

OTR

SALES AND REFERENCE GUIDE

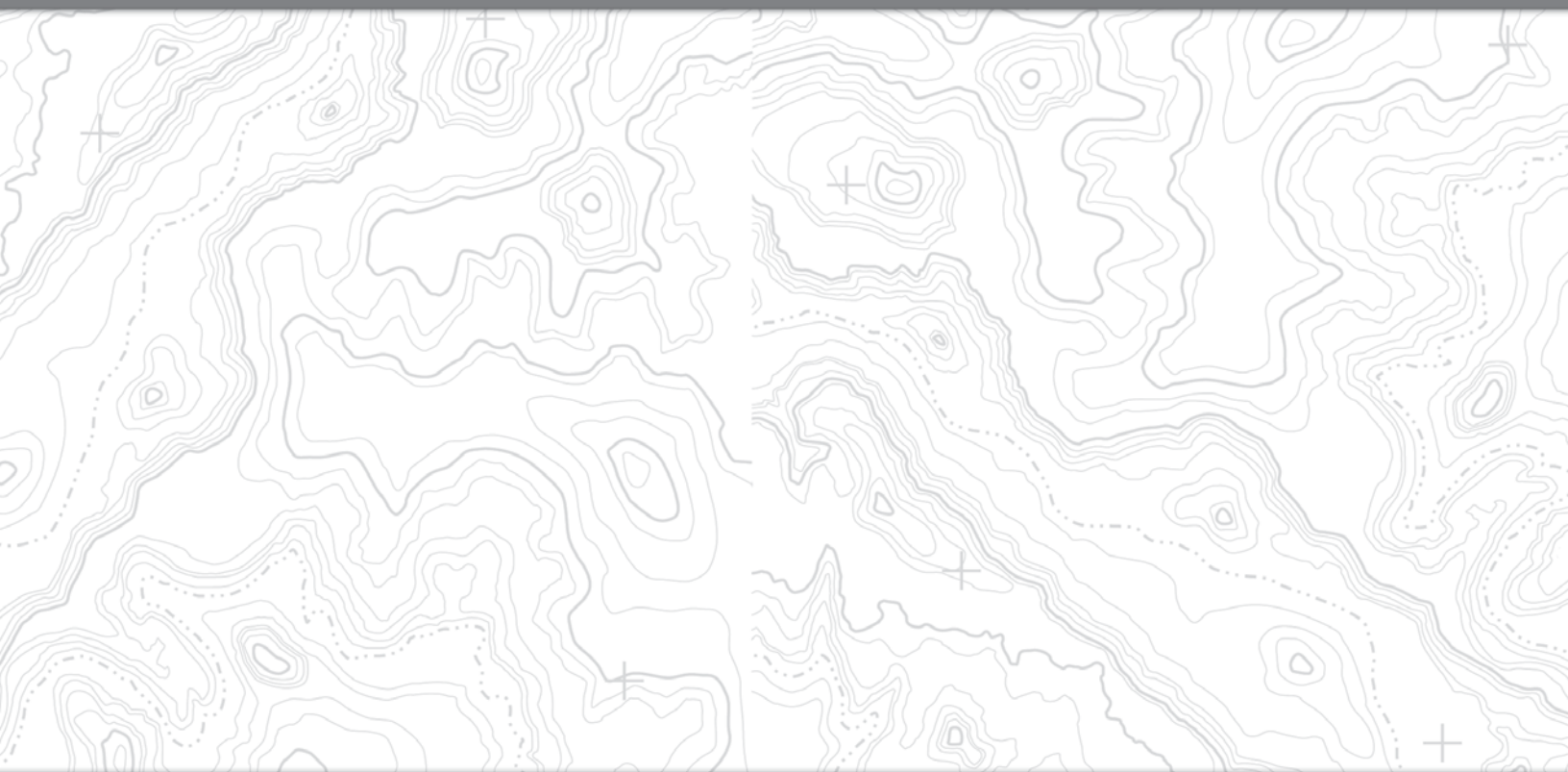


 **YOKOHAMA**

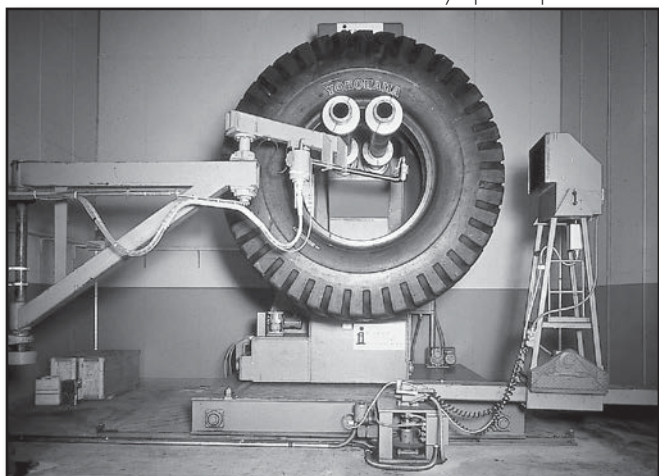
Off The Road Tires *OTR*







X-Ray Spectrophotometer



ONOMICHI Off-The-Road Tire Plant



OTR

SALES AND REFERENCE GUIDE

YOKOHAMA has built its reputation on the attention given to the technological capabilities and advancements of every one of its tires. Its off-the-road tires are high-quality products manufactured at integrated production facilities with rigid quality control. In the pages that follow, we discuss the basic construction, selection, use, maintenance of, and various applications encountered with, the wide variety of **YOKOHAMA** off-the-road tires so that you can get the most in performance, longevity and fuel efficiency out of whatever tire you may need.

Tire Drum Tester



Load Tester



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Outline of Off-The-Road Tires

TRA CLASSIFICATION OF OFF-THE-ROAD TIRES

YOKOHAMA off-the-road tires are classified as follows by the Tire and Rim Association, Incorporated (TRA).

EARTHMOVER TIRES (Dump Trucks and Scrapers)



TRA CODE	TREAD TYPE	YOKOHAMA CODE	
		Radial	Bias
E-1	Rib Regular	RT31+, RB31, RL31 RB41, RB42, RT41, RL42, RL45	Y67, Y565 Y523, Y530, Y567
E-2	Traction Regular		
E-3	Rock Regular		
E-4	Rock Deep Tread		
E-7	Flotation		

LOADER AND DOZER TIRES (Front-End Loaders and Dozers)



TRA CODE	TREAD TYPE	YOKOHAMA CODE	
		Radial	Bias
L-2	Traction Regular	RT31	Y103
L-3	Rock Regular	RT31, RB31, RL31	Y67, Y526, Y575
L-4	Rock Deep Tread	RT41	Y67ET, Y545
L-5	Rock Extra Deep Tread	RL51	Y524, Y525
L-4S	Smooth Deep Tread		Y69, Y69U
L-5S	Smooth Extra Deep Tread		Y69, Y69U, Y69ET

GRADER TIRES (Motor Graders)



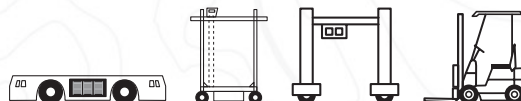
TRA CODE	TREAD TYPE	YOKOHAMA CODE	
		Radial	Bias
G-2	Traction Regular	RT21	Y103
G-3	Rock Regular		Y67

COMPACTOR TIRES



TRA CODE	TREAD TYPE	YOKOHAMA CODE	
		Radial	Bias
C-1	Smooth		Y69

INDUSTRIAL TIRES (Straddle Carriers, Transfer Cranes, Towing Tractors, Reach Stackers and Fork Lifts)



TRA CODE	TREAD TYPE	YOKOHAMA CODE	
		Radial	Bias
IND-3	Traction Regular	RR41	Y67
IND-4	Deep Tread		Y523, Y20
IND-5	Extra Deep Tread		

Caution: Never replace a tire mounted on a vehicle with any tire designed for a different type of vehicle.
For example, you should never place an earthmover tire on a loader.

1 Tires by Type of Vehicle

TIRES BY TYPE OF VEHICLE

YOKOHAMA off-the-road tires are also classified by type of vehicle and application suitable for usage.

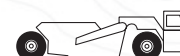
Dump Trucks



(TRA Codes E-1, E-2, E-3, E-4 and E-7)

Since dump trucks must travel under heavy load at high speeds over relatively long distances, tires for dump trucks must have high heat and wear resistance. High resistance to cuts is sometimes also necessary.

Scrapers



(TRA Code E-2, E-3, E-4 and E-7)

Scraper tires, of which the wide base type is most common, should have the same properties as those for dump trucks. Superior flotation and traction are also occasionally required.

Front-End Loaders



(TRA Codes L-2, L-3, L-4, L-5, L-4S and L-5S)

Since front-end loaders operate on rough ground, cut and wear resistance are vital and the tires must provide stability for the loader body. Flotation and traction properties may also be necessary, depending on the working conditions. In certain cases, such as the wet and rough conditions of underground mines, the L-4S and L-5S with smooth treads are used because of their high wear and cut resistant properties.

Motor Graders



(TRA Codes G-1, G-2 and G-3)

The motor grader, which is used for road leveling, clearing and snow removal, needs tires that provide high traction and directional stability. Other characteristics depend on job requirements.

Towing Tractors



(TRA Codes IND-3)

Towing tractors are used to move large aircraft. Thus, these tires mainly require extra traction.

Industrial Vehicles



(TRA Codes IND-3, IND-4 and IND-5)

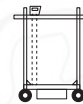
Used for particular service such as port and yard service, industrial vehicles range from forklifts to pot carriers to oil drilling platforms. These tires require extreme casing durability and outstanding tire life to perform in their harsh environments.

1 Tires by Type of Vehicle

TIRES BY TYPE OF VEHICLE

YOKOHAMA off-the-road tires are also classified by type of vehicle and application suitable for usage.

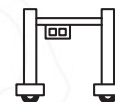
Straddle Carriers



(TRA Codes IND-3)

Straddle carriers are special vehicles that are mainly used at seaport areas to carry ocean-going freight containers. These tires require extra heavy-duty performance, and wear and heat resistance, because straddle carriers operate continuously and turn frequently.

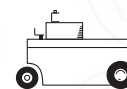
Rubber Tired Gantry Crane (RTG)



(TRA Codes IND-3 and IND-4)

Rubber tired gantry cranes are special cranes mainly used to load and unload containers at seaport areas. These tires require abrasion resistance and durability.

Tire Rollers



(TRA Codes C-1)

Tire rollers use wide tread tires that uniformly distribute weight because of their primary use in compacting road surfaces.

Tire Dozers



(TRA Codes L-2, L-3, L-4 and L-5)

Since a tire dozer is used not only for dozing and leveling, but sometimes for pushing a motor scraper, tires with better traction than loader tires are necessary. Other requirements vary widely depending on job conditions.

Underground Vehicles



Underground vehicles are used in underground mining operations. These tires need to be highly durable as well as highly resistant to cuts, punctures and snags, especially on the sidewalls.

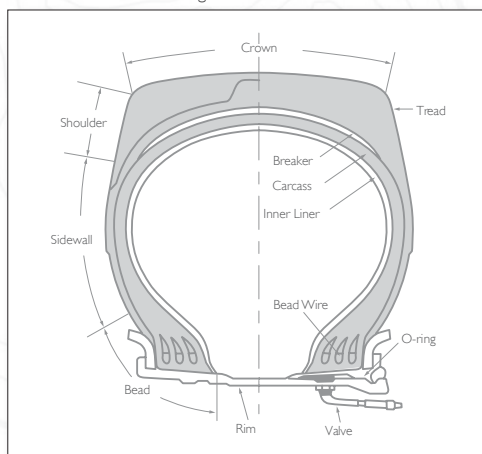
1 Construction of Off-The-Road Tires

CONSTRUCTION OF OFF-THE-ROAD TIRES

Basic Components

The construction of off-the-road tires depends, to a large extent, on the intended use of the tire. However, common components to all off-the-road tires are the tread, carcass, beads, breakers and sidewalls. Tubeless type tires also have an inner liner.

Cross Sectional Diagram of Off-The-Road Bias Tires



① Breakers

The breakers of bias tires are rubber-coated layers of cord between the tread and carcass, binding the two together. The breakers prevent cuts in the tread from reaching the carcass and absorb shocks.

② Tread

The tread is the outermost covering of the tire, and is the only part that normally comes in contact with the road surface. Therefore, it must be designed to protect the body of the tire from cuts and wear. Depending on the intended use of the tire, the rubber compound applied to the tread will be changed to customize cut resistance, heat resistance and oil resistance. The tread pattern also has a large effect on the performance of the tire.

③ Sidewalls

The sidewalls are composed of a flexible, crack resistant rubber, and protect the carcass from damage. For jobs where chuck holes, large rocks, etc., are a problem, tires with high cut resistant sidewalls can be used.

④ Carcass

The compressed air in a tire supports the load placed on the tire. The carcass forms a semi-rigid frame for the compressed air, but it is flexible enough to absorb some shocks and jolts. The carcass of bias tire consists of a number of rubber-coated layers of fabric called "plies."

⑤ Beads

The beads fix the tire to the rim to support the load.

⑥ Inner Liner

The inner liner of tubeless tires are lined. The liner is made of an air-impermeable rubber compound and is comparable to tubes used in tube type tires. Tubeless tires generally weigh less than comparable tube type tires and are simpler to maintain because tube and flap are eliminated.



Structural Diagram of Off-The-Road Bias Tires

COMPOUND CODE LEGEND

CPC.....Cut Protected Compound

RER.....Regular

HRH.....Heat Resistant

CPBP.....CP Compound Light Service

CCZV.....CP Steel Breaker

CPUS.....CP Compound Load & Carry

CPOP.....CP Compound Oil Resistance

CPSP.....CP Compound Anti-Impact Break

CPC/STL....CP Compound Steel Breaker

HRV.....Super Heat Resistance

ID.....Industrial Spec Particular Service

RET.....More Heat Resistant Than RER

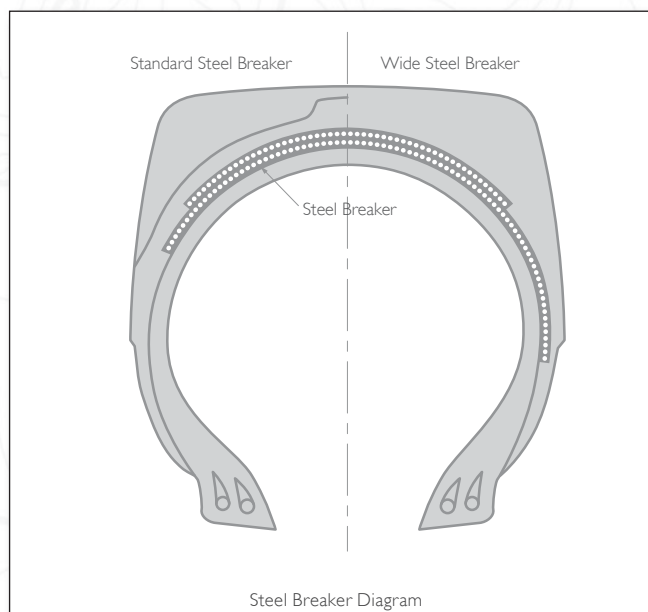
CPID.....Cut Protective Industrial Spec. Particular Service

CPSC.....Cut Protective and Sidewall Cut Protective

1 Construction of Off-The-Road Tires

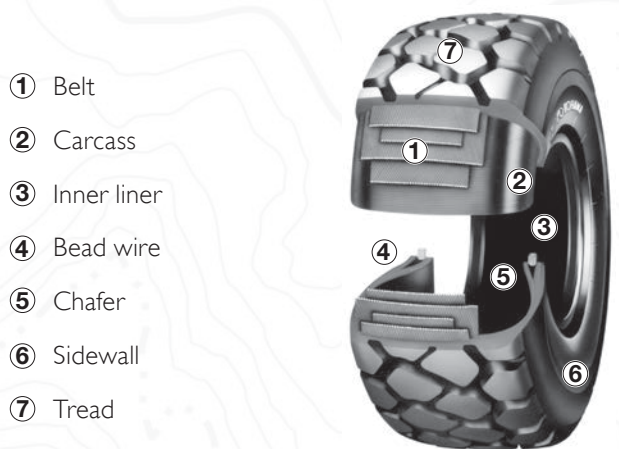
Steel Breakers

The steel breaker tire has steel cord breakers that give it very high cut resistance. It is specially useful where sharp rock is a problem, and is applicable to loader, dozer, dump truck and occasionally earthmover type tires. The adhesiveness between the steel cord and rubber is, however, more susceptible to heat damage than that of nylon cord and rubber. Accordingly, steel breaker tires should not be subjected to conditions where heat generation is great. Because of the difficulty involved in retreading steel breaker tires, they should not be used for jobs where more easily retreaded tires can be used. Steel breakers that extend to the side wall are also available for jobs where high sidewall cut resistance is required.



Radial Tires

The radial tire has two carcass components, both consist of steel. The first is a single bead to bead carcass ply which carries the load and supports the tread. The carcass ply runs at a 90 degree angle in relation to the tire bead. The second is low angle steel belts which are placed on the top of the carcass ply and under tread rubber to minimize tread distortion.



Structural Diagram of Off-The-Road Radial Tires

1 Tread Patterns • Tread Thickness

TREAD PATTERNS

The tread pattern is designed to produce varying degrees of traction, cut resistance, flotation, wear and heat resistance. So selection of the proper off-the-road tire depends on the job and the conditions. For example, different tread patterns are used to produce maximum traction or flotation on sand, mud and rock. There are five basic tread patterns: rock, traction, block, rib and smooth.

Rock Pattern

The rock pattern is specially designed to prevent cuts caused by sharp rock. Its large ground contact area provides excellent wear resistance. Characteristic grooves running across the direction of travel mark the most popular tread pattern for off-the-road tires.



Rock pattern



Rock-flush pattern

Traction Pattern

The traction pattern is a directional tread design, which means the direction of mounting on the rim is important. For example, the mounting direction should place the tread facing one way on the drive wheels to produce proper traction, while on free rolling wheels the tread should face the opposite direction.



Traction pattern

Smooth Pattern

The smooth tread pattern, designed for tire rollers, has no grooves. It is used for compacting and leveling. A smooth pattern tire is also sometimes used on loaders in underground mines because of its high wear and cut resistance. The smooth pattern for loaders, however, has two narrow grooves that are used to measure tread wear.



Smooth for tire rollers



Smooth for loaders

Rib Pattern

The rib pattern has grooves running parallel to the direction of travel and gives high directional stability. The rib-lug pattern (a variation of the rib pattern) has lugs on the shoulders of the tread. Rib pattern tires are mainly used on free-rolling wheels.



Rib pattern

Block Pattern

The block pattern tire is mostly characterized by wide tread width and rounded shoulders. Under heavy loads the block pattern's large ground contact area creates low ground contact pressure for good flotation properties. It is therefore well suited for use on soft, muddy ground. This pattern is also called the "alligator" or "button" pattern.



Block pattern

A narrow base tire has an aspect ratio (tire height/tire width) of 96 to 98%, and a wide base tire has an aspect ratio of 80 to 82%. Widths of narrow and wide base tires of the same diameter are shown here.

13.00-15.5	21.00-26.5
14.00-17.5	24.00-29.5
16.00-20.5	27.00-33.5
18.00-23.5	30.00-37.5

TREAD THICKNESS

According to the TRA, Incorporated, there are three general classifications for tread thickness for off-the-road tires: regular, deep and extra deep. Deep and extra deep are 1.5 and 2.5 times thicker than regular, respectively. The thicker treads have greater cut and wear resistance. The TRA tread codes are classified as follows:

Extra Deep Tread L-5, L-5S

Deep Tread E-4, L-4, L-4S, IND-4

Regular Tread E-2, E-3, G-2, G-3, L-2, L-3, IND-3

1 Tread Thickness

Although thicker treads give greater wear and cut resistance, they also generate and retain more heat. Accordingly, work conditions for thick tread tires should be thoroughly evaluated to prevent heat separation and other heat related damage. Deep and extra-deep tread tires have almost the same overall diameter which is larger than regular tread tires. When replacing regular tread tires with deep or extra-deep tread tires, the larger overall diameters of the thicker tread tires should be taken into consideration.



Regular, deep and extra-deep tread comparison

Size Identification and Aspect Ratio

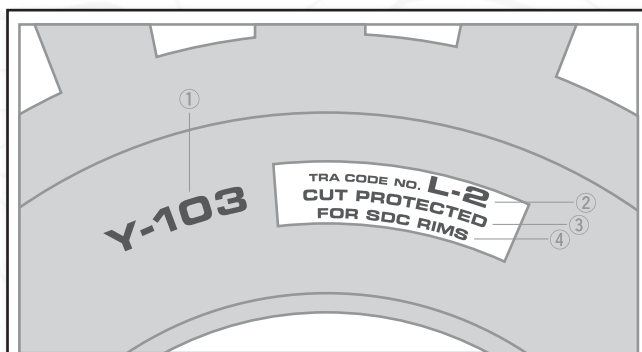
According to TRA guidelines, tire width and aspect ratio of 65 to 70% are called *super low profile tires* and provide high flotation and stability and are usually indicated as follows: *Tire width/aspect ratio-rim diameter* (40/65-39). Some low profile tires are also indicated by *overall diameter × tire width-rim diameter* (42 × 17-20). A suffix, NHS, TG or K, may be attached. These are TRA designations used to differentiate between tires requiring certain conditions. NHS: Not for highway service, TG: Tractor-grader tires, not for highway use, and K: Compactor tire for use on 5° drop center or semi-drop center rims having bead seats with nominal minus 0.032 diameter.

The size of an off-the-road tire is normally indicated by tire width, rim diameter and ply rating. The nomenclature for this is as follows:

Tire Width		Rim Diameter	Ply Rating
21.00	—	35	36PR (Bias Narrow Base)
16.00	R	25	☆☆☆ (Radial Narrow Base)
26.5	—	25	20PR (Bias Wide Base)
23.5	R	25	☆☆ (Radial Wide Base)
(inches)		(inches)	

Tire Specification Code

It is most critical that off-the-road tires are properly matched to the job and road conditions anticipated. Accordingly, off-the-road tires are classified by three types: "regular tire," "cut resistant tire" and "heat resistant tire." The regular type provides general performance for use under standard conditions. Where many obstacles pose cut damage, cut protected types are most suitable. And under good road conditions where higher speeds can be attained, heat resistant types are recommended. YOKOHAMA follows the above classifications and marks tire specifications on the sidewalls as depicted below:



1. Design number, e.g. Y67, Y523, Y575, etc.
2. TRA code, e.g. E-3, E-4, L-5, etc.
3. Tire specification code, RE-X (regular), CP-X (cut protected) or HR-X (heat resistant).
4. Rim specifications where applicable, e.g. for SDC rim use only.

1 Load Index

LOAD INDEX

The **LOAD INDEX** is an international numerical code associated with the maximum load a tire can carry at the speed indicated by its Speed Symbol under service specified conditions.

LI	kg	lbs	LI	kg	lbs	LI	kg	lbs	LI	kg	lbs	LI	kg	lbs	LI	kg	lbs
0	45	99	50	190	419	100	800	1,764	150	3,350	7,385	200	14,000	30,865	250	60,000	132,277
1	46	102	51	195	430	101	825	1,819	151	3,450	7,606	201	14,500	31,967	251	61,500	135,584
2	48	105	52	200	441	102	850	1,874	152	3,550	7,826	202	15,000	33,069	252	63,000	138,891
3	49	107	53	206	454	103	875	1,929	153	3,650	8,047	203	15,500	34,172	253	65,000	143,300
4	50	110	54	212	467	104	900	1,984	154	3,750	8,267	204	16,000	35,274	254	67,000	147,710
5	52	114	55	218	481	105	925	2,039	155	3,875	8,543	205	16,500	36,376	255	69,000	152,119
6	53	117	56	224	494	106	950	2,094	156	4,000	8,818	206	17,000	37,479	256	71,000	156,528
7	55	120	57	230	507	107	975	2,150	157	4,125	9,094	207	17,500	38,581	257	73,000	160,937
8	56	123	58	236	520	108	1,000	2,205	158	4,250	9,370	208	18,000	39,683	258	75,000	165,347
9	58	128	59	243	536	109	1,030	2,271	159	4,375	9,645	209	18,500	40,786	259	77,500	170,858
10	60	132	60	250	551	110	1,060	2,337	160	4,500	9,921	210	19,000	41,888	260	80,000	176,370
11	62	136	61	257	567	111	1,090	2,403	161	4,625	10,196	211	19,500	42,990	261	82,500	181,881
12	63	139	62	265	584	112	1,120	2,469	162	4,750	10,472	212	20,000	44,092	262	85,000	187,393
13	65	143	63	272	600	113	1,150	2,535	163	4,875	10,748	213	20,600	45,415	263	87,500	192,905
14	67	148	64	280	617	114	1,180	2,601	164	5,000	11,023	214	21,200	46,738	264	90,000	198,416
15	69	152	65	290	639	115	1,215	2,679	165	5,150	11,354	215	21,800	48,061	265	92,500	203,928
16	71	157	66	300	661	116	1,250	2,756	166	5,300	11,685	216	22,400	49,384	266	95,000	209,439
17	73	161	67	307	677	117	1,285	2,833	167	5,450	12,015	217	23,000	50,706	267	97,500	214,951
18	75	165	68	315	694	118	1,320	2,910	168	5,600	12,346	218	23,600	52,029	268	100,000	220,462
19	78	171	69	325	717	119	1,360	2,998	169	5,800	12,787	219	24,300	53,572	269	103,000	227,076
20	80	176	70	335	739	120	1,400	3,086	170	6,000	13,228	220	25,000	55,116	270	106,000	233,690
21	83	182	71	345	761	121	1,450	3,197	171	6,150	13,558	221	25,750	56,769	271	109,000	240,304
22	85	187	72	355	783	122	1,500	3,307	172	6,300	13,889	222	26,500	58,423	272	112,000	246,918
23	88	193	73	365	805	123	1,550	3,417	173	6,500	14,330	223	27,250	60,076	273	115,000	253,532
24	90	198	74	375	827	124	1,600	3,527	174	6,700	14,771	224	28,000	61,729	274	118,000	260,146
25	93	204	75	387	853	125	1,650	3,638	175	6,900	15,212	225	29,000	63,934	275	121,500	267,862
26	95	209	76	400	882	126	1,700	3,748	176	7,100	15,653	226	30,000	66,139	276	125,000	275,578
27	97	214	77	412	908	127	1,750	3,858	177	7,300	16,094	227	30,750	67,792	277	128,500	283,294
28	100	220	78	425	937	128	1,800	3,968	178	7,500	16,535	228	31,500	69,446	278	132,000	291,010
29	103	227	79	437	963	129	1,850	4,079	179	7,750	17,086	229	32,500	71,650	279	136,000	299,829
30	106	234	80	450	992	130	1,900	4,189	180	8,000	17,637	230	33,500	73,855			
31	109	240	81	462	1,019	131	1,950	4,299	181	8,250	18,188	231	34,500	76,059			
32	112	247	82	475	1,047	132	2,000	4,409	182	8,500	18,739	232	35,500	78,264			
33	115	254	83	487	1,074	133	2,060	4,542	183	8,750	19,290	233	36,500	80,469			
34	118	260	84	500	1,102	134	2,120	4,674	184	9,000	19,842	234	37,500	82,673			
35	121	267	85	515	1,135	135	2,180	4,806	185	9,250	20,393	235	38,750	85,429			
36	125	276	86	530	1,168	136	2,240	4,938	186	9,500	20,944	236	40,000	88,185			
37	128	282	87	545	1,202	137	2,300	5,071	187	9,750	21,495	237	41,250	90,941			
38	132	291	88	560	1,235	138	2,360	5,203	188	10,000	22,046	238	42,500	93,696			
39	136	300	89	580	1,279	139	2,430	5,357	189	10,300	22,708	239	43,750	96,452			
40	140	309	90	600	1,323	140	2,500	5,512	190	10,600	23,369	240	45,000	99,208			
41	145	320	91	615	1,356	141	2,575	5,677	191	10,900	24,030	241	46,250	101,964			
42	150	331	92	630	1,389	142	2,650	5,842	192	11,200	24,692	242	47,500	104,720			
43	155	342	93	650	1,433	143	2,725	6,008	193	11,500	25,353	243	48,750	107,475			
44	160	353	94	670	1,477	144	2,800	6,173	194	11,800	26,015	244	50,000	110,231			
45	165	364	95	690	1,521	145	2,900	6,393	195	12,150	26,786	245	51,500	113,538			
46	170	375	96	710	1,565	146	3,000	6,614	196	12,500	27,558	246	53,000	116,845			
47	175	386	97	730	1,609	147	3,075	6,779	197	12,850	28,329	247	54,500	120,152			
48	180	397	98	750	1,653	148	3,150	6,945	198	13,200	29,101	248	56,000	123,459			
49	185	408	99	775	1,709	149	3,250	7,165	199	13,600	29,983	249	58,000	127,868			

1 Load Index

SPEED SYMBOL

The **SPEED SYMBOL** indicates the speed at which the tire can carry a load corresponding to its Load Index under service specified conditions.

Speed Symbol	Speed (mph)	Speed (km/h)
A1	2.5	5
A2	5	10
A3	10	15
A4	12.5	20
A5	15	25
A6	20	30
A7	22.5	35
A8	25	40

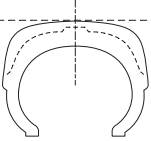
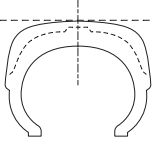
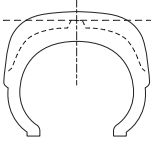
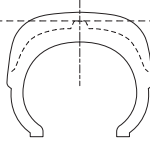







Speed Symbol	Speed (mph)	Speed (km/h)
B	30	50
C	35	60
D	40	65
E	43	70
F	50	80
G	55	90

CONVERSION TABLE: STAR MARK TO PLY RATING

(*)**STAR MARK:** The load capacity of a tire is indicated by the star mark in case of radial tire.

