate rings required is often based on the wheel loading requirements.
Note! Industrial wheels have an inflation maximum of 10 bar (145 p.s.i.).

WHEEL PARTS / COMPONENTS



Notice!
Wheel, when disc included.

Rim, when no disc included.

VALVE PROTECTORS

In tough operating conditions, i.e. forestry a R2" thread valve protector is commonly used. A transparent cap enables the use of LED pressure warning device.

R2" valve protector

Transparent cap for R2"

Other types of valve protectors depending on user preferences

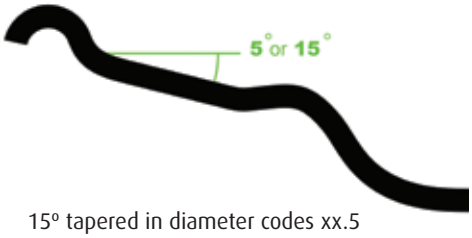
FORESTRY RIMS

Examples of typical forestry rim sizes:

AG 22.00 x 22.5 All 15º tapered
AG 24.00 x 24.5
AG 24.00 x 26.5
AG 28.00 x 26.5

DW 20 B x 26 All 5º tapered
DW 25 B x 26
DW 23 B x 34
DW 24 B x 34

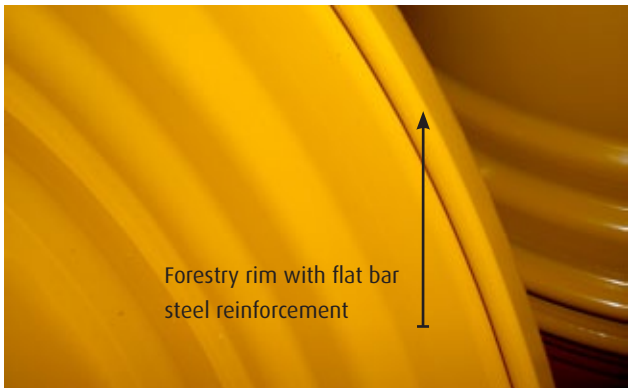
AG = agricultural rim contour (drop centre rims)
DW = deep well rims

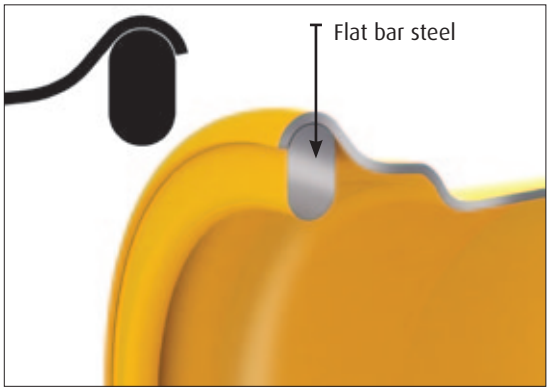


15º tapered in diameter codes xx.5
5º tapered in diameter codes xx

Reinforcements

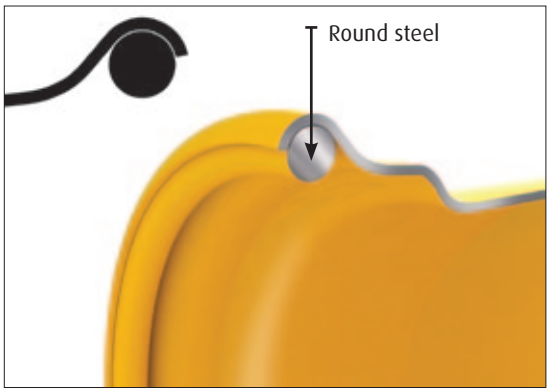
Rims used in professional logging operations are recommended to have contour flange reinforcements. These add load carrying capacity and protect flanges against impacts.





1) Rim diameters 24,5" and larger

Recommendation: Flat bar steel on the outside flange. Round steel / tube edge / long rolled flange on the inside flange.

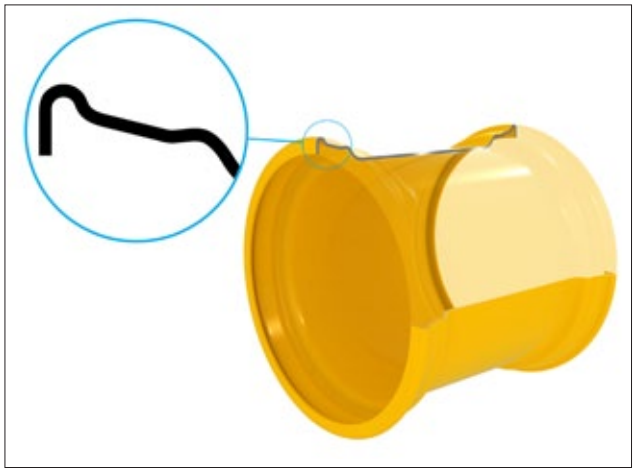


2) Rim diameters smaller than 24,5"

