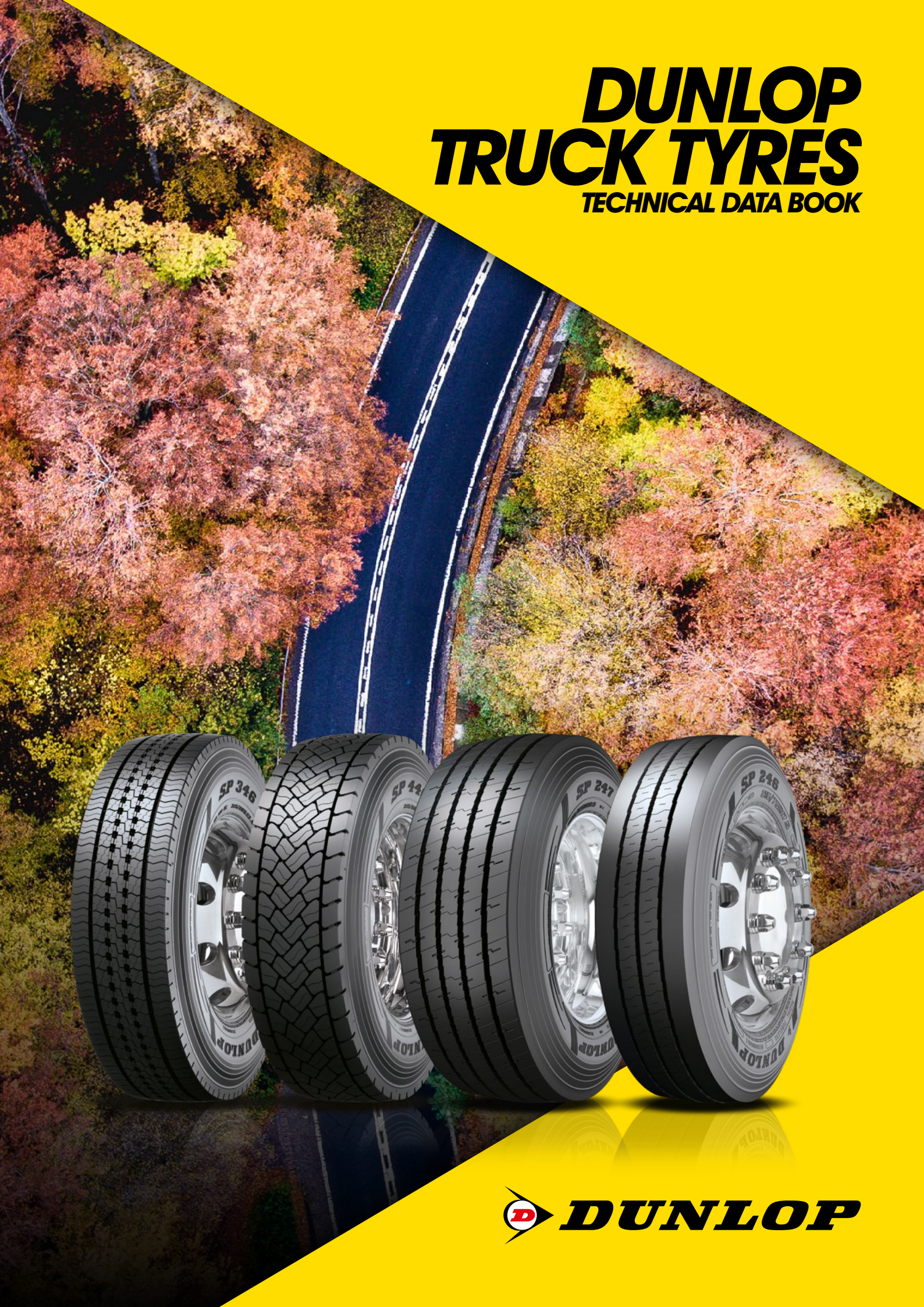
DUNLOP TRUCK TYRES

TECHNICAL DATA BOOK



DUNLOP

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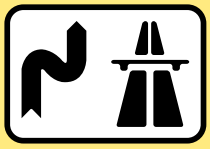
TRUCK TYRE RANGE AND APPLICATION MAP



ON ROAD

STEER

SP346+22.5″

SP346 22.5″

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SP446 17.5″& 19.5″

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URBAN

SP372 City 22.5″

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SP472* City 22.5″

MIXED SERVICE

SP382 22.5″
5 rib

SP382 22.5″
4 rib

SP482 22.5″

SP282 22.5″

SP281

ON ROAD TYRE RANGE

LEGEND

M+S	M+S (Mud and Snow) indicates that a tyre has better snow traction than a regular tyre (see details on page 50)
	3PMSF (Three Peak Mountain Snowflake) indicates that a tyre has passed a minimum performance threshold requirement on snow (see details on page 50)
TreadMax	TreadMax retreads are produced exclusively in-house and utilise the same casing, tread pattern and materials as new tyres - resulting in a similar to new tyre performance (see details on page 38)
FRT	FRT (Free Rolling Tyre) indicates that the tyre should only be fitted to free rolling axles, such as trailer applications (see details on page 50)

TYRE RANGE

DUNLOP

ON ROAD TYRE RANGE

Steer axle tyres

SP346+ 22.5″

LATEST GENERATION STEER TYRE FOR ALL ON ROAD APPLICATIONS.

The SP346+ combines robust design with very good mileage plus 3PMSF marking on all sizes.

It is designed for high functional versatility in a wide range of services. A high number of zig-zag sipes reduces slip and offers high traction and winter mobility. Stiffeners in the shoulder grooves reduce tread wear and result in improved robustness and damage resistance for high mileage potential.

SP346+ 22.5″ - SIZE LINE UP AND TYRE LABEL RESULTS

SIZE	LOAD INDEX	SPEED SYMBOL	COMMENTS				3PMSF	ICE GRIP	M+S
315/70R22.5	156/150	L	HIGH LOAD	C	B	B 74			M+S
315/60R22.5	154/148	L	HIGH LOAD	*	*	*			M+S

**Under development.*

SP346 22.5″

LATEST GENERATION STEER TYRE FOR ALL ON ROAD APPLICATIONS.

Thanks to the latest technology materials, a stiffer design and deeper sipe profile, the SP346 tyre features an improved mileage combined with excellent winter performance resulting in a decreased operational cost.

The SP346 tyre carries both the M+S and 3 Peak Mountain Snow Flake symbol providing winter mobility, rolling resistance and reduced external noise.

SP346 22.5″ - SIZE LINE UP AND TYRE LABEL RESULTS

SIZE	LOAD INDEX	SPEED SYMBOL	COMMENTS				3PMSF	ICE GRIP	M+S
295/80 R 22.5	154/149	M	HIGH LOAD	C	B	A 71			M+S
315/80 R 22.5	156/150 (154/150)	L (M)		C	B	B 73			M+S
385/65 R 22.5	160 (158)	K (L)		B	B	B 73			M+S
295/60 R 22.5	150/147 (149/146)	K (L)		C	C	B 72			M+S
385/55 R 22.5	160 (158)	K (L)		B	B	A 70			M+S

ON ROAD TYRE RANGE

Steer axle tyres

SP346 17.5″ & 19.5″

LATEST GENERATION 17.5″ AND 19.5″ STEER AXLE TYRE FOR ALL ON ROAD APPLICATIONS.

The new SP346 has been specifically designed for high mileage, strong steering capabilities and extended durability.

It offers high levels of robustness, versatility and performance in all weather conditions to help reduce operating costs. It features the 3PMSF / 3 peak mountain snowflake marking on all sizes.

SP346 17.5″ & 19.5″ – SIZE LINE UP AND TYRE LABEL RESULTS

SIZE	LOAD INDEX	SPEED SYMBOL	COMMENTS				3PMSF	ICE GRIP	M+S
205/75 R 17.5	124/122 (126/124)	M (G)		E	C	A 71			M+S
215/75 R 17.5	126/124	M		E	C	A 71			M+S
225/75 R 17.5	129/127	M		E	C	A 71			M+S
235/75 R 17.5	132/130	M		E	B	A 71			M+S
245/70 R 17.5	136/134	M		D	B	B 72			M+S
265/70 R 17.5	139/136	M		C	B	B 73			M+S
245/70 R 19.5	136/134	M		D	B	B 72			M+S
265/70 R 19.5	140/138	M		D	B	A 71			M+S
285/70 R 19.5	146/144 (144/142)	L (M)		D	C	A 71			M+S
305/70 R 19.5	148/145	M		C	C	B 72			M+S

SP344 22.5″

STEER TYRE FOR ON ROAD APPLICATIONS.

The "on road transport" steer axle SP344 tyres in 22.5″ sizes have been specifically developed for a multitude of applications, from delivery service, short and regional haul distribution operations to long haul transport.

The combination of specific technology materials, dedicated tread pattern features and a robust carcass result in excellent mileage performance and even wear type combined to good handling and braking on wet surfaces.

SP344 22.5″ - SIZE LINE UP AND TYRE LABEL RESULTS

SIZE	LOAD INDEX	SPEED SYMBOL	COMMENTS				3PMSF	ICE GRIP	M+S
315/60R22.5	152/148	L		C	B	B 72			M+S

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ON ROAD TYRE RANGE

Drive axle tyres

SP446 22.5″

LATEST GENERATION DRIVE TYRE FOR ALL ON ROAD APPLICATIONS.

The new SP446 tyre is designed to deliver improved mileage and outstanding traction in both summer and winter conditions.

It features an optimised tread shape and special bi-compound, giving improved mileage and better fuel efficiency. The SP446 tyre also has a directional tread design, which offers enhanced traction and low noise emission.

SP446 22.5″ - SIZE LINE UP AND TYRE LABEL RESULTS

SIZE	LOAD INDEX	SPEED SYMBOL	COMMENTS				3PMSF	ICE GRIP	M+S
295/80 R 22.5	152/148	M		D	C	A 72			M+S
315/80 R 22.5	156/150 (154/150)	L (M)		C	C	A 72			M+S
315/70 R 22.5	154/150 (152/148)	L (M)		C	C	A 71			M+S
295/60 R 22.5	150/147 (149/146)	K (L)		C	C	A 72			M+S
315/60 R 22.5	152/148	L		C	B	A 71			M+S

SP446 17.5″ & 19.5″

LATEST GENERATION 17.5″ AND 19.5″ DRIVE AXLE TYRE FOR ALL ON ROAD APPLICATIONS.

The new SP446 has been specifically designed for high mileage, strong traction performance and extended durability.

It offers high levels of robustness, versatility and performance in all weather conditions to help reduce operating costs. It features the 3PMSF / 3 peak mountain snowflake marking on all sizes.

SP446 17.5″ & 19.5″ – SIZE LINE UP AND TYRE LABEL RESULTS

SIZE	LOAD INDEX	SPEED SYMBOL	COMMENTS				3PMSF	ICE GRIP	M+S
205/75 R 17.5	124/122 (126/124)	M (G)		D	C	A 71			M+S
215/75 R 17.5	126/124	M		E	C	A 72			M+S
225/75 R 17.5	129/127	M		D	C	A 71			M+S
235/75 R 17.5	132/130	M		D	C	A 72			M+S
245/70 R 17.5	136/134	M		D	C	A 72			M+S
265/70 R 17.5	139/136	M		D	B	A 71			M+S
245/70 R 19.5	136/134	M		D	C	A 72			M+S
265/70 R 19.5	140/138	M		D	B	A 72			M+S
285/70 R 19.5	146/144 (144/142)	L (M)		D	C	A 72			M+S
305/70 R 19.5	148/145	M		C	C	A 72			M+S

ON ROAD TYRE RANGE

Trailer axle tyres

SP247

FRT

LATEST GENERATION TRAILER TYRE FOR ALL ON ROAD APPLICATIONS.

The new trailer tyre SP247 has been specifically designed to offer 3PMSF marking and extended all-weather capabilities without compromising on other performance criteria.

The SP247 features latest tread design technology in combination with robust casing constructions to help keeping up the high mileage and high durability and further reduce operating costs.

SP247 – SIZE LINE UP AND TYRE LABEL RESULTS

SIZE	LOAD INDEX	SPEED SYMBOL	COMMENTS				3PMSF	ICE GRIP	M+S
435/50 R 19.5	160	J		B	B	B 72			M+S
385/65 R 22.5	164 (158)	K (L)	HIGH LOAD	C	B	B 72			M+S
385/55 R 22.5	160 (158)	K (L)		B	B	A 71			M+S

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ON ROAD TYRE RANGE

Trailer axle tyres

SP241 19.5″

TRAILER TYRE FOR REGIONAL AND LONG HAUL APPLICATIONS.

Five straight ribs provide low noise level, high mileage potential and even wear pattern.

The casing and tread profile guarantee even ground pressure distribution and constant characteristics throughout the complete tyre life. Special heavy duty bead construction and tread compound to withstand high loads and stresses.

SP241 19.5″ - SIZE LINE UP AND TYRE LABEL RESULTS

SIZE	LOAD INDEX	SPEED SYMBOL	COMMENTS				3PMSF	ICE GRIP	M+S
425/55 R 19.5	160	J		C	C	B 71			M+S

ON ROAD TYRE RANGE

Trailer axle tyres

SP246 17.5″ & 19.5″

FRT

ROBUST CONSTRUCTION FOR LOW PLATFORM TRAILERS.

The latest SP 246 17,5″ and 19.5″ design is a robust tyre specifically for low platform trailers. Thanks to its sturdy construction and newly designed bead geometry the SP 246 offers excellent mileage and all season mobility (confirmed by M+S and Three Peak Mountain Snow Flake marking).

SP246 17.5″ & 19.5″ – SIZE LINE UP AND TYRE LABEL RESULTS

SIZE	LOAD INDEX	SPEED SYMBOL	COMMENTS				3PMSF	ICE GRIP	M+S
215/75 R 17.5	136/134	J		C	B	A 66			M+S
235/75 R 17.5	143/141 (144/144)	J (F)		C	B	A 69			M+S
245/70 R 17.5	143/141 (146/146)	J (F)		C	B	A 68			M+S
245/70 R 19.5	141/140	J		C	B	A 70			M+S
265/70 R 19.5	143/141	J		C	B	A 70			M+S
285/70 R 19.5	150/148	J		C	B	A 70			M+S

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WINTER TYRE RANGE

LEGEND

M+S	M+S (Mud and Snow) indicates that a tyre has better snow traction than a regular tyre (see details on page 50)
	3PMSF (Three Peak Mountain Snowflake) indicates that a tyre has passed a minimum performance threshold requirement on snow (see details on page 50)
TreadMax	TreadMax retreads are produced exclusively in-house and utilise the same casing, tread pattern and materials as new tyres - resulting in a similar to new tyre performance (see details on page 38)
FRT	FRT (Free Rolling Tyre) indicates that the tyre should only be fitted to free rolling axles, such as trailer applications (see details on page 50)

DUNLOP

WINTER TYRE RANGE

Steer axle tyres

SP362 22.5″

STEER AXLE TYRES FOR WINTER APPLICATIONS.

Centreline blocks combined with solid shoulders provide excellent winter traction and grip on snowy, icy roads. In addition, the bladed tread pattern provides outstanding braking performance on wet surfaces.

Excellent steering and handling capabilities allow usage as an all position tyre on coaches.

SP362 22.5″ - SIZE LINE UP AND TYRE LABEL RESULTS

SIZE	LOAD INDEX	SPEED SYMBOL	COMMENTS				3PMSF	ICE GRIP	M+S
295/80 R 22.5	152/148	L		D	B	B 72			M+S
315/80 R 22.5	156/150 (154/150)	K (L)		C	B	B 73			M+S
315/70 R 22.5	154/150 (152/148)	K (L)		C	B	B 72			M+S
385/65 R 22.5	160 (158)	K (L)		C	B	B 73			M+S

WINTER TYRE RANGE

Drive axle tyres

SP462 22.5″

DRIVE AXLE TYRE DESIGNED FOR WINTER APPLICATIONS.

The SP462 winter traction drive tyre is specifically designed to cope with severe winter conditions. It provides excellent traction on snowy and icy roads.

The dedicated block tread design, using latest technology blading and tread compounds combines excellent winter traction performances with high mileage and even wear. Combined with the 'state of the art' robust carcass construction, the SP462 provides all features required for today's truck's winter operations.

SP462 22.5″ - SIZE LINE UP AND TYRE LABEL RESULTS

SIZE	LOAD INDEX	SPEED SYMBOL	COMMENTS				3PMSF	ICE GRIP	M+S
295/80 R 22.5	152/148	L		E	C	B 74			M+S
315/80 R 22.5	156/150 (154/150)	L (M)		D	B	B 75			M+S
315/70 R 22.5	154/150 (152/148)	K (L)		D	C	B 74			M+S

DUNLOP

URBAN TYRE RANGE

LEGEND

M+S	M+S (Mud and Snow) indicates that a tyre has better snow traction than a regular tyre (see details on page 50)
	3PMSF (Three Peak Mountain Snowflake) indicates that a tyre has passed a minimum performance threshold requirement on snow (see details on page 50)
TreadMax	TreadMax retreads are produced exclusively in-house and utilise the same casing, tread pattern and materials as new tyres - resulting in a similar to new tyre performance (see details on page 38)
FRT	FRT (Free Rolling Tyre) indicates that the tyre should only be fitted to free rolling axles, such as trailer applications (see details on page 50)


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URBAN TYRE RANGE

Steer axle tyres

SP372 City 22.5″

SP372* CITY / SP372 CITY

HIGH LOAD

STEER AND ALL POSITION AXLE TYRE FOR URBAN BUSES.