Loader			Earthmover			Grader		
TIRE SIZE	STAR MARK (*)	PLY RATING	TIRE SIZE	STAR MARK ☆	PLY RATING	TIRE SIZE	STAR MARK ☆	PLY RATING
17.5R25	☆	UP TO 16 PR	17.5R25	☆☆	UP TO 16 PR	14.00R24	☆	UP TO 16 PR
20.5R25	☆	UP TO 24 PR	20.5R25	☆☆	UP TO 24 PR			
23.5R25	☆	UP TO 24 PR	23.5R25	☆☆	UP TO 24 PR			
26.5R25	☆	UP TO 24 PR	26.5R25	☆☆	UP TO 32 PR			
29.5R25	☆	UP TO 28 PR	29.5R25	☆☆	UP TO 34 PR			
			14.00R25	☆☆	UP TO 32 PR			
			16.00R25	☆☆	UP TO 36 PR			
			18.00R33	☆☆	UP TO 40 PR			
			24.00R35	☆☆	UP TO 48 PR			
			27.00R49	☆☆	UP TO 54 PR			

1 Off-The-Road Tires Applications: Radial

TRA Code	E-3	E-3	E-3	E-4	E-4
	Regular Tread	Regular Tread	Regular Tread	Deep Tread	Deep Tread
Tread Depth Index					
	100%	100%	100%/125%	150%	150%
Tread Type	ROCK	ROCK	ROCK	ROCK	ROCK
Pattern	RT3I	RB3I	RL3I	RT4I	RL45
Tread Design					
Machines	Dump Truck 	—	—	—	—
	Articulated Dump Truck 	●	●	●	●
	Grader 	—	—	—	—
	Mobile Crane 	—	—	—	—
Surface	Sand	●	○	—	○
	Mud	●	○	—	○
	*Silt & Clay	○	●	●	●
	Rock	○	●	●	●
	Paved	—	—	—	—

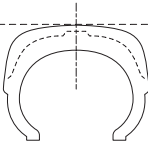
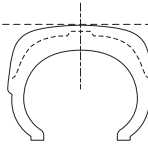
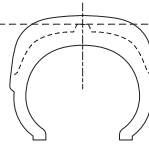
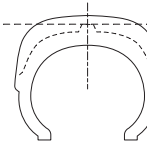
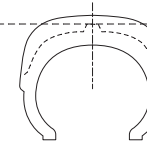









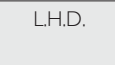
● Recommended ○ Suitable — Not applicable *Some rock surfaces acceptable

1 Off-The-Road Tires Applications: Radial

TRA Code		E-4	E-4	E-4
		Deep Tread	Deep Tread	Deep Tread
Tread Depth Index				
		150%	150%	150%
Tread Type		ROCK	ROCK	ROCK
Pattern		RB41	RB42	RL42
Tread Design				
Machines	Dump Truck 			
	Articulated Dump Truck 	—	—	—
	Grader 	—	—	—
	Mobile Crane 	—	—	—
Surface	Sand			
	Mud			
	*Silt & Clay			
	Rock			
	Paved	—	—	—

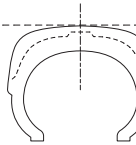
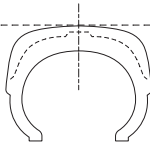
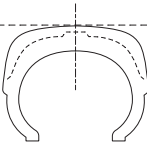
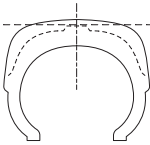




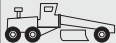


 Recommended  Suitable — Not applicable *Some rock surfaces acceptable

1 Off-The-Road Tires Applications: Radial

TRA Code		L-3	L-3	L-4	L-4	L-5
		Regular Tread	Regular Tread	Deep Tread	Deep Tread	Extra Deep Tread
Tread Depth Index						
		100%/125%	100%	150%	150%	250%
Tread Type		ROCK	ROCK	ROCK	ROCK	ROCK
Pattern		RT3I	RB3I	RT4I	RL45	RL5I
Tread Design						
Machines	Loader & Dozer 	●	●	●	●	●
	Dump Truck 	—	—	—	—	—
	Articulated Dump Truck 	—	—	—	—	—
	Grader 	—	—	—	●	—
	L.H.D. 	—	—	—	●	●
Surface	Sand	●	○	○	○	○
	Mud	●	○	○	○	○
	*Silt & Clay	○	●	●	●	●
	Rock	○	●	●	●	●
	Paved	—	—	—	—	—

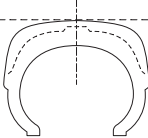
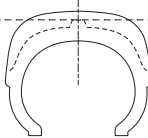
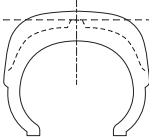


















● Recommended ○ Suitable — Not applicable *Some rock surfaces acceptable

1 Off-The-Road Tires Applications: Radial

TRA Code		G-2	Mobile Crane	Mobile Crane	IND-4
		Regular Tread	Regular Tread	Regular Tread	Deep Tread
Tread Depth Index					
		100%	100%	100%	150%
Tread Type		TRACTION	—	—	—
Pattern		RT21	RB01	RB03	RR41
Tread Design					
Machines	Grader 	●	—	—	—
	Mobile Crane 	—	●	●	—
	Forklift 	—	—	—	—
	Straddle Carrier 	—	—	—	●
Surface	Sand	●	—	—	—
	Mud	●	—	—	—
	*Silt & Clay	○	—	—	—
	Rock	○	—	—	—
	Paved	—	●	●	●

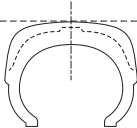
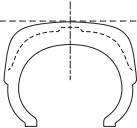
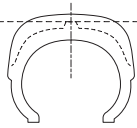
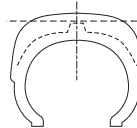
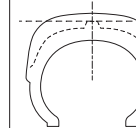
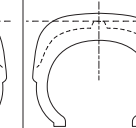
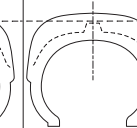





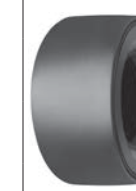
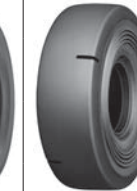

























● Recommended ○ Suitable — Not applicable *Some rock surfaces acceptable



1 Off-The-Road Tires Applications: Bias (for Earthmover)

TRA Code	E-3	E-4	E-4
	Regular Tread	Deep Tread	Deep Tread
Tread Depth Index			
	100%	150%	150%
Tread Type	ROCK	ROCK	ROCK
Pattern	Y67 Y565	Y523	Y567
Tread Design			
Machines	Dump Truck 		
	Scraper 		—
	Mobile Crane 	—	
Surface	Sand		
	Mud		
	*Silt & Clay		
	Rock		
	Paved	—	—

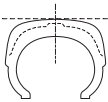
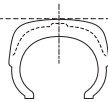
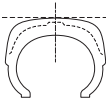
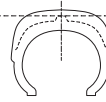










● Recommended ○ Suitable — Not applicable *Some rock surfaces acceptable

1 Off-The-Road Tires Applications: Bias (for Earthmover)

TRA Code	L-2	L-3	L-4	L-5	L-5	L-4S	L-5S
	Regular Tread	Regular Tread	Deep Tread	Extra Deep Tread	Extra Deep Tread	Deep Tread	Extra Deep Tread
Tread Depth Index							
	100%	100%	150%	250%	250%	150%	250%
Tread Type	TRACTION	ROCK	ROCK	ROCK	ROCK	SMOOTH	
Pattern	Y103	Y67 Y526 Y575	Y67ET Y545	Y524 Y524Z	Y525	Y69/Y69U	
Tread Design							
Machines	Loader 						
	Dozer 				—	—	—
	L.H.D. 	—		—			
Surface	Sand			—	—	—	—
	Mud			—	—	—	—
	*Silt & Clay			—	—	—	—
	Rock						
	Paved	—	—	—	—	—	—

 Recommended
  Suitable
 — Not applicable
 *Some rock surfaces acceptable

1 Off-The-Road Tires Applications: Bias (for Grader & Industrial Tires)

TRA Code		G-2	G-3	IND-3	IND-4
		Regular Tread	Regular Tread	Regular Tread	Deep Tread
Tread Depth Index					
		100%	100%	100%	150%
Tread Type		TRACTION	ROCK	—	—
Pattern		Y103	Y67	Y67	Y523
Tread Design					
Machines	Grader 	●	●	—	—
	Forklift 	—	—	●	●
	Straddle Carrier 	—	—	●	—
	Yard Service Vehicle 	—	—	●	—
	Transfer Crane 	—	—	●	—
	Towing Tractor 	—	—	●	—
Surface	Sand	●	○	—	—
	Mud	●	○	—	—
	*Silt & Clay	○	●	—	—
	Rock	—	●	—	—
	Paved	—	—	●	●

● Recommended ○ Suitable — Not applicable *Some rock surfaces acceptable





2 **Yokohama** **Off-The-Road Tires**

2 Off-The-Road: Radial

EARTH MOVERS



RT31 / RT31+ E-3

For articulated dump trucks

- Extra large void-to-lug ratio, in combination with non-directional tread, enables greater traction—particularly in soft and muddy terrain
- Enhanced tread compound provides outstanding wear, low heat generation and cut resistance



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
20.5R25	03167	CP	**	51	17.00x25-2.0	58.7	21.1	26.6	23.1	546.8
23.5R25	03170	CP	**	45	19.50x25-2.5	63.0	24.1	27.7	27.3	712.5
750/65R25	03169	CP	**	55	24.00x25-3.0	64.0	29.5	28.7	32.2	1,006.4
26.5R25	03173†	CP	**	57	22.00x25-3.0	68.1	26.4	30.6	29.4	1,016.1

†RT31+



RB31 E-3

For articulated dump trucks

- Tread designed with non-directional block pattern provides both abrasion resistance and excellent traction on soft surfaces
- Deepest tread depth in its class and industry's strongest belt package
- Buttress side protection and improved road stability
- Low heat generation and flat base hexagon bead construction



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
20.5R25	03152	CP	**	43	17.00x25-2.0	58.1	20.9	26.6	23.1	540.1
23.5R25	03155	CP	**	45	19.50x25-2.5	63.0	24.1	28.3	26.5	776.8
26.5R25	03191	CP	**	49	22.00x25-3.0	68.1	26.0	30.9	29.3	1,068.0
29.5R25	03127	CP	**	60	25.00x25-3.5	72.8	29.8	32.7	33.1	1,297.8



RL31 E-3

For articulated dump trucks

- Rock flush pattern and shoulder pattern provide excellent defense against cuts
- Superior compounds generate longer life and fewer punctures
- Four steel belts offer greater strength and durability
- Sidewall construction built to handle cuts and snags



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
17.5R25	03160	CP	**	40	14.00x25-1.5	52.8	17.5	24.5	19.1	396.8
20.5R25	03175	CP	**	44	17.00x25-2.0	58.1	20.9	26.6	23.1	626.9
23.5R25	03172	CP	**	51	19.50x25-2.5	63.0	25.2	28.3	26.2	895.9

2 Off-The-Road: Radial



RT4I/RT4I CPUG E-4

For articulated dump trucks and scrapers

- Belt package provides durability and greater stability
- High turn-up carcass provides greater lateral stiffness and improved road stability
- Non-directional block pattern creates excellent traction
- CPUG features a unique compound that is ideal for underground operations as it helps prevent cuts, protects against abrasions and provides long-lasting wear



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
23.5R25	04122	CP	**	68	19.50x25-2.5	63.5	23.9	28.7	26.5	809.8
26.5R25	04120	CP	**	76	22.00x25-3.0	68.2	26.4	30.7	29.1	1,083.8
29.5R25	04121	CP	**	82	25.00x25-3.5	73.4	29.9	33.3	32.8	1,421.2
23.5R25	04128*	CPUG	**	68	19.50x25-2.5	63.5	23.9	28.7	26.5	809.8
26.5R25	04126*	CPUG	**	76	22.00x25-3.0	68.2	26.4	28.7	29.1	1,083.7
29.5R25	04127*	CPUG	**	82	25.00x25-3.5	73.4	29.7	33.3	32.8	1,421.1

*RT4I CPUG



RB42 E-4

For rigid dump trucks

- Zig-zag groove pattern provides better traction
- Large center blocks resist cuts and enhance overall wear
- Steel cord belts guard against tread punctures
- Rock flush pattern ejects rocks and gravel for better longevity



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
18.00R33	04201	CP	**	70	13.00x33-2.5	73.6	20.0	33.7	22.4	967.9
24.00R35	04203	CP	**	80	17.00x35-3.5	85.4	26.0	38.5	29.3	1,618.5
24.00R35	04206	REG	**	80	17.00x35-3.5	85.4	26.0	38.5	29.3	1,613.9
27.00R49	04204	CP	**	93	19.50x49-4.0	105.6	28.9	48.0	32.7	2,818.9
27.00R49	04205	REG	**	93	19.50x49-4.0	105.6	28.9	48.0	32.7	2,818.9
33.00R51	04207	CP	**	115	24.00x51-5.0	120.5	36.0	54.3	40.2	5,070.6
33.00R51	04208	REG	**	115	24.00x51-5.0	120.5	36.0	54.3	40.2	5,070.6



RL42 E-4

For rigid dump trucks

- Circumferential grooves dissipate heat for longer hauling capabilities
- Directional tread pattern and deep, wide grooves expel mud and dirt for enhanced traction and stability
- Buttress side protection defends the sidewall from snags and cuts



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
18.00R33	42000	CP	**	63	13.00x33-2.5	73.2	20.0	33.6	22.4	965.8
24.00R35	42006	CP	**	74	17.00x35-3.5	84.9	26.1	38.5	29.5	1,719.4

2 Off-The-Road: Radial



RB4I E-4

For dump trucks and articulated dump trucks

- Non-directional block pattern provides both abrasion resistance and excellent traction on soft surfaces
- Deep treads with side protector



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
14.00R25	04153	REG	***	48	10.00x25-1.5	55.3	15.5	25.7	17.0	415.2
16.00R25	04150	CP	**	57	11.25x25-2.0	60.3	17.7	27.8	19.7	553.2



RL45 E-4

For articulated dump trucks

- Deep tread provides long life and enhanced stability
- Compound provides low heat generation and cut resistance
- Angled lugs promote long, even wear and improved traction



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
26.5R25	45001	CP	**	76	22.00x25-3.0	69.3	26.6	31.3	29.3	1,168.7

LOADERS



RT3I/RT3I+ L-3

For loaders and dozers

- Extra large void-to-lug ratio, in combination with non-directional tread, enables greater traction—particularly in soft and muddy terrain
- Enhanced tread compound provides outstanding wear, low heat generation and cut resistance



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
20.5R25	03168 [†]	CP	*	51	17.00x25-2.0	58.7	21.1	25.9	24.0	546.8
23.5R25	03171	CP	*	45	19.50x25-2.5	63.0	24.1	27.7	27.3	695.7
26.5R25	03174 ^{††}	CP	*	57	22.00x25-3.0	68.1	26.4	30.1	29.9	1,016.1

[†]RT3I+, ^{††}RT3I+S



RB3I L-3

For loaders and dozers

- Tread designed with non-directional block pattern provides both abrasion resistance and excellent traction on soft surfaces
- Deepest tread depth in its class and industry's strongest belt package
- Buttress side protection and improved road stability
- Low heat generation and flat base hexagon bead construction



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
17.5R25	03150	CP	*	39	14.00x25-1.5	53.1	17.4	23.9	19.7	362.8
20.5R25	03151	CP	*	43	17.00x25-2.0	58.1	20.9	25.9	24.0	540.1
23.5R25	03154	CP	*	45	19.50x25-2.5	63.0	24.1	27.7	27.3	760.0
26.5R25	03157	CP	*	49	22.00x25-3.0	68.1	26.4	30.0	30.0	1,066.1
29.5R25	03128	CP	*	60	25.00x25-3.5	72.8	30.0	31.7	34.1	1,297.8

2 Off-The-Road: Radial



RT4I L-4

For front-end loaders

- Belt package provides durability and greater stability
- High turn-up carcass provides greater lateral stiffness and improved road stability
- Non-directional block pattern creates excellent traction



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
23.5R25	04123	CP	*	68	19.50x25-2.5	63.5	24.0	28.0	27.2	809.8
26.5R25	04124	CP	*	76	22.00x25-3.0	68.2	26.4	29.8	30.0	1,084.0
29.5R25	04125	CP	*	82	25.00x25-3.5	73.4	29.9	32.8	33.7	1,433.6



RL45 L-4

For articulated dump trucks

- Deep tread enables longer wear and greater stability
- Serious traction, side cut protection and better ride comfort
- Abrasion resistant non-directional block pattern



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
26.5R25	45002	CP	*	76	22.00x25-3.0	69.3	26.6	30.6	30.3	1,168.7



RL52 L-5

For loaders, dozers and underground vehicles

- Unique cap compound yields superior cut resistance and longer wear
- Flush tread pattern offers abrasion and cut resistance and a lower lug-to-void ratio
- Buttress side protection helps prevent sidewall snags and cuts



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
26.5R25	52090	CP	*	121	22.00x25-3.0	70.2	27.4	31.5	29.0	1,574.1



RL5I L-5

For front-end loaders and graders

- Non-directional block pattern offers excellent traction
- Multi-layer, cross-ply steel belts promote durability and long lasting performance
- Outstanding wear and cut resistance



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
23.5R25	51501	CP	*	99	19.50x25-2.5	65.3	24.4	29.1	27.3	1,097.3

2 Off-The-Road: Radial

GRADERS



RT2I G-2

For motor graders

- Designed with a non-directional block pattern, allowing for better self-cleaning
- Good traction and flotation on soft and muddy surfaces



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
14.00R24	02101	REG	*	31	8.00x24-1.4	53.0	15.1	23.9	17.0	294.3

CRANES



RB01

For wheel cranes and all-terrain cranes

- New tread pattern and rubber compound provide excellent performance, even wear and long tread life
- Tough casing construction for lower fuel consumption, reduced tire noise, better driving stability and improved high speed durability



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
385/95R25	00131	MC	N	26	10.00x25-1.5	53.3	15.1	24.8	16.5	321.2
445/95R25	00129	MC	N	29	11.25x25-2.0	58.5	17.5	27.2	19.2	436.3



RB01 Tube Type

For mobile crane

- For use on wheel cranes and all-terrain cranes
- Lower fuel consumption
- Tough casing construction



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
14.00R24	00130	MC	***	28	10.00x24-2.0	53.3	15.1	24.6	17.0	341.9



RB03 Tube Type

For mobile crane

- Specially designed tread pattern and compound provide excellent performance, even wear and long tread life
- Tough casing construction and optimized rib pattern provide lower fuel consumption, reduced tire noise, better driving stability and improved high speed durability



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
14.00R24	00134	MC	***	30	10.00x24-2.0	53.2	14.8	25.0	16.5	340.4

2 Off-The-Road: Bias

INDUSTRIAL



RR4I E-4

For yard service vehicles, especially straddle carriers

- Specifically designed for straddle carriers
- Main two circumferential grooves provide excellent steering stability & improve vibration caused by tread design
- Steel cord belting acts to guard against punctures



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
16.00R25	04151	ID	***	66	11.25x25-2.0	59.0	17.0	26.0	20.0	594.4

EARTH MOVERS



Y67 E-3

For loaders and dozers on rock, coal and log-strewn terrain

- For hauling over rock, coal log-strewn terrain
- Tough tread offers resistance to cuts and snags
- Less heat buildup enables smooth running over longer distances than deep tread types



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
16.00-24	06722	CPC	24	43	11.25x24-2.0	58.1	17.5	27.0	18.4	428.4
14.00-25	06708	RER	24	35	10.00x25-1.5	53.0	15.0	24.6	16.1	291.8
16.00-25	06709	CPC	24	43	11.25x25-2.0	58.1	17.5	27.0	18.4	432.4
16.00-25	06710	CPC	28	43	11.25x25-2.0	58.1	17.5	27.0	18.4	450.6
18.00-25	06732	CPC	32	49	13.00x25-2.5	63.0	20.1	29.0	21.0	557.9
26.5-25	06759	RER	26	57	22.00x25-3.0	68.1	27.6	30.6	28.8	844.1
29.5-25	06762	RER	28	62	25.00x25-3.0	73.9	30.6	32.4	32.5	1,068.2
26.5-29	06760	RER	26	51	22.00x29-3.0	72.2	27.2	32.6	28.5	893.7
29.5-29	06764	CPC	34	62	25.00x29-3.5	76.9	30.3	34.5	31.7	1,236.0
33.25-29	16752	CPC	26	58	27.00x29-3.5	81.9	33.4	36.4	34.4	1,546.7
33.25-29	16753	CPC	32	58	27.00x29-3.5	81.9	33.4	46.4	34.4	1,597.3
29.5-35	06766	RER	34	50	25.00x35-3.5	83.5	30.6	38.0	32.2	1,464.6
33.25-35	16711	CPC	32	59	27.00x35-3.5	88.5	33.6	39.5	35.4	1,690.3
33.25-35	06770	RER	38	59	27.00x35-3.5	88.5	33.6	39.5	35.4	1,800.4
37.25-35	16701	CPC	30	64	31.00x35-4.0	94.1	37.8	41.7	39.8	2,123.7
37.25-35	16751	CPBP	30	64	31.00x35-4.0	94.1	37.8	41.7	39.8	1,851.5
37.25-35	16715	CPC	36	64	31.00x35-4.0	94.1	37.8	41.7	39.8	2,150.4
37.5-39	16710	CPC	44	68	32.00x39-4.5	99.0	38.1	44.8	40.0	2,540.5
37.5-39	16712	RER	52	68	32.00x39-4.5	99.0	38.1	44.8	40.0	2,605.7



Y67 E-3

Tube Type For dump trucks and scrapers

- Ideal for hauling over rock, coal and log-strewn terrain



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
14.00-24	06715	CPC	24	35	10.00Wx24	53.0	15.0	24.6	16.1	286.0
14.00-24	06716	CPC	28	35	10.00Wx24	53.0	15.0	24.6	16.1	302.7

2 Off-The-Road: Bias



Y67 E-3

Special Application/Steel Breaker



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
33.25-29	16766	CPC/STL	32	58	27.00x29-3.5	81.9	33.4	36.4	34.4	1,690.9
37.25-35	16714	CPC/STL	36	64	31.00x35-4.0	94.1	37.8	41.7	39.8	2,244.5
37.5-39	16741	CPSP	52	68	32.00x39-4.5	99.0	38.1	44.8	40.0	2,976.4
37.5-39	16750	CPC/STL	52	68	32.00x39-4.5	99.0	38.1	44.8	40.0	2,780.7



Y565 E-3

For hauling over rock, coal and log-strewn terrain

- Tough tread resists cuts and snags
- Less heat buildup enables smooth running over longer distances than the deep tread



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
36.00-51	03179	RET	58	65	26.00x51-5.0	126.0	41.1	57.5	43.3	4,899.8
36.00-51	03180	RET	66	65	26.00x51-5.0	126.0	41.1	57.5	43.3	5,203.9



Y523 E-4

For dump trucks

- Specially designed for use under highly abrasive conditions
- Large ground-contact area of wide, deep double chevron 'flush' pattern provides good cut resistance and long service life



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
16.00-25	02326	CPC	28	75	11.25x25-2.0	60.6	17.4	28.5	18.4	607.1
18.00-25	52304	CPC	32	77	13.00x25-2.5	65.0	20.4	30.4	21.3	817.7
18.00-33	52315	CPC	32	71	13.00x33-2.5	72.8	20.4	34.2	21.3	867.6
18.00-33	52318	RER	32	71	13.00x33-2.5	72.8	20.4	34.2	21.3	864.8
21.00-35	02302	CPC	36	80	15.00x35-3.0	80.5	23.2	37.2	24.5	1,221.4
21.00-35	02336	CCZV	36	80	15.00x35-3.0	80.5	23.2	37.2	24.5	1,355.4
21.00-35	52320	RER	40	80	15.00x35-3.0	80.5	23.2	37.2	24.5	1,355.4
24.00-35	02320	CPC	42	81	17.00x35-3.5	84.5	26.2	39.0	28.0	1,584.4
24.00-35	52322	RER	42	81	17.00x35-3.5	84.5	26.2	39.0	28.0	1,551.3
24.00-49	52339	CPC	42	81	17.00x49-3.5	99.6	25.8	46.6	27.4	2,242.9
27.00-49	52341	CPC	48	90	19.50x49-4.0	105.5	29.4	49.0	31.1	2,501.3
27.00-49	52373	RER	48	90	19.50x49-4.0	105.5	29.4	49.0	31.1	2,475.9
30.00-51	52390	RET	46	106	22.00x51-4.5	113.2	33.4	52.7	35.3	3,568.4
33.00-51	02329	HRV	58	104	24.00x51-5.0	119.6	36.5	55.3	38.8	4,350.7
36.00-51	52345	CPC	50	116	26.00x51-5.0	125.9	40.9	58.1	42.9	5,644.5
40.00-57	02307	RET	68	122	29.00x57-6.0	139.8	44.4	63.9	47.2	7,788.3
40.00-57	02308	RET	76	122	29.00x57-6.0	139.8	44.4	63.9	47.2	7,787.2

2 Off-The-Road: Bias



Y523 E-4

Special Application & Steel Breaker

- For use on dump trucks in high-abrasion conditions
- Flush pattern gives good cut resistance and long service life



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
24.00-35	52330	CPC/STL	42	81	17.00x35-3.5	84.5	26.2	39.0	28.0	1,661.4
27.00-49	02328 ^{††}	CPC/STL	48	90	19.50x49-4.0	105.5	29.4	49.0	31.1	2,610.5
33.00-51	52329	CPC/STL	50	104	24.00x51-5.0	119.6	36.5	55.3	38.8	4,974.6

^{††}Y523ET



Y567 E-4

For long haul operations

- Advanced composition of enhanced tread compound provides outstanding wear, low heat generation and cut resistance
- Less heat buildup enables a smooth running over longer distances than the deep tread type



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
33.00-51	56750	CPC	58	104	24.00x51-5.0	119.6	36.5	55.3	38.8	4,478.8
33.00-51	56752 [†]	RET	58	104	24.00x51-5.0	119.6	36.5	55.3	38.8	4,478.8
33.00-51	56754	CPC	50	104	24.00x51-5.0	119.6	36.5	55.3	38.8	4,200.5
33.00-51	56755 [†]	RER	50	104	24.00x51-5.0	119.6	36.5	55.3	38.8	4,200.5
40.00-57	56751 [†]	RER	68	117	29.00x57-6.0	139.5	44.4	63.9	47.2	7,449.7
40.00-57	56753	CPC	68	117	29.00x57-6.0	139.5	44.4	63.9	47.2	7,494.1

^{††}Y567E

LOADERS



Y103 L-2

For loaders and dozers

- Provides good traction and flotation on muddy ground
- Directionally-opposed lug produces self-cleaning action



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
15.5-25	10350	RER	12	32	12.00x25-1.3	50.6	15.4	22.6	17.0	202.3
17.5-25	10352	RER	12	34	14.00x25-1.5	53.7	17.1	23.6	18.8	238.9
20.5-25	10361	RER	12	40	17.00x25-2.0	58.9	21.1	25.5	23.0	324.8
20.5-25	10362	RER	16	40	17.00x25-2.0	58.9	21.1	25.5	23.0	346.2
23.5-25	10364	RER	16	45	19.50x25-2.5	63.8	24.1	27.0	26.8	517.1

2 Off-The-Road: Bias



Y67 L-3

For loaders and dozers on rock, coal and log-strewn terrain

- Tough tread protects from cuts and snags
- Wide ground-contact area lengthens service life



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
13.00-24	06701	RER	16	35	8.00TGx24	50.4	13.7	23.1	15.1	261.6
17.5-25	06705	CPC	12	38	14.00x25-1.5	53.1	17.4	23.6	19.0	264.6
17.5-25	06706	CPC	16	38	14.00x25-1.5	53.1	17.4	23.6	19.0	282.2
20.5-25	06723	CPC	16	42	17.00x25-2.0	59.0	20.8	25.6	22.8	365.6
23.5-25	06726	CPC	16	53	19.50x25-2.5	63.2	23.5	27.9	25.0	583.0



Y526 L-3

For loaders and dozers

- Unique asymmetrical tread pattern and reinforced outer sidewall help prevent cuts



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
23.5-25	52632	CPC	16	56	19.50x25-2.5	63.4	24.2	28.0	26.1	737.5



Y575 L-3

For loaders and dozers in mining, construction and logging operations

- Optimized configuration for improved durability and cut resistance
- Flush tread pattern provides greater contact area meaning a steady, more constant area remains in contact over varying surfaces
- Improved stability and longer service life



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
17.5-25	57505	CPC	12	38	14.00x25-1.5	52.8	17.1	23.4	18.6	259.7
17.5-25	57506	CPC	16	38	14.00x25-1.5	52.8	17.1	23.4	18.6	277.1
20.5-25	57501	CPC	12	41	17.00x25-2.0	58.9	20.9	26.1	22.5	362.2
20.5-25	57508	CPC	20	41	17.00x25-2.0	58.8	20.9	26.1	22.5	427.5
23.5-25	57504	CPC	16	53	19.50x25-2.5	63.2	23.8	27.9	25.4	581.3
23.5-25	57507	CPC	20	53	19.50x25-2.5	63.2	23.8	27.9	25.4	612.0
26.5-25	57509	CPC	20	54	22.00x25-3.0	68.5	27.2	30.3	28.9	874.5
26.5-25	57512	CPC	24	54	22.00x25-3.0	68.5	27.2	30.3	28.9	909.7
29.5-25	57514	CPC	28	62	25.00x25-3.0	73.0	30.1	32.0	32.7	1,255.5

2 Off-The-Road: Bias



Y67ET L-4

For loaders and dozers on rock, coal and log-strewn terrain

- Thicker tread provides added scrub resistance
- ID spec designed to carry heavy loads
- Reinforcements made to the sidewall and to the bead area help deliver exceptional durability



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
29.5-29	06774	CPC	28	99	25.00x29-3.5	79.3	30.3	35.6	32.4	1,653.6



Y545 L-4

For loaders and dozers on rock, coal and log-strewn terrain

- Excels over rock, coal and log-strewn environments
- Deep tread offers excellent wear with superb cut resistance
- Steel breaker construction reduces rock penetration for a longer lifespan



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
23.5-25	54503	CPC	20	71	19.50x25-2.5	65.4	24.5	29.9	26.0	896.0
23.5-25	54502	CPC	24	71	19.50x25-2.5	65.4	24.5	29.9	26.0	921.8
26.5-25	54505	CPC	20	86	22.00x25-3.0	70.3	27.7	31.5	30.1	1,156.6
26.5-25	54506	CPC	24	86	22.00x25-3.0	70.3	27.7	31.5	30.1	1,197.7
29.5-25	54501	CPC	28	94	25.00x25-3.0	74.8	30.9	33.3	33.1	1,490.2
35/65-33	54512	CPUS	30	79	28.00x33-3.5	82.0	35.5	37.5	36.4	2,244.4
35/65-33	54515	CPUS	42	79	28.00x33-3.5	82.0	35.3	37.5	36.4	2,394.8
45/65-45	54507	CPC	58	88	36.00x45-4.5	107.5	45.3	48.8	47.4	4,944.5



Y69U L-4S/L-5S

Underground Mine Service Reinforced Wavy Side Profile (WSP) & Steel Breaker

- Unique wavy side profile with special reinforcement provides high cut resistance for long service life
- Extra-deep reinforced tread for longer treadwear in extreme underground mining conditions
- Specially formulated tread compounds extend the treadlife
- Superior durability in extreme underground mining conditions



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
12.00-24	06907	CPSP	16	56	8.50Vx24	49.4	12.9	23.2	13.7	312.5
17.5-25	06941	CPSP	20	87	14.00x25-1.5	54.7	16.9	25.6	17.9	561.5
18.00-25	06938	CPSP	32	106	13.00x25-2.5	65.7	21.1	30.7	22.5	1,209.3
26.5-25	06918	CPSP	32	114	22.00x25-3.0	70.8	27.2	33.0	29.1	1,721.4

2 Off-The-Road: Bias



Y524 L-5

For loaders and dozers in high-abrasion conditions

- Unique profile with side protector for improved resistance to shoulder and sidewall cuts



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
20.5-25	52401	RER	16	101	17.00x25-2.0	61.3	21.2	28.4	22.6	753.6
20.5-25	52402	RER	20	101	17.00x25-2.0	61.3	21.2	28.4	22.6	793.2
23.5-25	52403	RER	16	111	19.50x25-2.5	65.6	24.4	30.1	26.1	1,036.9
23.5-25	52404	CPC	20	111	19.50x25-2.5	65.6	24.4	30.1	26.1	1,068.6
26.5-25	52405	CPC	20	122	22.00x25-3.0	70.7	26.9	32.3	28.4	1,364.8
26.5-25	52406	RER	24	122	22.00x25-3.0	70.7	26.9	32.3	28.4	1,369.2
29.5-25	52431	CPC	28	140	25.00x25-3.0	75.1	30.5	34.2	32.5	1,870.2
29.5-29	52409	CPC	28	134	25.00x29-3.5	80.3	30.4	36.0	31.5	1,852.3
35/65-33	52433	CPBP	24	121	28.00x33-3.5	81.7	35.4	37.5	36.7	2,385.1
35/65-33	52444	CPBP	30	121	28.00x33-3.5	81.7	35.4	37.5	36.7	2,452.7
35/65-33	52436	CPC	42	121	28.00x33-3.5	81.7	35.4	37.5	36.7	2,686.1
45/65-45	52427	CPBP	38	145	36.00x45-4.5	107.9	46.5	49.6	48.4	4,947.8
45/65-45	52420	CPC	50	145	36.00x45-4.5	107.9	46.5	49.6	48.4	5,418.0
45/65-45	52442	CPC HD	58	145	36.00x45-4.5	107.9	46.5	49.6	48.4	6,229.7

†Y524A



Y524Z L-5

Half Slick For loaders and dozers

- Ideal for rock, coal and ore mining environment
- Half slick asymmetric tread pattern is specifically designed for superior tread and sidewall cut resistance



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
35/65-33	52443	CPC	42	121	28.00x33-3.5	81.3	35.7	37.6	36.8	2,821.2
45/65-45	52440	CPC	58	145	36.00x45-4.5	107.9	46.5	49.6	48.4	5,971.8



Y69ET L-5S

For loaders and underground vehicles

- Deep tread and reinforced sidewalls offer superior resistance to damage and wear



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
12.00-24	06902	CPC	16	69	8.50Vx24	50.4	13.1	23.8	14.0	325.7
14.00-24	06954	CPC	20	79	10.00Wx24	53.7	15.0	25.7	15.5	460.4
17.5-25	06952	CPC	16	87	14.00x25-1.5	54.7	16.9	25.6	17.9	561.5
17.5-25	06955	CPC	20	87	14.00x25-1.5	54.7	16.9	25.6	17.9	581.7
18.00-25	06932	CPC	28	105	13.00x25-2.5	65.0	21.0	30.7	22.5	968.4
18.00-25	06906	CPC	32	105	13.00x25-2.5	65.0	21.0	30.7	22.5	1,187.3
20.5-25	06933	CPC	16	102	17.00x25-2.0	60.8	21.3	28.1	22.2	760.6
23.5-25	06935	CPC	20	117	19.50x25-2.5	64.4	24.3	29.4	25.7	1,062.2
26.5-25	06905	CPC	32	109	22.00x25-3.0	70.8	27.2	31.4	28.8	1,696.7

2 Off-The-Road: Bias



Y69 L-5S

Underground Mine Service For underground vehicle

- Unique wavy side profile with special reinforcement provides high cut resistance for long service life
- Extra-deep reinforced tread for longer treadwear in extreme underground mining conditions
- Specially formulated tread compounds extend the treadlife
- Superior durability in extreme underground mining conditions



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
29.5-29	06965	CPC	34	136	25.00x29-3.5	79.5	30.8	36.9	32.3	2,266.8



Y525 L-5 Tube Type

For loaders and underground vehicles

- Deep tread and reinforced sidewalls offer superior resistance to damage and wear



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
12.00-24	52503	CPC	20	74	8.50Vx24	50.2	13.0	23.4	14.2	309.8

GRADERS



Y103 G-2

For motor graders

- Directionally opposed lugs produce self-cleaning action
- Optimum traction and flotation on muddy surface



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
13.00-24	10356	RER	12	34	8.00TGx24 SDC	50.7	13.8	22.3	15.5	173.3
14.00-24	10357	RER	12	36	10.00TGx24 SDC	53.2	15.6	23.4	17.4	206.2



Y67 G-3

For motor graders on rock, coal and log-strewn terrain

- Tough tread prevents cuts and snags
- Large ground-contact provides long service life



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
13.00-24	06719	RER	12	35	8.00TGx24	50.4	13.1	23.1	14.1	203.1
14.00-24	06720	RER	16	35	10.00VAx24 SDC	53.2	15.0	24.6	15.3	260.6
16.00-24	06721	RER	16	43	10.00VAx24 SDC	58.1	17.5	27.0	18.4	404.2

2 Off-The-Road: Bias

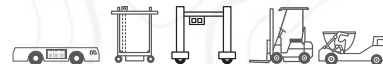
INDUSTRIAL

Y67



Particular Service For straddle-carriers and towing tractors that require better traction than Y92

- Reinforced bead and sidewall area provide exceptional durability
- Specially designed, highly durable spec enables increased load capacity
- Deeper tread depth provides enhanced traction
- Special compounding enables less heat generation and additional scrub resistance
- Optimal rubber-to-void ratio provides better stability



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
12.00-20	06711	ID	18	32	8.50Vx20	44.7	12.8	21.0	13.4	196.3
12.00-24	16746	ID	20	33	8.50Vx24	48.4	12.0	22.6	13.0	205.1
16.00-25	16747	ID	36	43	11.25x25-2.0	58.3	17.5	26.5	19.6	535.1
18.00-25	16719	ID	40	49	13.00x25-2.5	63.8	20.1	28.2	21.7	781.6
21.00-25	16743	ID	40	51	15.00x25-3.0	68.3	23.2	30.8	24.8	964.0
29.5-25	16793	ID	34	62	25.00x25-3.5	73.3	30.6	31.6	32.9	1,206.8
21.00-35	16781	ID	40	58	15.00x35-3.0	78.9	22.8	36.8	24.5	1,172.3
33.25-29	16767	ID	38	58	27.00x29-3.5	81.9	33.4	36.4	34.4	1,698.1
33.25-35	16749	ID	44	59	27.00x35-3.5	88.5	33.6	38.7	35.5	1,999.0

Y69



For industrial vehicles including forklifts and straddle carriers; loaders, underground vehicles, container handlers and port equipment

- Optimized tread volume and ID spec handles heavier loads
- Wider treadface provides better ground contact and stability
- Compound is optimized for long wear on concrete and asphalt surfaces
- Deep tread and reinforced bead and sidewall increase durability in tough operations
- Special under-tread compounds and over-ply casing resist heat enervation and provide longer, more durable casing life



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
14.00-24	06914	ID	30	58	10.00Wx24	53.7	15.4	25.6	15.9	469.4
16.00-25	06919	ID	32	53	11.25x25-2.0	60.4	17.2	27.9	18.7	683.7
18.00-25	06915	ID	40	74	13.00x25-2.5	64.5	21.1	29.7	22.5	1,003.1
18.00-25	06916	ID	40	105	13.00x25-2.5	65.0	21.0	30.7	22.5	1,074.2
21.00-25	06972	ID	40	71	15.00x25-3.0	70.1	23.5	31.3	25.4	1,170.2
18.00-33	06977	ID	40	72	13.00x33-2.5	73.5	20.2	33.2	22.2	1,175.4
21.00-35	06917	ID/CPC	42	81	15.00x35-3.0	80.2	23.6	36.2	25.6	1,574.5

2 Off-The-Road: Bias



Y523

Particular Service / Port Service

- Specially designed for use under highly abrasive conditions
- Large ground-contact area of wide, deep double chevron 'flush' pattern provides good cut resistance and long service life



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
18.00-25	02343	ID	40	77	13.00x25-2.5	65.0	20.4	30.4	21.3	831.9
18.00-33	05326	ID	40	71	13.00x33-2.5	72.8	20.4	34.2	21.3	1,011.0
18.00-33	02335	ID/STL	40	71	13.00x33-2.5	72.8	20.4	34.2	21.3	1,097.3
33.00-51	02355	ID	58	104	24.00x51-5.0	119.6	36.5	55.3	38.8	4,740.5
36.00-51	05230	CPC/ID	58	116	26.00x51-5.0	125.9	40.9	58.1	42.9	5,904.6
40.00-57	02338	ID	76	122	29.00x57-6.0	138.8	44.4	63.9	47.2	7,979.0

MINE SERVICE



Y67

Designed for use in severe applications for underground mines

- Cut-protection compound provides exceptional durability
- Optimal rubber-to-void ratio provides better stability
- Lower cost-per-hour
- Some sizes include steel breakers for extra protection



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
10.00-20	16757	RER	24	26	7.50x20	41.7	11.0	19.6	11.6	150.3
12.00-20	16759	CPC/STL	24	32	8.50Vx20	44.7	12.8	21.0	13.4	213.5
12.00-20	16786	CP	28	32	8.50Vx20	44.7	12.8	21.0	13.4	237.9
14.00-20	16765	CPSC	32	35	10.00W1x20	53.2	15.0	23.5	17.0	353.7
42x13-20	16782	IND-3	36	26	10.00W1x20	42.5	12.8	19.9	13.7	209.5
42x18-20	16788	IND-3	36	27	15.00Tx20	43.7	16.9	20.5	18.1	275.6
44x15-20	16784	IND-3	36	31	10.00W1x20	45.4	13.7	20.6	14.6	277.8
44x18-20	16763	ID	36	32	15.00Tx20	45.3	17.4	20.7	18.2	372.7
50x20-20	16769	ID	36	35	15.00Tx20	49.6	20.2	22.7	19.8	482.5
12.00-24	16787	ID	28	33	8.50x24	49.6	12.7	22.3	14.0	217.6



Y20

Underground Mine Service Tire

- Tough tread protects against cuts and snags
- Wide ground-contact area lengthens service life
- New tread rubber compound provides outstanding wear and cut resistance



Size	Part#	Compound	Ply	Groove Depth	Rim Size	Inflated Dimensions		Static Loaded Radius (in.)	Static Loaded Width (in.)	Ship Weight
						Overall Diameter (in.)	Overall Width (in.)			
39x15-20	02003	ID	36	29	12.00x20	39.6	13.4	18.0	14.0	209.0
39x15-20	02004†	ID	36	29	12.00x20	39.6	13.4	18.0	14.0	188.5

†TT

2 Load & Inflation Pressure Tables: Radial

LOAD & INFLATION PRESSURE TABLES: RADIAL

Off-The-Road Haulage Service (for Dump Trucks & Scrapers)

Wide Base Radial Ply Tires

Maximum Speed: 30 MPH (50 KPH). Distance: Up to 2.5 miles (4 km) one way.