Recommended reinforcements depending on loading and operating conditions. Types:

- Round steel
- Tube flange edge
- Long rolled flange edge

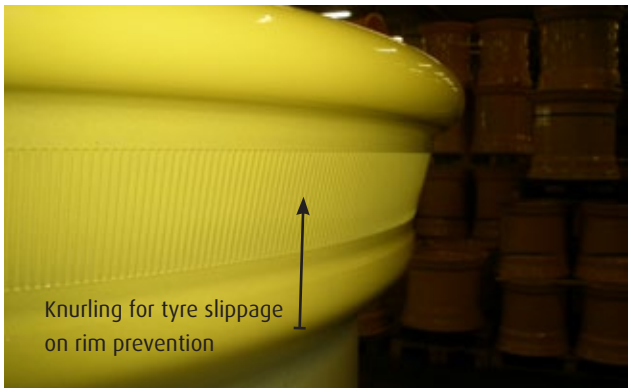
Tube flange edge



Long rolled flange edge

Knurling

Knurling has been designed to prevent tyre slippage on rim caused by the inherent traction force on the wheel.
To produce the desired effect, knurling must extend beyound the surface of the rim bead seat.



Other methods to prevent tyre slippage on rim

- Friction paint on bead area
- Paint removed from bead area

Notice!
For preventing tyre slippage on rim:
1. Proper inflation pressure.
2. Use high quality standards fulfilling rims.

Recommendations for knurling use on 5° tapered rim contours

Rim width	Rim Diameter	Rim Diameter 24″ and larger
13″ and smaller	Upon request	Upon request
14″ and larger	Upon request	Always

Knurling conditions (ETRTO)

Tubeless forestry rims

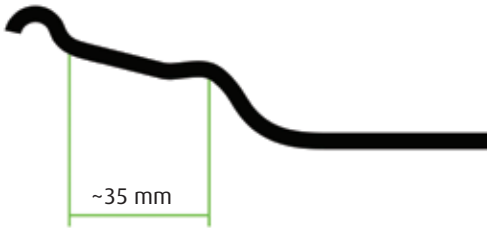
With the introduction of radial forestry tyres(Forest Rider), Nokian Heavy Tyres is able to offer tubeless wheels for forestry.

Advantages:

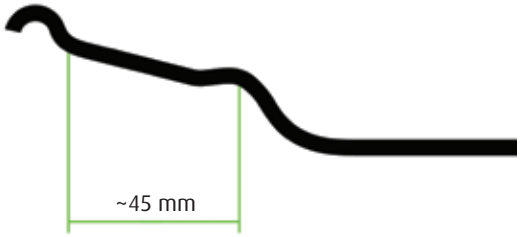
1. No need for tubes and regular tube maintenance
2. No tube valve break-ups from occasional tyre wheel spins in severe high torque conditions.
3. If a wheel spin should occur it has no effect on wheel functionability

A tubeless forestry rim has 3 differences compared with a standart similar contour agricultural rim.

1. Rim flange reinforcements
2. Knurling
3. 15° tapered rims with wider hump dimensioning to accomodate stiffer and wider tyre bead area.



Traditional agricultural rim hump dimensioning



Forestry rim hump dimensioning to accomodate wider tyre base

Notice!
Rims with wider hump can be used also in agricultural and forestry trailer tyres. 5° tapered rims don't require humps to perform as tubeless (i.e. 34" Forest Rider sizes).

AGRICULTURAL RIMS

Agricultural rims are TL (tubeless) type.
Rim material, rim shape (contour) and material thickness are based on wheel loading requirements.

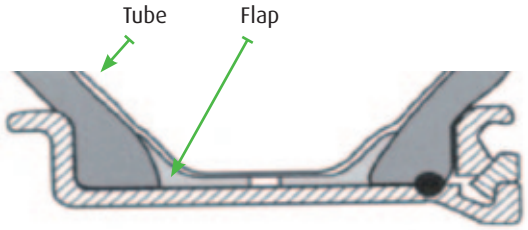
Examples of agricultural rim sizes:

13.00 x 15.5	All 15° tapered agricultural rim sizes are equipped with humps.
16.00 x 17	5° tapered sizes dont require humps for tubeless use.
AG 13.00 x 22.5	
AG 20.00 x 26.5	
DW 13 x 24	
DW 16 x 34	

INDUSTRIAL RIMS

Examples of typical industrial rim sizes:
20" , 24", 25", 33" lock rings

10.00 WA - 24 /2.0
10.00VA - 24 HD
10.00V - 20
11.00DC - 20
13.00 - 25 /2.5 HD
14.00 - 25 /1.3
8.0 - 20
8.5 - 20



Tube-type on a multi-piece rim

Multi-piece rims 20" and 24"

Generally tube-type wheels, requiring a tube and a flap.