The Dunlop SP372 City tyre, developed to cope with the multiple requirements of today's urban transport operations.

The tyre has been developed for use on steer axle and all position usage. The robust and wide 5-rib tread pattern results in high mileage performance, the frequent blading provides excellent braking and traction on wet and snowy roads.

The SP372 City tyres are designed for all season use and consequently are M+S marked. Reinforced sidewalls mean enhanced kerb scuffing resistance. The use of a dedicated, abrasion resistant tread compound in combination with the dedicated tread pattern results in high mileage performance, even wear type and low noise generation.

SP372 CITY 22.5″ - SIZE LINE UP AND TYRE LABEL RESULTS

SIZE	LOAD INDEX	SPEED SYMBOL	COMMENTS				3PMSF	ICE GRIP	M+S
275/70 R 22.5	148/145 (152/148)	J (E)		E	C	A 71			M+S
275/70 R 22.5	150/145 (152/148)	J (E)	HIGH LOAD	D	C	A 71			M+S
275/70 R 22.5	148/145 (152/148)	J (E)	SP 372* CITY	D	C	A 70			M+S
315/60 R 22.5	152/148	J		D	C	A 71			M+S

URBAN TYRE RANGE

Drive axle tyres

SP472* City All Season

DRIVE AXLE ALL SEASON TYRE FOR URBAN BUSES.

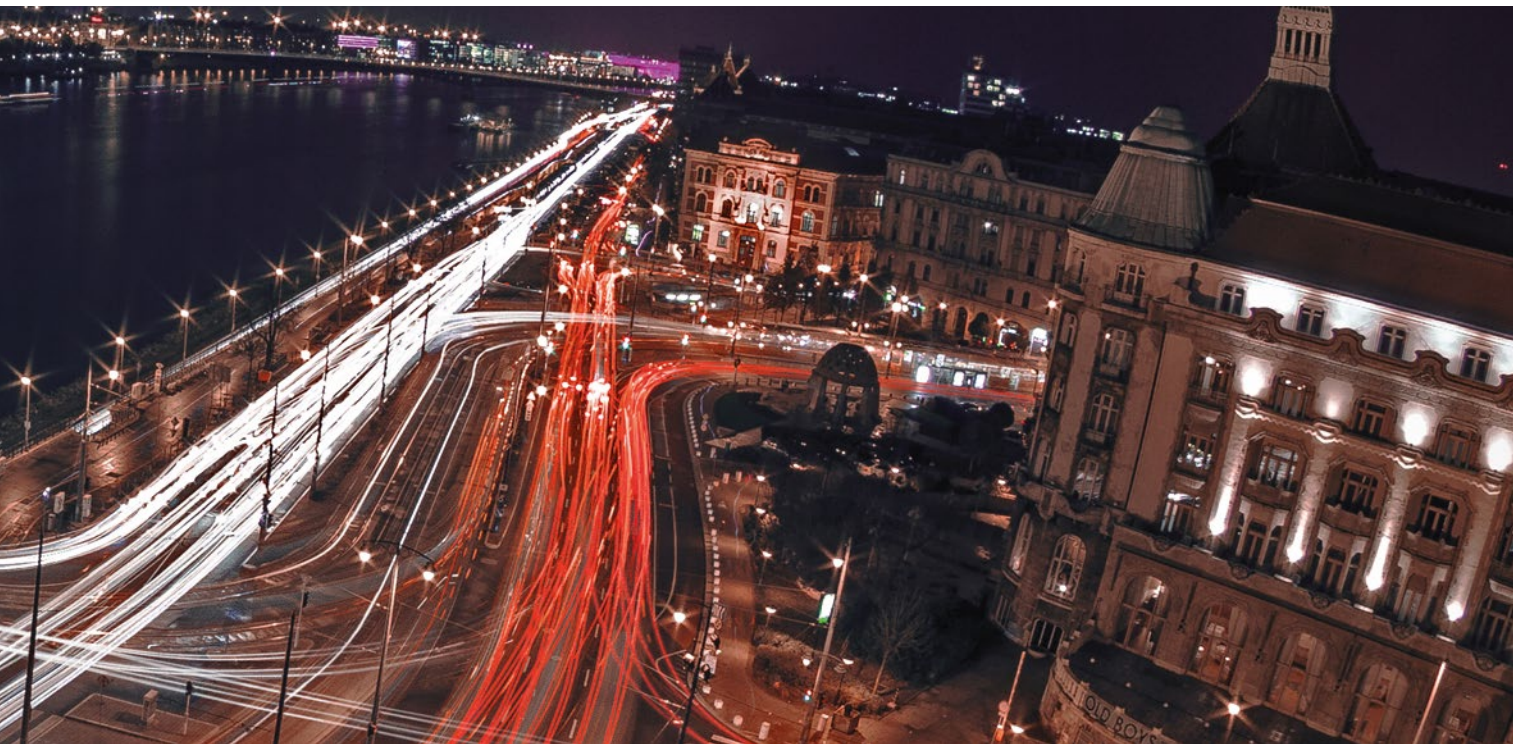
The latest Dunlop SP472* City All Season tyre, developed to cope with the multiple requirements of today's urban transport operations.

The tyre has been developed for drive axle use in operations where excellent traction is required. The robust, bladed tread pattern has been specifically developed to provide superb traction and braking on wet and snow covered roads, combined with high mileage, even wear and low noise.

The SP472* City tyres are designed for all season use and consequently are M+S marked. Reinforced sidewalls mean enhanced kerb scuffing resistance.

SP472* CITY ALL SEASON - SIZE LINE UP AND TYRE LABEL RESULTS

SIZE	LOAD INDEX	SPEED SYMBOL	COMMENTS				3PMSF	ICE GRIP	M+S
275/70 R 22.5	148/145 (152/148)	J (E)		E	B	A 71			M+S



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MIXED SERVICE TYRE RANGE

LEGEND

M+S	M+S (Mud and Snow) indicates that a tyre has better snow traction than a regular tyre (see details on page 50)
	3PMSF (Three Peak Mountain Snowflake) indicates that a tyre has passed a minimum performance threshold requirement on snow (see details on page 50)
TreadMax	TreadMax retreads are produced exclusively in-house and utilise the same casing, tread pattern and materials as new tyres - resulting in a similar to new tyre performance (see details on page 38)
FRT	FRT (Free Rolling Tyre) indicates that the tyre should only be fitted to free rolling axles, such as trailer applications (see details on page 50)


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MIXED SERVICE TYRE RANGE

Steer axle tyres

SP382 22.5″

SP382 22.5
5-RIB VERSION

SP382 22.5
4-RIB VERSION

THE SP382 MIXED SERVICE STEER TYRE IS SPECIFICALLY DESIGNED TO SUIT TODAY'S 'MIXED SERVICE' FLEET OPERATORS.

It provides excellent mileage while featuring an excellent damage resistant construction and pattern. Traction on wet and unpaved roads as well as a robust tread design are the main features of the SP382.

Two design versions are available, the 4-rib version for standard aspect ratio sizes and the 5-rib version for low aspect ratio sizes. Developed using the latest technologies in view of compounds and carcass geometry, the SP382 also provides a superb durability and consequently retreadability.

SP382 22.5″ - SIZE LINE UP AND TYRE LABEL RESULTS

SIZE	LOAD INDEX	SPEED SYMBOL	COMMENTS				3PMSF	ICE GRIP	M+S
13 R 22.5	156/150 (154/150	G (K)	4-RIB VERSION	D	B	A 68			M+S
315/80 R 22.5	156/150	K	5-RIB VERSION	D	B	A 69			M+S
385/65 R 22.5	160 (158)	K (L)	5-RIB VERSION	C	B	A 70			M+S

Drive axle tyres

SP482 22.5″

SPECIALIST DRIVE AXLE TYRE FOR USE IN ON/OFF ROAD APPLICATIONS AND CONSTRUCTION.

The SP482 features latest technology compounds and materials in view of providing best mileage combined with excellent damage resistance and traction properties to mixed service fleet operators.

The deep radial shoulder grooves combined with the centreline rib allow for excellent traction characteristics and handling.

The specific groove geometry is designed to reduce stone holding and to provide good self-cleaning properties.

SP482 22.5″ - SIZE LINE UP AND TYRE LABEL RESULTS

SIZE	LOAD INDEX	SPEED SYMBOL	COMMENTS				3PMSF	ICE GRIP	M+S
13 R 22.5	156/150 (154/150)	G (K)		D	B	B 76			M+S
315/80 R 22.5	156/150	K		D	B	B 76			M+S

MIXED SERVICE TYRE RANGE

Trailer axle tyres

SP282 22.5″

FRT

TRAILER TYRE FOR HEAVY DUTY ON/OFF ROAD APPLICATIONS.

The SP282 mixed service trailer tyre is specifically developed to cope with the demanding requirements of today's truck operations.

Its robust and damage resistant design, combined with the special wear resistant tread compound, the stone penetration protectors and the deep tread pattern result in excellent performance of the tyre in mixed service operations.

SP282 22.5″ - SIZE LINE UP AND TYRE LABEL RESULTS

SIZE	LOAD INDEX	SPEED SYMBOL	COMMENTS				3PMSF	ICE GRIP	M+S
385/65 R 22.5	160 (158)	J (K)		C	B	B 72			M+S
385/65 R 22.5	160 (158)	J (K)		*	*	*			M+S

**Under development.*

SP281

FRT

TRAILER TYRE FOR HEAVY DUTY ON/OFF-ROAD APPLICATIONS.

Deep pattern with four robust ribs and tie bars gives exceptionally high mileage.

V-shaped grooves to avoid stone trapping. The tough and cut resistant tread compound with high land-sea ratio minimises damage in on/off-road operations and provides maximum wear potential.

SP281 - SIZE LINE UP AND TYRE LABEL RESULTS

SIZE	LOAD INDEX	SPEED SYMBOL	COMMENTS				3PMSF	ICE GRIP	M+S
425/65 R 22.5	165	K		C	C	B 71			M+S

DUNLOP

TECHNICAL DATA

TECHNICAL DATA

DUNLOP

TYRE TECHNICAL DATA

Tyre dimensions and inflation pressure table

SIZE	DUNLOP DESIGN	LOAD/SPEED INDEX 1	LOAD/SPEED INDEX 2	ADDITIONAL MARKINGS/ COMMENTS			TYRE DIMENSIONS**				RIM DATA		
				M+S			OVERALL DIAMETER (MM) (+/- 1.5%)	OVERALL SEC. WIDTH (MM) (+/- 1.5%)	STATIC LOADED RADIUS (MM)	ROLLING CIRCUMF. (MM)	RECOMM. RIM WIDTH (INCH)	PERMITTED RIMS (INCH)	MIN. DUAL SPACING (MM)
TRUCK & BUS TYRES													
17.5"													
205/75 R 17.5	ETRTO	124/122					753	204	353	2297	6.00	5.25-6.75	231
	SP 346	124/122 M	126/124 G	M+S			758	211	354	2314	6.00	5.25-6.75	231
	SP 446	124/122 M	126/124 G	M+S			760	210	355	2320	6.00	5.25-6.75	231
215/75 R 17.5	ETRTO	126/124					767	212	359	2339	6.00	6.00-6.75	239
	SP 346	126/124 M		M+S			777	217	360	2372	6.00	6.00-6.75	239
	SP 446	126/124 M		M+S			778	217	361	2375	6.00	6.00-6.75	239
225/75 R 17.5	ETRTO	129/127					783	226	366	2388	6.75	6.00 -6.75	254
	SP 346	129/127 M		M+S			788	233	365	2405	6.75	6.00 -6.75	254
	SP 446	129/127 M		M+S			790	233	366	2411	6.75	6.00 -6.75	254
235/75 R 17.5	ETRTO	132/130					797	233	372	2431	6.75	6.75-7.50	262
	SP 346	132/130 M		M+S			806	239	374	2460	6.75	6.75-7.50	262
	SP 446	132/130 M		M+S			808	239	375	2466	6.75	6.75-7.50	262
245/70 R 17.5	ETRTO	136/134					789	248	364	2406	7.50	6.75-7.50	279
	SP 346	136/134 M		M+S			792	257	368	2418	7.50	6.75-7.50	279
	SP 446	136/134 M		M+S			793	258	368	2421	7.50	6.75-7.50	279
265/70 R 17.5	ETRTO	139/136					817	262	376	2492	7.50	6.75/8.25	295
	SP 346	139/136 M		M+S			819	265	379	2500	7.50	6.75/8.25	295
	SP 446	139/136 M		M+S			822	265	380	2509	7.50	6.75/8.25	295
19.5"													
245/70 R 19.5	ETRTO	136/134					839	248	389	2559	6.75	6.75-7.50	270
	SP 346	136/134 M		M+S			848	246	393	2589	6.75	6.75-7.50	270
	SP 446	136/134 M		M+S			851	246	394	2598	6.75	6.75-7.50	270
265/70 R 19.5	ETRTO	140/138					867	262	401	2644	7.50	6.75-8.25	295
	SP 346	140/138 M		M+S			867	260	402	2647	6.75	6.75-7.50	286
	SP 446	140/138 M		M+S			870	260	403	2656	6.75	6.75-7.50	286
285/70 R 19.5	ETRTO	146/144					895	283	413	2730	8.25	7.50-9.00	318
	SP 346	146/144 L	144/142 M	M+S			895	291	412	2732	8.25	7.50-9.00	318
	SP 446	146/144 L	144/142 M	M+S			901	291	415	2750	8.25	7.50-9.00	318
305/70 R 19.5	ETRTO	148/145					923	305	424	2815	9.00	8.25-9.00	343
	SP 346	148/145 M		M+S			927	290	428	2830	9.00	8.25-9.00	343
	SP 446	148/145 M		M+S			931	290	430	2842	9.00	8.25-9.00	343
20"													
8.25 R 20	ETRTO	136/134					962	230	447	2934	6.50	5.50-7.00	265
	SP 160	136/134 L					980	239	447	2930	6.50	5.50-7.00	265
9.00 R 20	ETRTO	140/137					1018	258	471	3105	7.00	6.00-7.50	297
	SP 160	140/137 L		M+S			1038	268	471	3100	7.00	6.00-7.50	297

* For any tyre design not listed or under development please use the ETRTO data instead. ETRTO: European Tyre and Rim Technical Organisation

** Measured tyre dimension using the Dunlop recommended rim.

MAX LOAD			LOAD VARIATION																
					MAX. LOAD CAPACITY PER AXLE (KG) AT INFLATION PRESSURE (BAR)														
MAX. INFLATION PRESSURE (BAR)	MAX. SINGLE AXLE LOAD (KG)	MAX. DUAL AXLE LOAD (KG)	LOAD INDEX	SINGLE/ DUAL FITMENT	5.0 BAR	5.5 BAR	6.0 BAR	6.25 BAR	6.5 BAR	6.75 BAR	7 BAR	7.25 BAR	7.5 BAR	7.75 BAR	8 BAR	8.25 BAR	8.5 BAR	8.75 BAR	9 BAR
7,50	3200	6000	124	S	2310	2500	2680	2770	2850	2950	3030	3110	3200						
7,50	3200	6000	134	D	4340	4680	5020	5190	5350	5520	5680	5840	6000						
210	355	2320																	
7.00	3400	6400	126	S	2600	2800	3000	3110	3200	3300	3400								
7.00	3400	6400	124	D	4890	5280	5650	5850	6030	6220	6400								
7.00	3400	6400																	
7,25	3700	7000	129	S	2750	2970	3180	3290	3390	3500	3600	3700							
7,25	3700	7000	127	D	5200	5610	6020	6220	6410	6610	6810	7000							
7,25	3700	7000																	
7,75	4000	7600	132	S	2820	3040	3260	3370	3470	3580	3690	3790	3900	4000					
7,75	4000	7600	130	D	5350	5780	6190	6400	6600	6810	7010	7210	7400	7600					
7,75	4000	7600																	
8,50	4480	8480	136	S	2930	3160	3390	3500	3610	3730	3840	3940	4050	4160	4270	4370	4480		
8,50	4480	8480	134	D	5550	5990	6420	6630	6840	7050	7260	7470	7670	7880	8080	8280	8480		
8,50	4480	8480																	
8,00	4860	8960	139	S	3340	3600	3860	3990	4120	4240	4370	4490	4620	4740	4860				
8,00	4860	8960	136	D	6150	6640	7120	7360	7590	7820	8050	8280	8510	8740	8960				
8,00	4860	8960																	
8,25	4480	8480	136	S	3000	3240	3470	3590	3700	3820	3930	4040	4150	4260	4370	4480			
8,25	4480	8480	134	D	5680	6130	6570	6790	7010	7220	7440	7650	7860	8070	8270	8480			
8,25	4480	8480																	
7,75	5000	9440	140	S	3520	3800	4070	4210	4340	4480	4610	4740	4870	5000					
7,75	5000	9440	138	D	6650	7170	7690	7950	8200	8450	8700	8950	9200	9440					
7,75	5000	9440																	
9,00	6000	11200	146	S	3750	4050	4340	4480	4620	4770	4910	5050	5190	5320	5460	5600	5730	5870	6000
9,00	6000	11200	144	D	7000	7550	8100	8370	8630	8900	9160	9420	9680	9940	10190	10450	10700	10950	11200
9,00	6000	11200																	
8,50	6300	11600	148	S	4120	4450	4770	4930	5080	5240	5390	5550	5700	5850	6000	6150	6300		
8,50	6300	11600	145	D	7590	8190	8780	9070	9360	9650	9930	10210	10490	10770	11050	11330	11600		
8,50	6300	11600																	
7,50	4480	8480	136	S	3240	3500	3750	3870	4000	4120	4240	4360	4480						
7,50	4480	8480	134	D	6130	6620	7100	7330	7560	7800	8030	8250	8480						
7,25	5000	9200	140	S	3720	4010	4300	4440	4580	4720	4860	5000							
7,25	5000	9200	137	D	6840	7380	7910	8170	8430	8690	8950	9200							