TIRE SIZE DESIGNATION	TIRE LOAD LIMITS AT VARIOUS COLD INFLATION PRESSURES											
	kPa psi	275 40	300 44	325 47	350 51	375 54	400 58	425 62	450 65	475 69	500 73	525 76
17.5R25	kg lbs	3350 7400	3550 7850	3750 8250	4000 8800	4125 ☆ 9100 ☆	4375 9650	4625 10200	4750 10500	5000 11000	5150 11400	5450 ☆☆ 12000 ☆☆
20.5R25	kg lbs	4375 9650	4750 10500	5000 11000	5300 11700	5600 ☆ 12300 ☆	5800 12800	6150 13600	6500 14300	6700 14800	6900 15200	7300 ☆☆ 16100 ☆☆
23.5R25	kg lbs	5600 12300	6000 13200	6500 14300	6700 14800	7100 ☆ 15700 ☆	7500 16500	7750 17100	8250 18200	8500 18700	9000 19800	9250 ☆☆ 20400 ☆☆
26.5R25	kg lbs	7100 15700	7500 16500	8000 17600	8500 18700	9000 ☆ 19800 ☆	9500 20900	9750 21500	10300 22700	10600 23400	11200 24700	11500 ☆☆ 25400 ☆☆
29.5R25	kg lbs	8500 18700	9250 20400	9750 21500	10300 22700	10900 ☆ 24000 ☆	11500 25400	11800 26000	12500 27600	12850 28300	13600 30000	14000 ☆☆ 30900 ☆☆

NOTES 1: Bold face figures denote maximum load for symbols shown.

2: For 40 mph (65 km/h) maximum speed, the above loads must be reduced 12% with no change in inflation pressure.

Off-The-Road Haulage Service (for Dump Trucks & Scrapers)

Conventional Radial Ply Tires

Maximum Speed: 30 MPH (50 KPH). Distance: Up to 2.5 miles (4 km) one way.

TIRE SIZE DESIGNATION	TIRE LOAD LIMITS AT VARIOUS COLD INFLATION PRESSURES											
	kPa psi	450 65	475 69	500 73	525 76	550 80	575 83	600 87	625 91	650 94	675 98	700 102
14.00R25	kg lbs	4000 8800	4125 ☆ 9100 ☆	4375 9650	4500 9900	4625 10200	4750 10500	5000 11000	5150 11400	5300 11700	5450 12000	5600 ☆☆ 12300 ☆☆
16.00R25	kg lbs	5150 11400	5450 ☆ 12000 ☆	5600 12300	5800 12800	6000 13200	6300 13900	6500 14300	6700 14800	6900 15200	7100 15700	7300 ☆☆ 16100 ☆☆
18.00R33	kg lbs	7750 17100	8000 ☆ 17600 ☆	8500 18700	8750 19300	9000 19800	9250 20400	9750 21500	10000 22000	10300 22700	10600 23400	10900 ☆☆ 24000 ☆☆
24.00R35	kg lbs	13200 29100	13600 ☆ 30000 ☆	14000 30900	14500 32000	15500 34200	16000 35300	16500 36400	17000 37500	17500 38600	18000 39700	18500 ☆☆ 40800 ☆☆
27.00R49	kg lbs	19500 43000	20000 ☆ 44100 ☆	20600 45400	21800 48100	22400 49400	23000 50700	23600 52000	25000 55100	25750 56800	26500 58400	27250 ☆☆ 60000 ☆☆

NOTES 1: Bold face figures denote maximum load for symbols shown.

2: For 40 mph (65 km/h) maximum speed, the above loads must be reduced 12% with no change in inflation pressure.

Off-The-Road Slow Speed Service (for Loaders & Dozers)

Wide Base Radial Ply Tires

Maximum Speed: 5 MPH (10 KPH). Distance: Up to 250 feet (76 m) one way.

TIRE SIZE DESIGNATION	TIRE LOAD LIMITS AT VARIOUS COLD INFLATION PRESSURES											
	kPa psi	400 58	425 62	450 65	475 69	500 73	525 76	550 80	575 83	600 87	625 91	650 94
17.5R25	kg lbs	6000 13200	6150 13600	6500 14300	6700 14800	7100 ☆ 15700 ☆	7300 16100	7500 16500	7750 17100	8000 17600	8250 18200	8500 ☆☆ 18700 ☆☆
20.5R25	kg lbs	8000 17600	8250 18200	8750 19300	9000 19800	9500 ☆ 20900 ☆	9750 21500	10000 22000	10300 22700	10900 24000	11200 24700	11500 ☆☆ 25400 ☆☆
23.5R25	kg lbs	10300 22700	10600 23400	11200 24700	11500 25400	12150 ☆ 26800 ☆	12500 27600	12850 28300	13200 29100	13600 30000	14000 30900	14500 ☆☆ 32000 ☆☆
26.5R25	kg lbs	12850 28300	13200 29100	14000 30900	14500 32000	15000 ☆ 33100 ☆	15500 34200	16000 35300	16500 36400	17000 37500	18000 39700	18500 ☆☆ 40800 ☆☆
29.5R25	kg lbs	15500 34200	16000 35300	17000 37500	17500 38600	18000 ☆ 39700 ☆	19000 41900	19500 43000	20000 44100	20600 45400	21200 46700	22400 ☆☆ 49400 ☆☆

NOTES 1: Bold face figures denote maximum load for symbols shown.

2: On front tires for front end loaders, it is permissible to increase inflation pressure up to 100 kPa (15 psi) above that shown in the table with no increase in load.

3: For tire load limits at various speeds:

Max. Speed	% Load Change From Above 5 MPH Table
Stationary	+60%
Creep	+30%
2.5 mph (4 km/h)	+15%
5 mph (10 km/h)	No Change
10 mph (15 km/h)	-13%
15 mph (25 km/h)	-20%

1 PSI = 0.0703 kg/cm² | POUND = 0.453592 kg | PSI = 6.894771 kPa | kg = 2.20462 POUNDS | kPa = 0.145038 PSI

2 Load & Inflation Pressure Tables: Radial

Off-The-Road Tractor & Grader Service

Conventional Radial Ply Tires

Maximum Speed: 25 MPH (40 KPH). Distance: Unlimited.

TIRE SIZE DESIGNATION	TIRE LOAD LIMITS AT VARIOUS COLD INFLATION PRESSURES								
	kPa	200	225	250	275	300	325	350	375
	psi	29	33	36	40	44	47	51	54
I4.00R24TG	kg	2240	2430	2650	2800	3000	3250	3350	3650 ☆
	lbs	4940	5360	5840	6150	6600	7150	7400	8050 ☆

- NOTES 1: Bold face figures denote maximum load for symbols shown.
 2: For maintenance work on established highways, inflation pressures may be increased 50% if desired with no increase in loads.
 3: For slope and ditching service, inflation pressures should be increased 15 psi (100 kPa) with no increase in load rating. For extreme conditions, consult tire and rim manufacturers for additional recommended operating requirements.
 4: For tire load limits at various speeds with no increase in inflation pressure:

Max. Speed	% Change To Loads In Above Table
40 km/h (25 mph)	No Change
50 km/h (30 mph)	-9%
60 km/h (35 mph)	-18%
65 km/h (40 mph)	-27%

Off-The-Road in Highway Service (for Mobile Cranes)

Maximum Speed: 44 MPH (70 KPH).

TIRE SIZE DESIGNATION	TIRE LOAD LIMITS AT VARIOUS COLD INFLATION PRESSURES													
	kPa	600	625	650	675	700	725	750	775	800	825	850	875	900
	psi	87	91	94	98	102	105	109	112	116	120	123	127	131
385/95R25 170E	kg	4735	4845	4960	5070	5180	5285	5395	5495	5600	5700	5805	5900	6000
	lbs	10400	10700	10900	11200	11400	11600	11900	12100	12300	12600	12800	13000	13200
445/95R25 177E	kg	5760	5900	6035	6170	6300	6435	6560	6690	6815	6940	7060	7180	7300
	lbs	12700	13000	13300	13600	13900	14200	14500	14700	15000	15300	15600	15800	16100
505/95R25 183E	kg	7395	7575	7750	7920	8095	8260	8425	8590	8750				
	lbs	16300	16700	17100	17500	17800	18200	18600	18900	19300				

Off-The-Road Tire in Highway Service (For Wheel and Mobile Cranes) Tire Load Limits at Various Speed

Max. Speed		Load Capacity Index
MPH	KPH	
Stationary		3.03
Creep		2.46
2.5	5	2.18
5	10	1.89
20	30	1.3
25	40	1.24
30	50	1.18
35	60	1.12
40	70	1.00
Reference Speed		
50	80	0.82
55	90	0.7
60	100	0.6

Size Conversion Table

INCH	METRIC
14.00R24, 25	385/95R24, 25
16.00R25	445/95R25
18.00R25	505/95R25

Off-The-Road in Highway service (for Wheeled Cranes)

Maximum Speed: 28 MPH (45 KPH)

TIRE SIZE DESIGNATION	TIRE LOAD LIMITS AT VARIOUS COLD INFLATION PRESSURES													
	kPa	600	625	650	675	700	725	750	775	800	825	850	875	900
	psi	87	91	94	98	102	105	109	112	116	120	123	127	131
I4.00R24	kg	4750	4895	5040	5190	5330	5470	5610	5750	5800	6030	6170	6300	6500 ☆☆☆
	lbs	10500	10800	11100	11400	11700	12100	12400	12700	12800	13300	13600	13900	14300 ☆☆☆

2 Load & Inflation Pressure Tables: Bias

LOAD & INFLATION PRESSURE TABLES: BIAS

Off-The-Road Haulage Service (for Dump Trucks & Scrapers)

Code No. E-1, E-2, E-3, E-4 and E-7 Narrow Base Bias Ply Tires

Maximum Speed: 30 MPH (50 KPH). Distance: Up to 2.5 miles (4 km) one way.

TIRE SIZE DESIGNATION	TIRE LOAD LIMITS AT VARIOUS COLD INFLATION PRESSURES													
	kPa psi	275 40	300 44	325 47	350 51	375 54	400 58	425 62	450 65	475 69	500 73	525 76	550 80	575 83
12.00-20NHS	kg lbs	2180 4800	2300 5080	2430 5360	2500 5520	2650 (14) 5840 (14)	2725 6000	2800 6150	2900 (16) 6400 (16)	3000 6600	3075 6800	3125 6950	3250 (20) 7150 (20)	
12.00-24, *25NHS	kg lbs	2500 5520	2575 5680	2725 6000	2800 6150	3000 (14) 6600 (14)	3075 6800	3150 6950	3250 (16) 7150 (16)	3350 7400	3450 7600	3550 7850	3650 (20) 8050 (20)	
13.00-24, *25NHS	kg lbs	2900 6400	3000 6600	3150 6950	3250 7150	3450 7600	3550 7850	3650 8050	3875 (18) 8550 (18)					
14.00-20NHS	kg lbs	3000 6600	3150 6950	3350 7400	3450 7600	3650 (16) 8050 (16)	3750 8250	3875 8550	4000 8800	4125 (20) 9100 (20)				
14.00-24, 25NHS	kg lbs	3350 7400	3550 7850	3750 8250	3875 8550	4000 (16) 8800 (16)	4250 9350	4375 9650	4500 9900	4625 (20) 10200 (20)	4750 10500	4875 10700	5000 11000	5150 (24) 11400 (24)
16.00-25	kg lbs	4375 9650	4625 10200	4875 10700	5000 11000	5300 11700	5450 (20) 12000 (20)	5600 12300	5800 12800	6000 (24) 13200 (24)	6300 13900	6500 14300	6700 (28) 14800 (28)	
18.00-25	kg lbs	5600 (16) 12300 (16)	6000 13200	6300 13900	6500 (20) 14300 (20)	6900 15200	7100 15700	7300 (24) 16100 (24)	7500 16500	7750 17100	8000 (28) 17600 (28)	8250 18200	8500 18700	8750 (32) 19300 (32)
18.00-33	kg lbs	6500 14300	6900 15200	7300 16100	7500 16500	8000 17600	8250 18200	8500 (24) 18700 (24)	8750 19300	9000 19800	9250 (28) 20400 (28)	9500 20900	10000 22000	10300 (32) 22700 (32)
21.00-25	kg lbs	7300 16100	7750 (20) 17100 (20)	8000 17600	8500 18700	8750 (24) 19300 (24)	9000 19800	9500 (28) 20900 (28)	9750 21500	10000 22000	10300 (32) 22700 (32)			
21.00-35	kg lbs	8750 19300	9250 20400	9500 20900	10000 22000	10300 22700	10900 24000	11200 (28) 24700 (28)	11500 25400	11800 26000	12150 (32) 26800 (32)	12850 28300	12850 (36) 28300 (36)	
24.00-25	kg lbs	9500 20900	10000 22000	10300 (24) 22700 (24)	10900 24000	11200 24700	11800 (30) 26000 (30)							
24.00-35	kg lbs	11200 24700	11800 26000	12150 26800	12850 28300	13200 29100	14000 (30) 30900 (30)	14500 32000	15000 33100	15500 (36) 34200 (36)	15500 34200	16000 35300	16500 36400	17000 (42) 37500 (42)
24.00-49	kg lbs	13200 29100	14000 30900	14500 32000	15500 34200	16000 35300	16500 (30) 36400 (30)	17000 37500	17500 38600	18500 (36) 40800 (36)	19000 41900	19500 43000	20000 44100	20600 (42) 45400 (42)
27.00-49	kg lbs	16500 36400	17000 37500	18000 39700	19000 41900	19500 43000	20600 45400	21200 (36) 46700 (36)	21800 48100	22400 49400	23000 (42) 50700 (42)	23600 52500	24300 53600	25000 (48) 55100 (48)
30.00-51	kg lbs	20000 44100	21200 46700	22400 49400	23000 50700	24300 53600	25000 55100	25750 56800	27250 60000	28000 61500	29000 (46) 64000 (46)	29000 64000	30000 (52) 66000 (52)	
33.00-51	kg lbs	23600 52000	24300 53600	25750 56800	27250 60000	28000 61500	29000 64000	30000 66000	31500 69500	32500 71500	33500 (50) 74000 (50)	34500 76000	35500 78500	35500 (58) 78500 (58)
36.00-51	kg lbs	28000 61500	30000 66000	31500 69500	32500 71500	34500 (42) 76000 (42)	35500 78500	36500 80500	37500 (50) 82500 (50)	38750 85500	40000 88000	41250 (58) 91000 (58)		
40.00-57	kg lbs	36500 80500	38750 85500	40000 88000	41250 91000	43750 96500	45000 99000	46250 102000	48750 107500	50000 (60) 110000 (60)	51500 113500	53000 117000	54500 (68) 120000 (68)	

② 24 ply rating: 3550 kg @ 650 kPa (7850 lbs @ 94psi) 28 ply rating: 3875 kg @ 750kPa (8850 lbs @ 109psi) ③ 28 ply rating: 4945 kg @ 625 kPa (10900 lbs @ 91psi) 48 ply rating: 5250 kg @ 725kPa (11600 lbs @ 105psi) ④ 28 ply rating: 5600 kg @ 650kPa (12300 lbs @ 94psi) ⑤ 32 ply rating: 7300 kg @ 650 kPa (16100 lbs @ 94psi) ⑥ 12 ply rating: 4750 kg @ 200kPa (10500lbs @ 29psi) 36 ply rating: 9250 kg @ 625 kPa (20400 lbs @ 94psi) 40 ply rating: 9750 kg @ 700 kPa (21500 lbs @ 102psi) ⑦ 36 ply rating: 16000 kg @ 625kPa (35300lbs @ 91psi) 40 ply rating: 11500 kg @ 700 kPa (25400lbs @ 102psi) ⑧ 40 ply rating: 14000 kg @ 625kPa (30900lbs @ 91psi) ⑨ 48 ply rating: 18500kg @ 650 kPa (40800lbs @ 94psi) ⑩ 48 ply rating: 21800 kg @ 650 kPa (48100lbs @ 94psi) ⑪ 66 ply rating: 44700kg @ 600 kPa (98500lbs @ 87psi) ⑫ 76 ply rating: 58700 kg @ 625 kPa (129400lbs @ 91psi)

NOTES: Figures in parenthesis denote ply rating for which bold face loads and inflations are maximum.

*Unavailable from The Yokoyama Rubber Co., Ltd. For 40 MPH (65 KPH) maximum speed, the above loads must be reduced 15% with no change in inflation pressure.

NHS: Not for highway service

Off-The-Road Haulage Service (for Dump Trucks & Scrapers)

Code No. E-1, E-2, E-3, E-4 and E-7 Wide Base Bias Ply Tires

TIRE SIZE DESIGNATION	TIRE LOAD LIMITS AT VARIOUS COLD INFLATION PRESSURES										
	kPa psi	175 25	200 29	225 33	250 36	275 40	300 44	325 47	350 51	375 54	400 58
15.5-25	kg lbs	2575 (8) 5680 (8)	2800 6150	3000 6600	3250 (12) 7150 (12)						
17.5-25	kg lbs	3150 6950	3350 7400	3650 (12) 8050 (12)	3875 8550	4125 9100	4250 (16) 9350 (16)	4500 9900	4625 10200	4875 10700	5000 (20) 11000 (20)
A 20.5-25	kg lbs	4125 9100	4500 (12) 9900 (12)	4875 10700	5150 11400	5450 (16) 12000 (16)	5800 12800	6000 (20) 13200 (20)			
B 23.5-25	kg lbs	5300 (12) 11700 (12)	5800 12800	6150 (16) 13600 (16)	6500 14300	6900 15200	7300 (20) 16100 (20)	7750 17100	8000 (24) 17600 (24)		
C 26.5-25	kg lbs	6700 14800	7300 16100	7750 17100	8250 (20) 18200 (20)	8750 19300	9250 (24) 20400 (24)	9500 (26) 20900 (26)	10000 (28) 22000 (28)		
26.5-29	kg lbs	7100 15700	7750 17100	8250 18200	8750 19300	9250 20400	9750 21500	10300 (26) 22700 (26)			
D 29.5-25	kg lbs	8000 17600	8750 19300	9250 20400	10000 22000	10600 23400	10900 24000	11500 (28) 25400 (28)			
29.5-29	kg lbs	8500 18700	9250 20400	10000 22000	10600 23400	11200 24700	11800 26000	12150 (28) 26800 (28)	12850 28300	13200 29100	14000 (34) 30900 (34)

2 Load & Inflation Pressure Tables: Bias

TIRE SIZE DESIGNATION	TIRE LOAD LIMITS AT VARIOUS COLD INFLATION PRESSURES										
	kPa psi	175 25	200 29	225 33	250 36	275 40	300 44	325 47	350 51	375 54	400 58
29.5-35	kg lbs	9250 20400	10000 22000	10900 24000	11500 25400	12150 26800	12850 28300	13600 (28) 30000 (28)	14000 30900	14500 32000	15000 (34) 33100 (34)
33.25-29	kg lbs	10300 22700	11200 24700	12150 26800	12850 28300	13600 (26) 30000 (26)	14000 30900	15000 (32) 33100 (32)			
33.25-35	kg lbs	11200 24700	12150 26800	12850 28300	14000 30900	14500 32000	15500 34200	16000 (32) 35300 (32)	17000 37500	17500 38600	18000 (38) 39700 (38)
33.5-33	kg lbs	11500 25400	12500 27600	13200 29100	14000 30900	15000 33100	16000 35300	16500 (32) 36400 (32)	17500 38600	18000 39700	18500 (38) 40800 (38)
*33.5-39	kg lbs	12500 27600	13600 30000	14500 32000	15500 34200	16000 35300	17000 37500	18000 (32) 39700 (32)	18500 40800	19500 43000	20000 (38) 44100 (38)
37.25-35	kg lbs	13600 30000	14500 32000	15500 34200	16500 36400	17500 (30) 38600 (30)	18500 40800	19500 (36) 43000 (36)	20000 44100	21200 46700	21800 (42) 48100 (42)
37.5-33	kg lbs	14000 30900	15000 33100	16000 35300	17000 37500	18000 (30) 39700 (30)	19000 41900	20000 (36) 44100 (36)	20600 45400	21800 48100	22400 (42) 49400 (42)
Ⓐ 37.5-39	kg lbs	15000 33100	16000 35300	17000 37500	18500 40800	19500 43000	20600 45400	21200 (36) 46700 (36)	22400 49400	23000 50700	24300 (44) 53600 (44)
*37.5-51	kg lbs	17000 37500	18000 39700	19500 43000	20600 45400	21800 48100	23000 50700	24300 (36) 53600 (36)	25000 55100	26500 58400	27250 (44) 60000 (44)

Ⓐ 24 ply rating: 6700 kg @ 400 kPa (14800lbs @ 58psi) 28 ply rating: 7500 kg @ 475 kPa (16500lbs @ 69psi). Ⓐ 28 ply rating: 8750 kg @ 400 kPa (19300lbs @ 58psi) 32 ply rating: 9350 kg @ 450 kPa (20600lbs @ 65psi). Ⓑ 32 ply rating: 11200 kg @ 425 kPa (24700lbs @ 62psi). Ⓐ 34 ply rating: 13200 kg @ 400 kPa (29100lbs @ 58psi). Ⓐ 52 ply rating: 26500 kg @ 475 kPa (58400lbs @ 69psi)

NOTES: 1: Figure in parentheses denote ply rating for which bold face loads and inflations are maximum. 2: For 40 mph (65 kph) maximum speed, the above loads must be reduced 17% with no change in inflation pressure. *Unavailable from The Yokohama Rubber Co., Ltd

Off-The-Road Slow Speed Service (for Loaders & Dozers)

Code No. L-2, L-3, L-4, L-5, L-4S and L-5S Narrow Base Bias Ply Tires
Maximum Speed: 5 MPH (10 KPH). Distance: Up to 250 feet (76 meters) one way.

TIRE SIZE DESIGNATION	TIRE LOAD LIMITS AT VARIOUS COLD INFLATION PRESSURES												
	kPa psi	475 69	500 73	525 76	550 80	575 83	600 87	625 91	650 94	675 98	700 102	725 105	750 109
8.25-20NHS	kg lbs	2650 5840	2725 6000	2800 6150	2900 (10) 6400 (10)	2900 6400	3000 6600	3075 6800	3150 6950	3250 (12) 7150 (12)			
9.00-20NHS	kg lbs	3150 6950	3250 7150	3350 7400	3450 7600	3550 7850	3550 (12) 7850 (12)						
10.00-20NHS	kg lbs	3550 7875	3650 8050	3750 8250	3875 (12) 8550 (12)	4000 8800	4000 8800	4125 9100	4250 (14) 9350 (14)				
11.00-20NHS	kg lbs	3875 8550	4000 8800	4125 (12) 9100 (12)	4250 9350	4250 9350	4375 9650	4500 (14) 9900 (14)					
12.00-20NHS	kg lbs	4375 9650	4500 9900	4625 10200	4750 10500	4875 (14) 10700 (14)	5000 11000	5150 11400	5300 11700	5450 (16) 12000 (16)			
12.00-24NHS	kg lbs	5000 11000	5150 11400	5300 11700	5450 12000	5600 12300	5600 12300	5800 12800	6000 13200	6150 (16) 13600 (16)			
14.00-20NHS	kg lbs	6000 13200	6300 13900	6500 14300	6700 14800	6700 14800	6900 15200	7100 (18) 15700 (18)	7300 16100	7500 16500	7500 (20) 16500 (20)		
14.00-24NHS	kg lbs	6700 14800	6900 15200	7100 15700	7300 16100	7500 16500	7750 17100	8000 17600	8250 18200	8250 18200	8500 (20) 18700 (20)		
16.00-25	kg lbs	8750 19300	9000 19800	9500 20900	9750 (20) 21500 (20)	10000 22000	10000 22000	10300 22700	10600 (24) 23400 (24)	10900 24000	11200 24700	11200 24700	11500 (28) 25400 (28)
Ⓐ 18.00-25	kg lbs	11500 (20) 25400 (20)	11800 26000	12150 26800	12500 (24) 27600 (24)	12850 28300	13200 29100	13600 30000	13600 (28) 30000 (28)	14000 30900	14500 32000	14500 32000	15000 (32) 33100 (32)

Ⓐ 12 ply rating: 8250 kg @ 275 kPa (18200lbs @ 40psi) 16ply rating: 10000 kg @ 375 kPa (22000lbs @ 54psi) 36ply rating: 16000 kg @ 850 kPa (35300lbs @ 123 psi) 40ply rating: 17000kg @ 950 kPa (37500 lbs @ 138 psi)

65 Series Bias Ply Tires

Code No. L-2, L-3, L-4, L-5, L-4S and L-5S.
Maximum Speed: 5 MPH (10 KPH). Distance: Up to 250 feet (76 meters) one way.

TIRE SIZE DESIGNATION	TIRE LOAD LIMITS AT VARIOUS COLD INFLATION PRESSURES													
	kPa psi	275 40	300 44	325 47	350 51	375 54	400 58	425 62	450 65	475 69	500 73	525 76	550 80	575 83
Ⓐ 35/65-33	kg lbs	16500 36400	17000 37500	18000 39700	19000 (24) 41900 (24)	19500 43000	20000 44100	21200 46700	21800 (30) 48100 (30)	22400 49400	23000 50700	23600 (36) 52000 (36)	24300 53600	25000 55100
Ⓑ 40/65-39	kg lbs	22400 49400	23600 52000	25000 55100	25750 56800	27250 (30) 60000 (30)	28000 61500	29000 64000	30000 66000	30750 (36) 68000 (36)				
Ⓒ 45/65-45	kg lbs	30000 66000	31500 69500	32500 71500	34500 76000	35500 78500	37500 82500	38750 (38) 85500 (38)	40000 88000	41250 91000	42500 93500	43750 (46) 96500 (46)	45000 99000	46250 (50) 102000 (50)

Ⓐ 42 ply rating: 26500 kg @ 625 kPa (58400 lbs @ 91psi) 48 ply rating: 28300 kg @ 700 kPa (62400 lbs @ 102 psi).
 Ⓑ 56 ply rating: 40300 kg @ 725 kPa (88900 lbs @ 109psi). Ⓒ 58 ply rating: 50000 kg @ 675 kPa (110000 lbs @ 98psi).

NOTES: 1. Figures in parentheses denote ply rating for which bold face loads and inflations are maximum.
 2. On front tires for front end loaders, it is permissible to increase the inflation pressure up to 100 kPa (15 psi) above that shown in the table with no increase in load.
 3. For tire load limits at various speeds:

Max. Speed	% Load Change From Above 5 MPH Table
Stationary	+60%
Creep	+30%
2 1/2 mph (4 kph)	+15%
5 mph (10 kph)	No Change
10 mph (15 kph)	-13%
15 mph (25 kph)	-20%

1 PSI = 0.0703 kg/cm² | POUND = 0.453592 kg | PSI = 6.894771 kPa
 1 kg = 2.20462 POUNDS | kPa = 0.145038 PSI

2 Load & Inflation Pressure Tables: Bias

Off-The-Road Slow Speed Service (for Loaders & Dozers)

Code No. L-2, L-3, L-3, L-5 and L5S Wide Base Bias Ply Tires

TIRE SIZE DES.	kPa psi	TIRE LOAD LIMITS AT VARIOUS COLD INFLATION PRESSURES															
		225 33	250 36	275 40	300 44	325 47	350 51	375 54	400 58	425 62	450 65	475 69	500 73	525 76	550 80	575 83	600 87
15.5-25	kg lbs	4000 8800	4250 (8) 9350 (8)	4500 9900	4750 10500	4875 (10) 10700 (10)	5150 11400	5300 11700	5600 (12) 12300 (12)								
17.5-25	kg lbs	4750 10500	5000 11000	5300 11700	5600 12300	5800 12800	6150 (12) 13600 (12)	6300 13900	6700 (14) 14800 (14)	6900 15200	7100 15700	7300 (16) 16100 (16)	7500 16500	7750 17100	8000 17600	8250 (20) 18200 (20)	
Ⓐ 20.5-25	kg lbs	6300 13900	6700 (12) 14800 (12)	7100 15700	7500 16500	7750 17100	8250 (16) 18200 (16)	8500 18700	8750 19300	9250 20400	9500 (20) 20900 (20)	9750 21500	10000 22000	10300 (24) 22700 (24)			
Ⓑ 23.5-25	kg lbs	8000 (12) 17600 (12)	8500 18700	9000 19800	9500 (16) 20900 (16)	10000 22000	10600 23400	10900 (20) 24000 (20)	11200 24700	11800 26000	12150 26800	12500 (24) 27600 (24)					
Ⓒ 26.5-25	kg lbs	10000 (14) 22000 (14)	10900 24000	11500 25400	12150 26800	12500 27600	13200 (20) 29100 (20)	13600 30000	14000 (24) 30900 (24)	14500 (26) 32000	15000 (26) 33100 (26)	15500 (28) 34200 (28)	16000 35300	16500 36400	17000 (32) 37500 (32)		
26.5-29	kg lbs	10900 24000	11500 25400	12150 26800	12500 28300	13600 30000	14000 30900	14500 (22) 32000 (22)	15000 33100	15500 34200	16000 (26) 35300 (26)	17000 37500	17500 38600	18000 (30) 39700 (30)			
29.5-25	kg lbs	12150 26800	12850 (16) 28300 (16)	13600 30000	14500 32000	15000 (22) 33100 (22)	16000 35300	16500 36400	17000 37500	17500 (28) 38600 (28)	18500 40800	19000 41900	19500 43000	20000 (34) 44100 (34)	20600 45400	21200 (34) 46700 (34)	
Ⓓ 29.5-29	kg lbs	12850 28300	14000 30900	14500 32000	15500 34200	16000 (22) 35300 (22)	17000 37500	17500 38600	18000 39700	19000 (28) 41900 (28)	19500 43000	20000 44100	20600 45400	21200 (34) 46700 (34)			
29.5-35	kg lbs	14000 30900	15000 33100	16000 35300	17000 37500	17500 38600	18500 40800	19000 41900	20000 44100	20600 (28) 45400 (28)	21200 46700	21800 48100	22400 49400	23000 (34) 50700 (34)			
33.25-29	kg lbs	16000 35300	17000 37500	17500 (20) 38600 (20)	18500 40800	19500 43000	20600 (26) 45400 (26)	21200 46700	21800 48100	23000 50700	23600 (32) 52000 (32)	24300 53600	25000 55100	25750 (38) 56800 (38)			
33.25-35	kg lbs	17000 37500	18000 39700	19000 (20) 41900 (20)	20000 44100	21200 46700	22400 (26) 49400 (26)	23000 50700	24300 53600	25000 55100	25750 (32) 56800 (32)	26500 58400	27250 60000	28000 (38) 61500 (38)			
33.5-33	kg lbs	17500 38600	18500 40800	19500 43000	20600 45400	21800 48100	22400 49400	23600 52000	24300 53600	25750 (32) 56800 (32)	26500 58400	27250 60000	28000 61500	29000 (38) 64000 (38)	30000 66000	30000 66000	30750 (44) 68000 (44)
*33.5-39	kg lbs	19000 41900	20000 44100	21200 46700	22400 49400	23600 52000	24300 53600	25750 56800	26500 58400	27250 60000	28000 61500	29000 64000	30000 66000	30750 (38) 68000 (38)			
37.25-35	kg lbs	20600 45400	21800 48100	23000 50700	24300 53600	25750 56800	26500 58400	28000 (30) 61500 (30)	29000 64000	30000 66000	30750 (36) 68000 (36)	31500 69500	32500 71500	33500 (42) 74000 (42)			
37.5-33	kg lbs	21200 46700	22400 49400	23600 52000	25000 55100	25750 56800	27250 60000	28000 (30) 61500 (30)	29000 64000	30750 68000	31500 (36) 69500 (36)	32500 71500	33500 74000	34500 (42) 76000 (42)			
37.5-39	kg lbs	22400 49400	24300 53600	25750 56800	26500 58400	28000 61500	29000 64000	30750 68000	31500 69500	32500 71500	33500 (36) 74000 (36)	34500 76000	36500 80500	37500 (44) 82500 (44)			
37.5-51	kg lbs	25750 56800	27250 60000	29000 64000	30000 66000	31500 69500	33500 74000	34500 76000	35500 78500	37500 82500	38750 (36) 85500 (36)	40000 88000	41250 91000	42500 93500	42500 (44) 93500 (44)		

Ⓐ a. 28 ply rating: 11100 kg @ 600 kPa (24500 lbs @ 87psi). Ⓑ 28 ply rating: 13600 kg @ 550 kPa (30000 lbs @ 80psi). Ⓒ 36 ply rating: 17900 kg @ 600 kPa (39500 lbs @ 87psi). Ⓓ 40 ply rating: 23600 kg @ 625 kPa (52000 lbs @ 91psi). *Unavailable from The Yokohama Rubber Co., Ltd.