Examples of tyre sizes:
12.00 - 20
14.00 - 24

Flap	Flap product code	Tyre sizes
170-20	T299520	9.00-20, 10.00-20, 11.00-20
195-20	T299530	11.00R20 (rims 7.0-7.5), 12.00-20
225-20	T299537	10.00R20 (rim 8.0), 12.00R20 (rim 8.0)
260-20	T299538	12.00R20 (rims 8.5 - 9.0) 14.00-20, 14.00R20
*)260-24/25	T299531	13.00-24, 14.00-24, 16.00-24, 16.00-25
430-25	T299540	20.5-25

*) Flap valve hole made afterwards depending on required positioning

Multi-piece rims 25" and 33"

Generally tubeless wheel, requiring a sealant ring (o-ring)

Examples of tyre sizes:
17.5 R 25
16.00 R 25
18.00 - 25
18.00 - 33

O-ring code	Nokian O-ring product code	Rim contours
OR-224	-	10.00VA
OR-225	T449610	12.00/1.3, 14.00/1.5
OR-325	T449620	10.00WA, 11.25/20, 13.00/2.5, 15.00/2.5, 17.00/2.0, 19.50/2.5, 22.00/3.0
OR-329	T449630	22.00/3.0
OR-333	-	13.00/2.5

OR - 2XX ← **O-ring diameter: 2** : 2/8 inch = 6.35 mm / **3** : 3/8 inch = 9.53 mm

OR: O-ring

INSPECTIONS ON RIMS

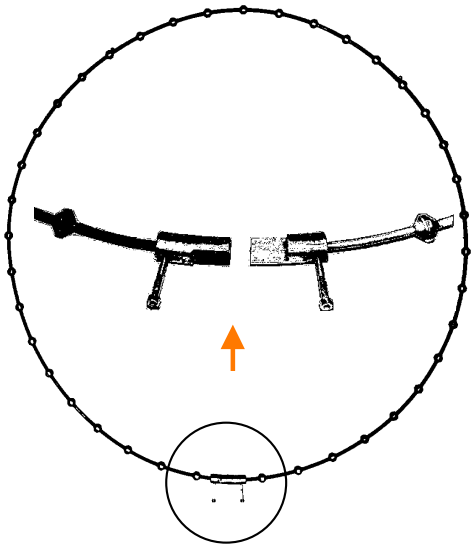
Allowed wheel radial- / lateral run-outs

Tolerances of the rim radial-/lateral run-out in agricultural and industrial use.

Nominal rim diameter	STRO radial / lateral		DIN 7823 radial / lateral	
	mm	32 nds in	mm	32 nds in
15″ - 20″	2.5 / 2.5	3.2 / 3.2	3.5 / 3.5	4.4 / 4.4
22″ - 28″	3.5 / 3.5	4.4 / 4.4	3.5 / 3.5	4.4 / 4.4
30″ - 38″	5.0 / 5.0	6.3 / 6.3	5.0 / 5.0	6.3 / 6.3

Mandrel gauge

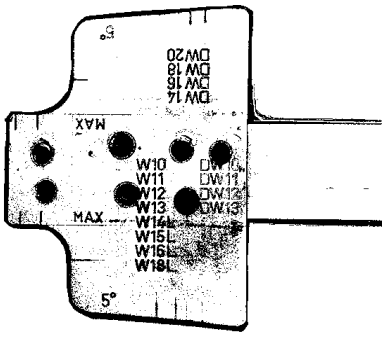
- Tolerance of the mandrel circumference is +/- 1.2 mm
- Even a small under-swing on circumference accelerates the wearing of the rim and leads to tyre rotation on the rim or bead chafing
- Crossing on circumference can cause a tyre damage already when fitting the tyre on to the rim



Mandrel gauge for rim circumference measurement

Contour gauge

- If the flange is worn out or bend it does not support the bead of the tyre and can cause bead chafing and ruin the tyre



Tubes and valves

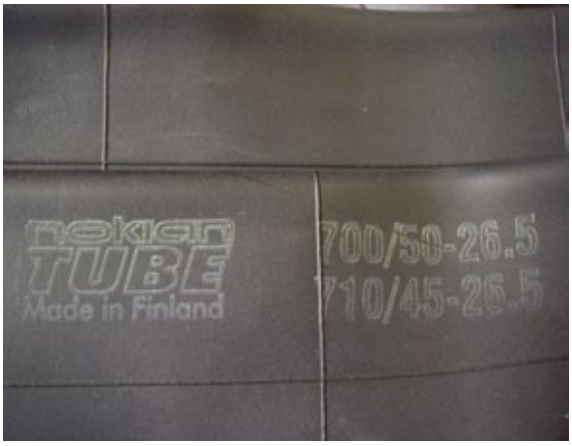
TUBES

Tube markings

Tube markings go hand in hand with tyre markings with one exception: a tube may be suitable for use with one ore more different tyre sizes. In such instances, the tube bears a so called combination size designation. Before installation, it is imperative to ensure the tube carries the same size designation as the tyre.