M+S M+S (Mud and Snow) indicates that a tyre has better snow traction than a regular tyre (see details on page 54)

3PMSF (Three Peak Mountain Snowflake) indicates that a tyre has passed a minimum performance threshold requirement on snow (see details on page 54)

HIGH LOAD High Load indicates that the tyre is able to carry increased weight compared to a standard load carrying capacity

TYRE TECHNICAL DATA

Tyre dimensions and inflation pressure table

							TYRE DIMENSIONS**				RIM DATA		
SIZE	DUNLOP DESIGN	LOAD/SPEED INDEX 1	LOAD/SPEED INDEX 2	ADDITIONAL MARKINGS/ COMMENTS			OVERALL DIAMETER (MM) (+/- 1.5%)	OVERALL SEC. WIDTH (MM) (+/- 1.5%)	STATIC LOADED RADIUS (MM)	ROLLING CIRCUMF. (MM)	RECOMM. RIM WIDTH (INCH)	PERMITTED RIMS (INCH)	MIN. DUAL SPACING (MM)
				M+S									
11.00 R 20	ETRTO	150/146					1082	286	498	3300	8.00	7.50-9.00	329
	SP 160	150/147 L					1104	297	498	3300	8.00	7.50-9.00	329
22.5"													
9 R 22.5	ETRTO	136/134					970	230	455	2959	6.75	6.00-6.75	259
	SP 160	136/134 L					986	239	455	2960	6.75	6.00-6.75	259
13 R 22.5	ETRTO	156/150					1124	312	521	3428	9.00	9.00-9.75	351
	SP 382	156/150 G	154/150 K	M+S			1127	316	523	3440	9.00	9.00-9.75	351
	SP 482	156/150 G	154/150 K	M+S			1133	318	522	3458	9.00	9.00-9.75	351
295/80 R 22.5	ETRTO	152/148					1044	298	487	3184	8.25	8.25-9.00	326
	SP 346 HL	154/149 M		M+S			1055	303	491	3212	8.25	8.25-9.00	326
	SP 446	152/148 M		M+S			1060	303	494	3215	8.25	8.25-9.00	326
	SP 362	152/148 L		M+S			1056	294	489	3223	8.25	8.25-9.00	326
	SP 462	152/148 L		M+S			1064	297	494	3248	8.25	8.25-9.00	326
315/80 R 22.5	ETRTO	156/150					1076	312	500	3282	9.00	9.00-9.75	351
	SP 346	156/150 L	154/150 M	M+S			1084	315	502	3294	9.00	9.00-9.75	351
	SP 446	156/150 L	154/150 M	M+S			1088	316	507	3294	9.00	9.00-9.75	351
	SP 362	156/150 K	154/150 L	M+S			1083	316	500	3306	9.00	9.00-9.75	351
	SP 462	156/150 L	154/150 M	M+S			1093	316	505	3336	9.00	9.00-9.75	351
	SP 382	156/150 K		M+S			1087	315	502	3318	9.00	9.00-9.75	351
	SP 482	156/150 K		M+S			1089	315	503	3324	9.00	9.00-9.75	351
255/70 R 22.5	ETRTO	140/137					930	255	434	2837	7.50	6.75-8.25	287
	SP 160	140/137 M					928	254	435	2842	7.50	6.75-8.25	287
275/70 R 22.5	ETRTO	148/145					958	276	445	2922	7.50	7.50-8.25	303
	SP 372 City	148/145 J	152/148 E	M+S			974	272	456	2973	7.50	7.50-8.25	303
	SP 372 City HL	150/145 J	152/148 E	M+S			972	273	457	2976	7.50	7.50-8.25	303
	SP 372* City	148/145 J	152/148 E	M+S			974	272	456	2973	7.50	7.50-8.25	303
	SP 472* City All Season	148/145 J	152/148 E	M+S			976	275	459	2985	7.50	7.50-8.25	303
315/70 R 22.5	ETRTO	154/150					1014	312	468	3093	9.00	9.00-9.75	351
	SP 346+	156/150 L		M+S			under development*				9.00	9.00-9.75	351
	SP 446	154/150 L	152/148 M	M+S			1015	313	473	3093	9.00	9.00-9.75	351
	SP 362	154/150 K	152/148 L	M+S			1020	314	469	3114	9.00	9.00-9.75	351
	SP 462	154/150 K	152/148 L	M+S			1025	314	472	3129	9.00	9.00-9.75	351

* For any tyre design not listed or under development please use the ETRTO data instead. ETRTO: European Tyre and Rim Technical Organisation

** Measured tyre dimension using the Dunlop recommended rim.

MAX LOAD			LOAD VARIATION																
					MAX. LOAD CAPACITY PER AXLE (KG) AT INFLATION PRESSURE (BAR)														
MAX. INFLATION PRESSURE (BAR)	MAX. SINGLE AXLE LOAD (KG)	MAX. DUAL AXLE LOAD (KG)	LOAD INDEX	SINGLE/ DUAL FITMENT	5.0 BAR	5.5 BAR	6.0 BAR	6.25 BAR	6.5 BAR	6.75 BAR	7 BAR	7.25 BAR	7.5 BAR	7.75 BAR	8 BAR	8.25 BAR	8.5 BAR	8.75 BAR	9 BAR
8,25	6700	12000	150	S	4490	4850	5200	5370	5540	5710	5880	6040	6210	6380	6540	6700			
8,25	6700	12300	146	D	8040	8680	9300	9610	9920	10220	10520	10820	11120	11420	11710	12000			
			150	S	4490	4850	5200	5370	5540	5710	5880	6040	6210	6380	6540	6700			
			147	D	8240	8890	9530	9850	10160	10480	10780	11090	11400	11700	12000	12300			
8,25	4480	8480	136	S	3000	3240	3470	3590	3700	3820	3930	4040	4150	4260	4370	4480			
8,25	4480	8480	134	D	5680	6130	6570	6790	7010	7220	7440	7650	7860	8070	8280	8480			
8,75	8000	13400	156	S	5110	5520	5920	6120	6310	6510	6690	6880	7070	7260	7450	7630	7820	8000	
8,75	8000	13400	150	D	8560	9240	9910	10240	10560	10890	11210	11530	11850	12160	12470	12780	13090	13400	
8,75	8000	13400																	
8,50	7100	12600	152	S	4640	5010	5370	5560	5730	5910	6080	6250	6420	6590	6760	6930	7100		
8,50	7500	13000	148	D	8240	8890	9540	9860	10170	10480	10790	11090	11400	11700	12000	12300	12600		
8,50	7100	12600	154	S	4910	5290	5680	5870	6050	6240	6420	6600	6790	6970	7140	7320	7500		
8,50	7100	12600	149	D	8500	9180	9840	10170	10490	10820	11130	11450	11760	12070	12380	12690	13000		
8,50	7100	12600																	
8,50	8000	13400	156	S	5230	5650	6050	6260	6450	6660	6850	7040	7240	7430	7620	7810	8000		
8,50	8000	13400	150	D	8760	9460	10140	10480	10810	11150	11470	11800	12120	12450	12770	13080	13400		
8,50	8000	13400																	
8,50	8000	13400																	
8,50	8000	13400																	
8,50	8000	13400																	
8,50	8000	13400																	
8,00	5000	9200	140	S	3430	3700	3970	4110	4240	4370	4490	4620	4750	4880	5000				
8,00	5000	9200	137	D	6320	6810	7310	7550	7790	8030	8270	8500	8740	8970	9200				
9,00	6300	11600	148	S	3940	4250	4550	4710	4860	5010	5150	5300	5440	5590	5730	5880	6020	6160	6300
9,00	6300	11600	150	S	4190	4520	4840	5000	5160	5320	5480	5640	5790	5940	6100	6250	6400	6550	6700
9,00	6700	11600	145	D	7250	7820	8390	8670	8940	9220	9490	9760	10030	10290	10560	10820	11080	11340	11600
9,00	6300	11600																	
9,00	6300	11600																	
9,00	7500	13400	154	S	4690	5060	5420	5610	5780	5960	6130	6310	6480	6650	6830	7000	7160	7330	7500
9,00	8000	13400	150	D	8370	9040	9690	10010	10330	10650	10960	11270	11580	11890	12200	12500	12800	13100	13400
9,00	7500	13400	156	S	5000	5390	5780	5980	6170	6360	6540	6730	6910	7100	7280	7460	7640	7820	8000
9,00	7500	13400	150	D	8370	9040	9690	10010	10330	10650	10960	11270	11580	11890	12200	12500	12800	13100	13400
9,00	7500	13400																	

M+S M+S (Mud and Snow) indicates that a tyre has better snow traction than a regular tyre (see details on page 54)

3PMSF (Three Peak Mountain Snowflake) indicates that a tyre has passed a minimum performance threshold requirement on snow (see details on page 54)

HIGH LOAD High Load indicates that the tyre is able to carry increased weight compared to a standard load carrying capacity

TYRE TECHNICAL DATA

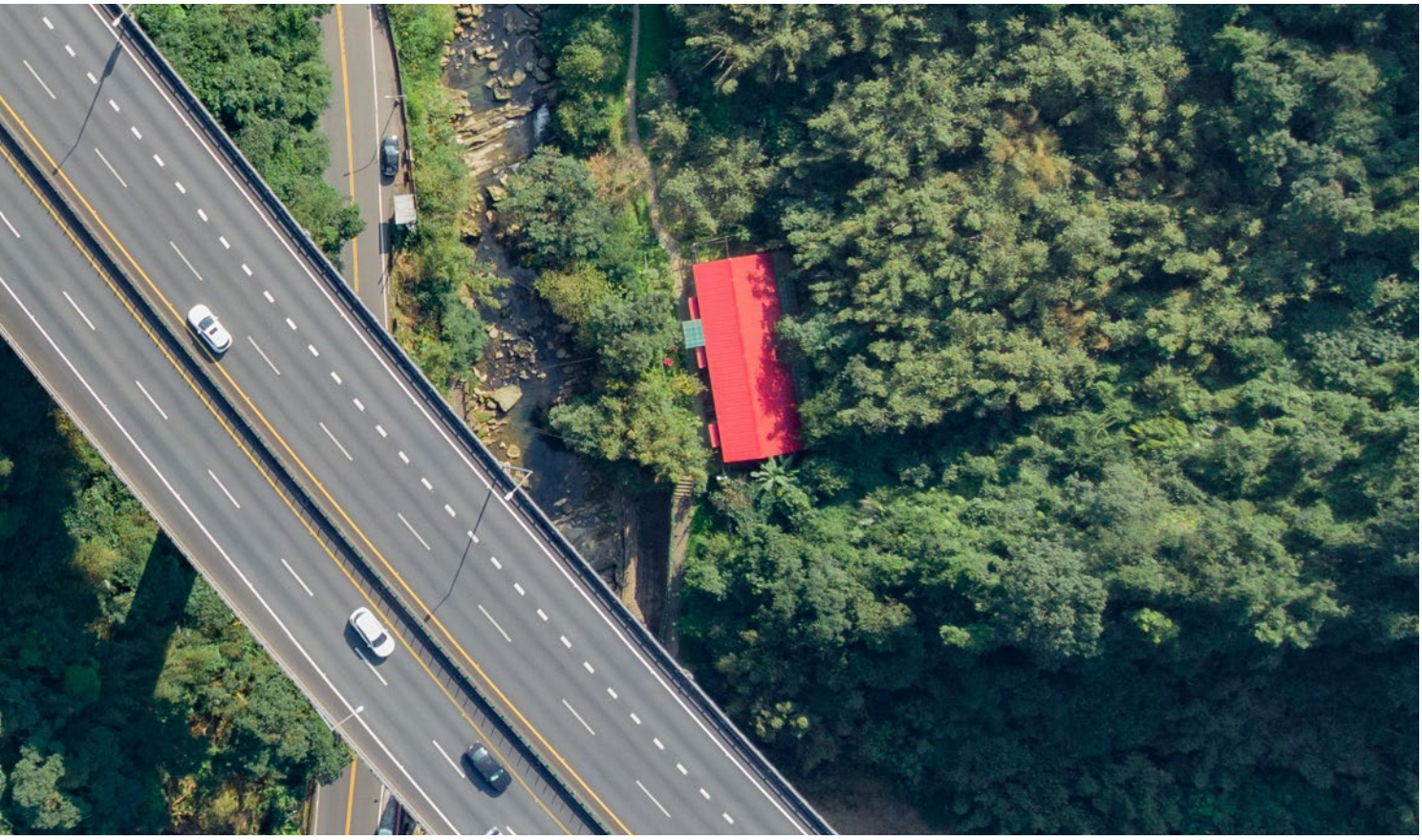
Tyre dimensions and inflation pressure table

							TYRE DIMENSIONS**				RIM DATA		
SIZE	DUNLOP DESIGN	LOAD/SPEED INDEX 1	LOAD/SPEED INDEX 2	ADDITIONAL MARKINGS/ COMMENTS			OVERALL DIAMETER (MM) (+/- 1.5%)	OVERALL SEC. WIDTH (MM) (+/- 1.5%)	STATIC LOADED RADIUS (MM)	ROLLING CIRCUMF. (MM)	RECOMM. RIM WIDTH (INCH)	PERMITTED RIMS (INCH)	MIN. DUAL SPACING (MM)
				M+S									
385/65 R 22.5	ETRTO	160					1072	389	496	3248	11.75	11.75-12.25	
	SP 346	160 K	158 L	M+S			1077	380	499	3293	11.75	11.75-12.25	
	SP 362	160 K	158 L	M+S			1078	378	496	3266	11.75	11.75-12.25	
	SP 382	160 K	158 L	M+S			1078	376	496	3266	11.75	11.75-12.25	
295/60 R 22.5	ETRTO	150/147					926	292	435	2806	9.00	9.00-9.75	329
	SP 346	150/147 K	149/146L	M+S			928	304	430	2814	9.00	9.00-9.75	329
	SP 446	150/147 K	149/146L	M+S			937	289	437	2856	9.00	9.00-9.75	329
315/60 R 22.5	ETRTO	152/148					950	313	445	2879	9.75	9.00-9.75	352
	SP 346 HL	154/148 L		M+S			955	309	442	2935	9.00	9.00-9.75	344
	SP 344	152/148 L		M+S			957	311	443	2900	9.00	9.00-9.75	344
	SP 446	152/148 L		M+S			965	308	450	2947	9.00	9.00-9.75	344
	SP 372 City	152/148 J		M+S			961	314	446	2912	9.00	9.00-9.75	344
385/55 R 22.5	ETRTO	160					996	386	456	3028	11.75	11.75-12.25	
	SP 346	160 K	158 L	M+S			993	382	458	3009	11.75	11.75-12.25	

* For any tyre design not listed or under development please use the ETRTO data instead. ETRTO: European Tyre and Rim Technical Organisation

** Measured tyre dimension using the Dunlop recommended rim.

MAX LOAD			LOAD VARIATION															
					MAX. LOAD CAPACITY PER AXLE (KG) AT INFLATION PRESSURE (BAR)													
MAX. INFLATION PRESSURE (BAR)	MAX. SINGLE AXLE LOAD (KG)	MAX. DUAL AXLE LOAD (KG)	LOAD INDEX	SINGLE/ DUAL FITMENT	5.0 BAR	5.5 BAR	6.0 BAR	6.25 BAR	6.5 BAR	6.75 BAR	7 BAR	7.25 BAR	7.5 BAR	7.75 BAR	8 BAR	8.25 BAR	8.5 BAR	8.75 BAR	9 BAR
9,00	9000		160	S	5620	6070	6510	6730	6940	7150	7360	7570	7780	7990	8190	8390	8600	8800	9000
9,00	9000																		
9,00	9000																		
9,00	9000																		
9,00	6700	12300	150	S	4190	4520	4840	5010	5160	5330	5480	5640	5790	5940	6100	6250	6400	6550	6700
9,00	6700	12300	147	D	7690	8290	8890	9190	9480	9780	10060	10350	10630	10910	11190	11470	11750	12030	12300
9,00	6700	12300																	
9,00	7100	12600	152	S	4440	4790	5130	5310	5470	5650	5810	5970	6140	6300	6460	6620	6780	6940	7100
9,00	7500	12600	148	D	7870	8500	9110	9420	9710	10010	10310	10600	10890	11180	11470	11750	12040	12320	12600
9,00	7100	12600	154	S	4690	5060	5420	5610	5780	5960	6130	6310	6480	6650	6830	7000	7160	7330	7500
9,00	7100	12600	148	D	7870	8500	9110	9420	9710	10010	10310	10600	10890	11180	11470	11750	12040	12320	12600
9,00	7100	12600																	
9,00	9000		160	S	5620	6070	6510	6730	6940	7150	7360	7570	7780	7990	8190	8390	8600	8800	9000
9,00	9000																		



M+S M+S (Mud and Snow) indicates that a tyre has better snow traction than a regular tyre (see details on page 54)

3PMSF (Three Peak Mountain Snowflake) indicates that a tyre has passed a minimum performance threshold requirement on snow (see details on page 54)

HIGH LOAD High Load indicates that the tyre is able to carry increased weight compared to a standard load carrying capacity