- NOTES: 1: Figures in parentheses denote ply rating for which bold face loads and inflations are maximum.
2: On front tires for front end loaders, it is permissible to increase inflation pressure up to 15psi above that shown in the table with no increase in load.
3: For tire load limits at various speeds:

Max. Speed	% Load Change From Above 5 MPH Table
Stationary	+60%
Creep	+30%
2 1/2 mph (4 kph)	+15%
5 mph (10 kph)	No Change
10 mph (15 kph)	-13%
15 mph (25 kph)	-20%

Maximum Speed: 5 MPH (10 KPH). Distance: Up to 250 feet (76 meters) one way.

TIRE SIZE DESIGNATION	TIRE LOAD LIMITS AT VARIOUS COLD INFLATION PRESSURES												
	kPa psi	325 47	350 51	375 54	400 58	425 62	450 65	475 69	500 73	525 76	550 80	575 83	600 87
Ⓐ 12.00-24TG	kg lbs	4000 (8) 8800 (8)											
13.00-24TG	kg lbs	4500 9900	4750 10500	5000 (10) 11000 (10)	5150 11400	5300 11700	5600 (12) 12300 (12)	5600 12300	5800 12800	6000 (14) 13200 (14)	6150 13600	6300 13900	6500 (16) 14300 (16)
14.00-24TG	kg lbs	5450 12000	5600 (10) 12300 (10)	6000 13200	6150 13600	6300 (12) 13900 (12)	6500 14300	6700 14800	6900 15200	7100 15700	7300 (16) 16100 (16)		
16.00-24TG	kg lbs	7100 (12) 15700 (12)	7300 16100	7750 17100	8000 17600	8250 (16) 18200 (16)							

Ⓐ 10 ply rating: 4520 kg @ 400 kPa (9960 lbs @ 58 psi) 12 ply rating: 4995 kg @ 475 kPa (11010 lbs @ 69 psi). 16 ply rating: 6000 kg @ 650 kPa (13200 lbs @ 94 psi).

NOTES: 1. Figures in parentheses denote ply rating for which bold face loads and inflations are maximum. TG Tractor-Grade tire - Not for highway service

1 PSI = 0.0703 kg/cm² | POUND = 0.453592 kg | PSI = 6.894771 kPa | kg = 2.20462 POUNDS | kPa = 0.145038 PSI

2 Load & Inflation Pressure Tables: Bias

ETC Bias Ply Tires

Maximum Speed: 5 MPH (10 KPH). Distance: Up to 250 feet (76 meters) one way.

TIRE SIZE DESIGNATION	TIRE LOAD LIMITS AT VARIOUS COLD INFLATION PRESSURES																	
	kPa psi	140 20	160 23	180 26	200 29	220 32	240 35	260 38	280 41	300 44	325 47	350 51	375 54	400 58	425 62	450 65	475 69	500 73
33 x 12.5-15	kg lbs			1510 3330	1605 3540	1695 3735	1785 (6) 3935 (6)											
12.5/70-16	kg lbs	1145 2525	1240 2735	1330 2930	1410 (6) 3110 (6)	1495 3295	1570 3460	1645 (8) 3625 (8)										
**10-16.5	kg lbs			1140 2515	1215 2680	1285 (4) 2830 (4)	1350 2975	1415 3120	1475 3250	1540 3395	1610 (6) 3550 (6)	1685 3715	1750 3860	1820 (8) 4010 (8)				
**10-18	kg lbs			1450 3195	1540 3395	1630 3595	1715 3780	1795 3995	1875 4135	1955 (6) 4310 (6)	2045 4510	2140 4715	2225 4905	2310 5090	2395 5280	2475 5455	2550 5630	2635 (10) 5810 (10)
**13.5-20	kg lbs			2300 5070	2445 5390	2585 5700	2720 5995	2850 6285	2980 6570	3100 6835	3250 7165	3395 7495	3535 7795	3670 8090	3800 8380	3930 8660	4055 8940	4180 (14) 9215 (14)
17.5/65-20	kg lbs	2330 5135	2520 5555	2700 5950	2875 6340	3040 6700	3195 (10) 7045 (10)											
42 x 17-20	kg lbs			2740 (6) 6040 (6)	2915 6425	3080 6790	3240 7140	3395 7485	3545 7815	3690 (10) 8135 (10)								
**16.9-24	kg lbs	2520 5555	2725 6005	2920 6435	3105 6845	3280 7230	3455 (10) 7615 (10)	3620 7980	3780 (12) 8335 (12)									
**18.4-24	kg lbs	3025 6670	3270 7210	3505 7725	3725 8210	3940 (10) 8685 (10)												

**On front tires for front end loaders

NOTES: Figures in parentheses denote ply rating for which load and inflation pressure are maximum. Consult your Yokohama service representative for data concerning front end loaders or shovels used in load and carry service. It is permissible to increase inflation pressure up to 15 psi above that shown in table with no increase of load. For tire load limits at various speeds.

Max. Speed	% Load Change From Above 5 MPH Table
Stationary	+60%
Creep	+30%
2 1/2 mph (4 kph)	+15%
5 mph (10 kph)	No Change
10 mph (15 kph)	-13%
15 mph (25 kph)	-20%

Off-The-Road Tractor and Grader Service (for Motor Graders)

Code No. G-1, G-2 and G-3 Narrow Base Bias Ply Tires
Maximum Speed: 25 MPH (40KPH). Distance: Unlimited.

TIRE SIZE DESIGNATION	TIRE LOAD LIMITS AT VARIOUS COLD INFLATION PRESSURES										
	kPa psi	125 18	150 22	175 25	200 29	225 33	250 36	275 40	300 44	325 47	350 51
12.00-24TG	kg lbs	1450 3200	1600 3520	1750 3860	1900 (8) 4180 (8)						
Ⓐ 13.00-24TG	kg lbs	1700 3740	1900 4180	2060 (8) 4540 (8)	2240 4940	2360 (10) 5200 (10)	2500 5520	2650 5840	2725 (12) 6000 (12)		
Ⓑ 14.00-24TG	kg lbs	2060 4540	2300 5080	2500 5520	2650 5840	2800 (10) 6150 (10)	3075 (12) 6800 (12)	3250 7150	3450 7600	3550 7850	3650 (16) 8050 (16)
16.00-24TG	kg lbs	2650 5840	3000 6600	3250 7150	3450 7600	3650 (12) 8050 (12)	4000 8800	4250 9350	4500 (16) 9900 (16)		
18.00-25	kg lbs	3250 7150	3650 8050	4000 8800	4125 (12) 9100 (12)	4625 10200	5000 (16) 11000 (16)				

Ⓐ 16 ply rating: 3055 kg @ 350 kPa (6745 lbs @ 51 psi). Ⓑ 20 ply rating: 4230 kg @ 450 kPa (9320 lbs @ 65 psi). TG: Tractor-Grader tires - Not for highway service.

Ⓐ 16 ply rating: 3055 kg @ 350 kPa (6745 lbs @ 51 psi). Ⓐ 20 ply rating: 4230 kg @ 450 kPa (9320 lbs @ 65 psi). TG: Tractor-Grader tires - Not for highway service.

TIRE SIZE DESIGNATION	TIRE LOAD LIMITS AT VARIOUS COLD INFLATION PRESSURES												
	kPa psi	140 20	160 23	180 26	200 29	220 32	240 35	260 38	280 41	300 44	325 47	350 51	375 54
10.00-20	kg lbs	1080 2380	1170 2580	1255 2765	1335 2945	1410 3110	1485 (8) 3275 (8)	1555 3430	1625 3580	1690 3725	1770 (10) 3900 (10)	1850 4080	1925 (12) 4245 (12)
11.00-20	kg lbs	1175 2590	1275 2810	1365 3010	1450 3195	1535 3385	1615 3560	1690 3725	1765 3890	1840 4055	1925 (10) 4245 (10)	2010 4430	2095 (12) 4620 (12)

NOTES: Figures in parentheses denote ply rating for which bold face loads and inflations are maximum.

2 Load & Inflation Pressure Tables: Bias

Wide Base Bias Ply Tires

Maximum Speed: 25 MPH (40 KPH). Distance: Unlimited.

TIRE SIZE DESIGNATION	TIRE LOAD LIMITS AT VARIOUS COLD INFLATION PRESSURES										
	kPa psi	125 18	150 22	175 25	200 29	225 33	250 36	275 40	300 44	325 47	350 51
**15.5-25	kg lbs	1800 3960	1950 (8) 4300 (8)	2180 (10) 4800 (10)	2360 5200	2500 5520	2650 (12) 5840 (12)				
**17.5-25	kg lbs	2120 4680	2360 5200	2575 5680	2900 (12) 6400 (12)	3000 (14) 6600 (14)	3150 6950	3350 (16) 7400 (16)	3550 7850	3650 (20) 8050 (20)	
**20.5-25	kg lbs	2800 6150	3150 6950	3550 (12) 7850 (12)	3750 8250	4000 (16) 8800 (16)	4250 9350	4500 (20) 9900 (20)			
**23.5-25	kg lbs	3650 8050	4000 (12) 8800 (12)	4375 9650	4750 (16) 10500 (16)	5150 11400	5450 (20) 12000 (20)				

**For slope and ditching service, inflation pressures should be increased 15 psi with no increase in load rating.

NOTES: Figures in parentheses denote ply rating for which load and inflation pressure are maximum. For maintenance work on established highways, inflation pressure may be increased 50% if desired with no increase in load.

Compactor Vehicle Service (for Tire Rollers). Code No. C-1

Maximum Speed: 5 MPH (10 KPH).

(Kg/lbs)

(Kg/lbs)

TIRE LOAD LIMITS AT VARIOUS COLD INFLATION PRESSURES			
INFLATION PRESSURE (kPa/psi)	7.50-15NHS	9.00-20NHS	11.00-20NHS
350 51	1700 3740	2900 6400	3550 7850
375 54	1750 3860	3000 6600	3750 8250
400 58	1850 (6) 4080 (6)	3150 6950	3875 8550
425 62	1900 4180	3250 7150	4000 8800
450 65	1950 4300	3350 7400	4125 9100
475 69	2060 4540	3450 7600	4250 9350
500 73	2120 4680	3550 7850	4375 9650
525 76	2180 4800	3650 (10) 8050 (10)	4500 9900
550 80	2240 4940	3750 8250	4750 (12) 10500 (12)
575 83	2300 5080	3875 8550	4750 10500
600 87	2300 5080	4000 8800	4875 10700
625 91	2360 (10) 5200 (10)	4000 (12) 8800 (12)	5000 11000
650 94	2430 5360	4125 9100	5150 (14) 11400 (14)
675 98	2500 5520	4250 9350	5300 11700
700 102	2575 5680	4375 9650	5300 11700
725 105	2575 5680	4375 (14) 9650 (14)	5450 (16) 12000 (16)
750 109	2650 (12) 5840 (12)	4500 9900	5600 12300
775 112	2725 6000	4625 10200	5600 12300
800 116	2725 6000	4750 10500	5800 12800
825 120	2800 6150	4750 (16) 10500 (16)	5800 (18) 12800 (18)
850 123	2900 6400		6000 13200
875 127	2900 (14) 6400 (14)		6150 13600
900 131			6150 13600
925 134			6300 (20) 13900 (20)

TIRE LOAD LIMITS AT VARIOUS COLD INFLATION PRESSURES			
INFLATION PRESSURE (kPa/psi)	7.50-15NHS	9.00-20NHS	11.00-20NHS
950 138			6300 13900
975 141			6500 14300
1000 145			6500 (22) 14300 (22)

(Kg/lbs)

TIRE LOAD LIMITS AT VARIOUS COLD INFLATION PRESSURES				
INFLATION PRESSURE (kPa/psi)	7.50-16	8.25-20	14/70-20	15.0-20
350 51	1750 3860	2410 5310	3460 7630	
375 54	1820 4010	2510 5530	3600 7935	
400 58	1890 (6) 4170 (6)	2605 5740	3740 8245	3325 7330
425 62		2700 5950	3875 8540	
450 65		2790 6150	4005 (12) 8830 (12)	3565 7860
475 69		2880 6350		
500 73		2970 6550		3790 8355
525 76		3055 6735		
550 80		3140 6920		4010 8840
575 83		3225 (10) 7110 (10)		
600 87		3305 7290		
625 91		3385 7460		
650 94		3460 7630		
675 98		3540 7805		
700 102		3615 (12) 7970 (12)		
725 105		3690 8135		
750 109		3765 8300		
775 112		3840 (14) 8465 (14)		

2 Load & Inflation Pressure Tables: Bias

Load Capacities at Various Speeds for Industrial Tires

TIRESIZE	PLY RATING	FOR OFF-THE-ROAD USE															
		I.P.		0 MPH (0 KPH)		0.5 MPH (1 KPH)		2.5 MPH (5 KPH)		5 MPH (10 KPH)		10 MPH (15 KPH)		12.5 MPH (20 KPH)		15 MPH (25 KPH)	
		PSI	kPa	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg
1600R25	***																
12.00-20	18	109	750	20,503	9,300	16,645	7,550	14,440	6,550	12,787	5,800	11,905	5,400	11,244	5,100	10,913	4,950
	20	123	850	21,716	9,850	17,637	8,000	15,322	6,950	13,558	6,150	12,566	5,700	11,905	5,400	11,574	5,250
12.00-24/25	16	98	675	21,716	9,850	17,637	8,000	15,322	6,950	13,558	6,150	12,566	5,700	11,905	5,400	11,574	5,250
	20	120	825	24,251	11,000	19,731	8,950	17,196	7,800	15,212	6,900	14,110	6,400	13,338	6,050	12,897	5,850
13.00-24/25	12	65	450	19,731	8,950	16,094	7,300	13,999	6,350	12,346	5,600	11,464	5,200	10,913	4,950	10,472	4,750
14.00-24/25	12	62	425	22,267	10,100	18,078	8,200	15,653	7,100	13,889	6,300	12,897	5,850	12,236	5,550	11,795	5,350
	20	102	700	29,983	13,600	24,471	11,100	21,164	9,600	18,739	8,500	17,417	7,900	16,535	7,500	15,984	7,250
	24	123	850	33,510	15,200	27,337	12,400	23,589	10,700	20,944	9,500	19,511	8,850	18,409	8,350	17,857	8,100
	28	134	925	35,274	16,000	28,660	13,000	24,912	11,300	22,046	10,000	20,503	9,300	19,401	8,800	18,739	8,500
16.00-24/25	16	62	425	29,101	13,200	23,589	10,700	20,503	9,300	18,188	8,250	16,865	7,650	15,984	7,250	15,432	7,000
	20	80	550	34,392	15,600	27,999	12,700	24,251	11,000	21,495	9,750	19,952	9,050	18,960	8,600	18,298	8,300
	24	94	650	37,479	17,000	30,424	13,800	26,455	12,000	23,369	10,600	21,716	9,850	20,613	9,350	19,842	9,000
	28	109	750	40,565	18,400	33,069	15,000	28,660	13,000	25,353	11,500	23,589	10,700	22,267	10,100	21,605	9,800
	32	127	875	44,092	20,000	35,935	16,300	31,085	14,100	27,558	12,500	25,574	11,600	24,251	11,000	23,369	10,600
	36	141	975	48,061	21,800	39,022	17,700	33,951	15,400	29,983	13,600	27,778	12,600	26,455	12,000	25,574	11,600
18.00-24/25	12	40	275	29,101	13,200	23,589	10,700	20,503	9,300	18,188	8,250	16,865	7,650	15,984	7,250	15,432	7,000
	16	54	375	35,274	16,000	28,660	13,000	24,912	11,300	22,046	10,000	20,503	9,300	19,401	8,800	18,739	8,500
	20	69	475	40,565	18,400	33,069	15,000	28,660	13,000	25,353	11,500	23,589	10,700	22,267	10,100	21,605	9,800
	24	80	550	44,092	20,000	35,935	16,300	31,085	14,100	27,558	12,500	25,574	11,600	24,251	11,000	23,369	10,600
	28	94	650	48,061	21,800	39,022	17,700	33,951	15,400	29,983	13,600	27,778	12,600	26,455	12,000	25,574	11,600
	32	109	750	52,911	24,000	42,990	19,500	37,479	17,000	33,069	15,000	30,865	14,000	29,101	13,200	28,219	12,800
	36	123	850	56,438	25,600	45,856	20,800	39,904	18,100	35,274	16,000	32,849	14,900	31,085	14,100	29,983	13,600
	40	138	950	59,966	27,200	48,722	22,100	42,329	19,200	37,479	17,000	34,833	15,800	33,069	15,000	31,967	14,500
18.00-33	36	123	850	65,257	29,600	53,131	24,100	46,077	20,900	40,786	18,500	37,920	17,200	35,935	16,300	34,613	15,700
	40	138	950	69,446	31,500	56,438	25,600	48,943	22,200	43,431	19,700	40,345	18,300	38,140	17,300	36,817	16,700
21.00-25	24	73	500	52,911	24,000	42,990	19,500	37,479	17,000	33,069	15,000	30,865	14,000	29,101	13,200	28,219	12,800
	28	83	575	58,202	26,400	47,399	21,500	41,006	18,600	36,376	16,500	33,731	15,300	31,967	14,500	30,865	14,000
	32	94	650	61,729	28,000	50,265	22,800	43,652	19,800	38,581	17,500	35,935	16,300	33,951	15,400	32,849	14,900
	36	109	750	67,021	30,400	54,454	24,700	47,399	21,500	41,888	19,000	39,022	17,700	36,817	16,700	35,715	16,200
	40	120	825	72,753	33,000	59,084	26,800	51,368	23,300	45,415	20,600	42,329	19,200	39,904	18,100	38,581	17,500

NOTES: Industrial Vehicle: Consists of usage on vehicles such as counter balanced lifttrucks, container handlers, straddle carriers, aircraft towtrucks, logstackers and rough terrain trucks.
Check maximum air pressure requirements of rims and wheels to ensure ability to accommodate correct air pressure of tire. For steer wheel loads on lift trucks, multiply the above load by 0.8.

2 Load & Inflation Pressure Tables: Bias

Load Capacities at Various Speeds for Industrial Tires

TIRE SIZE	PLY RATING	FOR SMOOTH FLOORS & RUNWAYS USE															
		I.P.		0 MPH (0 KPH)		0.5 MPH (1 KPH)		2.5 MPH (5 KPH)		5 MPH (10 KPH)		10 MPH (15 KPH)		12.5 MPH (20 KPH)		15 MPH (25 KPH)	
		PSI	kPa	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg
I600R25	***	145	1000	49,207	22,320	43,740	19,840	39,639	17,980	36,905	16,740	35,539	16,120	34,723	15,750	34,172	15,500
12.00-20	18	131	900	22,928	10,400	20,503	9,300	18,519	8,400	17,306	7,850	16,645	7,550	16,204	7,350	15,984	7,250
	20	145	1,000	24,471	11,100	21,716	9,850	19,621	8,900	18,298	8,300	17,637	8,000	17,196	7,800	16,976	7,700
12.00-24/25	16	117	810	24,471	11,100	21,716	9,850	19,621	8,900	18,298	8,300	17,637	8,000	17,196	7,800	16,976	7,700
	20	144	990	27,337	12,400	24,251	11,000	22,046	10,000	20,503	9,300	19,731	8,950	19,290	8,750	19,070	8,650
13.00-24/25	12	78	540	22,267	10,100	19,731	8,950	17,857	8,100	16,645	7,550	16,094	7,300	15,653	7,100	15,432	7,000
14.00-24/25	12	74	510	24,912	11,300	22,267	10,100	20,172	9,150	18,739	8,500	18,078	8,200	17,637	8,000	17,417	7,900
	20	122	840	33,731	15,300	29,983	13,600	27,117	12,300	25,353	11,500	24,471	11,100	23,810	10,800	23,369	10,600
	24	145	1,000	37,699	17,100	33,510	15,200	30,424	13,800	28,219	12,800	27,337	12,400	26,676	12,100	26,235	11,900
	28	145	1,000	39,683	18,000	35,274	16,000	31,967	14,500	29,762	13,500	28,660	13,000	27,999	12,700	27,558	12,500
16.00-24/25	16	74	510	32,849	14,900	29,101	13,200	26,455	12,000	24,471	11,100	23,589	10,700	23,149	10,500	22,708	10,300
	20	96	660	38,801	17,600	34,392	15,600	31,085	14,100	29,101	13,200	27,999	12,700	27,337	12,400	26,896	12,200
	24	113	780	42,108	19,100	37,479	17,000	33,951	15,400	31,526	14,300	30,424	13,800	29,762	13,500	29,321	13,300
	28	131	900	45,636	20,700	40,565	18,400	36,817	16,700	34,172	15,500	33,069	15,000	32,187	14,600	31,747	14,400
	32	145	1,000	49,604	22,500	44,092	20,000	39,904	18,100	37,258	16,900	35,935	16,300	35,054	15,900	34,392	15,600
	36	145	1,000	54,013	24,500	48,061	21,800	43,431	19,700	40,565	18,400	39,022	17,700	38,140	17,300	37,479	17,000
18.00-24/25	12	48	330	32,849	14,900	29,101	13,200	26,455	12,000	24,471	11,100	23,589	10,700	23,149	10,500	22,708	10,300
	16	65	450	39,683	18,000	35,274	16,000	31,967	14,500	29,762	13,500	28,660	13,000	27,999	12,700	27,558	12,500
	20	83	570	45,636	20,700	40,565	18,400	36,817	16,700	34,172	15,500	33,069	15,000	32,187	14,600	31,747	14,400
	24	96	660	49,604	22,500	44,092	20,000	39,904	18,100	37,258	16,900	35,935	16,300	35,054	15,900	34,392	15,600
	28	113	780	54,013	24,500	48,061	21,800	43,431	19,700	40,565	18,400	39,022	17,700	38,140	17,300	37,479	17,000
	32	131	900	59,525	27,000	52,911	24,000	48,061	21,800	44,754	20,300	42,990	19,500	42,108	19,100	41,447	18,800
	36	145	1,000	63,493	28,800	56,438	25,600	51,147	23,200	47,620	21,600	45,856	20,800	44,754	20,300	44,092	20,000
	40	145	1,000	67,461	30,600	59,966	27,200	54,454	24,700	50,706	23,000	48,722	22,100	47,620	21,600	46,958	21,300
18.00-33	36	145	1,000	73,414	33,300	65,257	29,600	59,084	26,800	55,116	25,000	53,131	24,100	51,809	23,500	50,927	23,100
	40	145	1,000	78,264	35,500	69,446	31,500	63,052	28,600	58,643	26,600	56,438	25,600	55,116	25,000	54,234	24,600
21.00-25	24	87	600	59,525	27,000	52,911	24,000	48,061	21,800	44,754	20,300	42,990	19,500	42,108	19,100	41,447	18,800
	28	100	690	65,477	29,700	58,202	26,400	52,690	23,900	49,163	22,300	47,399	21,500	46,297	21,000	45,415	20,600
	32	113	780	69,446	31,500	61,729	28,000	55,997	25,400	52,029	23,600	50,265	22,800	48,943	22,200	48,281	21,900
	36	131	900	75,398	34,200	67,021	30,400	60,848	27,600	56,659	25,700	54,454	24,700	53,131	24,100	52,470	23,800
	40	144	990	81,792	37,100	72,753	33,000	65,918	29,900	61,289	27,800	59,084	26,800	57,761	26,200	56,879	25,800

NOTES: Industrial Vehicle: Consists of usage on vehicles such as counter balanced lifttrucks, container handlers, straddle carriers, aircraft towtrucks, logstackers and rough terrain trucks.
Check maximum air pressure requirements of rims and wheels to ensure ability to accommodate correct air pressure of tire. For steer wheel loads on lift trucks, multiply the above load by 0.8.

2 Load & Inflation Pressure Tables: Bias

Load Capacities at Various Speeds for Industrial Tires

TIRE SIZE	PLY RATING	FOR OFF-THE-ROAD USE															
		I.P.		0 MPH (0 KPH)		0.5 MPH (1 KPH)		2.5 MPH (5 KPH)		5 MPH (10 KPH)		10 MPH (15 KPH)		12.5 MPH (20 KPH)		15 MPH (25 KPH)	
		PSI	kPa	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg
21.00-35	28	83	575	68,784	31,200	55,997	25,400	48,502	22,000	42,990	19,500	39,904	18,100	37,920	17,200	36,597	16,600
	32	94	650	74,737	33,900	60,848	27,600	52,911	24,000	46,738	21,200	43,431	19,700	41,226	18,700	39,683	18,000
	36	109	750	81,130	36,800	65,918	29,900	57,320	26,000	50,706	23,000	47,179	21,400	44,533	20,200	43,211	19,600
	40	120	825	85,760	38,900	69,666	31,600	60,627	27,500	53,572	24,300	49,824	22,600	47,179	21,400	45,636	20,700
	42	127	875	88,846	40,300	72,312	32,800	62,832	28,500	55,556	25,200	51,588	23,400	48,943	22,200	47,179	21,400
24.00-29	24	62	425	67,021	30,400	54,454	24,700	47,399	21,500	41,888	19,000	39,022	17,700	36,817	16,700	35,715	16,200
	30	76	525	76,941	34,900	62,391	28,300	54,234	24,600	48,061	21,800	44,754	20,300	42,329	19,200	40,786	18,500
	36	94	650	85,760	38,900	69,666	31,600	60,627	27,500	53,572	24,300	49,824	22,600	47,179	21,400	45,636	20,700
	42	109	750	93,476	42,400	76,059	34,500	65,918	29,900	58,423	26,500	54,234	24,600	51,368	23,300	49,604	22,500
24.00-35	36	94	650	93,476	42,400	76,059	34,500	65,918	29,900	58,423	26,500	54,234	24,600	51,368	23,300	49,604	22,500
	42	109	750	102,295	46,400	83,114	37,700	72,312	32,800	63,934	29,000	59,525	27,000	56,218	25,500	54,454	24,700
	48	123	850	111,113	50,400	90,390	41,000	78,485	35,600	69,446	31,500	64,595	29,300	61,068	27,700	59,084	26,800
24.00-49	36	94	650	114,640	52,000	93,256	42,300	80,910	36,700	71,650	32,500	66,580	30,200	63,052	28,600	60,848	27,600
	42	109	750	121,695	55,200	98,988	44,900	85,980	39,000	76,059	34,500	70,768	32,100	68,784	31,200	64,595	29,300
	48	123	850	132,277	60,000	107,586	48,800	93,476	42,400	82,673	37,500	76,941	34,900	72,753	33,000	70,327	31,900
27.00-49	36	83	575	128,750	58,400	104,720	47,500	90,830	41,200	80,469	36,500	74,737	33,900	70,768	32,100	68,343	31,000
	42	98	675	141,096	64,000	114,640	52,000	99,649	45,200	88,185	40,000	82,012	37,200	77,603	35,200	74,957	34,000
	48	112	775	154,324	70,000	125,443	56,900	108,908	49,400	96,562	43,800	89,728	40,700	84,878	38,500	82,012	37,200
23.5-25	36	98	675	54,675	24,800	44,533	20,200	38,581	17,500	34,172	15,500	31,747	14,400	29,983	13,600	29,101	13,200
29.5-29	40	91	625	83,335	37,800	67,682	30,700	58,863	26,700	52,029	23,600	48,281	21,900	45,856	20,800	44,313	20,100
37.5-39	60	109	750	158,733	72,000	128,970	58,500	112,215	50,900	99,208	45,000	92,374	41,900	87,303	39,600	84,437	38,300
33.00-51	50	94	650	197,534	89,600	160,497	72,800	139,553	63,300	123,459	56,000	114,861	52,100	108,688	49,300	104,940	47,600
	58	109	750	216,935	98,400	176,370	80,000	153,221	69,500	135,584	61,500	126,104	57,200	119,270	54,100	115,302	52,300
36.00-51	58	98	675	250,445	113,600	203,487	92,300	176,921	80,250	156,528	71,000	145,615	66,050	137,789	62,500	133,049	60,350
	66	112	775	271,610	123,200	220,683	100,100	191,824	87,010	169,756	77,000	157,873	71,610	149,385	67,760	144,293	65,450
40.00-57	68	105	725	326,284	148,000	265,216	120,300	230,383	104,500	203,928	92,500	189,598	86,000	179,456	81,400	173,283	78,600
	76	116	800	345,685	156,800	280,869	127,400	244,140	110,740	216,053	98,000	200,929	91,140	190,127	86,240	183,645	83,300

NOTES: Industrial Vehicle: Consists of usage on vehicles such as counter balanced lift trucks, container handlers, straddle carriers, aircraft tow tractors, log stackers and rough terrain trucks.
Check maximum air pressure requirements of rims and wheels to ensure ability to accommodate correct air pressure of tire. For steer wheel loads on lift trucks, multiply the above load by 0.8.

2 Load & Inflation Pressure Tables: Bias

Load Capacities at Various Speeds for Industrial Tires

TIRE SIZE	PLY RATING	FOR SMOOTH FLOORS & RUNWAYS USE															
		I.P.		0 MPH (0 KPH)		0.5 MPH (1 KPH)		2.5 MPH (5 KPH)		5 MPH (10 KPH)		10 MPH (15 KPH)		12.5 MPH (20 KPH)		15 MPH (25 KPH)	
		PSI	kPa	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg
21.00-35	28	100	690	77,382	35,100	68,784	31,200	62,391	28,300	57,982	26,300	55,997	25,400	54,675	24,800	53,793	24,400
	32	113	780	84,217	38,200	74,737	33,900	67,682	30,700	63,052	28,600	60,848	27,600	59,304	26,900	58,423	26,500
	36	131	900	91,271	41,400	81,130	36,800	73,634	33,400	68,564	31,100	65,918	29,900	64,375	29,200	63,493	28,800
	40	144	990	96,342	43,700	85,760	38,900	77,603	35,200	72,312	32,800	69,666	31,600	68,123	30,900	67,021	30,400
	42	145	1000	100,090	45,400	88,846	40,300	80,469	36,500	74,957	34,000	72,312	32,800	70,548	32,000	69,446	31,500
24.00-29	24	74	510	75,398	34,200	67,021	30,400	60,848	27,600	56,659	25,700	54,454	24,700	53,131	24,100	52,470	23,800
	30	91	630	86,421	39,200	76,941	34,900	69,666	31,600	64,816	29,400	62,391	28,300	61,068	27,700	60,186	27,300
	36	113	780	96,342	43,700	85,760	38,900	77,603	35,200	72,312	32,800	69,666	31,600	68,123	30,900	67,021	30,400
	42	131	900	105,161	47,700	93,476	42,400	84,658	38,400	81,130	36,800	76,059	34,500	74,296	33,700	72,973	33,100
24.00-35	36	113	780	105,161	47,700	93,476	42,400	84,658	38,400	81,130	36,800	76,059	34,500	74,296	33,700	72,973	33,100
	42	131	900	115,081	52,200	102,295	46,400	92,815	42,100	86,421	39,200	83,114	37,700	81,130	36,800	80,028	36,300
	48	145	1,000	125,002	56,700	111,113	50,400	100,751	45,700	93,696	42,500	91,933	41,700	88,185	40,000	86,862	39,400
24.00-49	36	113	780	128,970	58,500	114,640	52,000	103,838	47,100	96,783	43,900	93,256	42,300	91,051	41,300	89,508	40,600
	42	131	900	136,907	62,100	121,695	55,200	110,231	50,000	102,735	46,600	98,988	44,900	96,562	43,800	95,019	43,100
	48	145	1000	148,812	67,500	132,277	60,000	119,931	54,400	111,554	50,600	107,586	48,800	104,940	47,600	103,397	46,900
27.00-49	36	100	690	144,844	65,700	128,750	58,400	116,625	52,900	108,688	49,300	104,720	47,500	102,295	46,400	100,531	45,600
	42	117	810	158,733	72,000	141,096	64,000	127,868	58,000	119,050	54,000	114,640	52,000	111,995	50,800	110,231	50,000
	48	135	930	173,724	78,800	154,324	70,000	139,994	63,500	130,293	59,100	125,443	56,900	122,577	55,600	120,593	54,700
23.5-25	36	117	810	61,509	27,900	54,675	24,800	49,604	22,500	46,077	20,900	44,533	20,200	43,431	19,700	42,770	19,400
29.5-29	40	109	750	93,696	42,500	83,335	37,800	75,398	34,200	70,327	31,900	67,682	30,700	66,139	30,000	65,036	29,500
37.5-39	60	131	900	178,574	81,000	158,733	72,000	143,962	65,300	134,041	60,800	128,970	58,500	126,104	57,200	124,120	56,300
33.00-51	50	113	780	222,226	100,800	197,534	89,600	179,015	81,200	166,669	75,600	160,497	72,800	156,749	71,100	154,324	70,000
	58	131	900	244,052	110,700	216,935	98,400	196,652	89,200	182,984	83,000	176,370	80,000	172,181	78,100	169,536	76,900
36.00-51	58	117	810	281,751	127,800	250,445	113,600	227,076	103,000	211,313	95,850	203,487	92,300	198,857	90,200	195,660	88,750
	66	135	930	305,561	138,600	271,610	123,200	246,146	111,650	229,171	103,950	220,683	100,100	215,590	97,790	212,195	96,250
40.00-57	68	126	870	367,070	166,500	326,284	148,000	295,640	134,100	275,357	124,900	265,216	120,300	259,043	117,500	254,854	115,600
	76	139	960	388,895	176,400	345,685	156,800	313,277	142,100	291,672	132,300	280,869	127,400	274,476	124,500	270,066	122,500

NOTES: Industrial Vehicle: Consists of usage on vehicles such as counter balanced lift trucks, container handlers, straddle carriers, aircraft tow tractors, log stackers and rough terrain trucks.
Check maximum air pressure requirements of rims and wheels to ensure ability to accommodate correct air pressure of tire. For steer wheel loads on lift trucks, multiply the above load by 0.8.