Examples of one tube fitting several tyre sizes

Tyre size	Valve	Tube marking (combination size)	Tube product code
18.00-25	TR 220A	18.00-25	T55872
20.5-25		20.5-25	
23.5-25		23.5-25	
25/65-25		25/65-25	
22/65-25	TR 220A	22/65-25	T55878
500/60-26.5	TR 218A	500/60-26.5	T55097
540/60R26.5		540/60R26.5	
480/65R28		480/65R28	
500/65R28		500/65R28	
600/55-26.5	TR 218A	600/55-26.5	T55098
700/50-26.5	TR 218A	700/50-26.5	T55099
710/45-26.5		710/45-26.5	



Size designation marking on tube

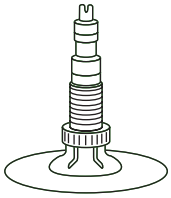
Tube mounting

With properly done mounting, the risk of premature tube failure can be virtually eliminated. A so called dual inflation and the use of talcum powder will help ensure that no air gets trapped between the tyre and the tube upon installation.

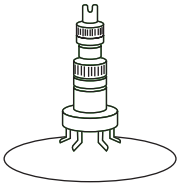
Use of improper or excessive lubricants can lead to rim slippage. This will cause the valve to tear off, which can cause damage to the entire tyre.

EXAMPLES OF VALVE TYPES

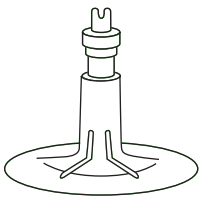
TR 1075 A / TRJ 1175



TR 220 A



TR 218 A



TR 15

Ground contact pressure comparison

GROUND PRESSURE COMPARISON BETWEEN DIFFERENT TYRE SIZES

Both the tyre diameter and width have an important role in determining the size of tyre contact area. In practice the tyre diameter increase has greater effect on machine mobility than the width increase. Due to the variation in operating ground the absolute ground pressure values can be difficult to assess. However the information in this table is useful when comparing the relative performance of different tyres.

Contact area and ground pressure at different tyre loads. Soft soil.

Size		600/50-22.5		710/40-22.5		710/40-24.5		500/60-26.5		600/55-26.5		650/60-26.5		650/65-26.5		710/45-26.5		750/55-26.5	
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
Diameter		1171	46.1	1171	46.1	1230	48.4	1273	50.1	1340	52.8	1485	58.5	1485	58.5	1340	52.8	1485	58.5
Width		601	23.7	710	28.0	710	28.0	503	19.8	601	23.7	650	25.6	650	25.6	710	28.0	750	29.5
Contact area *)		cm²	in²	cm²	in²	cm²	in²	cm²	in²	cm²	in²	cm²	in²	cm²	in²	cm²	in²	cm²	in²
		3520	545,565	4160	644,758	4370	677,306	3200	495,968	4030	624,610	4830	748,602	4830	748,602	4760	737,752	5570	863,294
Load		Ground pressure		Ground pressure		Ground pressure		Ground pressure		Ground pressure		Ground pressure		Ground pressure		Ground pressure		Ground pressure	
kg	lb	kg/cm²	lb/in²	kg/cm²	lb/in²	kg/cm²	lb/in²	kg/cm²	lb/in²	kg/cm²	lb/in²	kg/cm²	lb/in²	kg/cm²	lb/in²	kg/cm²	lb/in²	kg/cm²	lb/in²
500	1100	0.14	2.02	0.12	1.71	0.11	1.62	0.16	2.22	0.12	1.76	0.10	1.47	0.10	1.47	0.11	1.49	0.09	1.27
1000	2205	0.28	4.04	0.24	3.42	0.23	3.26	0.31	4.45	0.25	3.53	0.21	2.95	0.21	2.95	0.21	2.99	0.18	2.55
1500	3305	0.43	6.06	0.36	5.13	0.34	4.88	0.47	6.66	0.37	5.29	0.31	4.41	0.31	4.41	0.32	4.48	0.27	3.83
2000	4410	0.57	8.08	0.48	6.84	0.46	6.51	0.63	8.89	0.50	7.06	0.41	5.89	0.41	5.89	0.42	5.98	0.36	5.11
2500	5510	0.71	10.10	0.60	8.55	0.57	8.14	0.78	11.11	0.62	8.82	0.52	7.36	0.52	7.36	0.53	7.47	0.45	6.38
3000	6615	0.85	12.13	0.72	10.26	0.69	9.77	0.94	13.34	0.74	10.59	0.62	8.84	0.62	8.84	0.63	8.97	0.54	7.66
3500	7715	0.99	14.14	0.84	11.97	0.80	11.39	1.09	15.56	0.87	12.35	0.72	10.31	0.72	10.31	0.74	10.46	0.63	8.94
4000	8820	1.14	16.17	0.96	13.68	0.92	13.02	1.25	17.78	0.99	14.12	0.83	11.78	0.83	11.78	0.84	11.96	0.72	10.22
4500	9920	1.28	18.18	1.08	15.39	1.03	14.65			1.12	15.88	0.93	13.25	0.93	13.25	0.95	13.45	0.81	11.49
5000	11025	1.42	20.21			1.14	16.28			1.24	17.65	1.04	14.73	1.04	14.73	1.05	14.94	0.90	12.77
5500	12125	1.56	22.22			1.26	17.90			1.36	19.41	1.14	16.20	1.14	16.20	1.16	16.44	0.99	14.05
6000	13230					1.37	19.53			1.49	21.18	1.24	17.67	1.24	17.67	1.26	17.93	1.08	15.33
6500	14330									1.61	22.94	1.35	19.14	1.35	19.14			1.17	16.60
7000	15430											1.45	20.61	1.45	20.61			1.26	17.87
7500	16535											1.55	22.09	1.55	22.09			1.35	19.15
8000	17635											1.66	23.56	1.66	23.56			1.44	20.43
8500	18740													1.76	25.03				
9000	19840																		
9500	20945																		