DUNLOP

TYRE TECHNICAL DATA

Tyre dimensions and inflation pressure table

							TYRE DIMENSIONS**				RIM DATA		
SIZE	DUNLOP DESIGN	LOAD/SPEED INDEX 1	LOAD/SPEED INDEX 2	ADDITIONAL MARKINGS/ COMMENTS			OVERALL DIAMETER (MM) (+/- 1.5%)	OVERALL SEC. WIDTH (MM) (+/- 1.5%)	STATIC LOADED RADIUS (MM)	ROLLING CIRCUMF. (MM)	RECOMM. RIM WIDTH (INCH)	PERMITTED RIMS (INCH)	MIN. DUAL SPACING (MM)
				M+S									
TRAILER / SEMITRAILER TYRES													
17.5"													
215/75 R 17.5	ETRTO	135/133					767	211	351	2324	6.00	6.00-6.75	239
	SP 246	135/133 J		M+S			770	215	356	2353	6.00	6.00-6.75	239
	SP 246	136/134 J		M+S			under development*				6.00	6.00-6.75	239
235/75 R 17.5	ETRTO	143/141					797	233	363	2431	6.75	6.75-7.50	262
	SP 246	143/141 J	144/144 F	M+S			800	239	367	2448	6.75	6.75-7.50	262
245/70 R 17.5	ETRTO	143/141					789	248	360	2406	7.50	6.75-7.50	279
	SP 246	143/141 J	146/146 F	M+S			794	254	366	2433	7.50	6.75-7.50	279
19.5"													
245/70 R 19.5	ETRTO	141/140					839	248	385	2559	7.50	6.75-7.50	279
	SP 246	141/140 J		M+S			848	252	389	2589	7.50	6.75-7.50	279
265/70 R 19.5	ETRTO	143/141					867	262	401	2644	7.50	7.50-8.25	295
	SP 246	143/141 J		M+S			866	266	400	2643	7.50	7.50-8.25	295
285/70 R 19.5	ETRTO	150/148					895	283	408	2730	8.25	8.25-9.00	318
	SP 246	150/148 J		M+S			892	289	410	2723	8.25	7.50-9.00	318
425/55 R 19.5	ETRTO	160					963	421	435	2918	13.00	13.00-14.00	
	SP 241	160 J		M+S			963	421	441	2920	13.00	13.00-14.00	
435/50 R 19.5	ETRTO	160					931	438	422	2840	14.00	14.00-15.00	
	SP 247	160 J		M+S			924	430	422	2853	14.00	14.00-15.00	
22.5"													
385/65 R 22.5	ETRTO	160					1072	389	496	3248	11.75	11.75-12.25	
	SP 247 HL	164 K	158 L	M+S			1082	389	497	3320	11.75	11.75-12.25	
	SP 282	160 J	158 K	M+S			1091	376	498	3275	11.75	11.75-12.25	
425/65 R 22.5	ETRTO	165					1124	430	518	3406	13.00	13.00-14.00	
	SP 281	165 K		M+S			1124	430	518	3406	13.00	12.25-14.00	
385/55 R 22.5	ETRTO	160					996	386	456	3038	11.75	11.75-12.25	
	SP 247	160 K	158 L	M+S			994	387	456	3072	11.75	11.75-12.25	

* For any tyre design not listed or under development please use the ETRTO data instead. ETRTO: European Tyre and Rim Technical Organisation

** Measured tyre dimension using the Dunlop recommended rim.

MAX LOAD			LOAD VARIATION																
					MAX. LOAD CAPACITY PER AXLE (KG) AT INFLATION PRESSURE (BAR)														
MAX. INFLATION PRESSURE (BAR)	MAX. SINGLE AXLE LOAD (KG)	MAX. DUAL AXLE LOAD (KG)	LOAD INDEX	SINGLE/ DUAL FITMENT	5.0 BAR	5.5 BAR	6.0 BAR	6.25 BAR	6.5 BAR	6.75 BAR	7 BAR	7.25 BAR	7.5 BAR	7.75 BAR	8 BAR	8.25 BAR	8.5 BAR	8.75 BAR	9 BAR
8,50	4360	8240	135	S	2850	3080	3300	3410	3520	3630	3730	3840	3940	4050	4150	4260	4360		
8,50	4360	8240	133	D	5390	5820	6240	6450	6650	6860	7050	7260	7450	7650	7850	8050	8240		
9,00	4480	8480	136	S	2800	3020	3240	3350	3450	3560	3660	3770	3870	3980	4080	7180	4280	4380	4480
			134	D	5300	5720	6130	6340	6540	6740	6940	7130	7330	7520	7720	7910	8100	8290	8480
8,75	5450	10300	143	S	3480	3760	4030	4170	4300	4430	4560	4690	4820	4950	5070	5200	5330	5450	
8,75	5450	10300	141	D	6580	7110	7620	7870	8120	8370	8620	8870	9100	9350	9590	9830	10060	10300	
8,75	5450	10300	143	S	3480	3760	4030	4170	4300	4430	4560	4690	4820	4950	5070	5200	5330	5450	
8,75	5450	10300	141	D	6580	7110	7620	7870	8130	8370	8620	8860	9100	9350	9590	9830	10060	10300	
8,50	5150	10000	141	S	3370	3640	3900	4030	4160	4290	4410	4530	4660	4780	4910	5030	5150		
8,50	5150	10000	140	D	6540	7060	7570	7820	8070	8320	8560	8810	9050	9290	9530	9760	10000		
8,50	5450	10300	143	S	3560	3850	4120	4270	4400	4540	4670	4800	4930	5060	5190	5320	5450		
8,50	5450	10300	141	D	6740	7270	7800	8060	8310	8570	8820	9070	9320	9570	9810	10060	10300		
9,00	6700	12600	150	S	4190	4520	4840	5010	5160	5330	5480	5640	5790	5940	6100	6250	6400	6560	6700
9,00	6700	12600	148	D	7870	8500	9110	9420	9710	10010	10310	10600	10890	11180	11470	11750	12040	12320	12600
9,00	9000		160	S	5620	6070	6510	6730	6940	7150	7360	7570	7780	7990	8190	8390	8600	8800	9000
9,00	9000																		
9,00	9000		160	S	5620	6070	6510	6730	6940	7150	7360	7570	7780	7990	8190	8390	8600	8800	9000
9,00	9000																		
9,00	9000		160	S	5620	6070	6510	6730	6940	7150	7360	7570	7780	7990	8190	8390	8600	8800	9000
9,00	10000																		
9,00	9000																		
8,25	10300		165	S	6900	7450	7980	8250	8510	8780	9030	9290	9540	9800	10050	10300			
8,25	10300																		
9,00	9000		160	S	5620	6070	6510	6730	6940	7150	7360	7570	7780	7990	8190	8390	8600	8800	9000
9,00	9000																		

M+S

M+S (Mud and Snow) indicates that a tyre has better snow traction than a regular tyre (see details on page 54)

3PMSF (Three Peak Mountain Snowflake) indicates that a tyre has passed a minimum performance threshold requirement on snow (see details on page 54)

HIGH LOAD

High Load indicates that the tyre is able to carry increased weight compared to a standard load carrying capacity

RETREAD INFORMATION AND REGROOVING GUIDELINES

RETREAD & REGROOVING

DUNLOP

RETREAD INFORMATION

Why retreading?

Reason 1

RETREADING GIVES A TYRE MULTIPLE LIVES

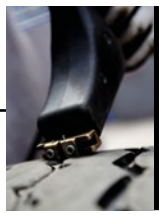
New Dunlop tyres feature high quality casings, produced with the latest technology and materials, and an intelligent construction. Excellent durability and damage resistance properties further add to their performance. Thanks to these features, Dunlop tyres last longer, plus tyre life does not need to end after it is worn! Our new tyres are made as an ideal basis for regrooving and retreading.

TreadMax

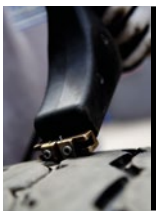
USE NEW TYRES FROM DUNLOP'S EXTENSIVE RANGE

1

2



REGROOVING INCREASES MILEAGE POTENTIAL



REGROOVE THE RETREADED TYRES FOR EXTRA MILEAGE

4

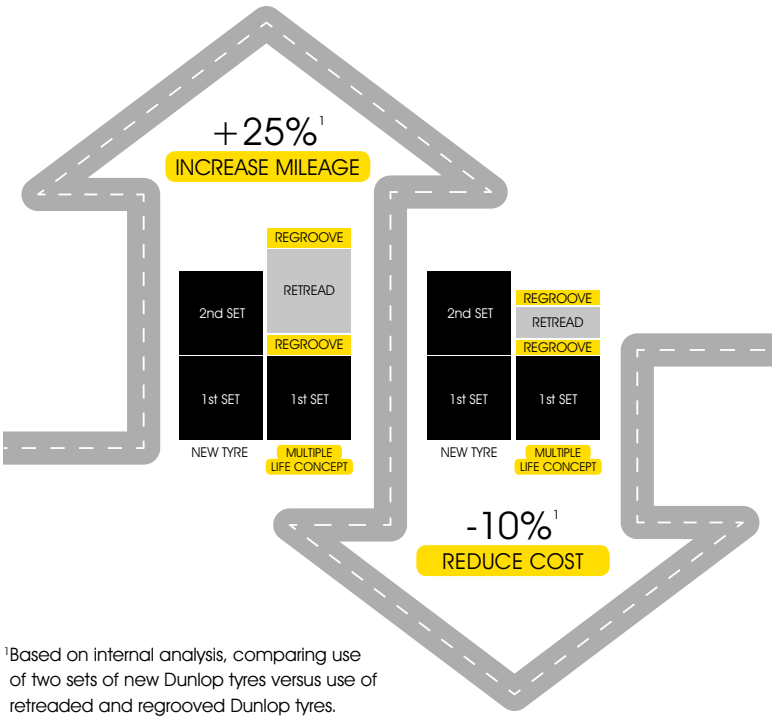
3

RETREAD YOUR CASING, UTILISING ONE OF DUNLOP'S RETREADING SOLUTIONS

Reason 2

RETREADS SUBSTANTIALLY REDUCE OPERATING COSTS

When compared to buying new tyres again after the first lifecycle of a new tyre, retreading and regrooving offers a substantial cost reduction. On the one hand, the price of a Dunlop retreaded tyre lies between 50% and 70% than that of a new tyre. On the other hand, it increases mileage. Moreover, by using more retreads, increasing the retread ratio and increasing the use of suitable cases of worn tyres, fleets can reduce their overall annual operational costs even further.



[1]Based on internal analysis, comparing use of two sets of new Dunlop tyres versus use of retreaded and regrooved Dunlop tyres.

Reason 3

DUNLOP RETREAD PERFORMANCE IS SIMILAR TO NEW TYRES

It may come as a surprise that the performance of Dunlop retreaded tyres is similar to that of new tyres. However, knowing that the team that develops Dunlop's new tyres also develops the retreads, and that the design profile of retreads is identical to the new tyre, it simply makes sense.

Moreover, the compound used is carefully selected to ensure top-level performance, as you can expect from any premium Dunlop product.

Reason 4

RETREADING HAS A POSITIVE IMPACT ON THE ENVIRONMENT

Prolonging the lifespan of a tyre by retreading has a positive impact on the environment in several ways. Retreads use fewer raw materials, produce less waste (both during manufacturing and because casings are re-used) and mean less energy waste.

For example, producing a retread consumes about 66% less oil than the production of a new tyre.

DUNLOP

REGROOVING INFORMATION

Truck tyre regrooving

Since the pneumatic tyre was patented by John Boyd Dunlop in 1888, many technology developments by Dunlop have led to the current high standards of vehicle technology. Providing a continuous succession of innovations, Dunlop is today an important partner of the automotive industry.

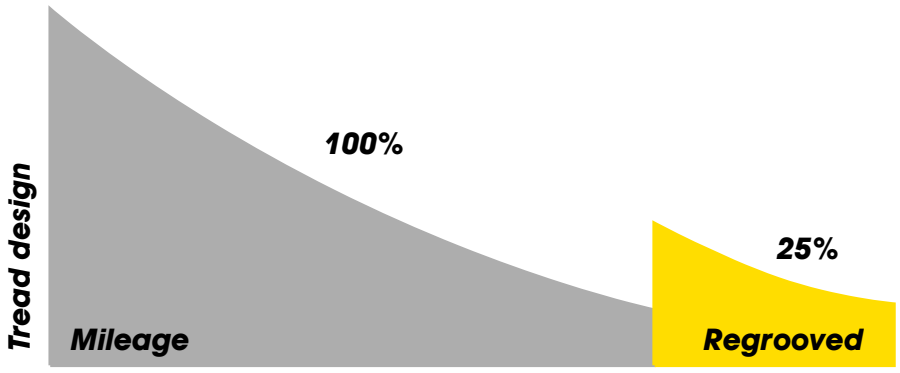
Cost efficiency is especially important for commercial vehicle operations. To allow the use of the complete potential of modern truck tyres, all Dunlop truck tyres are regroovable.

These guidelines provide all the required information for the correct regrooving of truck tyres and thus will support the regrooving specialist to execute Dunlop truck tyre regrooving in the most efficient manner.

Regrooving basics

1. A regrooved tyre is a tyre, either new or retreaded, on which the tread pattern has been renewed or a new tread pattern has been produced by cutting into the tread deeper than the original moulded groove depth.
2. The regrooving of truck tyres should be entrusted solely to fully trained operators.
3. Only proven regrooving tools with electrically heated blades should be used.
4. A minimum of remaining undertread rubber is essential to avoid damage at the top breaker belt, groove cracking and/or stone damage.
5. If regrooved according to the recommendations outlined in this manual, Dunlop tyres can, in principle, be mounted on all wheel positions. However, since it has become standard practice for users to normally fit new tyres on front axles, the regrooved tyres will usually be mounted on the rear axles or trailer positions
6. Tyres which are heavily damaged in the tread area (e.g. rib tearing, multiple cutting and chipping) should not be regrooved but retreaded.

All tyres which are marked 'Regroovable' in the sidewall areas have extra undertread thickness for regrooving purposes.



All Dunlop truck tyres are designed to allow regrooving and thus increase the mileage potential and consequently improve cost efficiency for the fleets.

25%* increased mileage for 10% additional cost

*Average value calculated on 2 tyre lives as part of the Multiple Life Concept. Actual results are not guaranteed and may differ based on external factors such as but not limited to road conditions, driving behaviour and temperature

RECOMMENDATIONS AND PARAMETERS

Regrooving recommendations

1. Under NO circumstances should the tyre be completely worn before regrooving. It is strongly recommended to regroove when 3-6mm of the original design is still left.
2. Determine the blade setting depth for each individual tyre as follows:
   a) Measure the remaining groove depth AT THE POINT OF LOWEST TREAD DEPTH.
   b) Set the blade in the cutter head to the 'minimum remaining groove depth' + 3mm maximum regrooving depth.

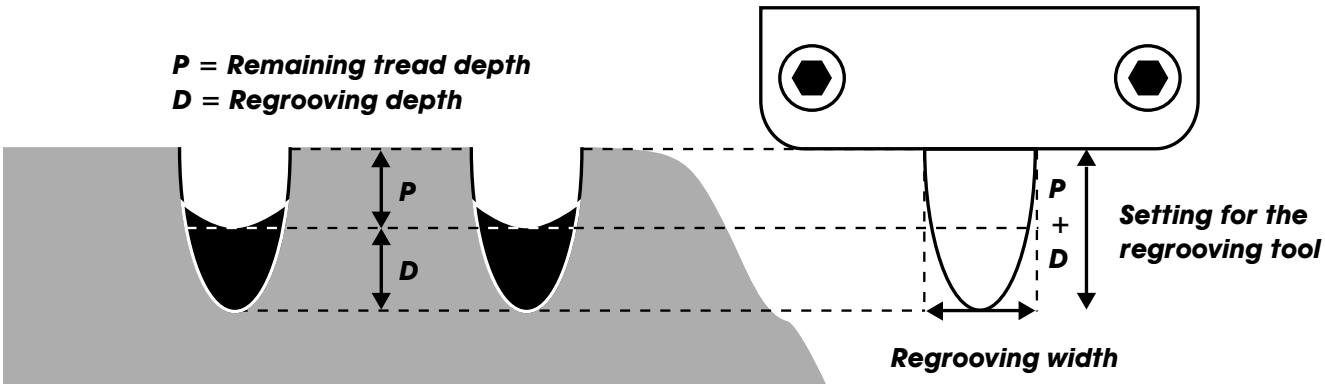
   This will maintain a 3mm gauge under the regrooved tread.
3. While regrooving, hold the cutter so that the underside of the cutting head is flush against the tread surface.
4. The maximum regrooving depth is 3mm for all Dunlop truck tyres.
5. If the wear is irregular, probing of the remaining undertread gauge is necessary to ensure that 3mm of undertread will remain after regrooving.

Regrooving Dunlop remould tyres

Provided that the retreading process is on Dunlop casings carried out by Dunlop Authorised Retreader, Dunlop remould tyres may be regrooved to the same pattern as the new tyre, with a maximum regrooving depth of 3mm.

Regrooving parameters

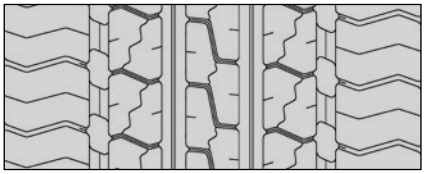
Regroove Dunlop truck tyres when there is still sufficent tread depth. Suggested remaining tread depths are: 3-4mm for regular highway use; 5-6mm in operating conditions where penetration damage is likely.