2 Combination Tables

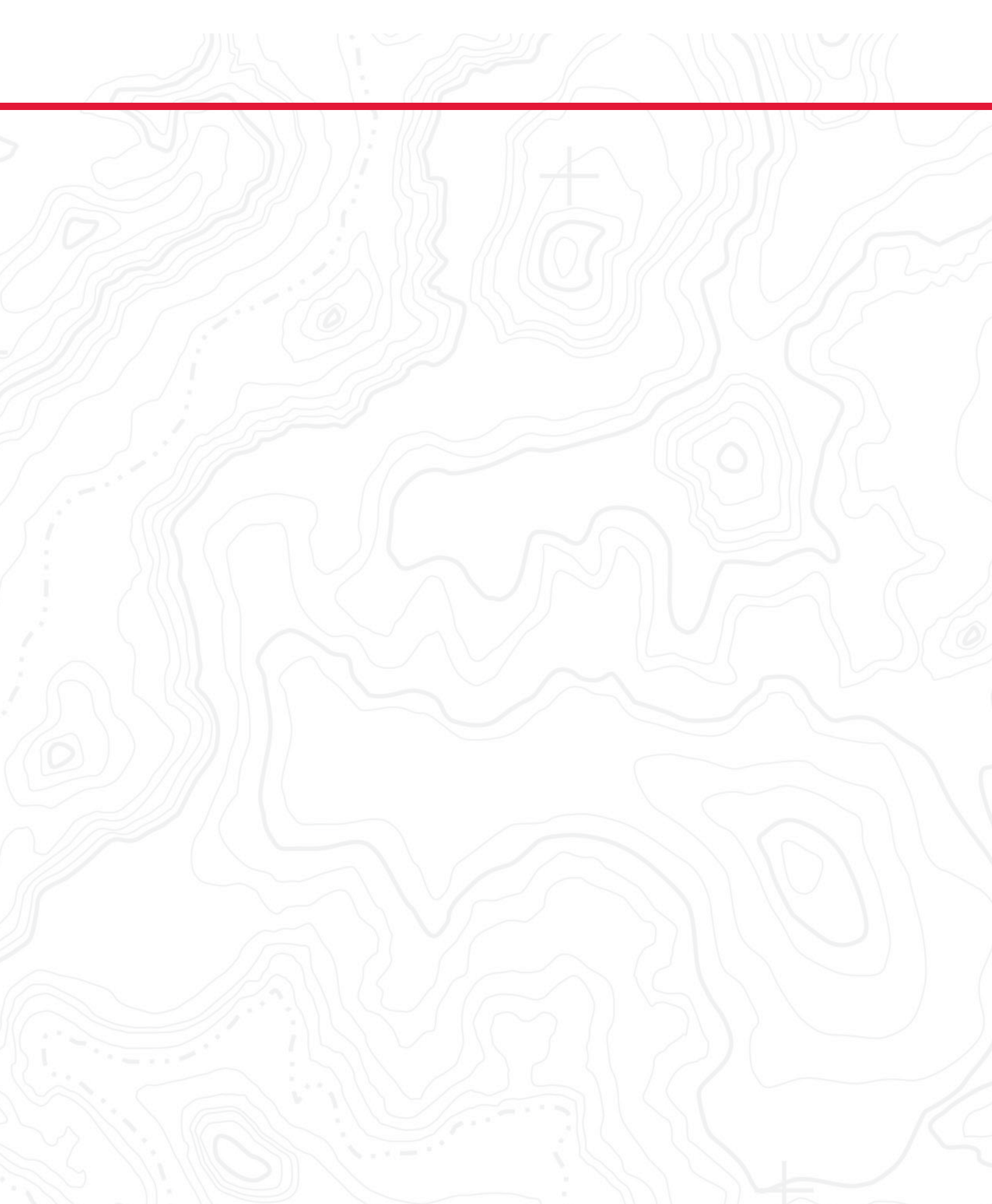
Off-The-Road Tire, Tube, Flap and O-Ring Combination Table

TIRE SIZE	TUBE SIZE	VALVE SIZE		FLAP SIZE	O-RING SIZE
		TUBE VALVE	RIM VALVE		
33 × 12.5-15	33 × 12.5-15	JS75	—	—	—
12.5/70-16	—	—	TR575,TR415	—	—
10-16.5	10-16.5	TR15	TR575	—	—
15.5/60-18	—	—	TR618A	—	—
15.5/70-18	—	—	TR618A	—	—
42 × 17-20	42 × 17-20	TR179A	—	42 × 17-20	—
14/70-20	14/70-20	TR179A	—	14/70-20	—
13.5-20	13.5-20	TR78A	—	13.5-20	—
15.0-20	15.0-20	TJ179W	—	15.0-20	—
17.5/65-20	17.5/65-20	TR218A	TR618A	—	—
16.9-24	16.9-24	TR218A	TR618A	—	—
18.4-24	18.4-24	TR218A	TR618A	—	—
15.5-25	15.5-25	JS1175B,JS1175	TRJ650,TRJ670,TRJ690	15.5/17.5-25	OR225T
17.5-25	17.5-25	JS1175B,JS1175	TRJ650,TRJ670,TRJ690	15.5/17.5-25	OR225T
20.5-25	20.5-25	JS1175B,JS1175	TRJ650,TRJ670,TRJ690	20.5-25	OR325T/OR225T
23.5-25	23.5-25	JS1175B,JS1175	TRJ650,TRJ670,TRJ690	23.5-25	OR325T
17.5R25	—	—	TRJ650,TRJ670,TRJ690	—	OR225T
20.5R25	—	—	TRJ650,TRJ670,TRJ690	—	OR325T/OR225T
23.5R25	—	—	TRJ650,TRJ670,TRJ690	—	OR325T
26.5-25	26.5-25	JS1175	TRJ650,TRJ670,TRJ690	26.5-25	OR325T
29.5-25	—	—	TRJ650,TRJ670,TRJ690	—	OR325T
29.5-29	—	—	TRJ650,TRJ670,TRJ690	—	OR329T
29.5-35	—	—	TRJ650,TRJ670,TRJ690	—	OR335T
33.25-35	—	—	TRJ650,TRJ670,TRJ690	—	OR335T
3.5-33	—	—	TRJ650,TRJ670,TRJ690	—	OR333T
37.25-35	—	—	TRJ650,TRJ670,TRJ690	—	OR335T
37.5-33	—	—	TRJ650,TRJ670,TRJ690	—	OR333T
37.5-39	—	—	TRJ650,TRJ670,TRJ690	—	OR339T
35/65-33	—	—	TRJ650,TRJ670,TRJ690	—	OR333T
40/65-39	—	—	TRJ650,TRJ670,TRJ690	—	OR339T
45/65-45	—	—	TRJ650,TRJ670,TRJ690	—	OR345T
385/95R25	—	—	TRJ650	—	OR225T
445/95R25	—	—	TRJ650,TRJ670,TRJ690	—	OR325T
505/95R25	—	—	TRJ650,TRJ670,TRJ690	—	OR325T
750/65R25	—	—	TRJ650,TRJ670,TRJ690	—	OR325T

TIRE SIZE	TUBE SIZE	VALVE SIZE		FLAP SIZE	O-RING SIZE
		TUBE VALVE	RIM VALVE		
8.25-20	8.25(R)20	TR77A,TR175A	—	8.25/9.00(R)20	—
9.00-20	9.00-20	TR175A,TR76A	—	8.25/9.00(R)20	—
10.00-20	11.1/10.00(R)20	TR78A,TR76A	—	10.00/11.1(R)20	—
12.00-20	12.00-20	TR78A,TR76A	—	11.00/12.00(R)20	—
12.00-24	11.00/12.00(R)24	TR78A,TR77A	TR618A,TR503A	10.00/11.00/12.00-24	—
13.00-24	13.00-24/25	TR77A,JS179A	TR618A,TR503A	13.00/14.00-24/25	OR224TG
14.00-24	14.00-24/25	TR77A,TR175A,TR179A	TR618A,TR503A	13.00/14.00-24/25	OR224TG
14.00R24	14.00(R)24/25	JS179	TR618A	13.00/14.00-24/25	OR224TG
14.00-25	14.00-24/25	TR77A,TR175A,TR179A	TR508,TR650	13.00/14.00-24/25	OR225T
16.00-24	16.00-24/25	JS1175B,JS1175	TR618A,TR503A	1600/1800-24/25	OR224TG
16.00-25	16.00-24/25	JS1175B,JS1175	TRJ650,TRJ670,TRJ690	1600/1800-24/25	OR325T
1600R25	—	—	TRJ650,TRJ670,TRJ690	—	OR325T
18.00-25	18.00-24/25	JS1175B,JS1175C	TRJ650,TRJ670,TRJ690	1600/1800-24/25	OR325T
18.00-33	—	—	TRJ650,TRJ670,TRJ690	—	OR333T
18.00R33	—	—	TRJ650,TRJ670,TRJ690	—	OR333T
21.00-25	21.00-24/25	JS1175	TRJ650,TRJ670,TRJ690	2100-24/25*15.5/17.5-25	OR325T
24.00-25	24.00-25	JS1175	TRJ650,TRJ670,TRJ690	20.5/24.00-25	OR325T
24.00-35	—	—	TRJ650,TRJ670,TRJ690	—	OR335T
24.00R35	—	—	TRJ650,TRJ670,TRJ690	—	OR335T
24.00-49	—	—	TRJ650,TRJ670,TRJ690	—	OR349T
27.00-49	—	—	TRJ650,TRJ670,TRJ690	—	OR349T
27.00R49	—	—	TRJ650,TRJ670,TRJ690	—	OR349T
30.00-51	—	—	TRJ650,TRJ670,TRJ690	—	OR451T
33.00-51	—	—	TRJ650,TRJ670,TRJ690	—	OR451T
36.00-51	—	—	TRJ650,TRJ670,TRJ690	—	OR451T
40.00-57	—	—	TR-L870,TR-L850	—	OR457T

The valve sizes for tubes and rims shown in tables(p.56-57) correspond with the conventional standards of TRA,JATMA, etc.

1 PSI = 0.0703 kg/cm² 1 POUND = 0.453592 kg 1 PSI = 6.894771 kPa 1 kg = 2.20462 POUNDS 1 kPa = 0.145038 PSI



3 Tire Maintenance

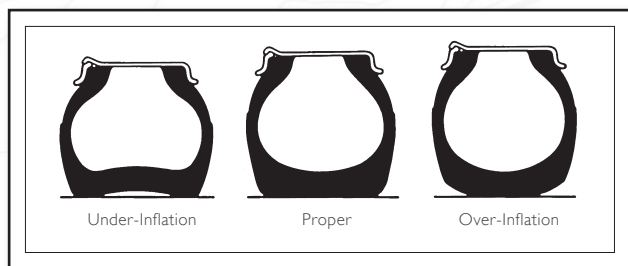
3 Tire Maintenance

TIRE MAINTENANCE

Off-the-road tires are an investment, therefore it is very important to use them under proper conditions. It cannot be overemphasized to have a good maintenance program for obtaining the best tire performance.

Inflation Pressure

Proper inflation pressure is essential to get the best performance from tires. Optimum traction, flotation, and load endurance can only be obtained if the proper inflation pressure is maintained. Both over-inflation and under-inflation shorten tire life and can result in tire failures. Proper inflation pressure depends on the vehicle, ground conditions, load, speed, and other factors.



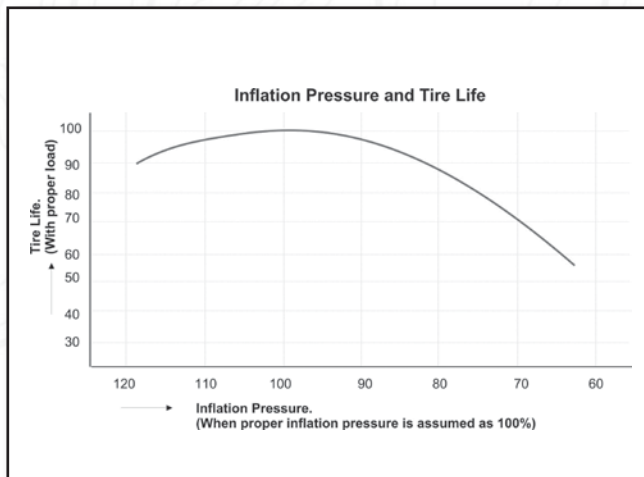
Results of Under-inflation

- Excessive deflection develops, generating heat and leading to early tire failure.
- Tread and ply separation.
- Cord fatigue is accelerated, leading to broken cord.
- Sidewalls become susceptible to rupture.
- Tread wear is uneven and radical cracks develop.
- Rim becomes displaced, creating air leaks in tubeless tires.
- Cracks at the inner liner.

Results of Over-inflation

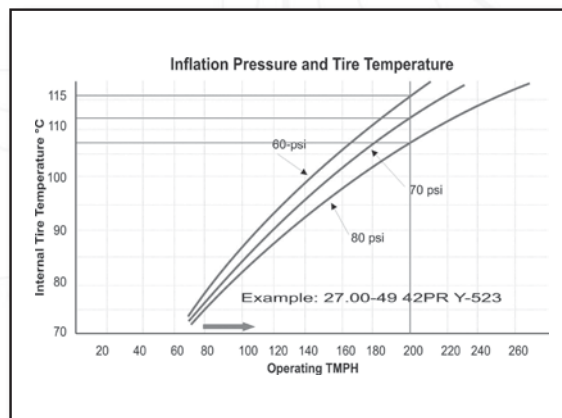
- Increased ground contact pressure at the center of the tread, causing excessive wear there.
- Reduced protection of the cord against shocks from uneven road surfaces, resulting in vulnerability to rupture from cuts or shock.
- Excessive pressure is exerted on the beads, increasing the potential for beads to burst.
- Riding comfort deteriorates and tendency to slip develops.

Inflation pressure and tire life have the following general relationship:



Caution:

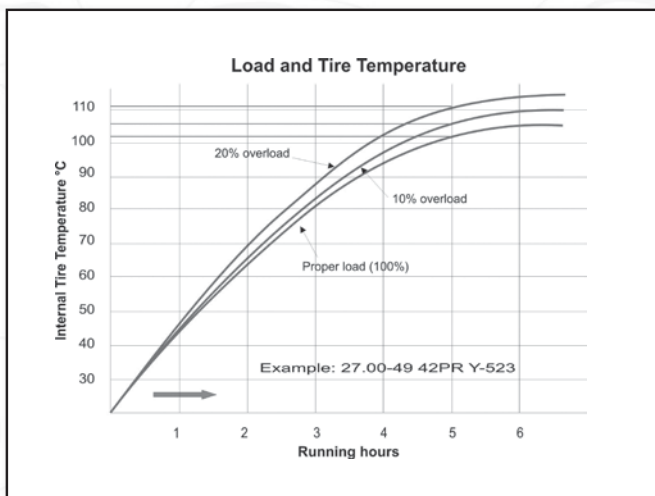
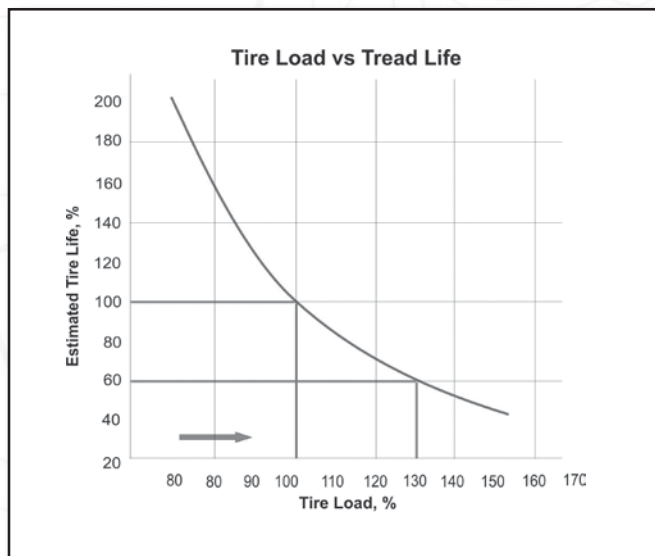
- In the course of operation air pressure rises inside tires in correlation with heat build up. This is a normal occurrence. The rise in pressure differs among tires, and should be kept in mind especially for tires used in continuous operation. If heat generated in operation results in a rise of 25% or more in inflation pressure, the cold inflation pressure should be rechecked. If the cold inflation pressure shows to be correct, either traveling speed and/or load must be reduced. Otherwise, overheating may cause separation in the tire.
- Tires should not be bled to compensate for the increase in pressure resulting from operation.
- Reducing inflation pressure can cause the internal temperature to rise, leading to tire failure.
- A pressure gauge used for checking inflation pressure should be periodically checked and calibrated, if necessary.
- Valves should always be capped. This keeps mud and dust out of the valve core and protects the air seal.



3 Tire Maintenance

Load

Overloading shortens tire life and increases the chance of early tire failure. For the best tire performance, the maximum recommended load should not be exceeded. If the load exceeds the specified capacity of the tire, a tire with a higher ply rating should be used.



Results of Overloading

- Excessive heat generation causes separation.
- Excessive tire deflection causes broken cords.
- Rapid wear due to excessive tread movement against road surface.
- Bead failure due to excessive bead movement.
- Risk of bursting due to increased cord tension.

Speed

Excessive traveling speeds produce abnormally high internal temperatures in tires. A vehicle has two speed limitations: the actual maximum speed that the vehicle can attain and the average operating speed that the vehicle can sustain. The average sustainable operating speed is limited by the tires' ton-mile-per-hour (TMPH) rating (refer to pages 59-60).

Speed and Load Relation (according to TRA)

The load capacity of a tire is influenced by the maximum speed of the vehicle as follows:

VEHICLE	MAXIMUM SPEED	VARIATION IN LOAD CAPACITY	
		Bias tire	Radial tire
Loaders and Dozers	Stationary	160%	160%
	Creep	130%	130%
	2 1/2 mph (4 kph)	115%	115%
	5 mph (10 kph)	100%	100%
	10 mph (15 kph)	87%	87%
	15 mph (25 kph)	80%	80%

VEHICLE	MAXIMUM SPEED	VARIATION IN LOAD CAPACITY	
		Bias tire	Radial tire
Dump Trucks and Scrapers	30 mph (50 kph)	100%	100%
	40 mph (65 kph)	Narrow Base 85%	Narrow Base 88%
		Wide Base 83%	Wide Base 88%

3 Proper Matching of Dual Tires

PROPER MATCHING OF DUAL TIRES

It is essential that dual tires have the same overall diameter. Otherwise, the one with the larger diameter will carry most of the load and will be prone to damage and wear. If the difference in outer diameters is extremely large, the smaller tire slips and scrapes along the ground, causing the center of the tread to wear quickly. Naturally, the larger tire will be prone to excessive heat generation from overloading. The allowable difference in dual-tire pair diameters is shown in the table below.

In no case should a difference in diameters be corrected by adjusting inflation pressure.

SECTION WIDTH	MAXIMUM DIFFERENCE (BIAS TIRE)	
	DIAMETER (m/m)	CIRCUMFERENCE (m/m)
~ 8.25	8	25
9.00 ~ 14.00	12	38
16.00 ~ 18.00	22	69
21.00 ~	24	75

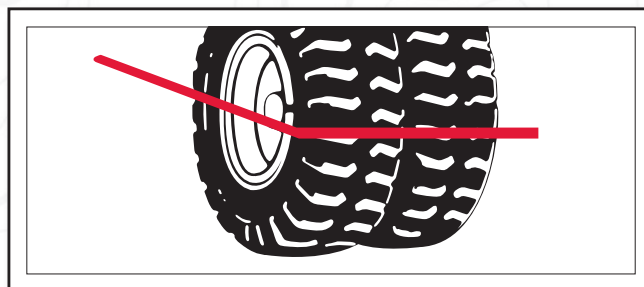
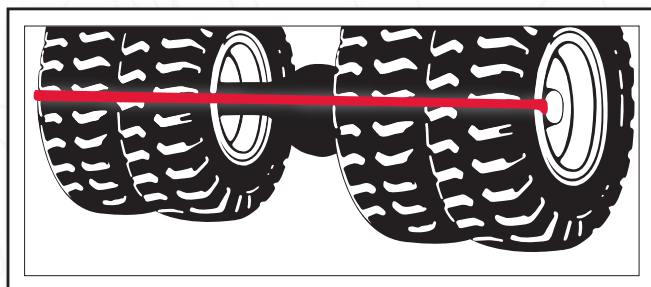
SECTION WIDTH	MAXIMUM DIFFERENCE (RADIAL TIRE)	
	DIAMETER (m/m)	CIRCUMFERENCE (m/m)
~ 8.25	6	19
9.00 ~ 14.00	8	25
16.00 ~ 18.00	15	47
21.00 ~	19	60

Diameter Measuring Methods

Use a 1-inch x 2-inch wooden stud.

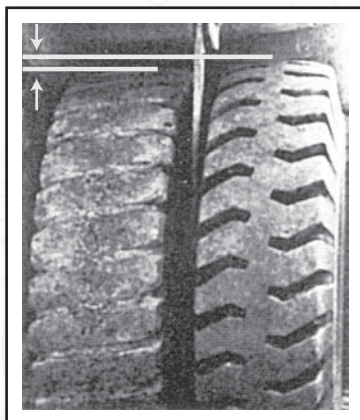
Use a rubber cord across the dual tires.

Use a steel tape to measure the circumference of each tire.



For Example:

When the overall diameters of dual tires differ from each other, load distribution is uneven. The tire with the larger diameter has to bear a higher load than the tire with the smaller diameter. For dual tires with differences in diameter of 20 mm, 40 mm and 60 mm with actual load on each tire at 100% (TRA SPEED 30 MPH (50 KPH)) is as follows:



TIRE SIZE \ DIFFERENCE OF OVERALL DIAMETER		20 mm	40 mm	60 mm
21.00-35 36PR	Large	14.4 tons	15.7 tons	17.0 tons
	Small	11.7	10.4	9.1
24.00-35 42PR	Large	17.5	18.9	20.3
	Small	14.6	13.2	11.8
24.00-49 42PR	Large	20.9	22.6	24.2
	Small	17.6	15.9	14.3

3 Road Surface Maintenance • Tire Problems & Major Causes

ROAD SURFACE MAINTENANCE

The maintenance of road surfaces is one of the most important factors in determining the life of a tire. Bumps, check holes, rocks and so on cut and wear tires. Even bursting can result. Of particular importance is the maintenance of loading and dumping areas because the chances of damage at these places are great. Road and ground conditions there have a large effect on the productivity of the vehicles.



Good Condition

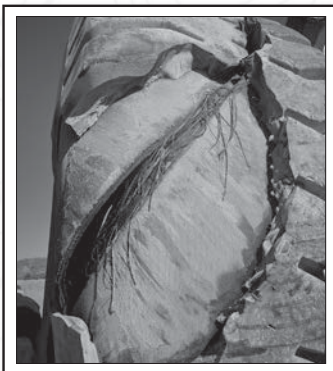


Poor Condition

TIRE PROBLEMS AND MAJOR CAUSES

Any aberrations causing tire problems should be promptly repaired. The following is a list of tire problems and causes:

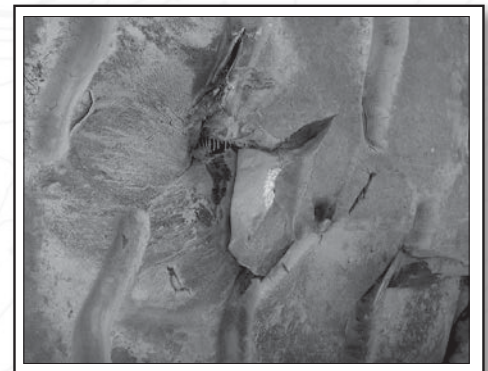
TIRE PROBLEMS	OVERLOAD	HIGH SPEED TRAVEL	SLIPPAGE	OVER INFLATION	UNDER INFLATION	EXCESS BRAKING	POOR ROAD CONDITION	POOR VEHICLE MAINTENANCE	POOR RIM
1. Tread cuts and snags	○	○	○	○	○		○		
2. Uneven, rapid tread wear	○	○	○	○	○	○	○	○	
3. Cracked and broken tread	○		○	○		○	○	○	
4. Sidewall cuts and snags	○				○		○		
5. Tread separation	○	○		○	○			○	
6. Ply separation	○	○		○	○			○	
7. Bead failure	○		○	○	○	○		○	○
8. Inner liner failure	○	○			○				○
9. Impact break	○	○		○			○		



Impact Break



Tread Separation



Tread Cuts (Rock Penetration)

3 Instructions for Operations • Tire Appearance Checkup

INSTRUCTIONS FOR OPERATIONS

Even if tires and roads are properly maintained, tire life can be seriously shortened by improper use. The following are musts for maximum efficiency.

General:

- Avoid abrupt starts and stops.
- Do not operate on road shoulders.
- Reduce speed on turns.
- Do not turn wheels while stationary.
- Do not spin tires.
- Maintain proper inflation pressure.
- Remove any objects, such as rocks, which get stuck in the tread or between dual tires.
- Check tires, rims and valves regularly for any abnormalities.
- Repair any damaged tires immediately.
- Avoid rocks at loading and dumping areas.
- Avoid running over oil or grease spills.

Loader Operating:

- Keep loading areas clear of rocks and other obstacles.
- Avoid spilling load around the tires.
- Avoid over-loading.
- Load to the center of the dump truck's decks.

Motor Scraper Operating:

- Prevent tires from slipping when loading.
- Avoid cornering when the pusher is in operation

Operating with Ambient Temperatures Below -40°C:

- Consult Yokohama

TIRE APPEARANCE CHECKUP

In order to prevent tire troubles, it is helpful to make routine visual checkups of the tire, rim, valve, inflation pressure, etc. Make inspections for the following and carry out any procedure recommended.

Tire Tread:

- Remove foreign matter from the tread.
- Repair any damage reaching the carcass.
- If separation exists, remove tire and examine if repair is necessary.
- If damage reached carcass, remove tire and repair.
- If cuts or chips reach carcass, repair.
- Cracks in tread groove may be source of air leakage; check inflation pressure.
- Uneven wear may be caused by improper inflation pressure. Rotate tires if necessary.
- Damage from contact with vehicle should be avoided. Alter body parts if possible. Repair any tire damage if necessary.
- Oil or grease on tire should be washed off.

Shoulder and Sidewall:

- Repair any cuts reaching the carcass.
- Identify cause of cracks e.g. from under-inflation, overloading, ozone or cut growth and repair if necessary.
- Wash off oil or grease spots.

Valve:

- Replace valve or valve parts if leakage exists from valve core, deflection of stem or extension.
- Ensure valve cap is in position.

Dual Tires:

- Remove any foreign object stuck between duals.
- Repair stone ejector if bent or out of position.

Inflation Pressure:

- Adjust if not proper.
- Detect location and repair if leakage exists.

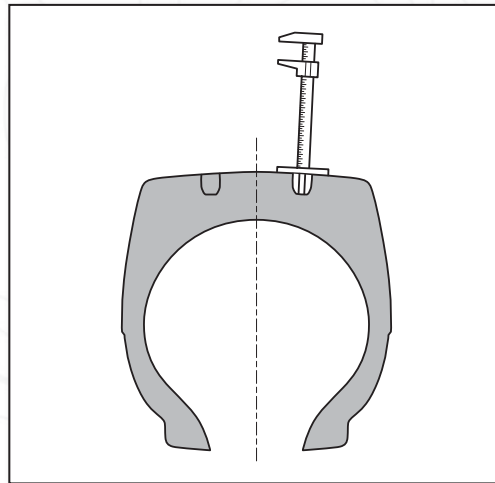
Rim:

- Replace if deformation or cracks exist.

3 Measuring Tread Wear

MEASURING TREAD WEAR

Tread wear can be determined by comparing the groove depth with that of a new tire. For a rib pattern, the depth should be measured at the groove specified by the manufacturer. For rock or traction patterns, measure the depth at the position which is one-fourth of the tread width from the shoulder. There is a special mark indicating this position in the grooves of YOKOHAMA tires. The average figures obtained by measuring groove depth at the inside and outside of the tire should be used. A depth gauge is used to measure the depth of the grooves as shown below:



• Measuring point			
	TRACTION		
	Y103 (E-2, L-2, G-2) Y25 (G-2)		
	BLOCK		
	Y65 (E-7)		
	SMOOTH		
	Y69ET, Y69KET (L-4S) Y69SET, Y69KSET (L-5S)		
	ROCK		
	Y67 (E-3, L-3, G-3) Y67ET (L-4) Y525 (L-5)		
	ROCK (FLUSH)		
	Y565 (E-3) Y523/R/U (E-4) Y530, Y535 (E-4) Y526, Y575 (L-3)		
	ROCK (FLUSH)		
	Y545 (L-4) Y524/Z (L-5)		
	ROCK		
	RT31 (E-3, L-3)		
	ROCK		
	RT21 (G-2) RB31 (E-3, L-3) RB41 (E-4, L-4) RB42 (E-4, L-4) RT41 (E-4, L-4)		
	ROCK		
	RL31 (E-3, L-3) RL42 (E-4) RL45 (E-4, L-4)		

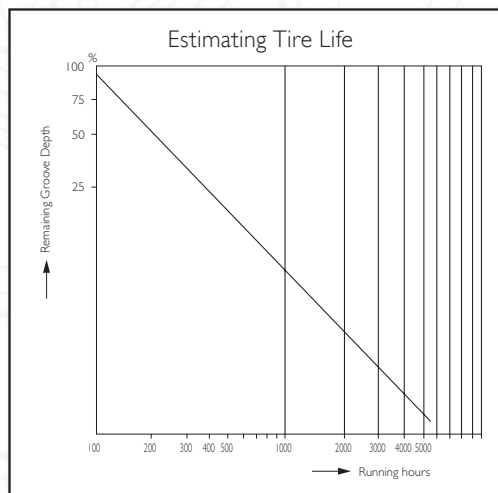
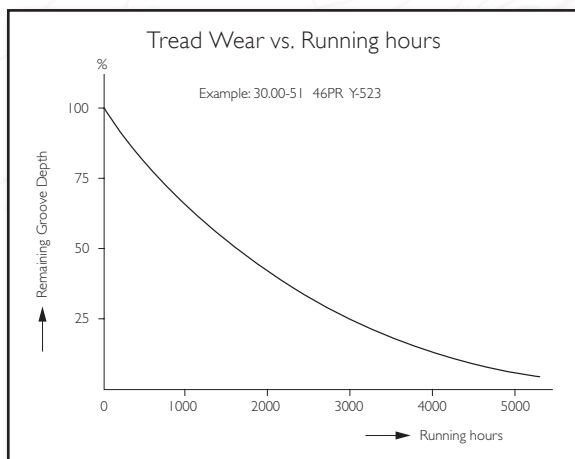
3 Estimating Tire Life

ESTIMATING TIRE LIFE

Tire life can be estimated by using two methods, first by 'wear graph' and second by 'usage parameters.'

Estimation by Wear Graph

The general relationship between tire wear and operating time (or distance) is formula $y = axb$, where y is the degree of wear, x is the number of running hours, and a and b are coefficients. If plotted, the general shape of the graph would be appeared as shown below.



Difficulty in choosing accurate coefficients leads to a simpler method of analyzing recorded data on tire wear and running hours, and then simple, straight-line extrapolation to obtain an estimate of the remaining tire life. While this method is not entirely accurate, it does provide an estimate.

Estimation by Usage Parameter

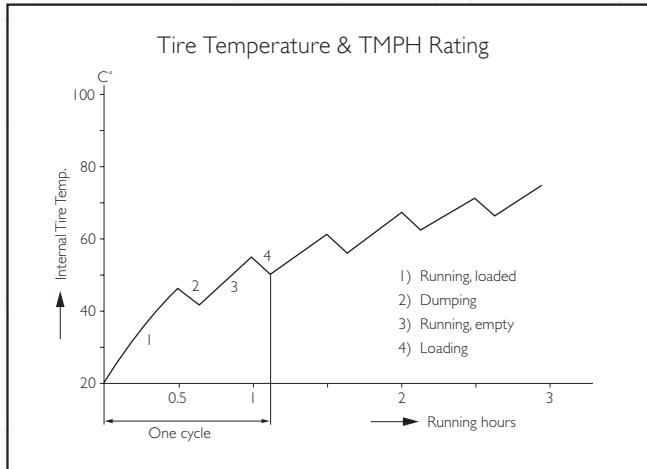
The life of a tire can be estimated by using the parameters of usage listed below where: Estimated life Expectancy = 2000 km/mm original groove depth (mm) × Value for Item A × Value for Item B ×...× Value for Item H.

Item	State of Application	Value
(A) Maximum Speed	10 miles per hour (15 kilometers per hour)	1.0
	20 miles per hour (30 kilometers per hour)	0.8
	30 miles per hour (50 kilometers per hour)	0.6
(B) Road Surface	Sand or soft soil without rock	1.0
	Soft soil with rock	0.9
	Gravel road in good condition	0.9
	Gravel road in poor condition	0.7
	Rough road with sharp-edged stones and rocks	0.6
(C) Position of Tire	Trailer wheel	1.0
	Front wheel	0.9
	Drive wheel (rear dump)	0.8
	Drive wheel (bottom dump)	0.7
	Drive wheel (motor scraper)	0.6
(D) Tire Load	Standard	1.0
	10% overload	0.9
	20% overload	0.8
	40% overload	0.5
(E) Curved in Road	Straight or slightly curved	1.0
	Curved	0.9
	Sharply curved	0.8
(F) Road Grade (for drive wheels)	Flat	1.0
	6% maximum	0.9
	15% maximum	0.7
	Other than drive wheels	1.0
(G) Braking	Infrequent	1.0
	Average	0.9
	Frequent	0.8
(H) Tire Maintenance	Good	1.0
	Average	0.9
	Poor	0.7

3 Tire Temperature & Ton-Miles-Per-Hour (TMPH) Rating

TIRE TEMPERATURE AND TON-MILES-PER-HOUR

Rating materials and adhesives used in tires are especially vulnerable to damage from high temperatures which limit the amount and type of usage for tires. This is especially true for OTR tires for dump trucks and scrapers where high internal temperatures are not uncommon, because rapid dissipation of heat is hindered by the thick tire construction. Various conditions also influence the limits of use for OTR tires. TMPH is the measure of usage that normally indicates the limits of use under average working conditions.