*) Contact area calculated by using a formula by the Swedish Forestry Research Institute (Skogsarbeten).

Contact area and ground pressure at different tyre loads. Soft soil.

Size		780/55-26.5		800/40-26.5		600/65-34		700/55-34		700/70-34		23.1-26		28L-26		30.5L-32		620/75-26	
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
Diameter		1485	58.5	1340	52.8	1644	64.7	1485	58.5	1844	72.6	1632	64.3	1644	64.7	1857	73.1	1590	62.6
Width		780	30.7	800	31.5	600	23.6	700	27.6	700	27.6	587	23.1	714	28.1	775	30.5	625	24.6
Contact area *)		cm²	in²	cm²	in²	cm²	in²	cm²	in²	cm²	in²	cm²	in²	cm²	in²	cm²	in²	cm²	in²
		5790	897,392	5360	830,746	4930	764,101	5200	805,948	6450	999,686	4790	742,402	5870	909,791	7200	1115,93	4970	770,300
Load		Ground pressure		Ground pressure		Ground pressure		Ground pressure		Ground pressure		Ground pressure		Ground pressure		Ground pressure		Ground pressure	
kg	**lb**	kg/cm²	lb/in²	kg/cm²	lb/in²	kg/cm²	lb/in²	kg/cm²	lb/in²	kg/cm²	lb/in²	kg/cm²	lb/in²	kg/cm²	lb/in²	kg/cm²	lb/in²	kg/cm²	lb/in²
500	**1100**	0.09	1.23	0.09	1.32	0.10	1.44	0.10	1.36	0.08	1.10	0.14	2.02	0.12	1.71	0.11	1.62	0.16	2.22
1000	**2205**	0.17	2.46	0.19	2.65	0.20	2.89	0.19	2.74	0.16	2.21	0.28	4.04	0.24	3.42	0.23	3.26	0.31	4.45
1500	**3305**	0.26	3.68	0.28	3.98	0.30	4.33	0.29	4.10	0.23	3.31	0.43	6.06	0.36	5.13	0.34	4.88	0.47	6.66
2000	**4410**	0.35	4.91	0.37	5.31	0.41	5.77	0.38	5.47	0.31	4.41	0.57	8.08	0.48	6.84	0.46	6.51	0.63	8.89
2500	**5510**	0.43	6.14	0.47	6.63	0.51	7.21	0.48	6.84	0.39	5.51	0.71	10.10	0.60	8.55	0.57	8.14	0.78	11.11
3000	**6615**	0.52	7.37	0.56	7.96	0.61	8.66	0.58	8.21	0.47	6.62	0.85	12.13	0.72	10.26	0.69	9.77	0.94	13.34
3500	**7715**	0.60	8.60	0.65	9.29	0.71	10.10	0.67	9.57	0.54	7.72	0.99	14.14	0.84	11.97	0.80	11.39	1.09	15.56
4000	**8820**	0.69	9.83	0.75	10.62	0.81	11.54	0.77	10.94	0.62	8.82	1.14	16.17	0.96	13.68	0.92	13.02	1.25	17.78
4500	**9920**	0.78	11.05	0.84	11.94	0.91	12.98	0.87	12.31	0.70	9.92	1.28	18.18	1.08	15.39	1.03	14.65	1.41	20.00
5000	**11025**	0.86	12.29	0.93	13.27	1.01	14.43	0.96	13.68	0.78	11.03	1.42	20.21	1.20	17.10	1.14	16.28	1.56	22.23
5500	**12125**	0.95	13.51	1.03	14.60			1.06	15.04	0.85	12.13	1.56	22.22	1.32	18.81	1.26	17.90	1.72	24.45
6000	**13230**	1.04	14.74	1.12	15.93			1.15	16.42	0.93	13.23	1.70	24.25	1.44	20.52	1.37	19.53		
6500	**14330**	1.12	15.97	1.21	17.25					1.01	14.33					1.49	21.16		
7000	**15430**	1.21	17.19							1.09	15.43					1.60	22.78		
7500	**16535**	1.30	18.43													1.72	24.41		
8000	**17635**	1.38	19.65													1.83	26.04		
8500	**18740**	1.47	20.88																
9000	**19840**	1.55	22.11																
9500	**20945**	1.64	23.34																