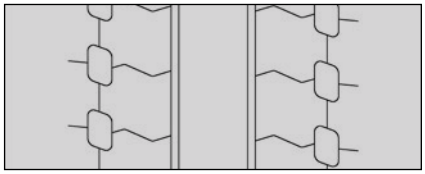
ON ROAD

SP346+ 22.5″

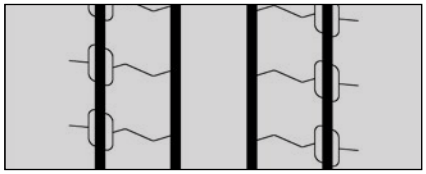
Maximum regrooving depth 3mm, regrooving width 6-8mm.



New tyre tread



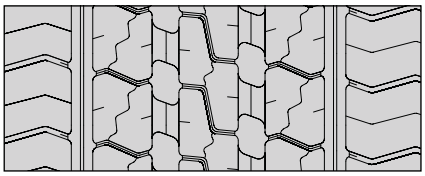
80% worn



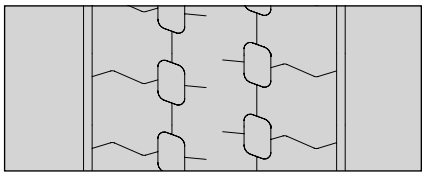
Regrooved tyre tread

SP346 22.5″

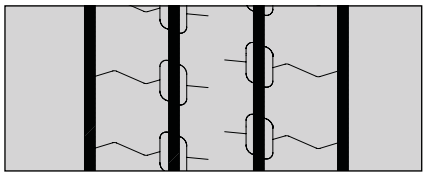
Maximum regrooving depth 3mm, regrooving width 6-8mm.



New tyre tread



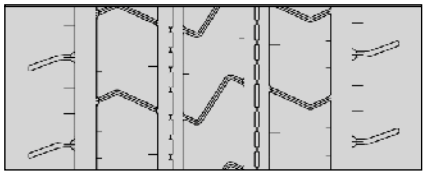
80% worn



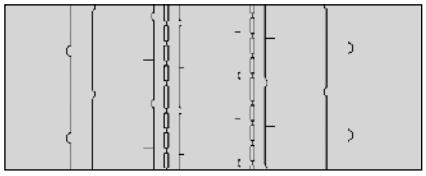
Regrooved tyre tread

SP344 22.5″

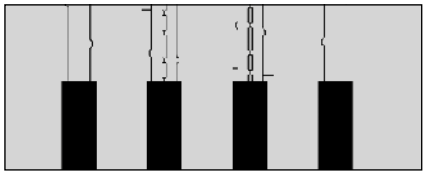
Maximum regrooving depth 3mm, regrooving width 6-8mm.



New tyre tread



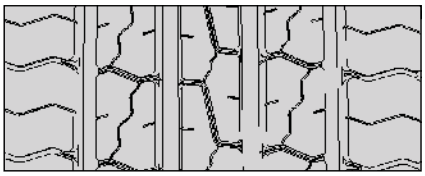
80% worn



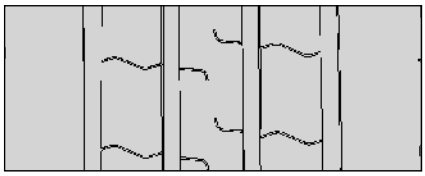
Regrooved tyre tread

SP346 17.5″&19.5″

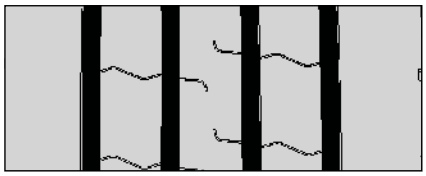
Maximum regrooving depth 3mm, regrooving width 6-8mm.



New tyre tread



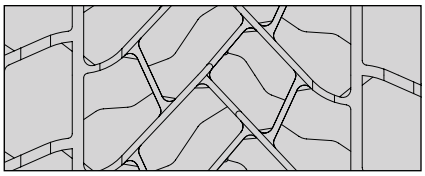
80% worn



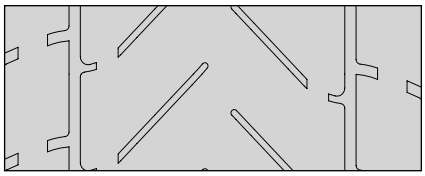
Regrooved tyre tread

SP446 22.5″

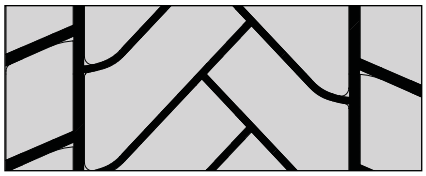
Maximum regrooving depth 3mm, regrooving width 6-8mm.



New tyre tread



80% worn

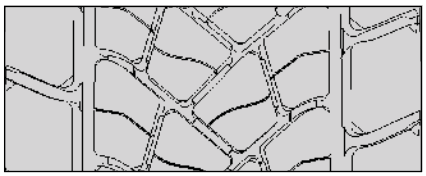


Regrooved tyre tread

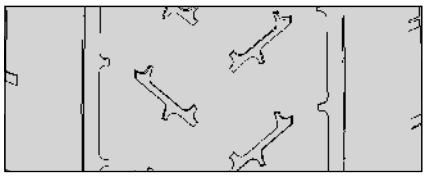
ON ROAD

SP446 17.5″&19.5″

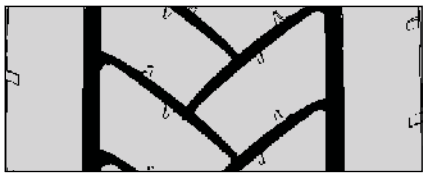
Maximum regrooving depth 3mm, regrooving width 6-8mm.



New tyre tread



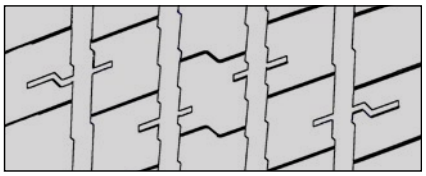
80% worn



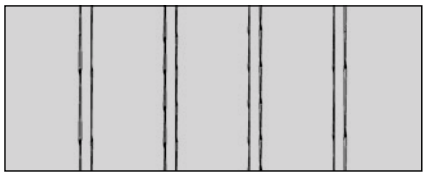
Regrooved tyre tread

SP247

Maximum regrooving depth 3mm, regrooving width 6-8mm.



New tyre tread

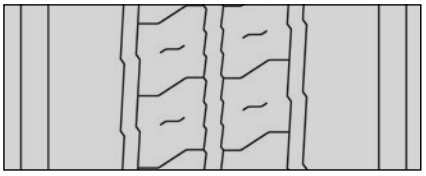


80% worn

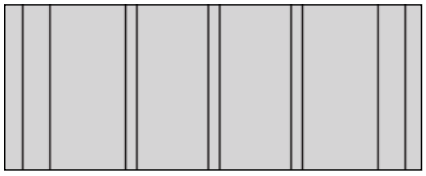
Regrooved tyre tread

SP246 17.5″&19.5″

Maximum regrooving depth 2.5mm, regrooving width 6mm.



New tyre tread

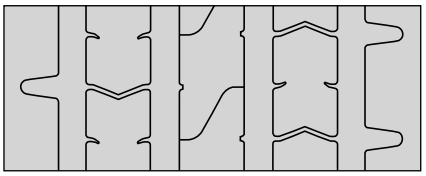


80% worn

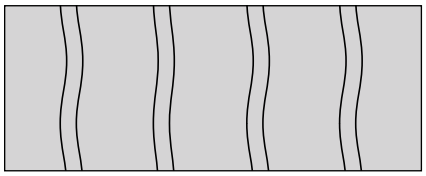
Regrooved tyre tread

SP241 425/55R19.5

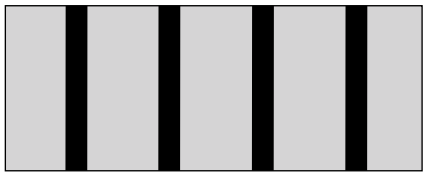
Maximum regrooving depth 3mm, regrooving width 6-8mm.



New tyre tread



80% worn

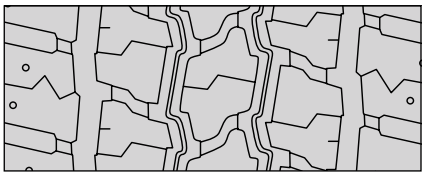


Regrooved tyre tread

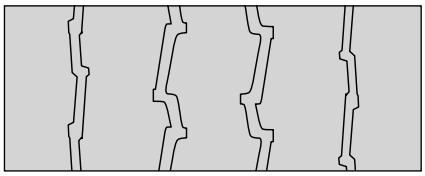
WINTER

SP362 22.5″

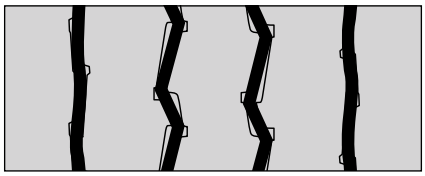
Maximum regrooving depth 3mm, regrooving width 6-8mm.



New tyre tread



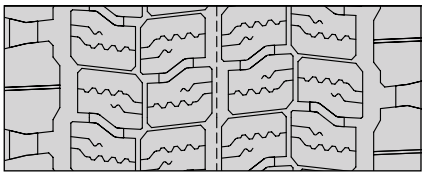
80% worn



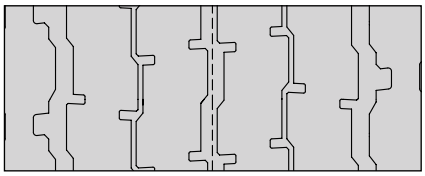
Regrooved tyre tread

SP462 22.5″

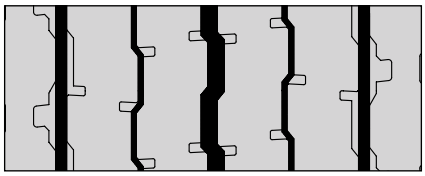
Maximum regrooving depth 3mm, regrooving width 6-8mm.



New tyre tread



80% worn

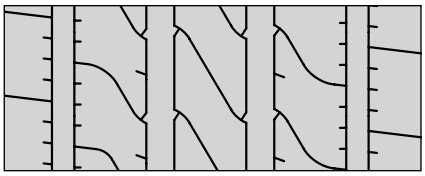


Regrooved tyre tread

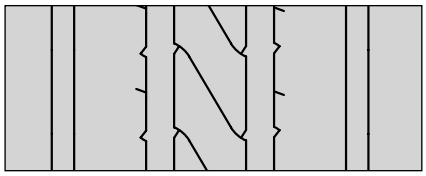
URBAN

SP372 CITY 22.5″

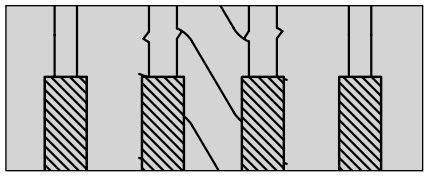
Maximum regrooving depth 3mm, regrooving width 6-8mm.



New tyre tread



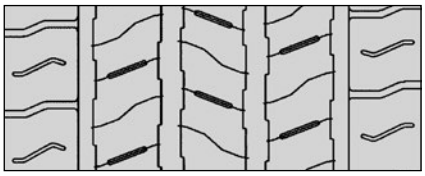
80% worn



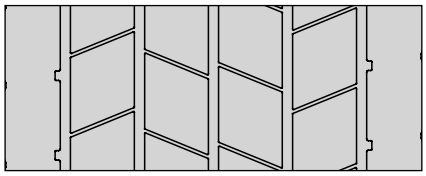
Regrooved tyre tread

SP472* CITY ALL SEASON

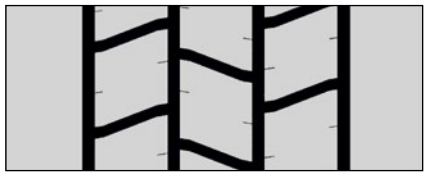
Maximum regrooving depth 3mm, regrooving width 6-8mm.



New tyre tread



80% worn

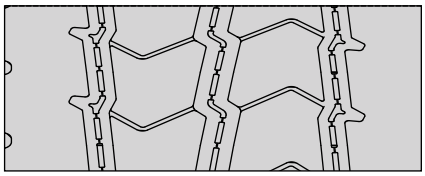


Regrooved tyre tread

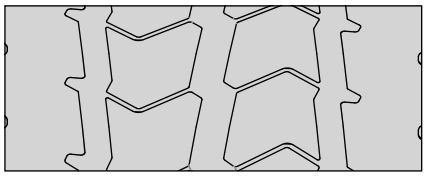
MIXED SERVICE

SP382 4 RIB 22.5″

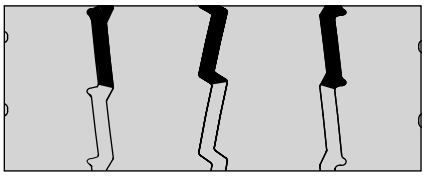
Maximum regrooving depth 3mm, regrooving width 6-8mm.



New tyre tread



80% worn



Regrooved tyre tread

SP382 5 RIB 22.5″

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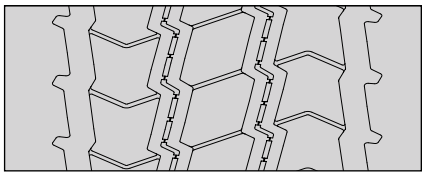
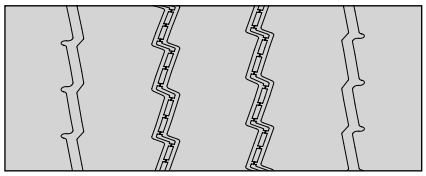
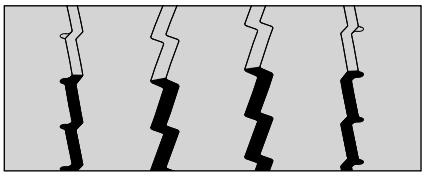


New tyre tread



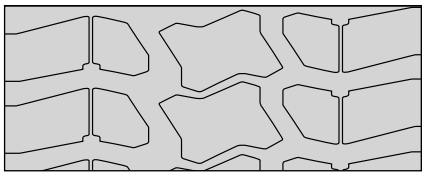
80% worn



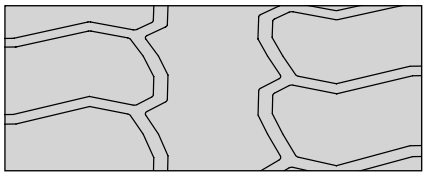
Regrooved tyre tread

SP482 22.5″

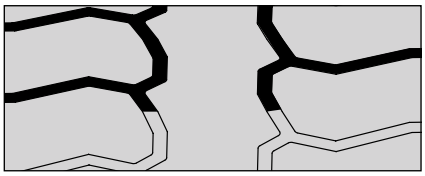
Maximum regrooving depth 3mm, regrooving width 6-8mm.



New tyre tread



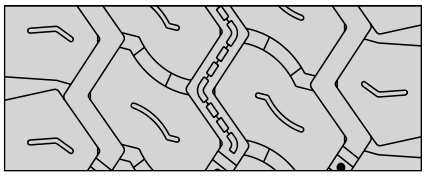
80% worn



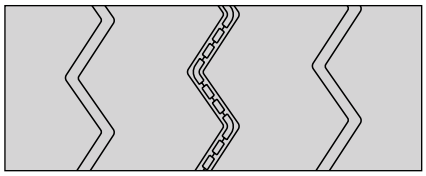
Regrooved tyre tread

SP282 385/65R22.5

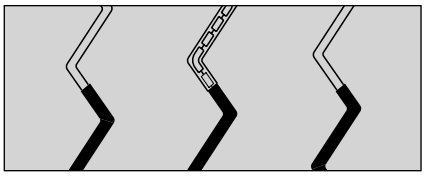
Maximum regrooving depth 3mm, regrooving width 6-8mm.



New tyre tread



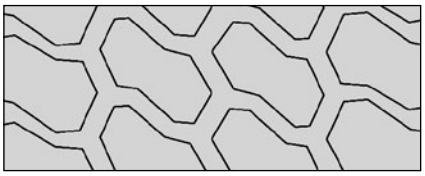
80% worn



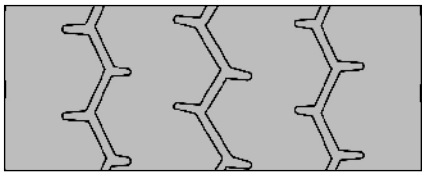
Regrooved tyre tread

SP281

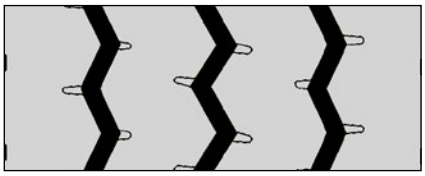
Maximum regrooving depth 3mm, regrooving width 6-8mm.



New tyre tread



80% worn



Regrooved tyre tread

DUNLOP

TYRE TECHNOLOGY

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TYRE TECHNOLOGY

TYRE CONSTRUCTION AND TERMINOLOGY

Truck tyres are a high value investment whose performance potential can be dramatically influenced by a multitude of service parameters – which can be globally identified as operating and maintenance conditions. In other words, the true cost per kilometre is not only a function of the tyre quality and price, but is primarily a direct consequence of the actual running conditions of the tyre. In order to be able to optimise these conditions, it is essential to first of all be familiar with the construction characteristics of a tyre and to understand its mechanical properties.