- Vehicle empty: Load on front axle ÷ number of tires = _tons/tire
Load on rear axle ÷ number of tires = _tons/tire
- Vehicle loaded: load on front axle ÷ number of tires = _tons/tire
Load on rear axle ÷ number of tires = _tons/tire
- Payload = _tons
- Hauling distance per trip = _miles
- Number of trips per day = _times
- Number of shifts per day hours of each shift
Number of shifts _times
Hours per shift _hours
(including inspection _hours, lunch _hours and rest _hours.)
- Actual maximum speed in operation _miles/hour
- Ambient temperature High _°F/Average _°F

Operating TMPH

Operating TMPH is computed to compare actual use with the tire's TMPH rating. The operating TMPH is calculated in the following manner by observation and measurement of actual operation.

Operating TMPH = (average tire load in short tons) × (average speed in miles per hour).

Where,

Average tire load =

$$1/2 [(load\ on\ tire\ when\ vehicle\ is\ empty) + (load\ on\ tire\ when\ vehicle\ is\ laden)]$$

Average speed =

$$(roundtrip\ distance\ in\ miles) \times (number\ of\ trips) \div (total\ hours\ from\ start\ of\ first\ shift\ to\ end\ of\ last\ shift)$$

For actual computation and reference this data should be collected:

Use of TMPH Rating

With the formula described above, the operating TMPH required for a particular job can be computed and off-the-road tires which satisfy the requirement can be selected. Operating TMPH should always be less than the tire's TMPH rating. The real factor limiting tire usage is heat. TMPH measurements and ratings are only tools used to construct guidelines so that tires do not overheat. As previously stated, these guidelines are constructed assuming average operating conditions. Under some conditions it is possible for more heat to be generated than would normally be expected at a given operating TMPH level. This should be kept in mind when operating TMPH approaches the tire's TMPH rating to prevent heat damage.

TKPH (Ton-Kilometers-Per-Hour)

Generally, TMPH is the common measure, but TKPH, the metric measure is also used. Care should be taken when converting from TMPH, since TMPH uses the short ton (2,000 lbs) and mileage (1 km = 0.621 miles) and TKPH uses the metric ton (2,204.6 lbs or 1.1023 short tons). To convert TKPH to TMPH, divide TKPH by 1.459.

3 Tire Temperature & Ton-Miles-Per-Hour (TMPH) Rating

Adjusting Operating TMPH for Ambient Temperature

The TMPH ratings are based on a maximum yearly ambient temperature of 100°F (38°C), so in calculating operating TMPH, adjustment must be made to compensate for temperature differences. ($^{\circ}\text{C} = (5 \div 9) \times (^{\circ}\text{F} - 32)$). The maximum ambient temperature is the maximum daytime high. To calculate the adjusted operating TMPH, conduct the following calculations:
Adjusted Operating TMPH rating = Operating TMPH \times F(t):

	If maximum yearly ambient temperature is less than 100°F (38°C)	If maximum yearly ambient temperature is more than 100°F (38°C)
RADIAL	$F(t) = \frac{55}{93 - T_c}$	$F(t) = \frac{55}{74 - \frac{1}{2}T_c}$
BIAS	$F(t) = \frac{77}{115 - T_c}$	$F(t) = \frac{77}{96 - \frac{1}{2}T_c}$

*The adjusted operating TMPH should never exceed the tires rated TMPH

TMPH of Steel Breaker Tires

A TMPH rating is not given for steel breaker tires. However, the TMPH capability can be estimated by multiplying the TMPH rating of a comparable tire of standard construction by 0.7.

3 Tire Temperature & Ton-Miles-Per-Hour (TMPH) Rating

Yokohama Off-The-Road Tires Ton-Miles-Per-Hour and Ton-Kilometers-Per-Hour Rating Chart (Radial)

SPECIFICATIONS			CUT PROTECTED **UG		CUT PROTECTED		REGULAR		HEAT RESISTANT	
TIRE SIZE	TRA	TYPE	TMPH	TKPH	TMPH	TKPH	TMPH	TKPH	TMPH	TKPH
17.5R25	E-3	RB3I			90	131				
		RL3I	60	88	85	124				
20.5R25	E-3	RB3I			105	153				
		RL3I			93	135				
	E-3+	RT3I			95	139				
23.5R25	E-3	RB3I			115	168				
		RT3I			120	175				
	E-3+	RL3I	75	109	100	146				
	E-4	RT4I			95	139				
26.5R25	E-3	RB3I			125	182				
	E-3+	RT3I			125	182				
	E-4	RT4I			110	160				
29.5R25	E-3	RB3I			185	270				
	E-4	RT4I			140	204				
16.00R25	E-4	RB4I			85	124	110	160		
18.00R33	E-4	RB42			115	168				
		RL42			115	168				
24.00R35	E-4	RB42			190	277	208	304		
		RL42			190	277				
27.00R49	E-4	RB42			295	430	367	535		
750/65R25	E-4	RT4I			154	225				

NOTES: *High TMPH rating tires can be offered to meet certain conditions. Consult your Yokohama technical representative.

**For underground use. TKPH = TMPH × 1.459. TMPH = TKPH ÷ 1.459

3 Tire Temperature & Ton-Miles-Per-Hour (TMPH) Rating

Yokohama Off-The-Road Tires Ton-Miles-Per-Hour and Ton-Kilometers-Per-Hour Rating Chart (Bias)

SPECIFICATIONS			CUT PROTECTED		REGULAR		HEAT RESISTANT	
TIRE SIZE	TRA	TYPE	TMPH	TKPH	TMPH	TKPH	TMPH	TKPH
14.00-24	E-3	Y67	65	95	75	109		
16.00-24	E-3	Y67	85	124	95	139		
14.00-25	E-3	Y67	65	95	75	109		
16.00-25	E-3	Y67	85	124	95	139		
	E-4	Y523	70	102	80	117		
18.00-25	E-3	Y67	110	160	120	175		
	E-4	Y523	95	139	105	153		
21.00-25	E-3	Y67			145	212		
26.5-25	E-3	Y67	90	131	105	153		
29.5-25	E-3	Y67	95	139	110	160		
26.5-29	E-3	Y67	110	160	125	182		
29.5-29	E-3	Y67	115	168	135	197		
33.25-29	E-3	Y67						
29.5-35	E-3	Y67			170	248		
33.25-35	E-3	Y67	155	226	180	263		
37.25-35	E-3	Y67	190	277	225	328	245	357
37.5-39	E-3	Y67	220	321	225	328		

SPECIFICATIONS			CUT PROTECTED-S		CUT PROTECTED-C		REGULAR-R		REGULAR-T		HEAT RESISTANT-H		HEAT RESISTANT-V	
TIRE SIZE	TRA	TYPE	TMPH	TKPH	TMPH	TKPH	TMPH	TKPH	TMPH	TKPH	TMPH	TKPH	TMPH	TKPH
18.00-33	E-3	Y67			130	190								
	E-4	Y523			105	153								
		Y523U			100	146								
21.00-35	E-4	Y523			130	190	150	219						
24.00-35	E-3	Y67					215	314						
	E-4	Y523	120	175	155	226	180	263			220	321		
24.00-49	E-4	Y523	150	219									290	423
27.00-49	E-4	Y523	180	263	230	336	265	387	285	416	310	452	340	496
30.00-51	E-4	Y523	210	306	265	387			340	496			405	591
33.00-51	E-4	Y523			295	430	350	511	380	554			440	642
		Y567			354	516	420	613	456	664			528	770
36.00-51	E-3	Y565											600	875
	E-4	Y523			330	481			430	627				
40.00-57	E-4	Y523			350	511	410	598	450	657			540	788
		Y567			420	613	492	717					648	945

NOTES: *High TMPH rating tires can be offered to meet certain operating conditions. Consult your Yokohama technical representative.
Figures are subjected to change without prior notice. TKPH = TMPH × 1.459, TMPH = TKPH ÷ 1.459

3 Load-and-Carry Operation of Front End Loaders

LOAD-AND-CARRY OPERATION OF FRONT END LOADERS

In loading and grading with loaders and dozers tire heat does not pose a large problem because the average operating speed is very low compared with dump trucks and scrapers. However, for load-and-carry operations the average operating speed is higher and tire temperature may become an important factor. This is especially important for the L-5 tire which has a very thick tread. In this case, operation must be limited by the **TMPH** rating. If the use of L-5 tires is too limiting, L-4 tires are an alternative.

Maximum Haul Length, Speed, and Load Table

MAXIMUM HAUL LENGTH	MAXIMUM SPEED	MAXIMUM LOAD
L-3 2000 ft. (610 m)	15 mph (25 kph)	Std. Load × 0.8
L-4 800 ft. (244 m)	15 mph (25 kph)	Std. Load × 0.8
*L-5 250 ft. (76 m)	5 mph (10 kph)	Std. Load × 1.0

*When tires designed for dig and load vehicles are used in load-and-carry operations, the haul distance must be limited to 76 meters and maximum speed to 5 mph (10 kph).

3 Protecting Tires on Vehicle in Highway Drive-Away

PROTECTING TIRES ON VEHICLE IN HIGHWAY DRIVE-AWAY

Because of the special extra-heavy construction of OTR tires, special precautions must be observed to protect these tires when the vehicle is driven on the highway for delivery, or moved by an operator to a new job site. If the precautions are not observed, excessive tire heat may develop and the tire may fail prematurely. Always consult the vehicle or tire manufacturer for specific information before starting out on a trip. Vehicles in transit should be accompanied by responsible personnel in a pilot car to enforce the following precautions and maintain a check on equipment. This is good insurance for a large investment. The following precautions apply to tires on all vehicles in transit, driven or towed. Check the following guidelines and consult Yokohama.

Load and Pressure

- Empty vehicles before starting.
- Instructions for use of drive-away tables:
 - 1) Determine the load each tire will carry.
 - 2) Using the table, select the inflation pressure shown for the load determined. This is the pressure required for drive-away service.
 - 3) Ignore tire ply rating when determining drive-away load and pressure conditions.
- Check inflation pressure before starting out each day and adjust to pressure recommended for highway drive-away by vehicle manufacturer.
- Do not drive or tow vehicles using tires with 'dry ballast' in highway drive-away.
- Do not reduce inflation pressure by bleeding tires during highway drive-away. During highway drive-away pressure build-up in tires is normal.

Maximum Highway Speed

- Regular Tread Tires (E-3)
 - Narrow Base 30 mph (50 kph)
 - Wide Base 20 mph (30 kph)
- Average operating speed (Running Mileage ÷ (Running Hours + Stop Hours)) should be under the speed obtained by the following equation:

$$\text{Speed} = \frac{\text{Tire TMPH}}{\text{Tire Load (s-ton)}} \times 0.8$$

0.8 is a safety coefficient.

- Where narrow base and wide base tires are mixed on a vehicle, use the guidelines specified for wide base tires.

Deep Tread (E-4) and Special Compound Tires

- Do not drive vehicles equipped with deep tread (E-4) and special compound tires over the highway unless the proposed trip is reviewed and approved by qualified Yokohama personnel.

Extra Deep Tread Tires

- Do not under any circumstances move extra deep tread tires over the highway.

Operation Mode

Yokohama recommends the following mode of operation:

- Stop for a 30-minute cooling period after each 2 hours of sustained operation.
- A one-hour minimum stop period should be observed after every four hours of operation.

Driving	Stop	Driving	Stop	Driving	Stop	...
2H	0.5H	2H	1.0H	2H	0.5H	

The following is an example for driving a vehicle on the highway for delivery:

- 1) Vehicle model: YOKO 100 (85 s-ton)
- 2) Tire size: 24.00-49 42PR E-3
- 3) Temperature: 50°F~100°F (10°C~38°C)
- 4) Tire load: Empty before starting, load on front tire 14.3 s-ton (13.0 m-ton)
- 5) Inflation pressure: 70 psi (4.9 kg/cm²)
- 6) Maximum speed: 30 mph (50 kph)
- 7) Average speed:

YOKOHAMA Pattern Code	TRA Code	TIRE SPEC	TON-MILEAGE		AVERAGE SPEED	
			TMPH	TKPH	MPH	KPH
Y67	E-3	CPC	245	360	13.71	22.15
		REG	280	410	15.66	25.23
		HRH	330	480	18.46	29.50

8) Recommended Operation Mode

2H Driving	0.5H Stop	2H Driving	1H Stop	2H Driving	0.5H Stop	2H Driving	1H Stop	...
Speed (V)		Speed (V)		Speed (V)		Speed (V)		

YOKOHAMA Pattern Code	TRA Code	TIRE SPEC	*SPEED (V)	
			MPH	KPH
Y67	E-3	CP	18.85	30.45
		REG	21.53	34.69
		HR	25.38	40.56

$$\begin{aligned} * \text{Speed} &= \text{Average Speed} \times \frac{\text{Driving Hours} + \text{Stop Hours}}{\text{Driving Hours}} \\ &= \text{Average Speed} \times (5.5 \div 4) \end{aligned}$$

3 Load and Inflation Pressure Table for Transit

LOAD AND INFLATION PRESSURE TABLE FOR TRANSIT

Narrow Base Earthmover Tires in Drive-Away Service Only 30 MPH (50 KPH) Maximum Speed.

Tire Load Limits at Various Cold Inflation Pressures (PSI)																	(LBS)
Tire Size Designation	Radial Ply																
	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	
	Diagonal Ply																
	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
16.00*25	5380	5980	6550	7100	7600	8050	8550	9000	9400	9850	10200	10600	11000	11400	11800	12100	
18.00*25	6950	7750	8500	9150	9800	10400	11000	11600	12200	12700	13200	13700	14200	14700	15200	15700	
18.00*33	8050	9000	9850	10600	11400	12100	12800	13500	14100	14700	15400	15900	16500	17100	17600	18200	
18.00*49 (**)	10200	11400	12400	13400	14400	15300	16200	17000	17800	18600	19400	20200	20900	21600	22300	23000	
21.00*25	8950	9550	10900	11800	12600	13400	14200	14900	15700	16400	17000	17700	18300	18900	19600	20200	
21.00*35	10600	11800	12900	14000	15000	15900	16900	17700	18600	19400	20200	21000	21700	22500	23200	23900	
21.00*49 (**)	12900	14300	15700	17000	18200	19300	20400	21500	22500	23500	24500	25400	26300	27200	28100	29000	
24.00*25	11600	12900	14100	15200	16300	17400	18400	19300	20200	21100	22000	22900	23700	24500	25300	26000	
24.00*29	12400	13800	15100	16300	17500	18600	19700	20700	21700	22600	23600	24500	25400	26200	27100	27900	
24.00*35	13600	15100	16600	17900	19200	20400	21600	22700	23800	24800	25800	26800	27800	28800	29700	30600	
24.00*43 (**)	15200	16900	18500	20000	21400	22700	24000	25300	26500	27700	28800	29900	31000	32100	33100	34100	
24.00*49	16300	18100	19900	21500	23000	24500	25900	27200	28500	29800	31000	32200	33400	34500	35600	36700	
27.00*33	16200	18100	19800	21400	22900	24400	25800	27100	28400	29700	30900	32100	33200	34400	35500	36600	
27.00*49	20000	22200	24300	26300	28200	30000	31700	33300	34900	36500	38000	39400	40900	42300	43600	44900	
30.00*33 (**)	20000	22200	24300	26300	28200	30000	31700	33300	34900	36500	38000	39400	40900	42200	43600	44900	
30.00*51	24700	27500	30100	32500	34900	37100	39200	41300	43200	45200	47000	48800	50600	52300	54000	55600	
33.00*51	28600	31900	34900	37700	40400	43000	45400	47800	50100	52300	54500	56500	58600	60500	62500	64500	
36.00*51	34900	38800	42500	45900	49200	52300	55300	58200	61000	63500	66500	69000	71500	74000	76000	78500	
40.00*57	44500	49600	54200	58600	63000	67000	70500	74500	78000	81500	84500	88000	91000	94000	97500	100000	
*Tire size designation will include "R" (Radial Ply) or "-." (Diagonal or Bias Ply). **Not available from The Yokohama Rubber Co., Ltd.																	

*Tire size designation will include "R" (Radial Ply) or "-" (Diagonal or Bias Ply). **Not available from The Yokohama Rubber Co., Ltd.

NOTES: Figures are subjected to change without prior notice. Figures listed are in pounds.

Wide Base Earthmover Tires in Drive-Away Service Only 30 MPH (50 MPH) Maximum Speed.

(LBS)																
Tire Size Designation	Tire Load Limits at Various Cold Inflation Pressures (PSI)															
	Radial Ply															
	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110
	Diagonal Ply															
	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
15.5*25 (**)	3740	4160	4540	4920	5260	5600	5920	6250	6550	6800	7100	7400	7650	7900	8150	8400
17.5*25	4460	4960	5440	5880	6300	6700	7100	7450	7800	8150	8500	8800	9150	9450	9750	10000
20.5*25	5960	6650	7250	7850	8400	8950	9450	9950	10400	10900	11300	11800	12200	12600	13000	13400
23.5*25	7600	8450	9250	10000	10700	11400	12100	12700	13300	13900	14500	15000	15600	16100	16600	17100
26.5*25	9550	10600	11600	12600	13500	14300	15200	16000	16700	17500	18200	18900	19600	20200	20900	21500
26.5*29	10200	11400	12400	13400	14400	15300	16200	17000	17900	18700	19400	20200	20900	21600	22300	23000
29.5*25	11500	12800	14000	15200	16300	17300	18300	19200	20200	21000	21900	22800	23600	24400	25200	25900
29.5*29	12300	13700	14900	16200	17300	18400	19500	20500	21500	22400	23300	24200	25100	26000	26800	27600
29.5*35	13400	14900	16300	17600	18800	20000	21200	22300	23400	24400	25400	26400	27300	28300	29200	30100
33.25*29	15100	16800	18400	19900	21300	22700	24000	25200	26500	27600	28800	29900	30900	32000	33000	34000
33.25*35	16400	18200	20000	21600	23100	24600	26000	27400	28700	29900	31200	32400	33500	34700	35800	36900
33.5*33	16500	18400	20100	21700	23300	24800	26200	27500	28900	30100	31400	32600	33800	34900	36000	37100
33.5*39 (**)	17800	19800	21600	23400	25100	26700	28200	29700	31100	32500	33800	35100	36400	37600	38800	40000
37.25*35	19800	22000	24100	26000	27900	29600	31300	33000	34500	36100	37600	39000	40400	41800	43100	44400
37.5*33	19800	22100	24200	26100	28000	29800	31500	33100	34700	36200	37700	39200	40600	42000	43300	44700
37.5*39	21300	23700	25900	28000	30000	32000	33800	35600	37300	38900	40500	42100	43600	45100	46500	47900
37.5*51 (**)	24100	26800	29300	31700	34000	36100	38200	40200	42100	44000	45800	47600	49300	51000	52600	54200
*Tire size designation will include "R" (Radial Ply) or "-" (Diagonal or Bias Ply). **Not available from The Yokohama Rubber Co., Ltd.																

*Tire size designation will include "R" (Radial Ply) or "-" (Diagonal or Bias Ply). **Not available from The Yokohama Rubber Co., Ltd.

NOTES: Figures are subjected to change without prior notice. Figures listed are in pounds.

3 Tubes and Flaps • Rims

TUBES AND FLAPS

Tube type tires employ tubes to retain air under pressure within the carcass. The flap is a liner which is placed between the rim and tube to protect the tube from damage by the rim and beads. The size of the tube and flap are usually indicated by the size of tire for which they can be used, without regard for the ply rating. For example, a 23.5-25 size tube or flap can be used with a tire of 23.5-inch width and a diameter of 25 inches. Some tubes and flaps can be used for more than one size of tire. For example, a size 13.00-24 and 13.00-25.

Storage of Tubes and Flaps

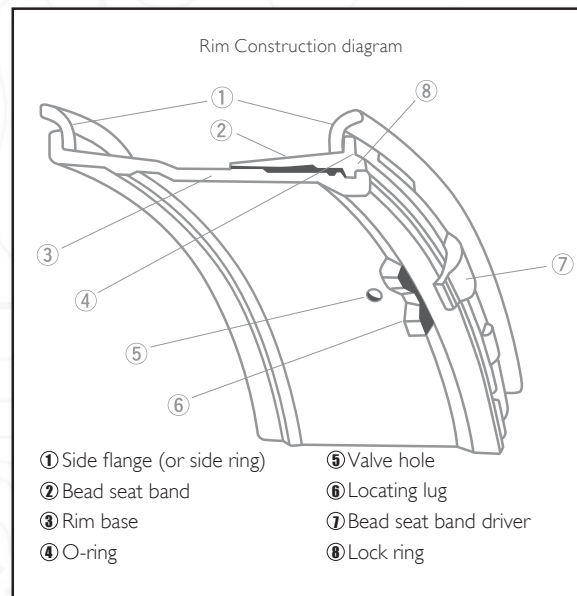
Tubes and flaps should be cleaned and all of the air expelled before storage. They should always be stored in a dry, cool place. The tubes should be packed lightly when storing to prevent the metal valve stems from causing damage.

Valves for Tube Type Tires

The type of valve used for a tube type tire depends on the type of rim it is mounted to. Therefore, when purchasing tubes, proper attention should be given to the valve type.

RIMS

Normally, a rim is composed of a rim base, two side flanges (or side rings), bead seat band and lock ring. On some smaller size rims, parts may be joined. For tubeless tires, an O-ring is also used.



3 Rims

Rim Identification

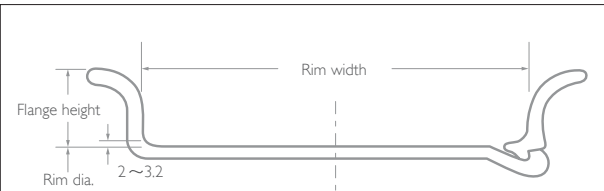
Rims are normally identified by a three-part code consisting of rim width (inches), flange shape (alphabetical) and rim diameter (inches). A flat base rim example would be: 9.00 V x 24. This follows the nomenclature of tire size with the addition of the flange identification, in this case. The code for full tapered bead seat rims does not indicate the flange shape, but some indicate flange height in inches. An example would be 17.00 x 25 - 2.0, where 2.0 is the flange height in inches.

Type of Rims

Tires can function properly only when they are mounted on the right rim. There are four basic types of rims for off-the-road tires: flat base, full tapered bead seat, semi-drop center and drop center.

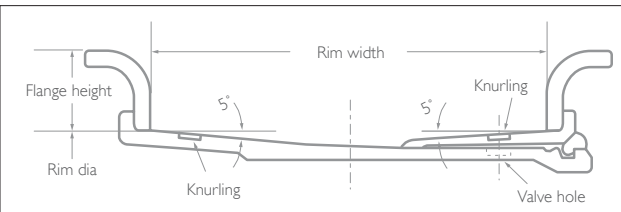
Flat Base Rims

There are two sub-classifications of interchangeable flat base rims as shown below. A tire which fits on one kind of flat base rim will fit on all flat base rims of the same width and diameter. These rims are used for relatively small tube type off-the-road tires.

Flat Base Rims/5° Flat Base Rims			
			
RIMS SIZE		TIRE SIZE	
FLAT BASE RIMS	5° FLAT BASE RIMS	STANDARD	ALTERNATIVE
6.50T	6.5	8.25-20	9.00-20
7.00T	7.0	9.00-20	10.00-20
7.50V(VM)	7.5	10.00-20	11.00-20
8.00V	8.0	11.00-20	12.00-20.24
8.50V(VM)	8.5	12.00-20.24	13.00-24
9.00V	9.0	13.00-24	12.00-20.24, 14.00-20.24
10.00WI(W)	—	14.00-20.24, R24	13.00-24

Full Tapered Bead Seat Rims

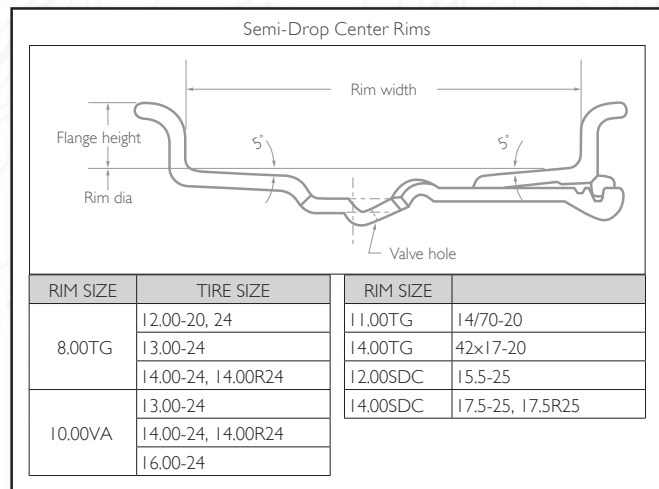
Most large-wheeled construction machinery employ full tapered bead seat rims. These rims have a 5° taper in the bead seat which strengthens the rim/bead binding. Additionally, a fine groove called "knurling" lines the bead surface to prevent further slippage. Flat base rims have a looser fit and some slippage may occur under quick acceleration if used on the same large-wheeled vehicle. Almost all rims with diameters over 25" are full tapered bead seat types. Wide base variations are also available.

Full Tapered Bead Seat Rims			
			
NARROW BASE		WIDE BASE	
RIM SIZE	TIRE SIZE	RIM SIZE	TIRE SIZE
8.50	12.00-25, 13.00-25	12.00	15.5-25
10.00	14.00-25	14.00	17.5-25, 17.5R25
11.25	16.00-25, 16.00R25	17.00	20.5-25, 20.5R25
13.00	18.00-25, 33, 18.00R33	19.50	23.5-25, 23.5R25
15.00	21.00-25, 35	22.00	26.5-25, 26.5R25
17.00	24.00-25, 29, 35, 49	25.00	29.5-25, 29, 35, 29.5R25
19.50	27.00-49	27.00	33.25-35
22.00	27.00-33, 30.00-51	28.00	33.5-33, 39, 35/65-33
24.00	33.00-51	31.00	37.25-35
26.00	36.00-51	32.00	37.5-33, 39, 51, 40/65-39
29.00	40.00-57	36.00	45/65-45

3 Rims

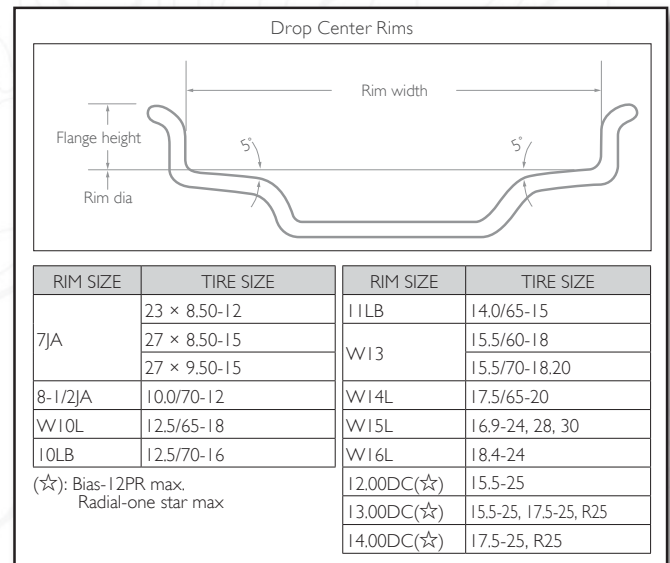
Semi-Drop Center Rims

This rim has a 5°-inclined bead seat and a depressed center. It is abbreviated as the "SDC" rim. Most SDC rims for OTR tires have diameters of 20" or 24". They are used on graders and loaders, and are identified by the marking on the tire sidewall: "For SDC RIM" or "For SDC RIMS."



Drop Center Rim

The drop center rim also has a 5°-inclined bead seat, but with a deeply depressed center (dropped rim center) section for easier tire mounting. Most DC rims are used on small loaders.



Caution with Wheel Use

Wheel defects such as cracks or corrosion can lead to air leakage, causing among other dangers, deteriorated traction and braking performance. Service life of the tire will degrade, also. More importantly, safe operation of the vehicle will be jeopardized.

- Do not use wheels with defects such as corrosion or cracks.
- Do not use rims for tubeless application that have been welded, have rust or have air leakage.
- Do not use wheels with cracks, breakage or rust erosion on the nut seat of the wheel.
- Do not use wheels if packing gutters are deformed by rust.
- Do not re-use O-rings.

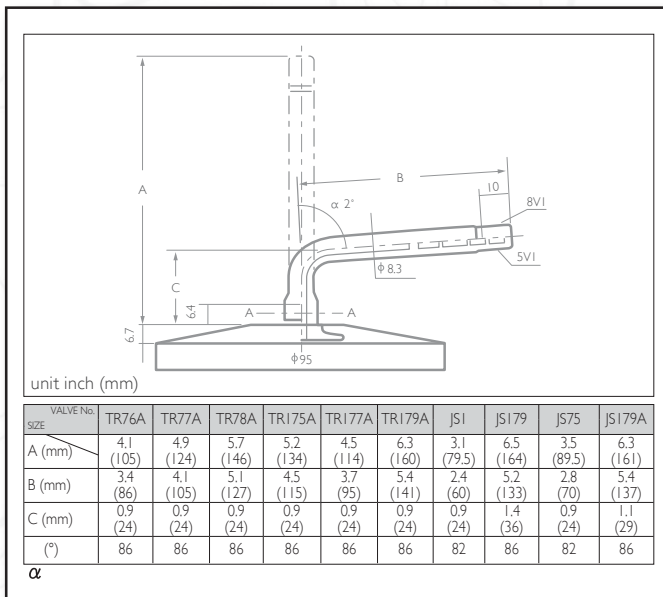
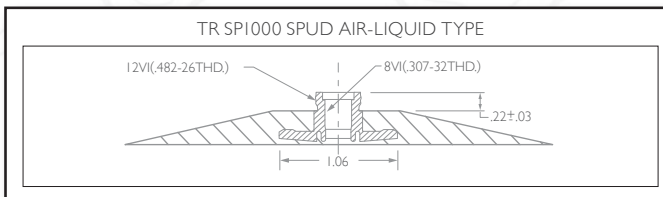
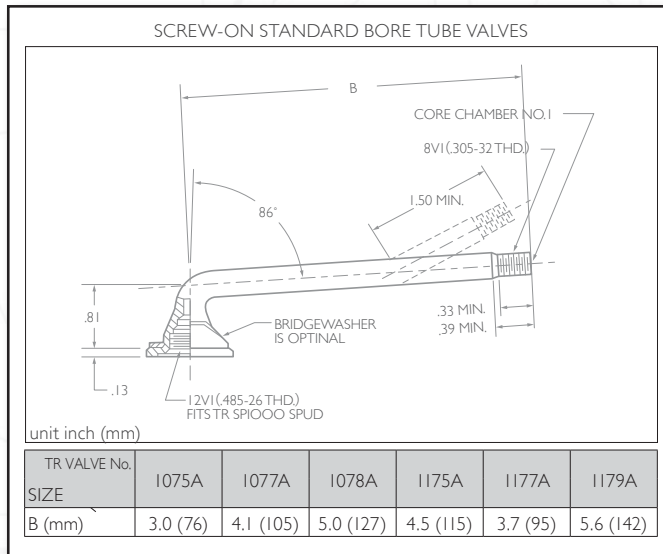
3 Valves (for tube/tubeless type OTR tires)

VALVES

Valves for OTR tires are of two types, tube or rim valves and are available in three makes: standard bore, large bore and air/water. Tube valves are for tube type tires and rim valves are for tubeless type tires.

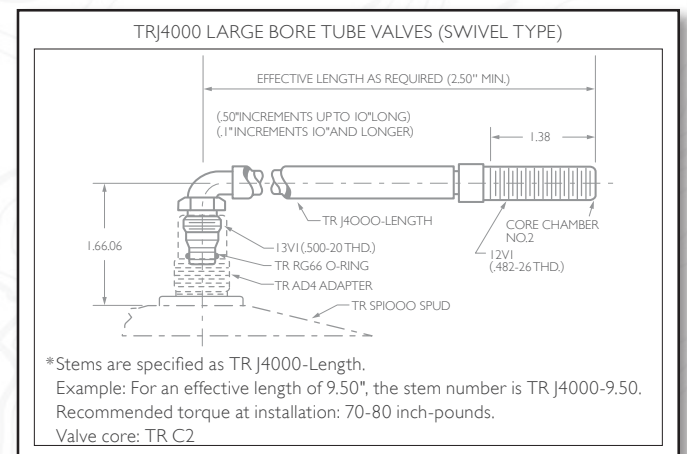
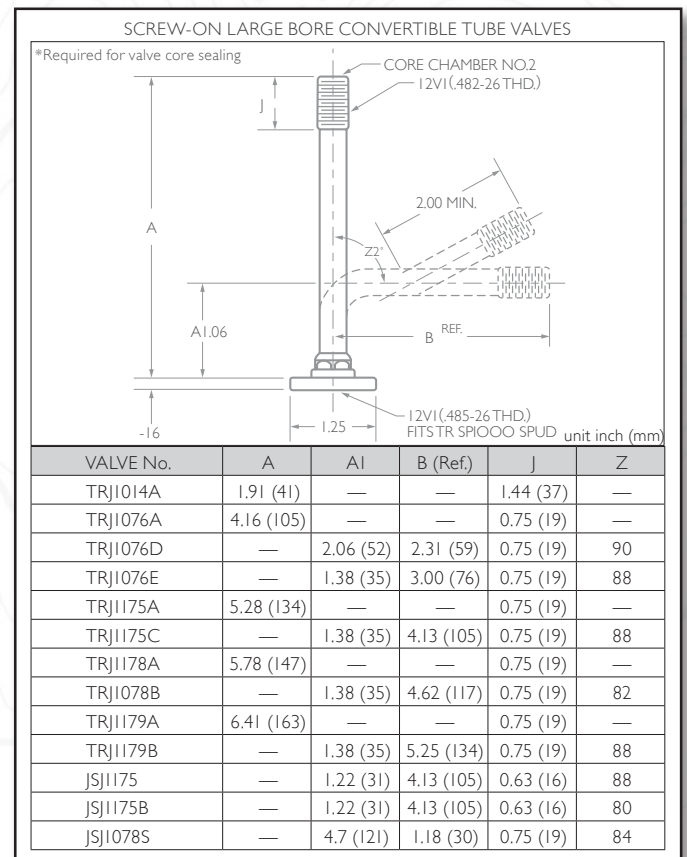
Tube Valves Standard Bore Tube Valve

This valve has an opening to accommodate a standard valve core.
This type of valve is mainly used for tires smaller than 14.00-24.