*) Contact area calculated by using a formula by the Swedish Forestry Research Institute (Skogsarbeten).

Contact area and ground pressure at different tyre loads. Soft soil.

Size		500/70-28		540/70-30		600/70-38		650/75-38		16.9-28		16.9-30		16.9-34		18.4-34		18.4-38		20.8-38	
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
Diameter		1405	55.3	1515	59.6	1820	71.7	1965	77.4	1435	56.5	1485	58.5	1585	62.4	1650	65.0	1750	68.9	1840	72.4
Width		503	19.8	540	21.3	611	24.1	650	25.6	429	16.9	429	16.9	429	16.9	467	18.4	467	18.4	528	20.8
Contact area *)		cm²	in²	cm²	in²	cm²	in²	cm²	in²	cm²	in²	cm²	in²	cm²	in²	cm²	in²	cm²	in²	cm²	in²
		3530	547,115	4090	633,909	5560	861,744	6390	990,386	3080	477,369	3190	494,418	3400	526,966	3850	596,712	4090	633,909	4860	753,251
Load		Ground pressure		Ground pressure		Ground pressure		Ground pressure		Ground pressure		Ground pressure		Ground pressure		Ground pressure		Ground pressure		Ground pressure	
kg	**lb**	kg/cm²	lb/in²	kg/cm²	lb/in²	kg/cm²	lb/in²	kg/cm²	lb/in²	kg/cm²	lb/in²	kg/cm²	lb/in²	kg/cm²	lb/in²	kg/cm²	lb/in²	kg/cm²	lb/in²	kg/cm²	lb/in²
500	**1100**	0.12	1.76	0.10	1.47	0.10	1.47	0.11	1.49	0.09	1.27	0.09	1.23	0.09	1.32	0.10	1.44	0.10	1.36	0.08	1.10
1000	**2205**	0.25	3.53	0.21	2.95	0.21	2.95	0.21	2.99	0.18	2.55	0.17	2.46	0.19	2.65	0.20	2.89	0.19	2.74	0.16	2.21
1500	**3305**	0.37	5.29	0.31	4.41	0.31	4.41	0.32	4.48	0.27	3.83	0.26	3.68	0.28	3.98	0.30	4.33	0.29	4.10	0.23	3.31
2000	**4410**	0.50	7.06	0.41	5.89	0.41	5.89	0.42	5.98	0.36	5.11	0.35	4.91	0.37	5.31	0.41	5.77	0.38	5.47	0.31	4.41
2500	**5510**	0.62	8.82	0.52	7.36	0.52	7.36	0.53	7.47	0.45	6.38	0.43	6.14	0.47	6.63	0.51	7.21	0.48	6.84	0.39	5.51
3000	**6615**	0.74	10.59	0.62	8.84	0.62	8.84	0.63	8.97	0.54	7.66	0.52	7.37	0.56	7.96	0.61	8.66	0.58	8.21	0.47	6.62
3500	**7715**	0.87	12.35	0.72	10.31	0.72	10.31	0.74	10.46	0.63	8.94	0.60	8.60	0.65	9.29	0.71	10.10	0.67	9.57	0.54	7.72
4000	**8820**	0.99	14.12	0.83	11.78	0.83	11.78	0.84	11.96					0.75	10.62	0.81	11.54	0.77	10.94	0.62	8.82
4500	**9920**			0.93	13.25	0.93	13.25	0.95	13.45							0.91	12.98	0.87	12.31	0.70	9.92
5000	**11025**					1.04	14.73	1.05	14.94											0.78	11.03
5500	**12125**					1.14	16.20	1.16	16.44											0.85	12.13
6000	**13230**					1.24	17.67	1.26	17.93												
6500	**14330**					1.35	19.14	1.37	19.42												
7000	**15430**							1.47	20.91												
7500	**16535**																				
8000	**17635**																				
8500	**18740**																				
9000	**19840**																				
9500	**20945**																				

*) Contact area calculated by using a formula by the Swedish Forestry Research Institute (Skogsarbeten).