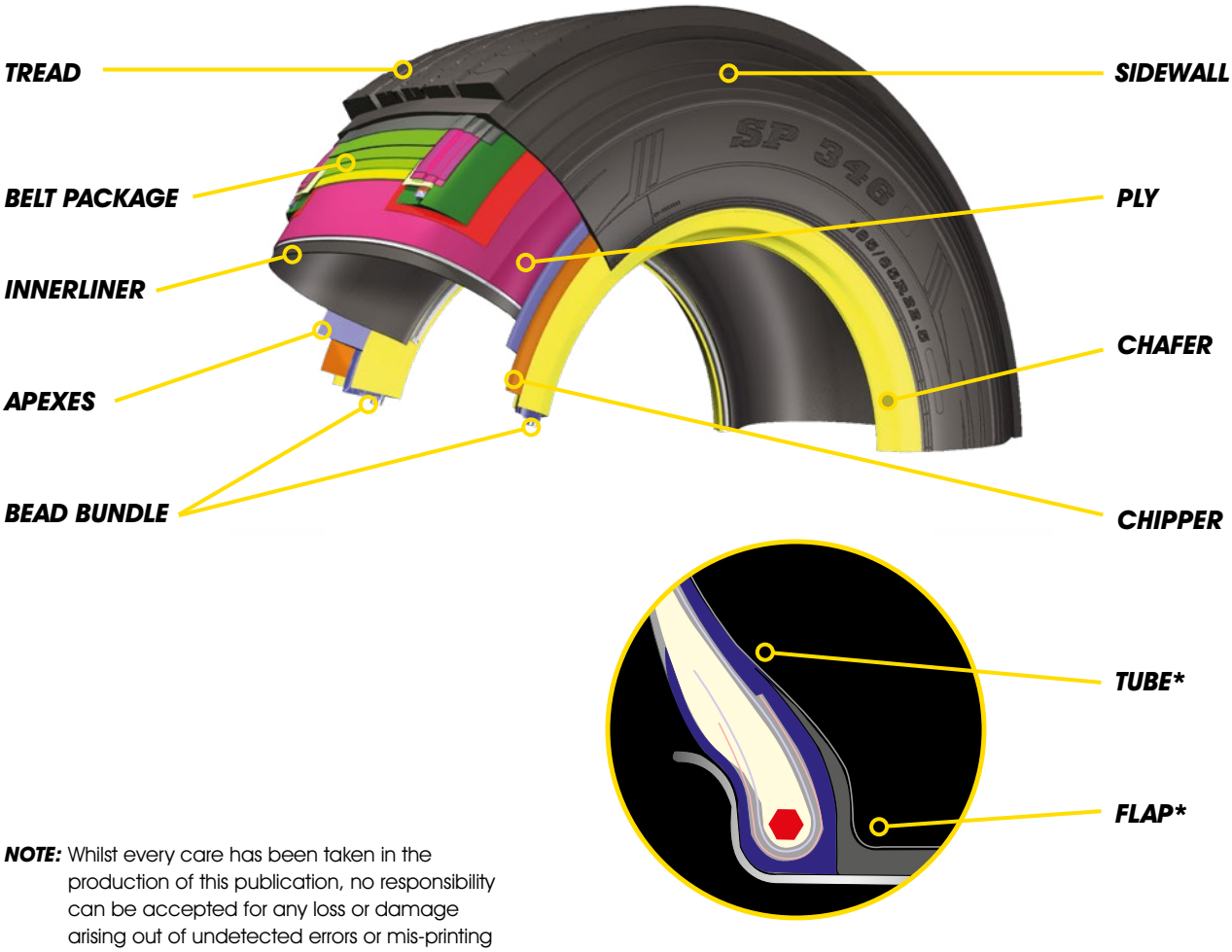
It will also be advisable to have a basic knowledge of vehicle dynamics and to recognise the importance of environmental factors such as road design and ambient temperature.

This brochure is designed to convey these elementary rules and guidelines and to therefore help minimise fleet operating expenses. For further clarifications and updated facts and figures, please consult your truck tyre specialist.

Tyre construction

The commercially available tyre is a composite product, made up from rubber compounds and textile, steel synthetic reinforcements. The major components of the radial ply, steel carcass and belt tyre are described below.

FEATURES



NOTE: Whilst every care has been taken in the production of this publication, no responsibility can be accepted for any loss or damage arising out of undetected errors or mis-printing which may have occurred.

***Only applicable to tube type tyres

Tyre terminology

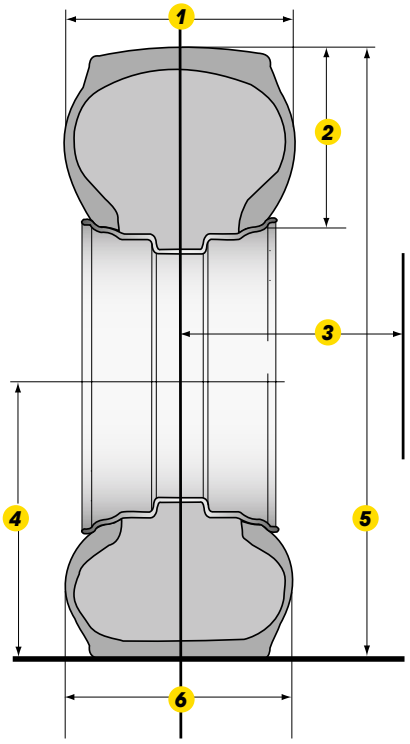
- ***TREAD***
  Provides primarily traction and wear and protects the carcass underneath.
- ***BELT***
  Multiple, low angle, steel cord layers provide strength to the tyre, stabilise the tread and prevent penetrations into the carcass.
- ***SIDEWALL***
  Provides protection for the ply and withstands flexing and weathering.
- ***PLY***
  The radial (90°) ply transmits all load, braking and steering forces between the wheel and the road and withstands the burst loads of the tyre under operating pressure.
- ***INNERLINER***
  A layer of rubber in tubeless tyres specially compounded to prevent loss of air.
- ***BEAD BUNDLE***
  The steel bead bundle properly seats and seals the tyre on the rim and maintains it in position.
- ***APEX***
  Rubber filler in the bead and lower sidewall area to provide progressive transition from the stiff bead area into the flexible sidewall.
- ***CHAFER***
  A layer of hard rubber that resists erosion of the bead zone by the rim flange.
- ***TUBE****
  A separate air chamber, compounded to prevent loss of air, inserted into tube-type tyres.
- ***FLAP****
  A rubber band placed between tube and rim. Protects the tube from chafing and prevents damage to the tube by the rim.

*Only applicable to tube type tyres.

Tyre dimension definitions

Tyre companies throughout the world are members of regional tyre manufacturers associations (ETRTO for Europe), which establish tyre dimensions and tolerances, load carrying capacities and inflation pressures for the different tyre categories and sizes. The basic tyre and rim dimension nomenclature is explained below.

1. ***SECTION WIDTH (SW)***
   The width of the inflated tyre section, excluding any lettering or decoration.
2. ***SECTION HEIGHT (SH)***
   The distance from the bead seat to the outer tread contour of the inflated tyre at centreline.
3. ***MINIMUM DUAL SPACING***
   The minimum recommended distance between centrelines of dual mounted tyres to avoid kissing in the flex area.
4. ***STATIC LOADED RADIUS (SLR)***
   The standing height from the road surface to the axle centre under nominal tyre load/inflation conditions.
5. ***OUTSIDE DIAMETER (OD)***
   The diameter of an unloaded tyre, mounted on its recommended rim and inflated to recommended pressure.
6. ***LOADED SECTION WIDTH (LSW)***
   The width of the loaded cross-section.



Aspect Ratio - The section height (SH) expressed as a percentage of the section width (SW).

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TYRE MARKINGS

Size markings

There are various forms of tyre size marking and these differ in order to differentiate between tyre types. The size markings should be treated the same as a part number on a vehicle, so the motorist should ensure that the tyres on their vehicle carry the precise markings indicated in the vehicle handbook or are an approved alternative fitment.

Service description

In accordance with the European regulation (ECE-R54), all tyres intended for commercial vehicles will be marked with a 'Service Description' located near to the tyre size marking. This consists of a code which indicates operating limits of load and speed and includes a 'load index' for single and dual tyre fitment and a 'speed symbol' (e.g. 156/150 L).

An additional marking may be used to show the corresponding tyre loads for an alternative higher speed or for an alternative higher load. This additional marking will be placed in a circle.

Free Rolling Tyre (FRT)

'FRT' stands for 'Free Rolling Tyre' and is a legal marking according to the UNECE Regulation No. 54, which indicates that the tyre is specifically designed and intended for the equipment of trailer axles and axles of motor vehicles other than front steering and all drive axles.

Therefore these trailer tyres marked 'FRT' should be used exclusively on trailer axles and axles of motor vehicles other than front steering and all drive axles and should not be fitted in any other position.

Dunlop will not warrant and cannot be held accountable for any potential liability claim involving FRT tyres fitted outside these recommendations.

Winter tyre markings: M+S and 3PMSF

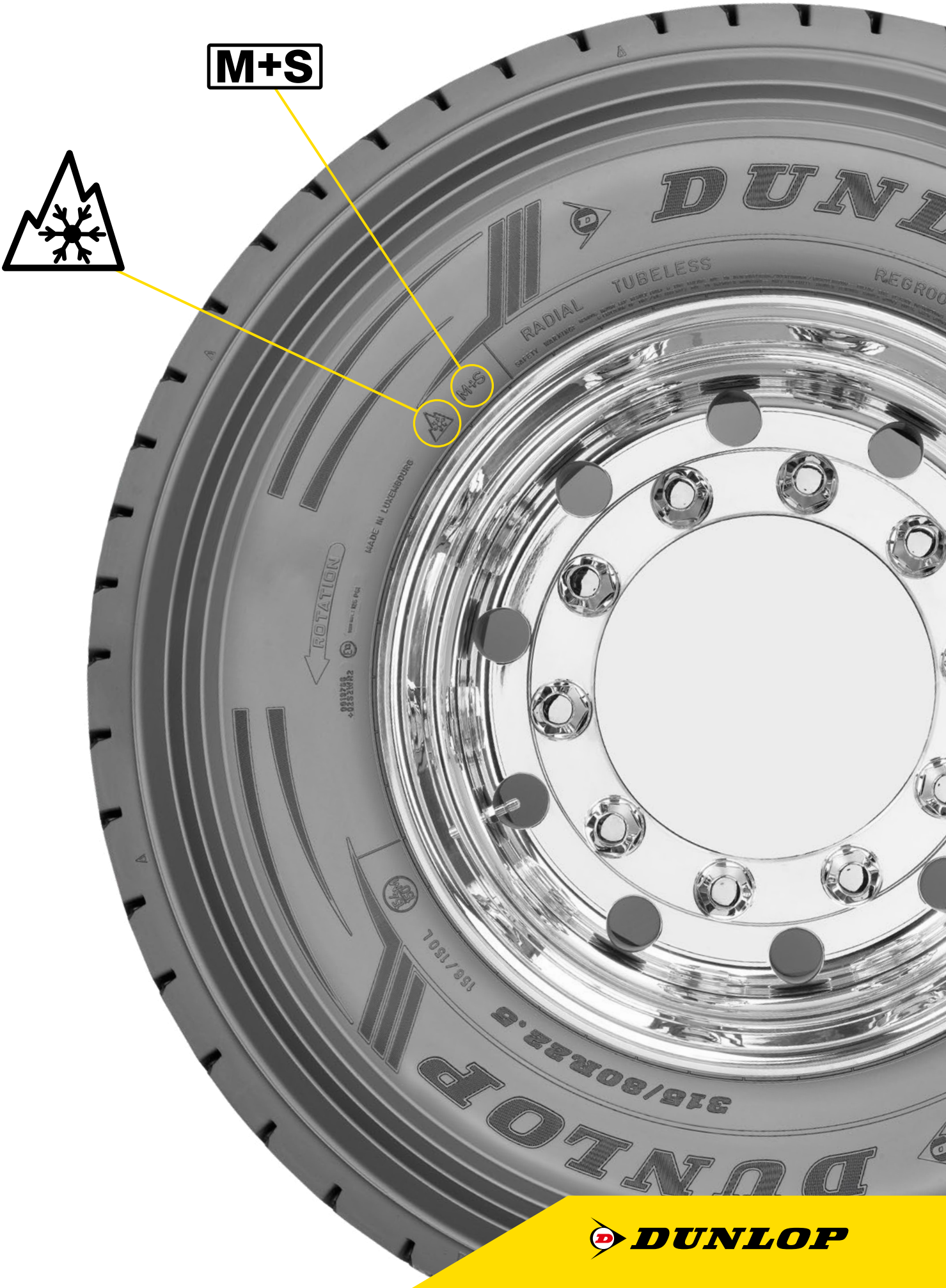
M+S (also M.S. or M&S) has been the widely used marking on winter tyres, stipulated in EU legislation.[1]

On 1 November 2012 Regulation 117 made a new marking official in the EU – the '***Alpine***' symbol, or the Three Peak Mountain Snowflake ('3PMSF'). Unlike the M+S marking, the 3PMSF can only be legally used if the tyre passes a minimum performance threshold requirement on snow, the so called 'snow grip index'.

However, M+S remains as a permitted marking, but not legally linked to a minimum guaranteed performance in winter conditions. M+S tyres have better snow traction than regular tyres but do not necessarily pass the snow grip threshold legal requirement to qualify for the new three-peak snowflake identification.

[1] Council Directive 92/23/EEC of 31 March 1992 relating to tyres for motor vehicles and their trailers and to their fitting.

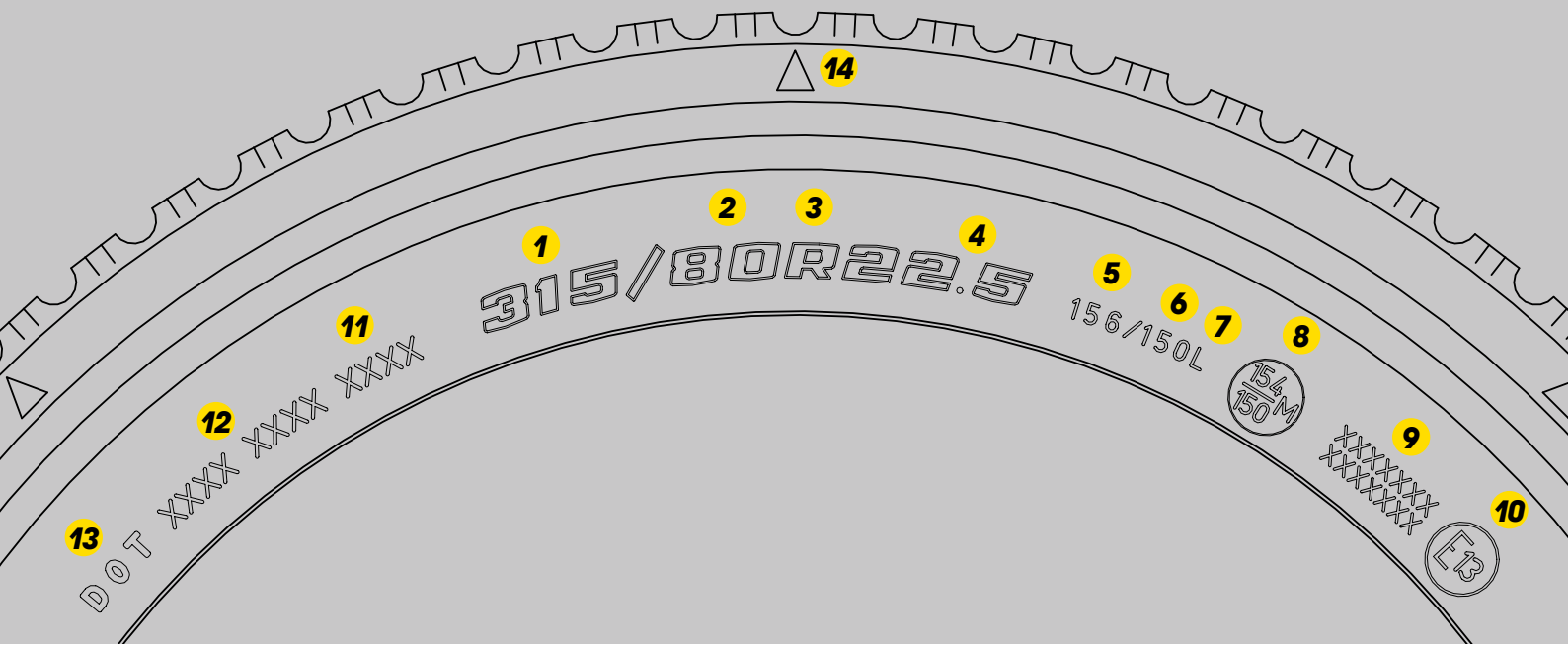
Most of Dunlop truck and bus tyres are marked with the ***M+S*** symbol and some of them already qualify for the new ***3PMSF*** marking.



SIZE DEFINITIONS

Listed below are the size designations that are being used on truck tyres. With each size is an explanation of what each component describes.