Large Bore Tube Valve

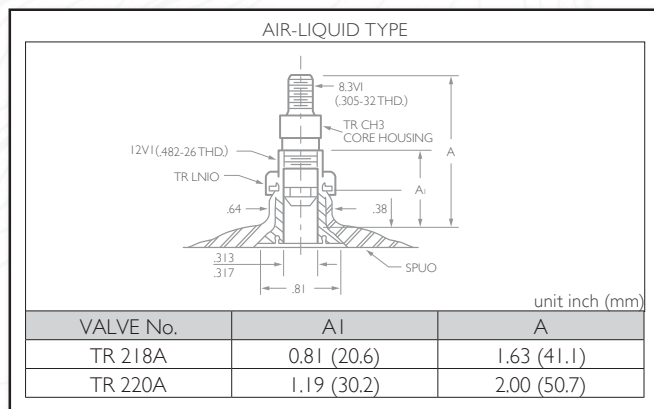
More air is required to fill larger tires. To decrease the filling time, a large bore valve can be utilized due to its increased internal diameter. This type of valve is used for wide base and narrow base tires with tread widths larger than 15.5 and 16.00, respectively. The large bore valve is also called a "jumbo valve," for which the third letter of its part number stands for:



3 Valves (for tube/tubeless type OTR tires)

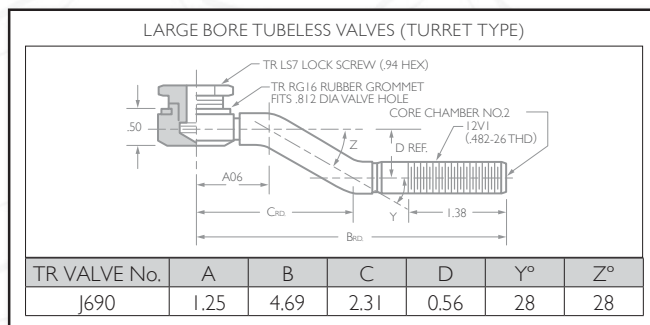
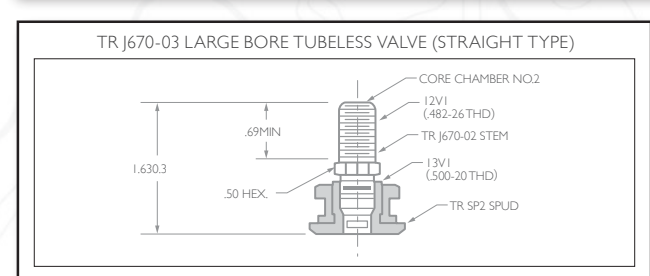
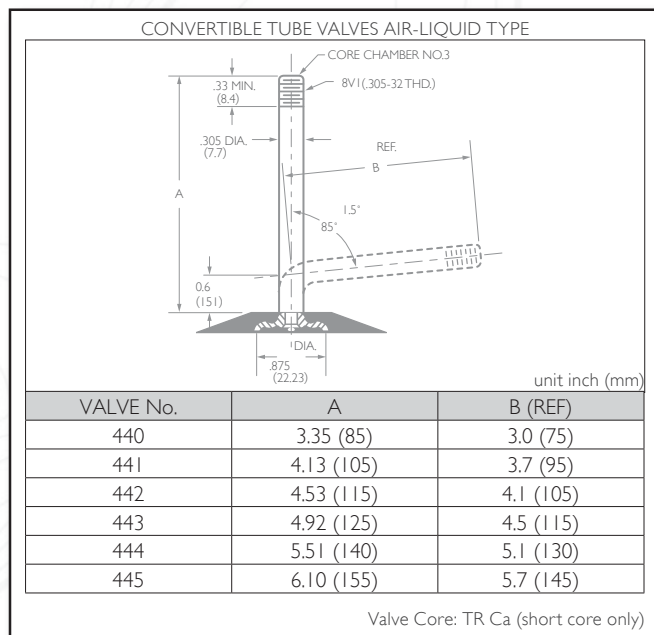
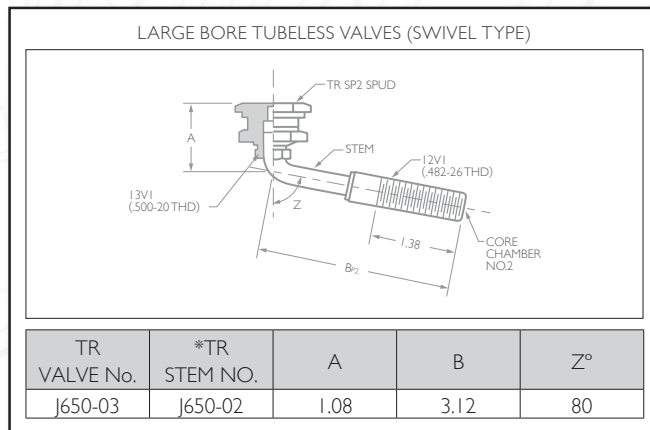
Air/Water Tube Valve

A liquid compound (normally a calcium chloride solution) can be injected into a tube with this valve. Two types are available, the TR218A and TR220A.



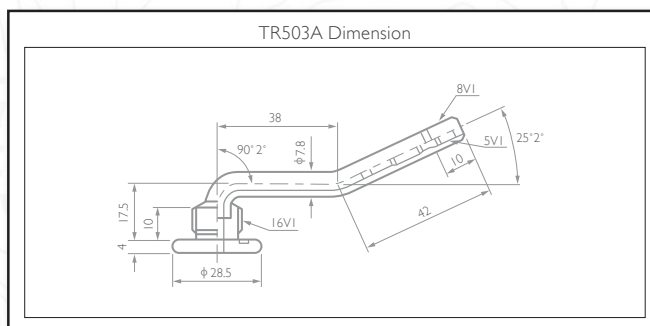
Large Bore Rim Valve

This is a rim valve with a large valve core, corresponding to the large bore tube valve. There are three types available.



Rim Valves - Standard Bore Rim Valve

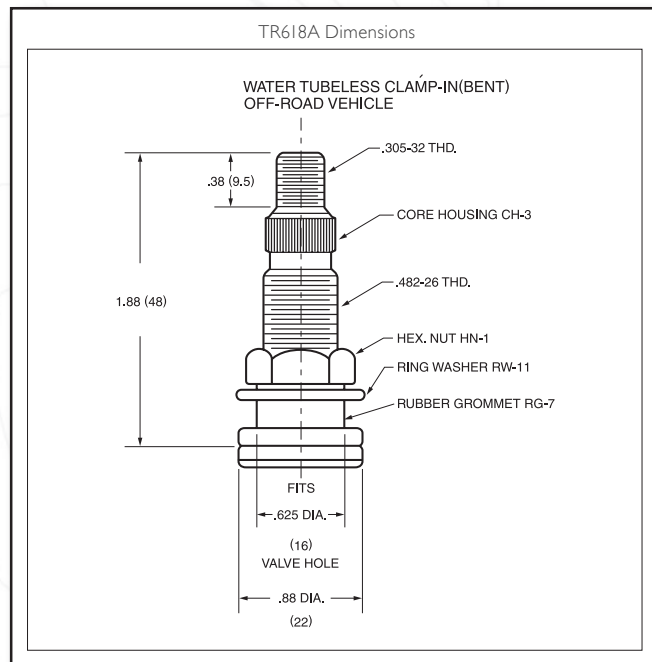
This is the rim valve counterpart to the standard bore tube valve explained on the opposite page.



3 Valves (for tube/tubeless type OTR tires)

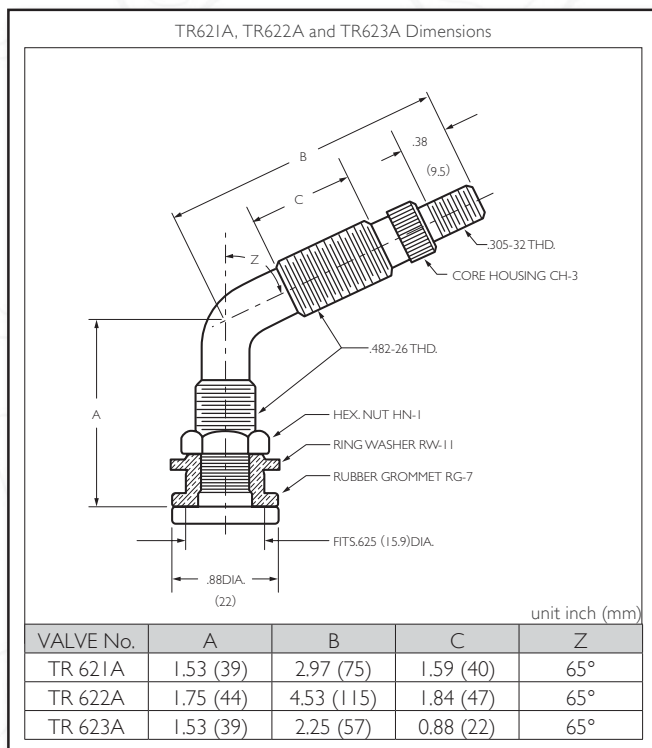
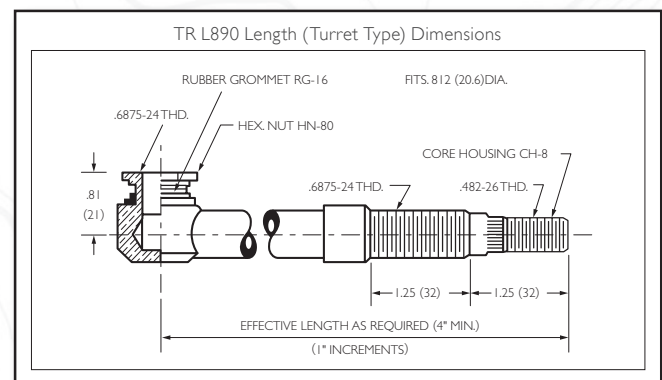
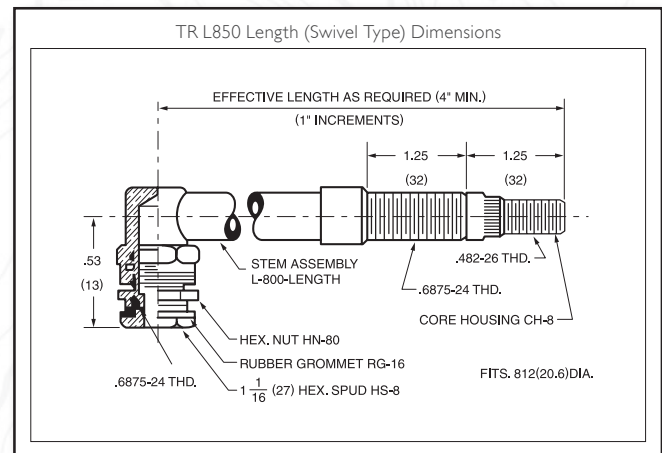
Air/Water Rim Valve

This is a rim valve with a core housing, corresponding to its tube valve type explained previously. There are four types of these valve available: TR618A, TR621A, TR622A and TR623A.

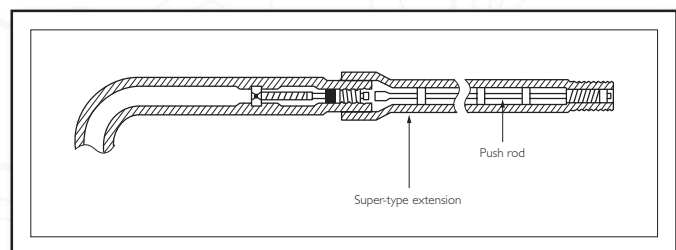


Super Large Bore Rim Valve

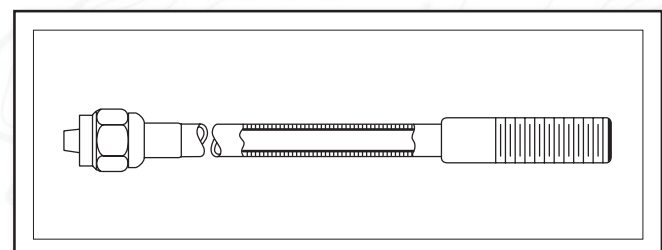
Super large bore rim valves have an internal diameter 50% larger than large bore valves which makes air inflation easier and faster.



Extension



Semi-flexible Extension



3 Valves • O-Rings

TYPE	NUMBER	OVERALL LENGTH(mm)	EFFECTIVE LENGTH(mm)	THREAD LENGTH(mm)
SUPER TYPE EXTENSION	3605	55	38	25
	3607	75	58	36
	3610	100	83	36
	3612	120	103	36
	3613	133	116	36
	3616	165	148	36
	3620	200	183	36

Caution with Tubeless Air Valves

Whenever the tubeless tire is demounted and changed, the tubeless air valve (rim valve) must be replaced with a new one, regardless of appearance.

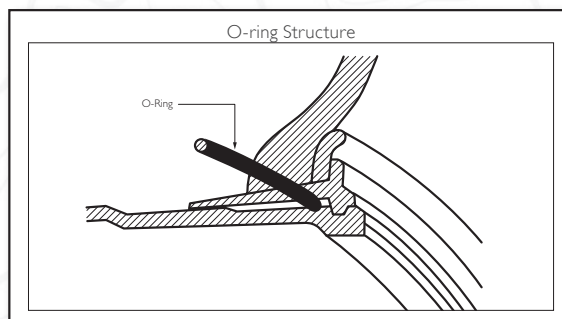
VALVE CLASSIFICATION BY RIM TYPE			
TYPE OF RIM	TIRE WIDTH	TUBE TYPE	TUBELESS
FLAT BASE TYPE	1400 AND UNDER 1600 AND OVER	STANDARD BORE TUBE VALVE LARGE BORE TUBE VALVE	STANDARD BORE RIM VALVE LARGE BORE RIM VALVE
FULL TAPERED	1400 AND UNDER 1600 AND OVER 15.5 AND OVER	STANDARD BORE TUBE VALVE LARGE BORE TUBE VALVE LARGE BORE TUBE VALVE	STANDARD BORE RIM VALVE LARGE BORE RIM VALVE LARGE/SUPER LARGE BORE RIM VALVE
SEMI-DROP CENTER	ALL SIZES	STANDARD BORE TUBE VALVE AIR/WATER TUBE VALVE	AIR/WATER RIM VALVE
DROP CENTER	ALL SIZES	AIR/WATER TUBE VALVE	AIR/WATER RIM VALVE

Notes:

Valves for inside dual-pair tire are quipped with a supplemental valve extension to facilitate air inflation. The extension is made of brass which is apt to nicks, scratches and dents. Care is required when (de)mounting, and storage should be in a clean, moisture free area.

O-RINGS

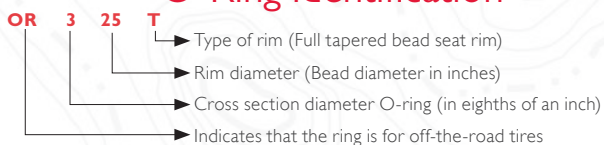
Rims for tubeless OTR tires require the use of an O-ring. Also referred to as a "seal ring" or "gasket," the O-ring forms an air-tight seal between separate parts of the rim. It must be used properly. It is very important to note that even if rim diameters are the same, different size O-rings may be necessary depending on the type of rim used.



O-RING No.	RIM	TIRE	SECTION DIAMETER		INSIDE CIRCUMFERENCE	
			mm	inch	mm	inch
OR224TG	24" SDC	24" rim diameter	6.7	0.26	1768	69.61
OR225T	25" SDC	14.00-25 and under	6.7	0.26	1802	70.94
	25" TB	17.5-25 and under *20.5-25 (uses 17.00 x 25-1.7 rim)				
OR325T	25" TB	16.00-25 and over 20.5-25 and over (except *rim)	9.8	0.39	1800	71.06
OR329T	29" TB	29" rim diameter	9.8	0.39	2127	83.74
OR333T	33" TB	33" rim diameter	9.8	0.39	2447	96.34
OR335T	35" TB	35" rim diameter	9.8	0.39	2560	100.79
OR339T	39" TB	39" rim diameter	9.8	0.39	2868	112.91
OR345T	45" TB	45" rim diameter	9.8	0.39	3311	130.35
OR349T	49" TB	49" rim diameter	9.8	0.39	3572	140.63
OR451T	51" TB	51" rim diameter	12.7	0.50	3666	144.33
OR457T	57" TB	57" rim diameter	12.7	0.50	4103	161.54

SDC: semi-drop center rim TB: tapered bead seat rim

O-Ring Identification



Caution with O-Rings

- Do not use used or damaged O-rings.
- Clean rim and then lubricate with vegetable oil before mounting the O-ring.
- Take caution not to damage O-ring with tire lever. Avoid twisting.
- Keep spare O-rings on hand for emergencies. A 20% backup rate is recommended.

3 Handling of Tires • Safety Precautions for Demounting

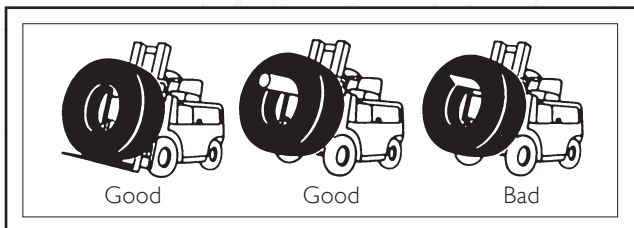
HANDLING OF TIRES

Improper handling of tires can lead to damage, especially to the beads.

Therefore, it is necessary to prevent excess pressure from being exerted on the beads.

When Using a Fork Lift to Lift a Tire:

- Lay the tire vertically across the fork, or
- Use a round fork at least six-inches in diameter.
- Do not insert a flat type fork within the tire.



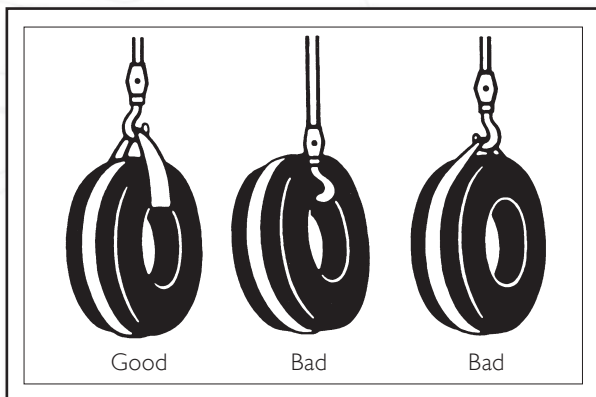
Safety Precautions

WARNING

Tire and rim servicing can be dangerous, and should be performed only by trained personnel using proper tools and procedures. Failure to comply with these procedures may result in faulty positioning of the tire and/or rim, and cause the assembly to burst with explosive force, sufficient to cause serious physical injury or death.

When Lifting Tires By Crane:

- Use a wide nylon or rubber sling.
- Do not hook the tire beads.
- Do not use a rope sling.



DEMOUNTING

Before Demounting

- Always exhaust all air from a single tire and from both tires of a dual assembly prior to removing any wheel components such as nuts and rim clamps.
- A broken rim part under pressure can blow apart and cause serious injury or death.
- Make sure to remove valve core to exhaust all air from the tire. Remove both cores from a dual assembly. *(When you remove the wheel lugs, if the tire is still under pressure, the assembly may fly apart.)*
- Check the valve stem by running a piece of wire through the stem to make sure it is not plugged. *(Foreign material may clog the valve stem during deflation or ice may form as the air leaves the tire, clogging the valve stem.)*

During Demounting

- Demounting tools apply pressure to rim flanges to unseat tire beads, and keep your fingers clear. Always stand to one side and hold the tool with one hand when you apply hydraulic pressure. *(If the tool slips off, it can fly with enough force to cause serious injury or death.)*
- Do not use tools in the vicinity of the flange butt weld.

After Demounting

- Clean rims and repaint to stop detrimental effects of corrosion and facilitate checking and tire mounting. Be very careful to clean all dirt and rust from the lock ring and gutter. This is important to secure the lock ring in its proper position. A filter on the air inflation equipment to remove the moisture from the air line helps prevent corrosion. The filter should be checked periodically to see that it is working properly. *(Parts must be clean for a proper fit - particularly the gutter section which holds the lock ring in its proper position.)*

3 Safety Precautions for Mounting

MOUNTING

Before Mounting

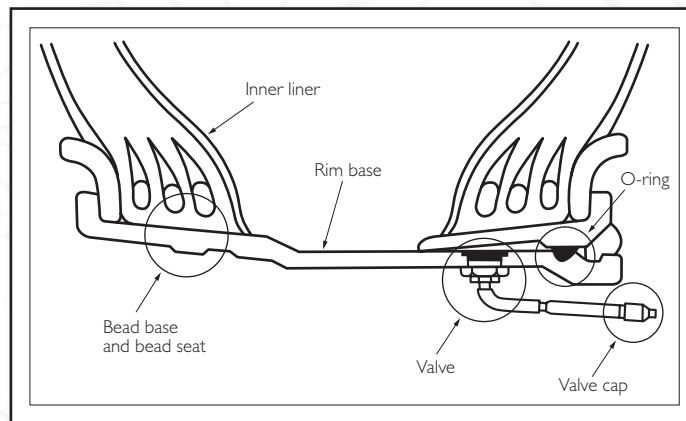
- Check rim components for cracks. Replace all cracked, badly worn, damaged and severely rusted components with new parts of the same size and type. When a components is in doubt, replace it. (Parts that are cracked, damage or excessively corroded are weakened. Bent or repaired parts may not engage properly.)
- Do not, under any circumstance, attempt to rework, weld, heat or braze any rim component that is cracked, broken or damaged. Replace with a new part that is not cracked, broken or damaged and which is of the same size and type. (Heating may weaken a part to extent that it is unable to withstand forces of inflation or operation.)
- Check type of rim and make sure all parts of such rim are being assembled properly. Follow instruction manual of rim or ask your distributor if you have any doubts. (Mismatched parts may appear to fit, but when the tire is inflated they may fly apart with explosive force.)
- Mixing parts of one type rim with those of another is potentially dangerous. Always check rim with manufacturer for approval.
- Remove rust, dirt and other foreign matter from the rim surface, particularly on the bead seats and O-ring slot.
- Clean the inside of the tire.
- Make sure tube and flap are correct and not damaged for tube type tires.
- Always prepare a new O-ring for tubeless tires.
- Do not reinflate a tire that has been run flat or has been run at 80% or less of its recommended operating pressure, or when there is obvious or suspected damage to the tire or wheel components. (Components may have been damaged or dislocated during the time the tire was run flat or seriously under-inflated.)

During Mounting and Inflation

- Do not try to seat rings or other components by hammering while tire is inflated or partially inflated.
- Double check to make sure all components are properly seated prior to inflation.
- Do not inflate tire before all components are properly in place. Place in safety cage or use a restraining device and inflate to approximately 0.35 kg/cm² (5 psi), recheck components for proper assembly. Observe that O-ring does not roll out of its groove. If assembly is not performed properly, deflate and correct. Never hammer on an inflated or partially inflated tire/rim assembly. If assembly is correct at approximately 0.35 kg/cm² (5 psi), continue to inflate fully to seat the tire beads.
- Never sit or stand in front of a tire and rim assembly that is being inflated. Always use a clip-on chuck with a sufficient length of hose to permit the person inflating the tire to stand clear of the potential trajectory of the wheel components, and use an in-line valve with gauge or a pressure regulator preset to a desired value when inflating a tire. When a tire is in a restraining device, do not lean any part of your body or equipment on or against the restraining device. (If parts are improperly installed they may fly apart with explosive force.)
- Never attempt to weld on an inflated tire/rim assembly or on a rim assembly with a deflated tire. (Heat from welding will cause a sudden, drastic increase in pressure, resulting in an explosion with the force of a bomb. Deflated tires can catch fire inside the air chamber.)

After Inflation

- Make sure no air leakage can be suspected, especially in tubeless tires.



3 Safety Precautions for Operation

OPERATION

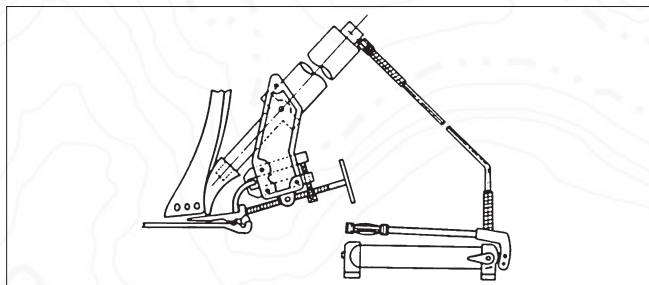
- Do not use under-inflated tires.
- Do not bleed or reduce air pressure to compensate for the increase in pressure resulting from operation.
- Do not use under-size rims. Use recommended rim for the tire.
- Do not overload or overinflate tire/rim assemblies. Check for adequate rim strength if special operating conditions are required. (Excessive overload can cause damage to the tire and rim assembly.)
- Never run a vehicle on one tire of a dual assembly. (The carrying capacity of the single tire and rim is dangerously exceeded, and operating a vehicle in this manner can result in damage to the rim and tire or cause a tire fire.)
- Never use a tube in a tubeless tire/rim assembly where the rim is suspected of air leakage. (Loss of air pressure through fatigue cracks or other fractures in a tubeless rim warns you of a potential rim failure. This safety feature is lost when tubes are used with leaking rims. Continued use may cause the rim to burst with explosive force.)
- Always inspect rims and wheels for damage during tire checks. (Early detection of potential rim failure may prevent serious injury.)
- Never add or remove an attachment or otherwise modify a rim (especially by heating, welding or brazing) unless the tire has been removed and approval has been received from the rim manufacturer. (Modification or heating of a rim or one of its parts may weaken it so that it cannot withstand forces created by inflation or operation.)
- Never mount bias tire and radial tire on the same axle. Follow vehicle manufacturer's recommendation.
- Never use tire under unintended service conditions for the tire. Please consult YOKOHAMA if vehicle operation requires specialized tire fitting.

Tools for Mounting and Demounting Tires

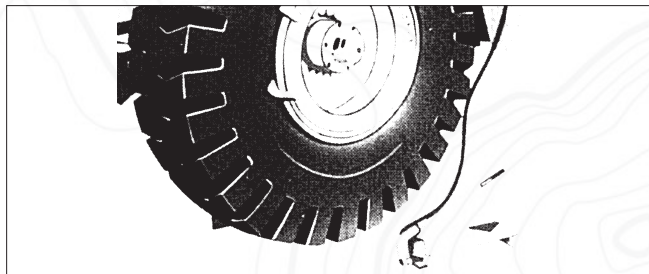
The following are all portable tools, and can be used both horizontally and vertically.



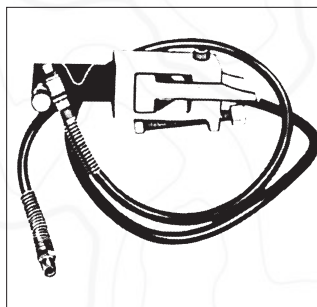
Hydraulic tire remover (tire push type) and bead wedges. Commonly used for 25 inch rims.



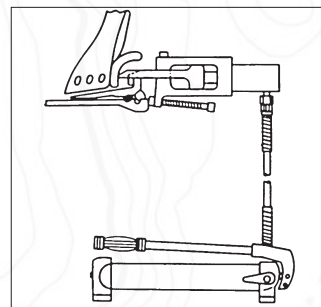
A man-powered hydraulic pump attached to a tire push type hydraulic tire remover.



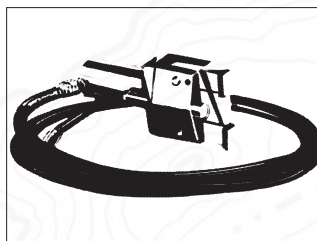
Hydraulic tire remover in operation.



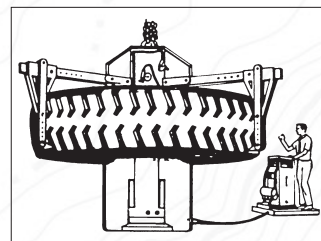
Hydraulic tire remover (rim flange push type). Commonly used for 33 inch or larger rims.



Man-powered hydraulic pump attached to rim flange push type hydraulic tire remover.



Another kind of hydraulic tire remover for 33 inch or larger rims (rim flange push type).



Tire mounting and demounting machine (unit-rig type) mainly used for 49 inch or larger rims. It is stationary and for horizontal use only. Hydraulic ram is driven by an electric pump.

3 Ballasted Tires

BALLASTED TIRES

A liquid or dry ballast is injected into the tires to add weight to graders, tire dozers, or loaders to increase traction and stability, hence the name ballasted tire. The advantage of this is that the ballast does not add any weight to the load on the axles. Generally, a solution of calcium chloride and water is considered best ballast. This solution has a low freezing temperature and will result in increased weight. It does, however, tend to corrode rims. Amounts and strengths of solutions used for different tire sizes, and resulting weight increases are shown in the table below.

The generally recommended amount of ballast is 75% of the tire's inner volume. The amount is limited to this to preserve the tire's cushioning properties. Rotate the tire so that the valve is at its highest point and fill until the solution overflows; this is approximately the 75% point. Then, inflate to the recommended air pressure.

Liquid Inflation Chart

Narrow Base...75% Full or Valve Level

TIRE SIZE	GAL- LONS of WATER	3 1/2 LBS OF CALCIUM CHLORIDE PER GALLON SPECIFIC GRAVITY 1.2 FROZEN TEMP -26°C			5 LBS CALCIUM CHLORIDE PER GALLON SPECIFIC GRAVITY 1.3 FROZEN TEMP -47°C		
		GALLONS of WATER	LBS of CaCl ₂	TOTAL WEIGHT (lbs)	GALLONS of WATER	LBS of CaCl ₂	TOTAL WEIGHT (lbs)
8.25-20	14.5	12.5	44	148	12	59	157
9.00-20	18	15.5	54	182	14.5	78	194
10.00-20	21	18	63	213	17	85	227
11.00-20	23.8	20	71	241	19	96	257
12.00-24	28	24	84	284	22.5	113	301
12.00-24	31	26	92	311	25	124	331
13.00-24, 25	38	33	115	390	31	155	414
14.00-20	43	36	128	432	34	172	459
14.00-24, 25	48	41	143	485	39	193	516
16.00-24, 25	67	58	203	686	55	273	729
18.00-24, 25	96	82	287	971	77	387	1032

Liquid Inflation Chart

Wide Base...75% Full or Valve Level

TIRE SIZE	GAL- LONS of WATER	3 1/2 LBS OF CALCIUM CHLORIDE PER GALLON SPECIFIC GRAVITY 1.2 FROZEN TEMP -26°C			5 LBS CALCIUM CHLORIDE PER GALLON SPECIFIC GRAVITY 1.3 FROZEN TEMP -47°C		
		GALLONS of WATER	LBS of CaCl ₂	TOTAL WEIGHT (lbs)	GALLONS of WATER	LBS of CaCl ₂	TOTAL WEIGHT (lbs)
15.5-25	46	40	139	470	37	187	500
17.5-25	60	51	180	609	48	243	647
20.5-25	90	77	269	910	72	362	967
23.5-25	118	101	354	1198	95	478	1274
26.5-25	159	136	477	1614	129	643	1716
26.5-29	174	149	521	1764	141	703	1875
29.5-25	207	177	618	2090	167	833	2223
29.5-29	224	192	673	2275	181	907	2419
29.5-35	251	215	753	2547	203	1015	2708
33.25-35	319	274	958	3242	258	1292	3447
33.5-33	328	281	983	3326	265	1325	3536
33.5-39	363	311	1089	3684	294	1470	3917
37.25-35	373	320	1115	3770	302	1510	4030
37.5-33	423	362	1268	4290	342	1710	4562
37.5-39	466	339	1397	4729	377	1885	5028
37.5-51	552	473	1656	5603	447	2235	5958
35/65-33	291	250	880	2970	235	1175	3140
40/65-39	416	357	1250	4230	336	1680	4485
45/65-45	586	502	1757	5920	474	2369	6304

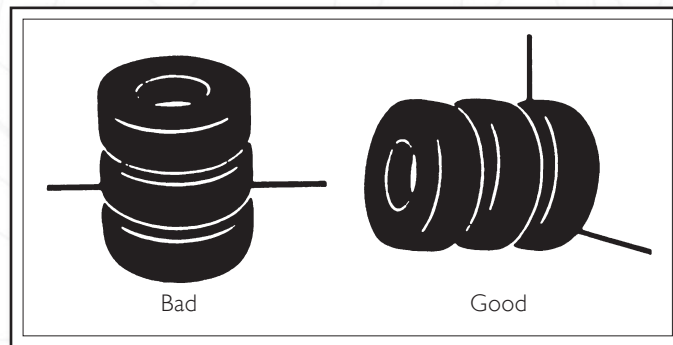
3 Tire Storage • How to Reduce Tire Costs

TIRE STORAGE

In general, tires should be removed from the rim, cleaned, and stored in a cool, dry room. They should be stored in an upright position, not horizontally, so that the proper space between the beads will be maintained. Make sure that the tire is not deformed by any external pressure exerted on it. Avoid the following when storing tires:

Direct sunlight
Ozone
Oil and grease
High temperatures and humidity

If tires must be stored outside, cover them with a tarpaulin for protection. If a vehicle is stored with tires mounted, rest the vehicle on blocks to relieve the load on the tires. Deflate the tires and cover them. Rotate the tires once a month to prevent permanent deformation, if the vehicle cannot be rested on blocks.



HOW TO REDUCE TIRE COSTS

Select the Proper Tire for the Job:

- Tire size.
- Ply rating.
- Tire specification.

Maintain a Tire Record:

- Keep a tire card for each tire.
- Analyze scrap tires.

Carry Out Good Tire Maintenance:

- Perform regular inflation pressure checks.
- Regularly inspect tire appearance.
- Ensure proper matching of dual tires.
- Prevent oil saturation.
- Prevent high temperature and humidity.
- Prevent wavy condition.
- Keep haul road, loading and dumping area clean.
- Provide good drainage.

Maintain Good Job Conditions:

- Do not overload.
- Avoid excessive speed.
- Train operator.