How to use load capacity tables?

Q: HOW TO FIND THE RIGHT INFLATION PRESSURE?

Tyre: 650/65R 26.5 174 D ELS
Load per tyre: 7000 kg / 15 432 lb
Max speed of vehicle: 40 km/h / 25 mph

Size: 650/65R26.5 174 D

Constant		0.8 bar 12 p.s.i.		1.2 bar 17 p.s.i.		1.6 bar 23 p.s.i.		2.0 bar 29 p.s.i.		2.4 bar 35 p.s.i.		2.8 bar 41 p.s.i.		3.2 bar 46 p.s.i.		3.6 bar 53 p.s.i.		4.0 bar 58 p.s.i.	
km/h	mph	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb
10	5	4260	9390	5400	11905	6400	14110	7200	15875	8350	18410	9300	20505	10100	22265	11100	24470	12100	26675
20	12,5	3900	8600	4960	10935	5860	12920	6600	14550	7650	16865	8500	18740	9250	20395	10150	22375	11100	24470
25	15	3740	8245	4740	10450	5620	12390	6350	14000	7350	16205	8150	17965	8850	19510	9750	21495	10600	23370
30	20	3580	7890	4540	10010	5380	11860	6050	13340	7000	15430	7800	17195	8500	18740	9300	20505	10150	22375
40	25	3220	7100	4080	8995	4840	10670	5440	11995	6300	13890	7050	15540	7650	16865	8400	18520	9150	20170
50	30	2860	6305	3640	8025	4300	9480	4840	10670	5600	12345	6250	13780	6800	14990	7450	16425	8150	17965
65	40	2360	5205	3000	6615	3550	7825	4000	8820	4625	10195	5150	11355	5600	12345	6150	13560	6700	14770

A: CORRECT INFLATION PRESSURE IS 2.8 BAR / 41 P.S.I.

Q: HOW TO FIND A MAXIMUM SPEED FOR THE APPLICATION (HIGHEST SPEED WITH THE CHOSEN TYRE)?

Tyre: 650/60 R 34 175 D
Load per tyre: 10 000 kg / 22 046 lb
Inflation pressure: 4,0 bar / 58 p.s.i. Use tyre maximum inflation pressure to gain the highest speed value

Size: 650/60R34 175 D

Constant		0.8 bar 12 p.s.i.		1.2 bar 17 p.s.i.		1.6 bar 23 p.s.i.		2.0 bar 29 p.s.i.		2.4 bar 35 p.s.i.		2.8 bar 41 p.s.i.		3.2 bar 46 p.s.i.		3.6 bar 53 p.s.i.		4.0 bar 58 p.s.i.	
km/h	mph	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb
10	5	4500	9920	5540	12215	6750	14880	7650	16865	8550	18850	9850	21715	10450	23040	11350	25020	12450	27445
20	12,5	4140	9125	5080	11200	6200	13670	7050	15540	7850	17305	9000	19840	9600	21165	10400	22930	11400	25130
25	15	3960	8730	4860	10715	5940	13095	6750	14880	7550	16645	8650	19070	9200	20280	10000	22045	10950	24140
30	20	3780	8335	4660	10275	5680	12520	6450	14220	7200	15875	8250	18190	8800	19400	9550	21055	10450	23040
40	25	3400	7495	4200	9260	5100	11245	5780	12745	6500	14330	7450	16425	7900	17415	8600	18960	9400	20725
50	30	3040	6700	3740	8245	4540	10010	5160	11375	5760	12700	6600	14550	7050	15540	7650	16865	8350	18410
65	40	2500	5510	3075	6780	3750	8265	4250	9370	4750	10470	5450	12015	5800	12785	6300	13890	6900	15210

A: MAXIMUM SPEED IS 30 KM/H / 20 MPH

Notice!
Exceeding maximum speed leads to tyre overheating resulting in premature break-up.

Q: FOR THE TYRE, WHAT ARE THE REQUIRED (MINIMUM) INFLATION PRESSURES WHEN:

1) DRIVING ON THE ROAD?
2) WORKING ON THE FIELD?