13	/		R	22.5	156/150	G
SECTION WIDTH IN INCHES			R-RADIAL	RIM DIAMETER IN INCHES	LOAD INDEX (SINGLE/DUAL MOUNTED)	SPEED SYMBOL
295	/	80	R	22.5	152/148	M
SECTION WIDTH IN MM		ASPECT RATIO	R-RADIAL	RIM DIAMETER IN INCHES	LOAD INDEX (SINGLE/DUAL MOUNTED)	SPEED SYMBOL
385	/	65	R	22.5	160	K
SECTION WIDTH IN MM		ASPECT RATIO	R-RADIAL	RIM DIAMETER IN INCHES	LOAD INDEX (SINGLE MOUNTED)	SPEED SYMBOL



The position of the major tyre markings are as shown;

1. Tyre Section width (mm or inches)
2. Aspect ratio SH / SW
3. Radial construction (R=Radial)
4. Rim Diameter (inches)
5. Single Load Index (Max. load per tyre - single tyre)
6. Dual Load Index (Max. load per tyre - dual mounted)
7. Speed Symbol
8. Single point marking - alternative load indices when used with alternative speed
9. ECE Homologation and noise number - indicates that the tyre conforms to ECE regulations
10. Issuing country of ECE homologation
11. Date code (week, year)
12. Manufacturing Code
13. DOT (Department Of Transportation) - legal marking for the US market
14. TWI - Tread Wear Indicator

USA and Canada
In accordance with US Safety Regulation MVSS 109 for Car tyres, the maximum load of the tyre in pounds (LBS) and its corresponding air pressure in pounds per square inch (PSI) must be shown on the tyre.

Additionally, the tyre must be marked D.O.T. (Department of Transportation) to insure that it conforms to all valid regulations in these countries.

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LOAD INDEX AND SPEED SYMBOL

These parameters are established by ETRTO and are the two most important service factors determining tyre performance.

Load indices and speed symbols are shown on both tyre sidewalls. Example: 149/145 L. The first number denotes the tyre load carrying capacity in SINGLE application, while the second number refers to DUAL fitment. The letter "L" defines the maximum speed limit. Unmarked Radial tyres are allowed up to a speed of 110km/h. (Bias ply tyres are confined to 100km/h).

Retreaded tyres can be run up to a maximum speed of 110km/h, unless they are marked otherwise.

Special purpose tyres, for specific heavy duty applications must have the respective speed limitations identified on the sidewall.

The speed and load service identifications below are required by the European ECE-R54 regulation. The scale below shows the relationship between the Load Index (LI) and actual load values in kilograms (kg).

LOAD INDICES AND CORRESPONDING LOAD CARRYING CAPACITIES IN KG

LI	KG	LI	KG	LI	KG	LI	KG	LI	KG	LI	KG	LI	KG	LI	KG
61	257	75	387	89	580	103	875	117	1285	131	1950	145	2900	159	4375
62	265	76	400	90	600	104	900	118	1320	132	2000	146	3000	160	4500
63	272	77	412	91	615	105	925	119	1360	133	2060	147	3075	161	4625
64	280	78	425	92	630	106	950	120	1400	134	2120	148	3150	162	4750
65	290	79	437	93	650	107	975	121	1450	135	2180	149	3250	163	4875
66	300	80	450	94	670	108	1000	122	1500	136	2240	150	3350	164	5000
67	307	81	462	95	690	109	1030	123	1550	137	2300	151	3450	165	5150
68	315	82	475	96	710	110	1060	124	1600	138	2360	152	3550	166	5300
69	325	83	487	97	730	111	1090	125	1650	139	2430	153	3650	167	5450
70	335	84	500	98	750	112	1120	126	1700	140	2500	154	3750	168	5600
71	345	85	515	99	775	113	1150	127	1750	141	2575	155	3850	169	5800
72	355	86	530	100	800	114	1180	128	1800	142	2650	156	4000	170	6000
73	365	87	545	101	825	115	1215	129	1850	143	2725	157	4125	171	6150
74	375	88	560	102	850	116	1250	130	1900	144	2800	158	4250	172	6300

The **Load Index** denotes the maximum load a given tyre can carry at the maximum speed as indicated by the speed symbol.

SPEED INDICES AND CORRESPONDING MAXIMUM SPEED CAPABILITY

SI	V MAX.	SI	V MAX.	SI	V MAX.	SI	V MAX.	SI	V MAX.
B	50	E	70	J	100	M	130	Q	160
C	60	F	80	K	110	N	140	R	170
D	65	G	90	L	120	P	150	S	180

The **Speed symbol** denotes the maximum speed at which a given tyre can carry the load indicated by the load index.

INTERACTION OF LOAD AND SPEED

Below information is based on the 'European Tyre and Rim Technical Organization - Standards Manual' - Load Variation with Speed section.

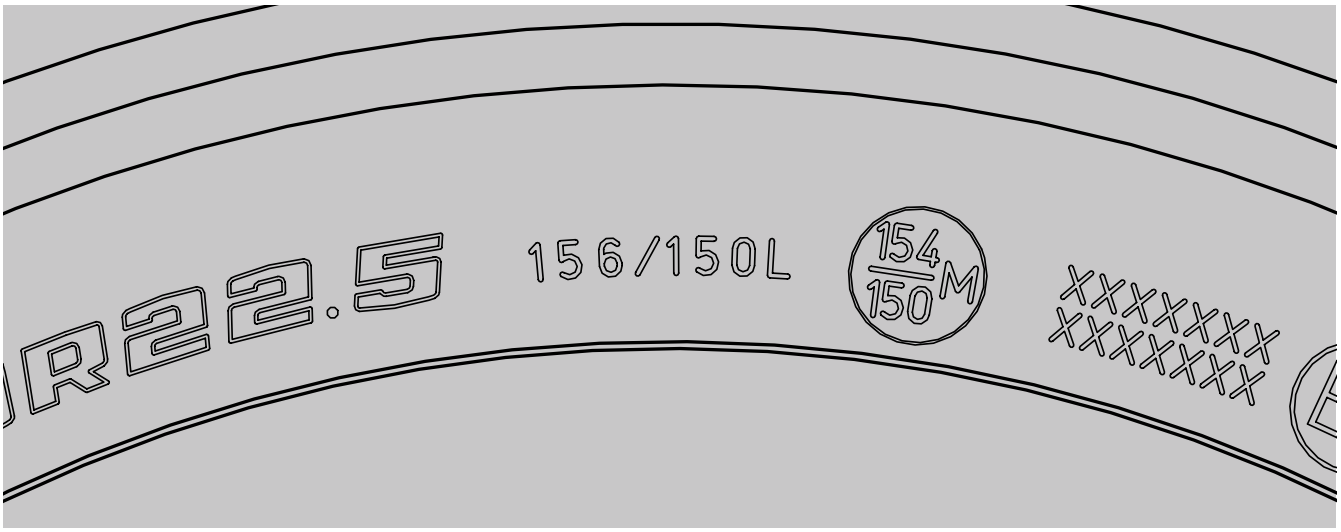
VARIATION IN LOAD CARRYING CAPACITY (%) SPEED SYMBOL							
SPEED (KM/H)	F 80 KM/H	G 90 KM/H	J 100 KM/H	K 110 KM/H	L 120 KM/H	M 130 KM/H	INFLATION PRESSURE COMPENSATION (%)
STATIC	+150	+150	+150	+150	+150	+150	+40
5	+110	+110	+110	+110	+110	+110	+40
10	+80	+80	+80	+80	+80	+80	+30
15	+65	+65	+65	+65	+65	+65	+25
20	+50	+50	+50	+50	+50	+50	+21
25	+35	+35	+35	+35	+35	+35	+17
30	+25	+25	+25	+25	+25	+25	+13
35	+19	+19	+19	+19	+19	+19	+11
40	+15	+15	+15	+15	+15	+15	+10
45	+13	+13	+13	+13	+13	+13	+9
50	+12	+12	+12	+12	+12	+12	+8
55	+11	+11	+11	+11	+11	+11	+7
60	+10	+10	+10	+10	+10	+10	+6
65	+7.5	+8.5	+8.5	+8.5	+8.5	+8.5	+4
70	+5.0	+7.0	+7.0	+7.0	+7.0	+7.0	+2
75	+2.5	+5.5	+5.5	+5.5	+5.5	+5.5	-1
80	0	1.0	+1.0	+4.0	+4.0	+4.0	0
85		2.0	+3.0	+3.0	+3.0	+3.0	0
90		0	+3.0	+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

NOTE: Increment to be applied in the absence of any specific agreement with the tyre manufacturer. These increments do only apply to the "nominal" load/speed indices.

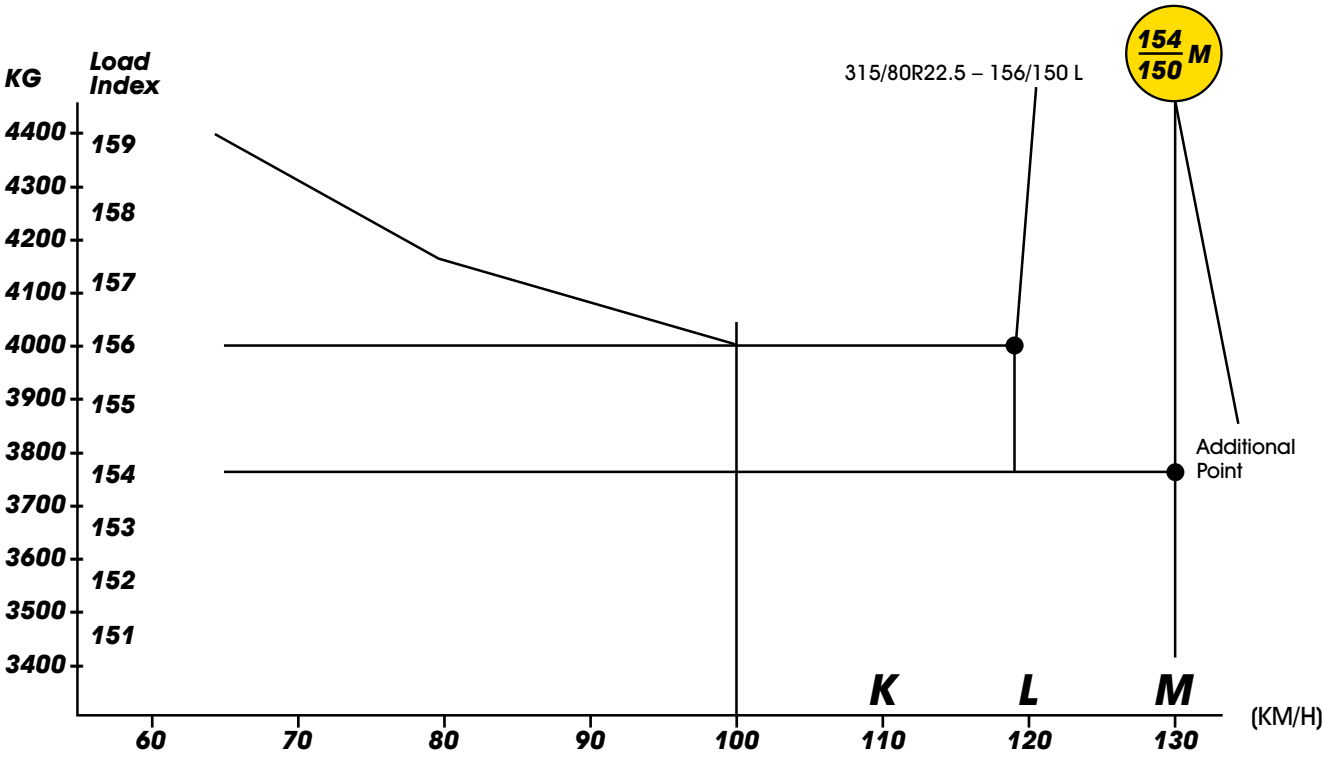
ADDITIONAL LOAD/SPEED MARKINGS

The tyre manufacturer has the possibility to add to the 'nominal' load/speed indices an additional load/speed index with different load index and different speed index. This additional load/speed index is circled.

For other load benefits due to maximum speed variations please consult the table and notes in the 'Interaction of Load and Speed' section.



NOTES: ETRTO tables apply only to nominal LI/SI marking.



NOTES CONCERNING 'VARIATIONS IN LOAD CAPACITY WITH SPEED (%)'

(Below notes refer to the ETRTO (European Tyre and Rim Technical Organisation) Guidelines, in case more details are required, please refer to the actual valid ETRTO Standards Manual)

- For the application being considered, "SPEED" means:

  - either the maximum speed capability of the motor vehicle

  - or any overriding national requirement/legislation for the type of motor vehicle

  - or, in case of "special applications", the specific conditions of use.

- The load carrying capacity of tyres in dual fitments is twice the load carrying capacity in single up to 40km/h. Bonus loads will not be permitted for speeds of 40km/h and above if the wheel axles are rigidly fixed to the body of vehicle.

- ***General definitions***

  Buses (Category M3 vehicles in the EU Directive) are subdivided into three classes depending on the intended type of use. Category M3 vehicles, for the carriage of passengers, have more than eight seats in addition to the driver's seat and exceed 5 tonnes in overall weight.

  Class I
  Urban bus or City bus – foreseen for urban use with frequent stops, these vehicles have spaces for standing passengers and allow movements of passengers.

  Class II
  Suburban bus or Interurban bus – foreseen for passenger transport within a given district, these vehicles have no specific spaces for standing passengers, but allow them to keep standing in the gangway for some distances during the trip.

  Class III
  Touring coach – These vehicles are mainly foreseen for long distances and are designed for the transportation of sitting passengers only.

  On the basis of the specific conditions of use of the buses designed for urban or suburban services and irrespective of their actual maximum speed capability, the following bonus loads apply:

  Class I
  + 15% of the load indices marked on the tyre, when the average speed does not exceed 40km/h.

  Class II
  + 10% of the load indices marked on the tyre, when the operating speed is restricted to 60km/h.

  Class III
  No bonus load Class

- For the equipment of special public service vehicles in urban and suburban applications (for instance road sweepers, fire tenders, etc.), on the basis of specific conditions of use and irrespective of the actual maximum speed capabilities of the vehicle, a bonus load of 10% applies with respect to the load indices marked on the tyre.

- In any case, it is recommended that the maximum permissible load capacity is avoided if the resulting inflation pressure is higher than 1000kPa. In that case, the load capacity shall be reduced accordingly.

- It is imperative to consult Rim/Wheel Manufacturers for the choice of rims and wheels suitable for the load carrying capacities and the inflation pressures required for applications at speeds of 40km/h and below.

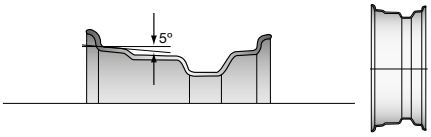
RIMS AND WHEELS

For truck tyres, there are essentially 3 basic rim types available on the market:

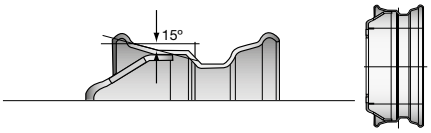
- One-piece tubeless drop centre rims
- Multi-piece tube-type flat base rims
- Multi-piece tubeless flat base rims

One-piece tubeless drop centre

5° Drop centre Rim – (13″, 14″, 17″ etc...) symmetric and asymmetric rims for standard and low section light truck (C) tyres.



15° Drop centre Rim – (17.5″, 19.5″, 22.5″ etc...) rims for standard and wide section (Low Aspect Ratio, Super Single) tyres.

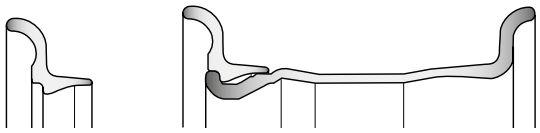


Two and four-piece tube-type flat base

(Mainly 20″) rims for high aspect ratio tyres.
It is important to avoid interchanging of parts from both systems.

NOTE: Each system is usually identified accordingly (stamped 2P or 4P).

Two-piece tube-type flat base



Combination Side Ring

Four-piece tube-type flat base

Lock Ring Side Ring Bead seat band

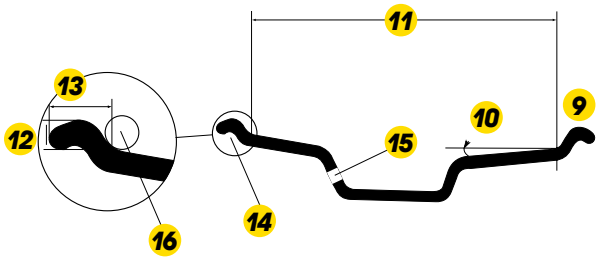
Four-piece tubeless flat base

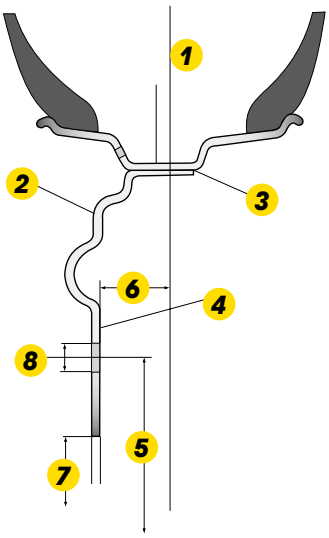
Lock Ring Side Ring Bead seat band

NOTE: (20″) rims for mainly 80-series tyres.
They require a new sealing gasket for each new tyre.

The position of the major tyre markings are as shown;

1. Drop centre
2. Disc
3. Rim/Disc junction
4. Hub contact face
5. Pitch (bolt) circle diameter
6. Offset
7. Centre hole diameter
8. Stud hole diameter
9. Rim flange
10. Taper
11. Rim width
12. Rim flange height
13. Rim flange width
14. Rim flange radius
15. Vale hole
16. Ball tape





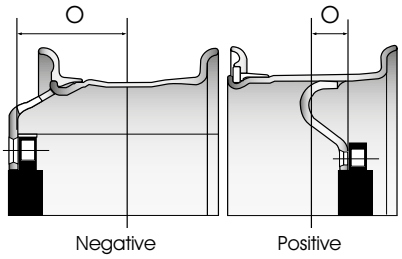
NOTE: Rim diameters can only be accurately measured by means of a special ball tape.