4 Miscellaneous Data

4 Earthmover Data

4. MISCELLANEOUS DATA

EARTHMOVER DATA

Formulas and Rules

The following are useful formulas and rules of thumb:

- Production, hourly = $\text{Load (BCY) / Cycles} \times \text{Cycles/hr}$
= $\text{Load (BM}^3\text{) / Cycles} \times \text{Cycles/hr}$
- Load factor (L.F.) = $\frac{\text{Bank cubic yards (BCY)}}{\text{Loose cubic yards (LCY)}}$
- Load factor (L.F.) = $\frac{\text{Bank cubic meters (B M}^3\text{)}}{\text{Loose cubic meters (LM}^3\text{)}}$
- Load factor (L.F.) = $\frac{100\%}{100\% + \% \text{ of swell}}$
- Load (bank measure) = $\text{Loose cubic yards (LCY)} \times \text{L.F.}$
= $\text{Loose cubic meters (LM}^3\text{)} \times \text{L.F.}$
- Shrinkage factor (S.F.) = $\frac{\text{Compacted cubic yards (CCY)}}{\text{Bank cubic yards (BCY)}}$
- Shrinkage factor (S.F.) = $\frac{\text{Compacted cubic meters (CM}^3\text{)}}{\text{Bank cubic yards (BM}^3\text{)}}$
- Density = $\text{Weight / Unit volume}$
- Load (bank measure) = $\frac{\text{Weight of Load}}{\text{Bank density}}$
- Rolling resistance factor
= $40 \text{ lbs/ton} + (30 \text{ lbs/ton/inch} \times \text{inches})$
= $20 \text{ kg/ton} + (15 \text{ kg/ton/2.5 cm} \times \text{cm})$
- Rolling resistance
= $2\% \text{ of GVW} + 1.5\% \text{ of GVW} \times \text{inch of tire penetration}$
= $2\% \text{ of GVW} + 0.6\% \text{ of GVW} \times \text{cm of tire penetration}$
- Grade resistance factor
= $20 \text{ lbs/ton} \times \% \text{ of grade}$
= $10 \text{ kg/ton} \times \% \text{ of grade}$
- Grade resistance
= $\text{GR factor (lbs/ton)} \times \text{GVW (tons)}$
= $\text{GR factor (kg/ton)} \times \text{GVW (tons)}$
- Grade resistance = $1\% \text{ of GVW} \times \% \text{ of Grade}$
- Total resistance =
Rolling resistance (lbs or kg) + Grade resistance (lbs or kg)
- Rolling Resistance (%)
= $2\% + 1.5\% \text{ per inch of tire penetration}$
= $2\% + 0.6\% \text{ per cm of tire penetration}$
- Grade (%) = $\% \text{ of grade}$
- Effective grade (%) = $\text{PR} (\%) + \text{GR} (\%)$
- Usable pull (traction limitation)
= $\text{Coeff. of traction} \times \text{Weight on drivers}$
= $\text{Coeff. of traction} \times (\text{Total wt} \times \% \text{ on drivers})$
- Pull required
= $\text{Rolling resistance} + \text{Grade resistance}$
= Total resistance
- Total cycle time = $\text{Fixed time} + \text{Variable time}$
- Fixed time: Refer to respective machine production section.
- Variable time = $\text{Total haul time} + \text{Total return time}$
- Travel time = $\frac{\text{Distance (ft)}}{\text{Speed (fpm)}}$
- Travel time = $\frac{\text{Distance (m)}}{\text{Speed (m/min)}}$
- Cycles per hour = $\frac{60 \text{ minutes}}{\text{Total cycle time (minutes)}}$
- Adjusted productivity = $\text{Hourly productivity} \times \text{Efficiency factor}$
- No. of units requires = $\frac{\text{Hourly production required}}{\text{Unit hourly production}}$
- No. of scrapers a pusher will load = $\frac{\text{Scraper cycle time}}{\text{Unit hourly production}}$

4 Earthmover Data

Typical Rolling Resistance Factors

ROAD SURFACE	lbs/ton	(kg/ton)
A roadway of hard, smooth, stabilized surface without penetration under load, watered, maintained:	40	(20)
A firm, smooth rolling roadway with dirt or light surface flexing slightly under or undulating, maintained fairly regularly, watered:	65	(35)
Snow packed:	50	(25)
Snow loose:	90	(45)
A dirt roadway, rutted, flexing under load, little if any maintenance, no water, 1" (25 mm) or more tire penetration:	100	(50)
Rutted dirt roadway, soft under travel, no maintenance, no stabilization, 4" (100 mm) to 6" (150 mm) tire penetration:	150	(75)
Loose sand or gravel:	200	(100)
Soft, muddy, rutted roadway, no maintenance:	200 to 400	(100 to 200)

Various tire sizes and inflation pressures will greatly reduce or increase the above figures. The quantities given are sufficiently accurate for estimating purposes when specific information on performance of particular equipment on given soil conditions is not available. See other Earth moving Data Section tables for additional information.

Material* Swell Percentage & Load Factors

MATERIALS	Swell %	Load Factor (%)
Cinders	45	69
Clay, dry or wet	40	72
Clay and gravel dry or wet	40	72
Coal, anthracite or bituminous	35	74
Earth, loam and dry or wet	25	80
Gravel, dry	12	89
wet	11	89
Gypsum	74	57
Hardpan	50	67
Limestone	67	60
Rock, well blasted	65	60
Sand, dry or wet	12	89
Sandstone	54	65
Shale and soft rock	65	60
Slag, bank	23	81
Slate	65	60
Trap rock	65	61

*Varies with moisture content, grain, size, degree of compactness, etc. Tests must be made to determine exact material characteristic.

Approximate Coefficient of Traction Factors

ROAD SURFACE	TRACTION FACTORS	
	Rubber Tires	Tracks
Concrete	.90	.45
Dry clay loam	.55	.90
Wet clay loam	.45	.70
Rutted clay loam	.40	.70
Dry sand	.20	.30
Wet sand	.40	.50
Quarry pit	.65	.55
Loose gravel road	.36	.50
Packed snow	.20	.25
Ice	.12	.12*
Firm earth	.55	.90
Loose earth	.45	.60
Stockpiled coal	.45	.60

*Semi-skeleton shoes = .27

Swell-Voids-Load Factor Table

Swell (%)	Voids (%)	Load Factor
5	4.8	.952
10	9.1	.909
15	13.0	.870
20	16.7	.833
25	20.0	.800
30	23.1	.769
35	25.9	.741
40	28.6	.714
45	31.0	.690
50	33.3	.667
55	35.5	.645
60	37.5	.625
65	39.4	.606
70	41.2	.588
75	42.9	.571
80	44.4	.556
85	45.9	.541
90	47.4	.526
95	48.7	.513
100	50.0	.500

Swell-Voids-Load Factor Table

Load Factor (%)	Voids (%)	Swell (%)
95	5	5.3
90	10	11.1
85	15	17.6
80	20	25.0
75	25	33.3
70	30	42.9
65	35	53.8
60	40	66.7
55	45	81.8
50	50	100.0

4 Conversion Tables

CONVERSION TABLES

Metric to Standard (UK, US, etc.)

MULTIPLY METRIC UNIT	BY	TO OBTAIN ENGLISH UNIT
Kilometer (km)	0.6214	Mile
Meter (m)	1.0936	Yard
Centimeter (cm)	0.0328	Foot
Millimeter (mm)	0.03937	Inch
Square Kilometer (km ²)	0.3861	Square Mile
Hectare (Ha)	2.4710	Acre
Square meter (m ²)	10.7600	Square foot
Square centimeter (cm ²)	0.1550	Square inch
Cubic meter (m ³)	1.3080	Cubic yard
kilograms/cubic meter (kg/m ³)	1.6860	Pounds/cubic yard
Liter (l or ltr)	0.2642	Gallon (US)
Imperial gallon	1.2000	US gallon
Kilometer per hour (kph)	0.6210	MPH
Liter (l or ltr)	61.0200	Cubic inch
Cubic centimeter (cm ³)	0.0338	Fluid ounce
Metric tonne (t)	0.9840	Long ton
Metric tonne (t)	1.1020	Short ton
Kilogram (kg)	2.2050	Pound, avdp.
Gram (g or gr)	0.0353	Ounce, avdp.
Calorie, Kilo (C or Cal.)	3.9680	BTU
Kilogram-meter (kgm)	7.2330	Foot-pound
Meter-kilogram (m-kg)	7.2330	Pound-foot
Metric horsepower (CV)	0.9863	HP
kg/square centimeter (kgs/cm ²)	14.2250	Pounds/square inch
kilopascal (kPa)	0.14503	Pounds/square inch

1 km = 1,000 m 1 m = 100 cm 1 cm = 10 mm 1 km² = 100 Ha
 1 Ha = 10,000 m² 1 m² = 10,000 cm² 1 cm² = 100 mm²
 1 m³ = 1,000 liters 1 liter = 1,000 cm³
 1 metric ton = 1,000 kg 1 quintal = 100 kg 1 kg = 1,000 g
 1 Cal = 427 kgm = 0.0016 CVH = 0.00116 KWH
 1 kg/cm² = 98.066 kPa Torque unit: 1 CV = 75 kgm/sec
 1 kg/cm² = 0.97 atmosph 1 bar = 100 kPa

Inches to Millimeters

in/32	mm	in/32	mm	in/32	mm	in/32	mm
1	0.8	21	16.7	41	32.5	105	83.3
2	1.6	22	17.5	42	33.3	110	87.3
3	2.4	23	18.3	43	34.1	115	91.3
4	3.2	24	19.1	44	34.9	120	95.3
5	4.0	25	19.8	45	35.7	125	99.2
6	4.8	26	20.6	46	36.5	130	103.2
7	5.6	27	21.4	47	37.3	135	107.2
8	6.4	28	22.2	48	38.1	140	111.1
9	7.1	29	23.0	49	38.9	145	115.1
10	8.0	30	23.8	50	39.7	150	119.1
11	8.7	31	24.6	55	43.7	155	123.0
12	9.5	32	25.4	60	47.6	160	127.0
13	10.3	33	26.2	65	51.6	165	131.0
14	11.1	34	27.0	70	55.6	170	134.9
15	11.9	35	27.8	75	59.5	175	138.9
16	12.7	36	28.6	80	63.5	180	142.9
17	13.5	37	29.4	85	67.5	185	146.9
18	14.3	38	30.2	90	71.4	190	150.8
19	15.1	39	31.0	95	75.4	195	154.8
20	15.9	40	31.8	100	79.4	200	158.8

Millimeters to Inches

mm	in/32	mm	in/32	mm	in/32	mm	in/32
1	1	19	24	37	47	75	95
2	3	20	25	38	48	80	101
3	4	21	27	39	49	85	107
4	5	22	28	40	50	90	113
5	6	23	29	41	52	95	120
6	8	24	30	42	53	100	126
7	9	25	32	43	54	105	132
8	10	26	33	44	55	110	139
9	11	27	34	45	57	115	145
10	13	28	35	46	58	120	151
11	14	29	37	47	59	125	158
12	15	30	38	48	61	130	164
13	16	31	39	49	62	135	170
14	18	32	40	50	63	140	176
15	19	33	42	55	69	145	183
16	20	34	43	60	76	150	189
17	21	35	44	65	82		
18	23	36	45	70	88		

Standard (UK, US, etc.) to Metric

MULTIPLY ENGLISH UNIT	BY	TO OBTAIN METRIC UNIT
Mile, statute (M)	1.6090	Kilometer
Foot (ft)	0.3048	Meter
	30.4800	Centimeter
Inch (in)	0.0250	Meter
Square mile (mile ²)	2.5900	Square kilometer
Acre	0.4047	Hectare
Square foot (ft ²)	0.0929	Square meter
Square inch (in ²)	6.4520	Square centimeter
Cubic yard (yd ³)	0.7650	Cubic meter
Cubic foot (ft ³)	0.0283	Cubic meter
Pound/cubic yard (lbs/yd ³)	0.5933	Kilogram/cubic meter
US gallon (US gal)	3.7850	Liter
US gallon	0.8330	Imperial gallon
MPH	1.6100	Kilometer per hour
TMPH	1.4590	TKPH
Cubic inch (in ³)	0.0160	Liter
Fluid ounce (fl oz)	29.5700	Cubic centimeter
Long ton (lg ton)	1.0160	Metric tonne
Short ton (sh ton)	0.9070	Metric tonne
Pound (lb)	0.4536	Kilogram
Ounce (oz)	28.3500	Gram
BTU	0.2520	Kilogram-calorie
Foot-pound (ft-lb)	0.1383	Kilogram-meter
Horse power (HP)	1.0140	Metric horsepower
Pound/square inch (PSI)	0.0703	Kg/square centimeter
Pound/square inch (PSI)	6.8950	Kilopascal

1 mile = 1,760 yds 1 yd = 3 ft 1 ft = 12 in 1 sq mile = 640 acres
 1 acre = 43,560 sq ft 1 sq ft = 144 sq in 1 cu ft = 7.48 gal
 1 gal = 231 cu in = 4 quarts liq 1 quart = 32 fl oz 1 fl oz = 1.80 cu in
 1 sh ton = 2,000 lbs 1 lg ton = 2,240 lbs 1 lb = 16 oz, avdp.
 1 BTU = 778 ft lb = 0.000393 HPH = 0.000293 KWH
 1 HP = 550 ft lb/sec 1 atmosph = 14.7 psi

4 Conversion Tables

CONVERSION TABLES

Pounds to Kilograms

lbs	kg	lbs	kg	lbs	kg	lbs	kg
1	0.5	260	117.9	1200	544.3	5000	2268.0
10	4.5	280	127.0	1300	589.7	5200	2358.7
20	9.1	300	136.1	1400	635.0	5400	2449.4
30	13.6	320	145.2	1500	680.4	5600	2540.2
40	18.1	340	154.2	1600	725.8	5800	2630.9
50	22.7	360	163.3	1700	771.1	6000	2721.6
60	27.2	380	172.4	1800	816.5	7000	3175.2
70	31.8	400	181.4	1900	861.8	8000	3628.8
80	36.3	420	190.5	2000	907.2	9000	4082.4
90	40.8	440	199.6	2200	997.9	10000	4536.0
100	45.4	460	208.7	2400	1088.6	11000	4989.6
110	49.9	480	217.7	2600	1179.4	12000	5443.2
120	54.4	500	226.8	2800	1270.1	13000	5896.8
130	59.0	520	235.9	3000	1360.8	14000	6350.4
140	63.5	540	244.9	3200	1451.5	15000	6804.0
150	68.0	560	254.0	3400	1542.2	16000	7257.6
160	72.6	580	263.1	3600	1633.0	17000	7711.2
170	77.1	600	272.2	3800	1723.7	18000	8164.8
180	81.6	700	317.5	4000	1814.4	19000	8618.4
190	86.2	800	362.9	4200	1905.1	20000	9072.0
200	90.7	900	408.2	4400	1995.8		
220	99.8	1000	453.6	4600	2086.6		
240	108.9	1100	499.0	4800	2177.3		

Miles Per Hour to Kilometers Per Hour

mph	kph	mph	kph	mph	kph	mph	kph
1	1.61	14	22.53	27	43.44	40	64.36
2	3.22	15	24.14	28	45.05	41	65.97
3	4.83	16	25.74	29	46.66	42	67.58
4	6.44	17	27.35	30	48.27	43	69.19
5	8.05	18	28.96	31	49.88	44	70.80
6	9.65	19	30.57	32	51.49	45	72.41
7	11.26	20	32.18	33	53.10	46	74.01
8	12.87	21	33.79	34	54.71	47	75.62
9	14.48	22	35.40	35	56.32	48	77.23
10	16.09	23	37.01	36	57.92	49	78.84
11	17.70	24	38.62	37	59.53	50	80.45
12	19.31	25	40.23	38	61.14		
13	20.92	26	41.83	39	62.75		

Kilometers Per Hour to Miles Per Hour

kph	mph	kph	mph	kph	mph	kph	mph
1	0.62	26	16.16	51	31.70	76	47.23
2	1.24	27	16.78	52	32.32	77	47.86
3	1.86	28	17.40	53	32.94	78	48.48
4	2.49	29	18.02	54	33.56	79	49.10
5	3.11	30	18.65	55	34.18	80	49.72
6	3.73	31	19.27	56	34.80	81	50.34
7	4.35	32	19.89	57	35.43	82	50.96
8	4.97	33	20.51	58	36.05	83	51.58
9	5.59	34	21.13	59	36.67	84	52.21
10	6.22	35	21.75	60	37.29	85	52.83
11	6.84	36	22.37	61	37.91	86	53.45
12	7.46	37	23.00	62	38.53	87	54.07
13	8.08	38	23.62	63	39.15	88	54.69
14	8.70	39	24.24	64	39.78	89	55.31
15	9.32	40	24.86	65	40.40	90	55.94
16	9.94	41	25.48	66	41.02	91	56.56
17	10.57	42	25.10	67	41.64	92	57.18
18	11.19	43	26.72	68	42.26	93	57.80
19	11.81	44	27.35	69	42.88	94	58.42
20	12.43	45	27.97	70	43.51	95	59.04
21	13.05	46	28.59	71	44.13	96	59.66
22	13.67	47	29.21	72	44.75	97	60.29
23	14.29	48	29.83	73	45.37	98	60.91
24	14.92	49	30.45	74	45.99	99	61.53
25	15.54	50	31.08	75	46.61	100	62.15

Kilograms to Pounds

kg	lbs	kg	lbs	kg	lbs	kg	lbs
1	2	130	287	600	1323	2500	5512
5	11	140	309	650	1433	2600	5732
10	22	150	331	700	1543	2700	5952
15	33	160	353	750	1654	2800	6173
20	44	170	375	800	1764	2900	6393
25	55	180	397	850	1874	3000	6614
30	66	190	419	900	1984	3500	7716
35	77	200	441	950	2094	4000	8818
40	88	210	463	1000	2205	4500	9921
45	99	220	485	1100	2425	5000	11023
50	110	230	507	1200	2646	5500	12125
55	121	240	529	1300	2866	6000	13228
60	132	250	551	1400	3086	6500	14330
65	143	260	573	1500	3307	7000	15432
70	154	270	595	1600	3527	7500	16535
75	165	280	617	1700	3748	8000	17637
80	176	290	639	1800	3968	8500	18739
85	187	300	661	1900	4189	9000	19841
90	198	350	772	2000	4409	9500	20944
95	209	400	882	2100	4630	10000	22046
100	221	450	992	2200	4850		
110	243	500	1102	2300	5071		
120	265	550	1213	2400	5291		

Grade in Degrees to Grade in Percent

Grade in Degrees	Grade in Percent	Grade in Degrees	Grade in Percent
1°	1.8%	11°	19.4%
2°	3.5%	12°	21.3%
3°	5.2%	13°	23.1%
4°	7.0%	14°	24.9%
5°	8.8%	15°	26.8%
6°	10.5%	16°	28.7%
7°	12.3%	17°	30.6%
8°	14.0%	18°	32.5%
9°	15.8%	19°	34.4%
10°	17.6%	20°	36.4%

CONVERSION TABLES

Inflation Pressure (kg/cm² to lbs/in²)

kg/cm ²	lbs/in ²	kg/cm ²	lbs/in ²	kg/cm ²	lbs/in ²	kg/cm ²	lbs/in ²
0.1	1	2.6	37	5.1	72	7.6	108
0.2	3	2.7	38	5.2	74	7.7	109
0.3	4	2.8	40	5.3	75	7.8	111
0.4	6	2.9	41	5.4	77	7.9	112
0.5	7	3.0	43	5.5	78	8.0	114
0.6	9	3.1	44	5.6	80	8.1	115
0.7	10	3.2	45	5.7	81	8.2	116
0.8	11	3.3	47	5.8	82	8.3	118
0.9	13	3.4	48	5.9	84	8.4	119
1.0	14	3.5	50	6.0	85	8.5	121
1.1	16	3.6	51	6.1	87	8.6	122
1.2	17	3.7	53	6.2	88	8.7	124
1.3	18	3.8	54	6.3	89	8.8	125
1.4	20	3.9	55	6.4	91	8.9	126
1.5	21	4.0	57	6.5	92	9.0	128
1.6	23	4.1	58	6.6	94	9.1	129
1.7	24	4.2	60	6.7	95	9.2	131
1.8	26	4.3	61	6.8	97	9.3	132
1.9	27	4.4	62	6.9	98	9.4	133
2.0	28	4.5	64	7.0	99	9.5	135
2.1	30	4.6	65	7.1	101	9.6	136
2.2	31	4.7	67	7.2	102	9.7	138
2.3	33	4.8	68	7.3	104	9.8	139
2.4	34	4.9	70	7.4	105	9.9	141
2.5	36	5.0	71	7.5	107	10.0	142

Temperature (Centigrade to Fahrenheit)

°C	°F	°C	°F	°C	°F	°C	°F
-19	-2.2	+24	+75.2	+67	+152.6	+110	+230.0
-18	-0.4	25	77.0	68	154.4	111	231.8
-17	+1.4	26	78.8	69	156.2	112	233.6
-16	3.2	27	80.6	70	158.0	113	235.4
-15	5.0	28	82.4	71	159.8	114	237.2
-14	6.8	29	84.2	72	161.6	115	239.0
-13	8.6	30	86.0	73	163.4	116	240.8
-12	10.4	31	87.8	74	165.2	117	242.6
-11	12.2	32	89.6	75	167.0	118	244.4
-10	14.0	33	91.4	76	168.8	119	246.2
-9	15.8	34	93.2	77	170.6	120	248.0
-8	17.6	35	95.0	78	172.4	121	249.8
-7	19.4	36	96.8	79	174.2	122	251.6
-6	21.2	37	98.6	80	176.0	123	253.4
-5	23.0	38	100.4	81	177.8	124	255.2
-4	24.8	39	102.2	82	179.6	125	257.0
-3	26.6	40	104.0	83	181.4	126	258.8
-2	28.4	41	105.8	84	183.2	127	260.6
-1	30.2	42	107.6	85	185.0	128	262.4
0	32.0	43	109.4	86	186.8	129	264.2
+1	33.8	44	111.2	87	188.6	130	266.0
2	35.6	45	113.0	88	190.4	131	267.8
3	37.5	46	114.8	89	192.2	132	269.6
4	39.2	47	116.6	90	194.0	133	271.4
5	41.0	48	118.4	91	195.8	134	273.2
6	42.8	49	120.2	92	197.6	135	275.0
7	44.6	50	122.0	93	199.4	136	276.8
8	46.8	51	123.8	94	201.2	137	278.6
9	48.2	52	125.6	95	203.0	138	280.4
10	50.0	53	126.4	96	204.8	139	282.2
11	51.8	54	129.2	97	206.6	140	284.0
12	53.6	55	131.0	98	208.4	141	285.8
13	55.4	56	132.8	99	210.2	142	287.6
14	57.2	57	134.6	100	212.0	143	289.4
15	59.0	58	136.4	101	213.8	144	291.2
16	60.8	59	138.2	102	215.6	145	293.0
17	62.6	60	140.0	103	217.4	146	294.8
18	64.4	61	141.8	104	219.2	147	296.6
19	66.2	62	143.6	105	221.0	148	298.4
20	68.0	63	145.4	106	222.8	149	300.2
21	69.8	64	147.2	107	224.6	150	302.0
22	71.6	65	149.0	108	226.4		
23	73.4	66	150.8	109	228.2		

Approximate Weight of Materials*

Materials	Lbs per Loose Yd ³	Kg per Loose M ³	Lbs per Bank Yd ³	Kg per Bank M ³
Bauxite	2400	1425	3200	1900
Caliche	2500	1485	3700	2200
Cinders	1100	650	—	—
Dry Excavated Clay	2500	1485	3100	1840
Wet Excavated Clay	2900	1725	4500	2675
Natural Bed Clay	2800	1650	3400	2015
Dry Clay & Gravel	2000	1185	2800	1650
Wet Clay & Gravel	2800	1650	3100	1840

Materials	Lbs per Loose Yd ³	Kg per Loose M ³	Lbs per Bank Yd ³	Kg per Bank M ³
Anthracite Raw Coal	2000	1190		
Bituminous Raw Coal	1600	950		
Decomposed Rock				
75% R 25% E	3300	1955	4720	2800
50% R 50% E	2900	1725	3860	2290
25% R 75% E	2650	1580	3320	1970
Dry Earth	2600	1550	3000	1780
Wet Earth	2900	1725	3500	2075
Loam Earth	2100	1250	2700	1600
Granite	2800	1650	4600	2725

Materials	Lbs per Loose Yd ³	Kg per Loose M ³	Lbs per Bank Yd ³	Kg per Bank M ³
Dry Sand & Gravel	2900	1725	3400	2015
Wet Sand & Gravel	3400	2015	3800	2250
Slag	3000	1780	5000	2965
Dry Snow	220	130		
Wet Snow	860	515		
Crushed Stone	2700	1600		
Top Soil	1600	960	2300	1365
Trap Rock	2900	1725	4400	2600

Approximate Weight of Materials*

Materials	Lbs per Loose Yd ³	Kg per Loose M ³	Lbs per Bank Yd ³	Kg per Bank M ³
Pit Run Gravel	3200	1900	3700	2200
Dry Gravel	2500	1485	2800	1650
Dry 1/4" - 2" Gravel	2800	1650	3200	1900
Wet 1/4" - 2" Gravel	3400	2015	3800	2250
Sand & Gravel	2700	1600	3400	2015
Gypsum	2700	1600	3400	2015
Limestone	2600	1550	4400	2600
Dry Peat	700	415	1150	675
Moist Peat	1350	800	2250	1340
Wet Peat	1900	1125	3200	1900
Sandstone	2660	1550	4300	2550
Dry Sand	2400	1425	2700	1600
Damp Sand	2850	1680	3200	1900
Wet Sand	3100	1840	3500	2075

*Varies with moisture content, grain, degree of compactness, etc. Tests must be made to determine exact material characteristics. R: Rock, E: Earth

Safety Precautions Concerning Mounting, Demounting and Operation

WARNING

Tire and rim servicing can be dangerous, and should be performed only by trained personnel using proper tools and procedures. Failure to comply with these procedures may result in faulty positioning of the tire and/or rim, and cause the assembly to burst with explosive force, sufficient to cause serious physical injury or death.

Demounting

1. Before Demounting
 - Always exhaust all air from a single tire and from both tires of a dual assembly prior to removing any wheel components such as nuts and rim clamps.
 - A broken rim part under pressure can blow apart and cause serious injury or death.
 - Make sure to remove valve core to exhaust all air from the tire. Remove both cores from a dual assembly. (When you remove the wheel lugs, if the tire is still under pressure, the assembly may fly apart.)
 - Check the valve stem by running a piece of wire through the stem to make sure it is not plugged. (Foreign material may clog the valve stem during deflation or ice may form as the air leaves the tire, clogging the valve stem.)
2. During Demounting
 - Demounting tools apply pressure to rim flanges to unseat tire beads, and keep your fingers clear. Always stand to one side and hold the tool with one hand when you apply hydraulic pressure. (If the tool slips off, it can fly with enough force to cause serious injury or death.)
 - Do not use tools in the vicinity of the flange butt weld.
3. After Demounting
 - Clean rims and repaint to stop detrimental effects of corrosion and facilitate checking and tire mounting. Be very careful to clean all dirt and rust from the lock ring and gutter. This is important to secure the lock ring in its proper position. A filter on the air inflation equipment to remove the moisture from the air line helps prevent corrosion. The filter should be checked periodically to see that it is working properly. (Parts must be clean for a proper fit - particularly the gutter section which holds the lock ring in its proper position.)

Mounting

1. Before Mounting
 - Check rim components for cracks. Replace all cracked, badly worn, damaged and severely rusted components with new parts of the same size and type. When a component is in doubt, replace it. (Parts that are cracked, damaged or excessively corroded are weakened. Bent or repaired parts may not engage properly.)
 - Do not, under any circumstance, attempt to rework, weld, heat or braze any rim component that is cracked, broken or damaged. Replace with a new part that is not cracked, broken or damaged and which is of the same size and type. (Heating may weaken a part to extent that it is unable to withstand forces of inflation or operation.)
 - Check type of rim and make sure all parts of such rim are being assembled properly. Follow instruction manual of rim or ask your distributor if you have any doubts. (Mismatched parts may appear to fit, but when the tire is inflated they may fly apart with explosive force.)
 - Mixing parts of one type rim with those of another is potentially dangerous. Always check rim with manufacturer for approval.
 - Remove rust, dirt and other foreign matter from the rim surface, particularly on the bead seats and O-ring slot.
 - Clean the inside of the tire.
 - Make sure tube and flap are correct and not damaged for tube type tires.
 - Always prepare a new O-ring for tubeless tires.
 - Do not reinflate a tire that has been run flat or has been run at 80% or less of its recommended operating pressure, or when there is obvious or suspected damage to the tire or wheel components. (Components may have been damaged or dislocated during the time the tire was run flat or seriously under inflated.)

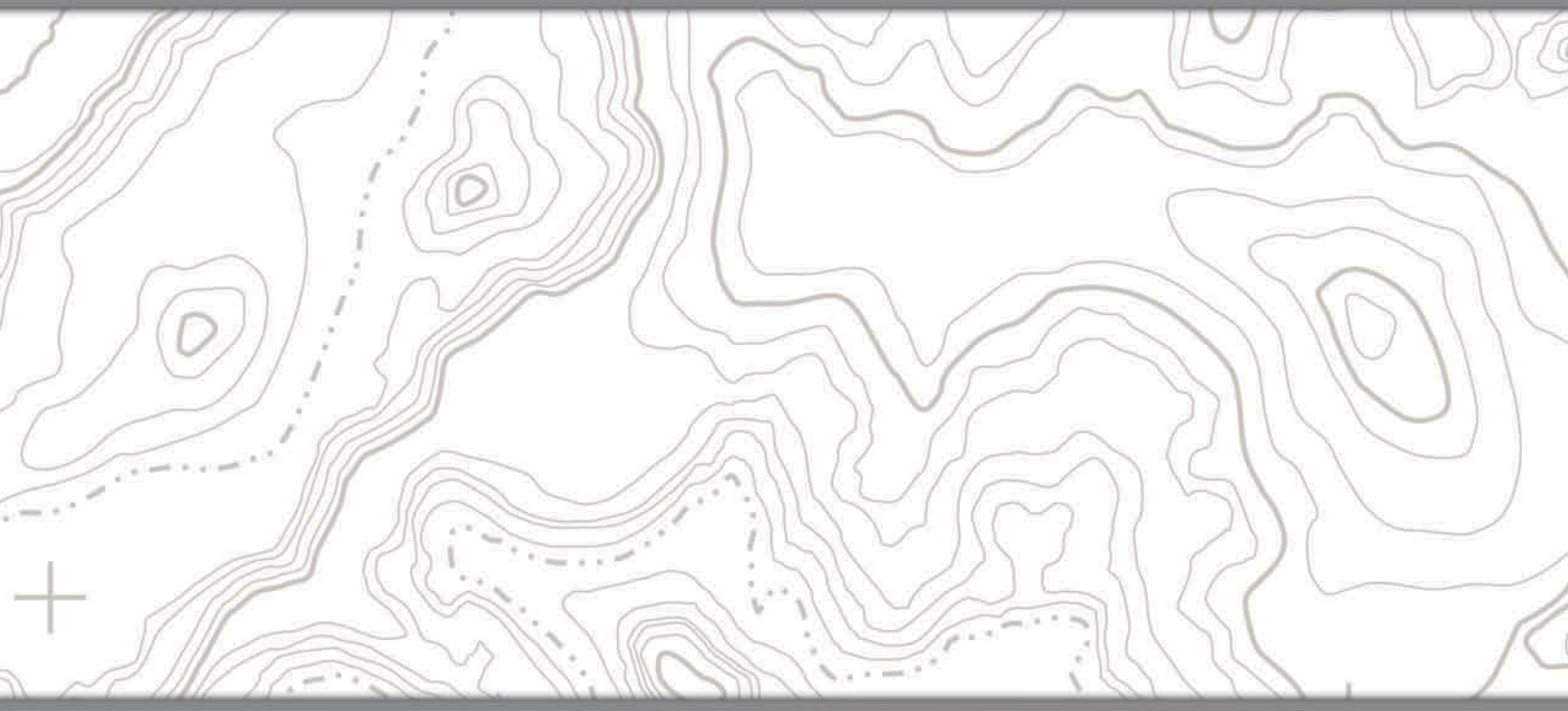
2. During Mounting and Inflation
 - Do not try to seat rings or other components by hammering while tire is inflated or partially inflated.
 - Double check to make sure all components are properly seated prior to inflation.
 - Do not inflate tire before all components are properly in place. Place in safety cage or use a restraining device and inflate to approximately 0.35 kg/cm² (5 psi), recheck components for proper assembly. Observe that O-ring does not roll out of its groove. If assembly is not performed properly, deflate and correct. Never hammer on an inflated or partially inflated tire/rim assembly. If assembly is correct at approximately 0.35 kg/cm² (5 psi), continue to inflate fully to seat the tire beads.
 - Never sit or stand in front of a tire and rim assembly that is being inflated. Always use a clip-on chuck with a sufficient length of hose to permit the person inflating the tire to stand clear of the potential trajectory of the wheel components, and use an in-line valve with gauge or a pressure regulator preset to a desired value when inflating a tire. When a tire is in a restraining device, do not lean any part of your body or equipment on or against the restraining device. (If parts are improperly installed they may fly apart with explosive force.)
 - Never attempt to weld on an inflated tire/rim assembly or on a rim assembly with a deflated tire. (Heat from welding will cause a sudden, drastic increase in pressure, resulting in an explosion with the force of a bomb. Deflated tires can catch fire inside the air chamber.)
3. After Inflation
 - Make sure no air leakage can be suspected, especially in tubeless tires.

Operation

- Do not use under inflated tires.
- Do not bleed or reduce air pressure to compensate for the increase in pressure resulting from operation.
- Do not use under-size rims. Use recommended rim for the tire.
- Do not overload or overinflate tire/rim assemblies. Check for adequate rim strength if special operating conditions are required. (Excessive overload can cause damage to the tire and rim assembly.)
- Never run a vehicle on one tire of a dual assembly. (The carrying capacity of the single tire and rim is dangerously exceeded, and operating a vehicle in this manner can result in damage to the rim and tire or cause a tire fire.)
- Never use a tube in a tubeless tire/rim assembly where the rim is suspected of air leakage. (Loss of air pressure through fatigue cracks or other fractures in a tubeless rim warns you of a potential rim failure. This safety feature is lost when tubes are used with leaking rims. Continued use may cause the rim to burst with explosive force.)
- Always inspect rims and wheels for damage during tire checks. (Early detection of potential rim failure may prevent serious injury.)
- Never add or remove an attachment or otherwise modify a rim (especially by heating, welding or brazing) unless the tire has been removed and approval has been received from the rim manufacturer. (Modification or heating of a rim or one of its parts may weaken it so that it cannot withstand forces created by inflation or operation.)
- Never mount bias tire and radial tire on the same axle. Follow vehicle manufacturer's recommendation.
- Never use tire under unintended service conditions for the tire. Please consult YOKOHAMA if vehicle operation requires specialized tire fitting.

Specifications subject to change without notice.





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Off The Road Tires **OTR**