Tyre: 710/55R34 177 D
Load per tyre: 7000 kg / 15 432 lb

Size: 710/55R34 177 D

	Constant		0.8 bar 12 p.s.i.		1.2 bar 17 p.s.i.		1.6 bar 23 p.s.i.		2.0 bar 29 p.s.i.		2.4 bar 35 p.s.i.		2.8 bar 41 p.s.i.		3.2 bar 46 p.s.i.		3.6 bar 53 p.s.i.		4.0 bar 58 p.s.i.	
	km/h	mph	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb
Field	10	5	4780	10540	5860	12930	7200	15875	8100	17855	9300	20505	10450	23040	11100	24470	12100	26675	13150	28990
	20	12,5	4380	9655	5380	11860	6600	14550	7450	16425	8500	18740	9600	21165	10150	22375	11100	24470	12050	26565
	25	15	4200	9260	5140	11330	6350	14000	7150	15765	8150	17965	9200	20280	9750	21495	10600	23370	11550	25465
	30	20	4020	8860	4920	10845	6050	13340	6800	14990	7800	17195	8800	19400	9300	20505	10150	22375	11050	24360
	40	25	3620	7980	4420	9745	5440	11995	6150	13560	7050	15540	7900	17415	8400	18520	9150	20170	9950	21935
Road	50	30	3220	7100	3940	8685	4840	10670	5460	12035	6250	13780	7050	15540	7450	16425	8150	17965	8850	19510
	65	40	2650	5840	3250	7165	4000	8820	4500	9920	5150	11355	5800	12785	6150	13560	6700	14770	7300	16095

A: 1) VEHICLE KEEPS MAXIMUM SPEED IN 50 KM/H / 30 MPH. WITH THIS LOAD THE MINIMUM INFLATION PRESSURE IS 2.8 BAR/41 P.S.I.

2) MAXIMUM SPEED IN FIELD APPLICATIONS IS 10 KM/H / 5 MPH. WITH THIS LOAD THE MINIMUM INFLATION PRESSURE IS 1.6 BAR / 23 P.S.I.

Limited warranty

The below terms of this limited warranty apply to defects in the materials and workmanship of tyres (here in after "Tyres") manufactured and/or sold by Nokian Tyres plc (hereinafter "Nokian") with the exclusion of retreaded tyres. The limited warranty is valid for three (3) years from the date of purchase or five (5) years from the manufacture of a Tyre. If the manufacturer discovers a defect in the materials or workmanship of a Tyre, it will be replaced on the following conditions.

Nokian's limited warranty shall not apply, and Nokian shall not be held liable under it, if a defect to a Tyre is a result of the following:
(a) normal wear and tear
(b) misuse
(c) use in motor racing or other exceptional use
(d) faulty mounting on rim
(e) faulty storage by a party other than Nokian
(f) faulty studding after delivery
(g) alteration or repair by anyone other than Nokian or a third party approved by Nokian
(h) damage resulting from accident or negligence of anyone other than Nokian
(i) faulty or incomplete product advice or instructions given to the customer not confirmed or approved by Nokian
(j) damage from accessories, like tracks and chains.

Inferior quality – indicated by the "DA" brand put on a Tyre during quality grading – which reduces the selling price to the customer, will not be adjusted for external cosmetic reasons.

What was stated above concerning Nokian's limited warranty applies only in cases where the tread depth of a Tyre meets the requirements of the vehicular laws of the country where the Tyre was sold. Should a Tyre's tread depth be less than the country-specific requirements, Nokian's limited warranty is not valid and Nokian cannot be held liable under it, even if the abovementioned time periods have not expired.

Nokian's limited warranty is valid only if the customer notifies Nokian or its authorized dealer (a list of dealers must be available to customers) in writing of the alleged defect within 14 days of the date the customer discovers it, or reasonably should have discovered it.

The customer must return the allegedly defective Tyre to Nokian or its authorized dealer without delay.

Should Nokian find the Tyre defective and the limited warranty applies to it, or Nokian is liable on other grounds, Nokian's liability shall be limited to the delivery of a new Tyre to the customer. In that case the customer shall pay Nokian the difference between the price of a new Tyre and the unrealized benefit from the use of the returned Tyre (realizable had the returned Tyre not been defective). The unrealized benefit from use is calculated on the basis of the Tyre's remaining tread depth.

Nokian's liability shall extend to mounting/dismounting and other costs only to the extent mandated by the consumer protection laws of the country where the Tyre has been sold. Nokian's liability shall also extend to studding, provided that the studding of the returned Tyre complies with the laws and regulations of the country where it was sold. In case the studding has been done by a third party, Nokian is liable only if that party is approved by Nokian and has done the studding in a manner approved by Nokian and according to Nokian's instructions. Studs are not covered by this limited warranty for Tyres.

In case of an integrated product, the warranties given by the producers of component products shall apply to defects in the materials and workmanship of their component products. Nokian shall not be liable for any failure to perform any of its obligations under this warranty due to problems beyond its reasonable control (force majeure events or effects). Such events or effects include: war, rioting, fire, industrial action, governmental acts, natural catastrophes, discontinuation of public or private transportation and energy and raw material shortages. In case of any of the mentioned events or effects, Nokian is unconditionally exempt from liability under the conditions set herein until the force majeure event or effect terminates. Nokian's liability shall be limited to the above and only to the extent mentioned herein. Under no circumstances shall Nokian be liable for indirect, incidental or consequential damages, loss of business income or other revenues, other economic losses, or damages due to not being able to use a Tyre – whatever kind they may be.