All wheels have a given offset (O) which does not only provide for the necessary brake drum space, but which also determines track width, kingpin offset, handling characteristics and wheel bearing load. On dual assemblies, it also influences the dual spacing.

Tyre fitters and mechanics must therefore ensure that:

- Specific vehicles are fitted with the correct offset wheels.
- Wheels with different offsets are not mixed up on the same axle.

Wheel offsets can be positive, negative or zero. The offset is defined as the distance from the wheel centre to the inside face of the disc (against the hub) and is called positive whenever this inside face is located outside of the centreline, negative when located inside, zero when matching the centreline exactly.

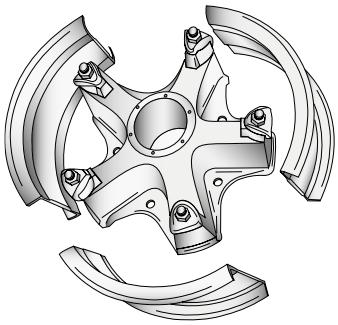


Maintenance, assembling and disassembling rules

As a general maintenance rule, assembling and disassembling of multi-piece rims should only be done with specially designed tools. This will not only assure the safety of the fitter, but will also avoid usage of hammers and other inadequate equipment which could sooner or later damage or break vital rim parts. Also, for 1-piece tubeless rims, proper tooling is essential, since it will otherwise be extremely difficult or even impossible to mount such tyres safely and without bead area damage.

For demountable 1- or multiple-piece spoke-type wheels, the following additional precautions should be taken:

- Contact surfaces between rim and star should not be painted to guarantee perfected centring.
- Bolts should be tightened clockwise (not crosswise) – without exceeding the recommended maximum torque given by the vehicle manufacturer.
- Bolts and clamps should be re-checked at 50-100km after wheel fitment and re-tightened if necessary.
- In case of dual mounting, the spacer ring should be pre-centred over the centring cams (placed on spokeheads).



TUBES AND FLAPS

Only use 'Radial' marked tubes and flaps in Radial Tyres. Preferably fit a new tube and a new flap when mounting a new tyre. Due to their inherent construction, Radial Tyres impose far greater local stresses on Inner tubes than Bias Tyres. 'Radial' marked Tubes are specially compounded to withstand these stresses and their use in Radial Tyres is mandatory. 'Radial' marked Tubes may also be used in Bias Tyres, but in this application, unmarked Bias Tubes are perfectly satisfactory.

The higher stresses in Radial Tyres render the tube more susceptible to Flap Edge Cutting, and the use of 'Radial' marked flaps, specially compounded such that they will not harden excessively in service is mandatory.

Tubes

There are various forms of tyre size marking and these differ in order to differentiate between tyre types. The size markings should be treated the same as a part number on a vehicle, so the motorist should ensure that the tyres on their vehicle carry the precise markings indicated in the vehicle handbook or are an approved alternative fitment.

In case of necessity, a tube may be reused if:

- There is no apparent damage
- The tube has not grown excessively during the first life. It is suggested that for a tube to be reused, a residual radial stretch of at least 15% is required.

NOTES: The fitment of tubes to "tubeless" tyres is not recommended.

Flaps

The flap is designed to:

- Protect the tube from the roughness of the rim
- Prevent the tube being pinched by the component parts of multi-pieced rims
- Prevent the tube being pushed through the valve slot

As a rule we can say that flaps are necessary for any rim which has a valve slot as against a valve hole.

All Drop centre rims including passenger, truck and farm, have a valve hole on the side of the well and require an off centre valve on the tube. They do not require a Flap.

Drop centre truck rims occasionally have the valve hole on centre, but these are normally only fitted with run out tubes in emergency cases which is a practice not endorsed by Dunlop.

All flat base rims with a removable flange have a valve slot extending from the centreline of the rim to the edge. These rims require a flap, and a tube with an on centre valve.

All Semi Drop centre rims have a short valve slot, which may be on or off centre dependant on the type of rim, and upon the rim manufacturer, and require flaps and tubes with respectively on or off centre valvehole, and tube valve.

Rim slot cover plates

Even the best flaps, subjected as they are to high pressure and temperature (wheel temperatures as high as 200°C have been measured on the inside rear position in City Bus service in Europe), are liable to be pushed through the rim slot in service.

Flaps are designed with fabric, or heavy rubber reinforcement in the valve slot area to overcome this problem, but for critical applications the use of commercially available rim slot coverplates, or even a large diameter metal washer are recommended. Since the push through, and possible failure occurs next to the bead, rather than around the valve, Bridge plates are not really effective and their use in Europe is decreasing.

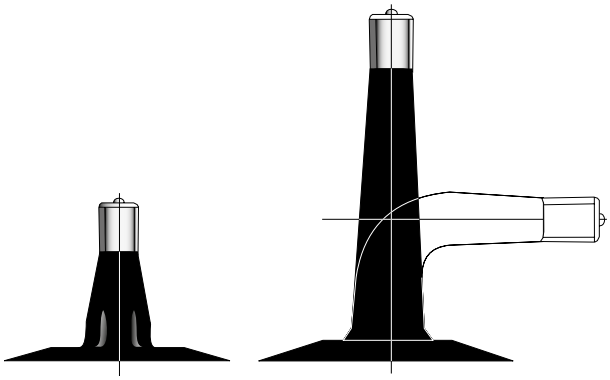
MEDIUM TRUCK – 20/24″			
TYRE SIZE	TUBE	RIM	FLAP
12.00R20	12.00R20	8.0	20R8.5
		8.5	20R8.5
		9.0	20R9.5
14.00R20	14.00R20	10.0	20R9.0
12.00R24	12.00R24	8.0	24R8.5
		8.5	24R8.5
		9.0	24R9.0

VALVES

Three types of Inner Tube Valve exist in Commercial service:

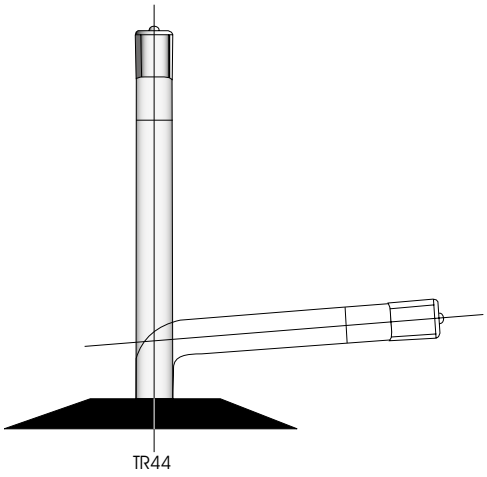
Rubber covered valves

Rubber covered valves which may be rigid as for the TR15, or hand bendable as for the TR150.



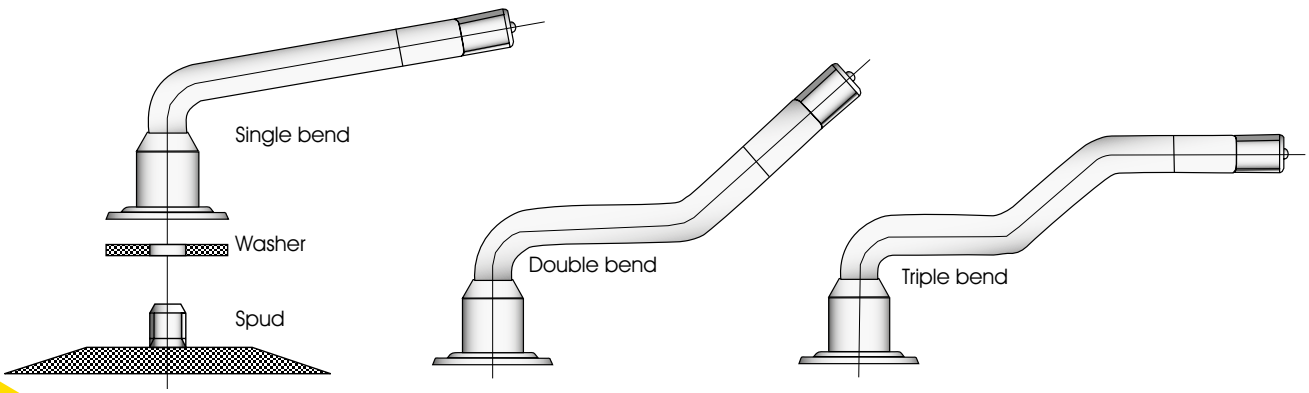
One-piece metal valves

One-piece metal valves, such as the TR44 series.
These are generally supplied with the required bent form, and may be single, double or triple bent.



Two-piece metal valves

European style two-piece metal valves consist of a spud (a short threaded metal tube) vulcanised onto the pre-bent extension which screws onto the spud, using a rubber washer as the air seal.



Fitting extension valves

Extensions are actually coded in the form V*-**-**, but to avoid confusion are generally referred to as the designation of the one piece metal valve to which they are equivalent.

The weakest part of the design of the extension type valves is the rubber washer. The washer is compressed when the valve is tightened, and loses its elasticity with age. Rubber washers should never be reused since they harden and take a permanent set. Similarly, extensions should never be backed off to make them line up with the rim slots.

The correct procedure is to wind the extension onto the stem until it just contacts the washer. Take another half turn. Then mount the tyre/tube/flap assembly, and line the extension up with the slot by tightening further.

Valve caps

Valves must always be fitted with a valve cap.

The valve core is present to allow the internal air pressure to be measured and changed. It is the valve cap which is the primary air seal. Valve caps are always made of metal and have a rubber sealing ring. The plastic dust caps are not suitable for field service. They are designed to prevent damage to the Tube/Valve/Valve Core during transportation from point of manufacture to point of use.

Valve cores

Valve cores are available in two lengths, two temperature ranges, and with either internal or external springs. Fortunately all these cores are interchangeable. It is recommended to use the short core, internal spring, heat resistant type. These are recognisable since the small rubber collar around the core is coloured red.

CONVERSION FROM T&RA TO REFERENCE NUMBERS

T&RA	SINGLE	ETRTO DOUBLE	TRIPLE
TR75	V3.02.27		
TR76	V3.02.8		
TR78	V3.02.12	V3.04.6	V3.06.5
TR175	V3.02.10	V3.04.4	V3.06.3
TR177	V3.02.9	V3.04.3/10	V3.06.1
TR178	V3.02.14		
TR179	V3.02.15		V3.06.6
TR285			V3.07.1

NOTE: Dunlop primarily manufactures truck tubes with spud/screw on extension type valves.

RECOMMENDATIONS

Tyre selection

Tyres should be selected preferably based on the vehicle manufacturer's specifications or recommendations. The tyre size selection is typically based on required axle loads and configurations, as well as on the maximum speed capability of the vehicles.

Tyres should be fitted to the corresponding recommended rims, as defined by the tyre manufacturer and/or by the ETRTO (European Tyre and Rim Technical Organisation) standards.

Usage of other allowed rims shall be agreed upon by the tyre and/or rim or vehicle manufacturer.

It is recommended that vehicles are equipped with tyres of the same construction type (radial or bias) on all positions, tread patterns may vary by axle (steer, drive and trailer). Dual mounted tyres should be the same construction type and of equivalent dimensions.

Tyre storage

Tyres should be preferably stored in cool, dry locations, away from direct sunlight or strong artificial light. Mounted or unmounted tyres should never be stored on oily floors or otherwise in contact with solvents, oil or grease. Nor should tyres be stored in the same or adjoining rooms with volatile solvents.

If possible, tyres should be stored vertically on treads. Unmounted tyres stacked horizontally (on sidewall) should be piled symmetrically and never so high as to cause severe distortion to the bottom tyre. Tyres that are mounted on rims but not on vehicles should follow the same recommendations as for unmounted tyres.

Mounting

Tyre mounting and demounting shall be handled preferably by experienced and trained personnel using proper tools and procedures.

A tyre which is not correctly mounted or which has been damaged will not deliver optimum performance.

Rims should be inspected prior to fitting a tyre – they should be rust free and should not be damaged or show any signs of wear and tear. Specifically, the rim flange areas should be inspected thoroughly.

It is recommended that new valves are always used when fitting new tubeless tyres, respectively new tubes and flaps in case of tube type tyres. New valve caps should be used to protect valve parts from dust, dirt and humidity and thus better protect from eventual air losses.

For lubrication, use vegetable oil based, self evaporating lubricants only or special, dedicated tyre mounting lubricants.

Check position of reference line versus rim flange for correct centring.

As correct bead seating at the rim flanges is important, the maximum 'mounting' inflation pressure may be required to assure correct seating. The maximum allowable 'mounting' inflation pressure is 150% of the maximum nominal inflation pressure of the tyre, but should not exceed 10 bar. Tyre inflation pressure should be adjusted after mounting.

Inflate tyres following the industry standard and legal safety practices.

Inflation pressure

Incorrect inflation pressure is often a cause of tyre damage. Truck and bus tyres should be inflated according to the inflation pressures as indicated in the tyre manufacturer's recommendations. Inflation pressures are typically in function of the axle loads.

Tyre inflation pressures should be checked on a bi-weekly basis. Inflation pressures are to be checked on cold tyres. The pressures indicated in the load-inflation tables always relate to 'cold' inflations at the indicated axle loads. A slight increase of inflation pressure while operating the vehicle has been accounted for in the tables and should not be adjusted.

Over-and under-inflation will not only generate irregular tread wear patterns, but can also lead to premature tyre failure.

Tyre inflation

Tyres may know a sudden air loss during inflation, releasing instant energy and possibly causing injury to the worker or a bystander. Truck and bus tyres should be inflated accordingly to the following safety rules:

1. Never work on an inflated tyre and rim assembly except for visual inspection.
   For other operations, it is essential to make sure that the tyre is completely deflated.
2. Used tyres should not be fitted and inflated if their previous history of use, maintenance or storage conditions are uncertain or unknown. A qualified tyre specialist should inspect the internal and external condition of the used tyres prior to application. Please consult the Tire Information Service Bulletin from Rubber Manufacturer Association ('Passenger And Light Truck Used Tires', Vol. 45, Number 4).
3. Ensure that the rim is correct for the tyre to be fitted.
4. Inflate the tyres in a safety cage or use a safety device. The worker should never face or stand next to the tyre when inflating tyres.
5. Use extension hose with gauge and clip on chuck.
6. Start the inflation in two steps making certain that the beads are seated correctly on the rim seat.
   Stop inflating the tyre at 150 kPa (1.5 bar) (1st step).
7. Inspect the tyre and ensure that there are no tyre deformations or blisters.
8. Check for proper seating of the rim parts. Ensure that the beads are correctly located against the rim flange.
9. Inflate it to the specified inflation pressure (2nd step).
10. Never inflate a tyre beyond the maximum pressure limitations indicated on the tyre sidewall or given in the tyre manufacturer documentation.

Tread depth

All countries belonging to the European Community require a minimum tread depth of 1mm, 1.6mm or 2mm, depending on their legislation. Tyres are required to have at least this much tread in the central three quarters of the tread area all the way around the tyre.

All truck and bus tyres are equipped with TWIs (Tread Wear Indicators) on a few spots around the circumference. These indicators are located in the main grooves of the tread pattern and have a height of 1.6mm from the groove bottom.

WHAT'S NEW WITH EU TYRE LABELLING?

From May 2021, Regulation (EU) 2020/740 applies, changing the way tyres are labelled.

At Dunlop, we continuously develop technology to improve the performance of our products. Our scientists and engineers have worked closely with the European Institutions on the updated tyre label to both promote industry innovation and help consumers make more informed decisions about their tyres. The new EU tyre label will provide greater clarity on the many aspects of a tyre's performance and additional new guidelines will make more detailed information available online – making it easier for consumers and professionals to make the right choice. The changes are summarised in this handy guide.

7 LEVELS REDUCED TO 5

Fuel efficiency and wet grip are now rated just from **A** to **E** (previously A to G).

EXTERNAL ROLLING NOISE

Rated from **A** (lowest noise) to **C** (highest noise).

SNOW TYRE

Only when applicable: tyre designated as "snow grip" tyre, as per UNECE R117.

QR CODE

This can be scanned to give access to product details in the public part of the EU product database.

TYRE TYPE IDENTIFIER

Each tyre product must show a unique identifier.

ICE TYRE

Only when applicable: tyre designated as "ice" tyre, using ISO standards for C1 tyres. No standards defined yet for C2 and C3 tyres.

The new rules

PUBLIC EU DATABASE

Product information sheets and tyre labels must all be made available in the public part of the EU product database.

PRODUCT INFORMATION SHEETS

All tyre types must be accompanied by a product information sheet. As well as the information included on the label, the sheet must show:

- Date of start of production
- Date of end of production when known

LABELLING FOR C3 TYRES

Under the new legislation, C3 tyres must be labelled – either individually or as a batch – as is already mandatory for C1 and C2 tyres.

Want more details?: This guide is a summary of the most important changes.
For more detailed information, please access the official EU legislation here: https://eur-lex.europa.eu/eli/reg/2020/740/oj

WWW.DUNLOP.EU

All information in this document was valid on its date of issuance (April 2021).
For detailed and up to date information, please refer to your dealer
or to www.dunlop.eu
0521/EU-ENG

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Av. Gordon Smith
L-7750 Colmar-Berg

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