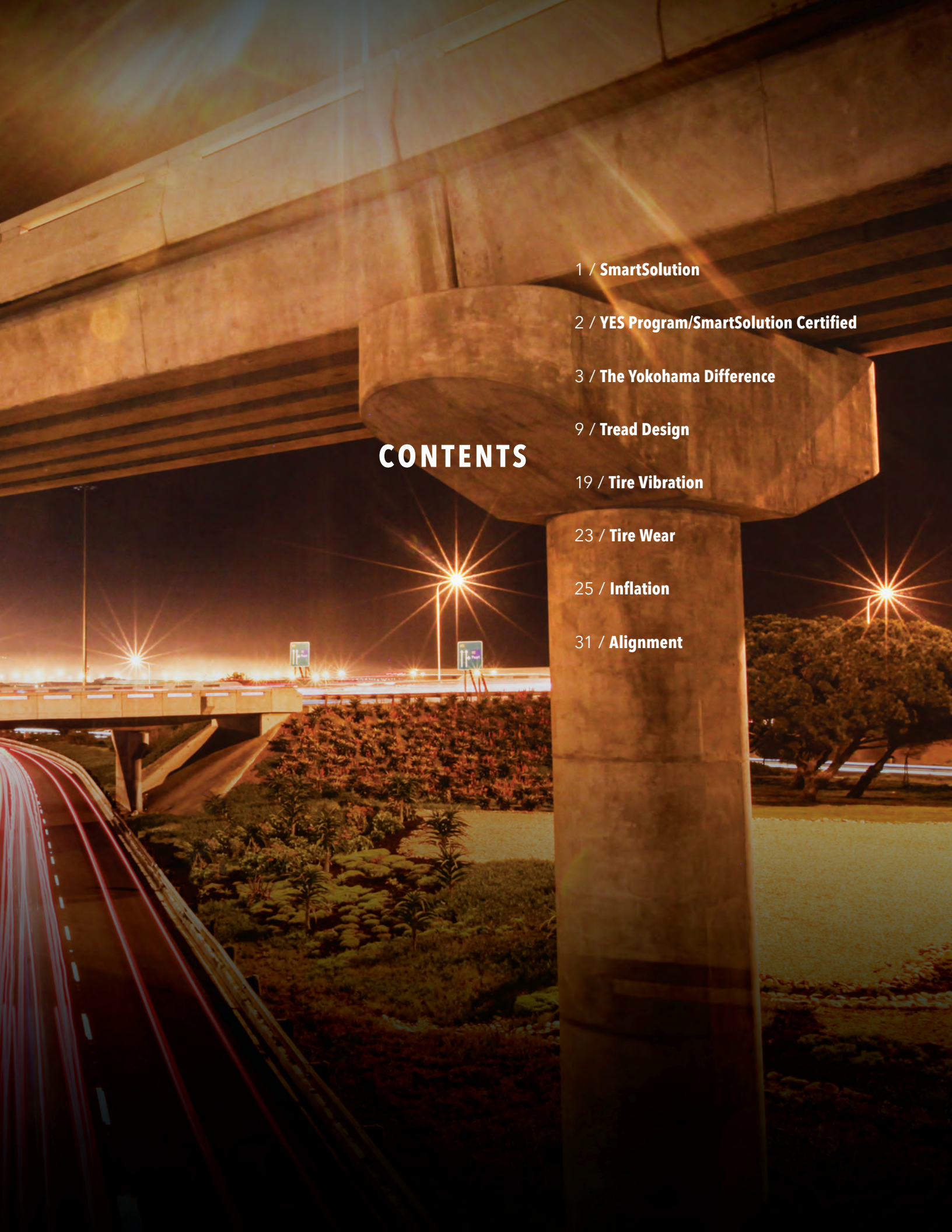
COMMERCIAL TIRE REFERENCE GUIDE

YOKOHAMA®



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THE ROAD AHEAD IS CHALLENGING.
YOKOHAMA IS THE SMART SOLUTION.

SmartSolution® is the driving force behind Yokohama innovation. It is our approach to ensure that we are the best partner for you, and it's what sets us apart from other suppliers.

Focusing on the things that our customers consider most important: Longevity, Efficiency, Availability and Dependability, we make your day-to-day challenges into our primary focus. Developing products and services to help your business run efficiently through industry fluctuations makes Yokohama truly the Smart Solution.

LONGEVITY
A HISTORY OF DELIVERING TIRES ENGINEERED TO LAST.

EFFICIENCY
STREAMLINED SERVICES & FUEL-EFFICIENT TIRES.

AVAILABILITY
TIRES AND ASSISTANCE ANYTIME, ANYWHERE – 24/7/365.

DEPENDABILITY
WORLD-CLASS DURABILITY & RELIABLE SERVICE.

YOKOHAMA smart solution®
LONGEVITY ▪ EFFICIENCY ▪ AVAILABILITY ▪ DEPENDABILITY

YES Program

Teaming up with Yokohama drives business to you 24-hours per day, every day of the year. Yokohama's YES, national emergency roadside tire service is just one more way Yokohama supports its dealers in providing fast, efficient service any time of day.

YOKOHAMA smart solution Certified

Trust Our Certified Dealer Network

Not only can we be found where and when you need us, we also partner with professional dealers who understand the importance of efficient and dependable service. Every SmartSolution Certified Dealer in our network is put through a rigorous certification process to ensure the quality of service expected from Yokohama.

THE YOKOHAMA DIFFERENCE

As a tire rotates under load, thousands and thousands of times, the forces on the casing steel and rubber compounds are incredibly stressful. This strain energy can take the life out of tires prematurely. Our exclusive technologies help combat this fatigue by reinforcing the casing to extend tire life, allowing for multiple retreads and reducing maintenance costs. Which means you're getting more tire for your dollar.

ENVIRONMENTAL PERFORMANCE

The BluEarth® brand is reserved for Yokohama's most environmentally-friendly tires engineered with advanced technologies focused on fuel efficiency and performance.

MC² CONSERVATION TO THE N^TH DEGREE

When the enemy is fuel consumption, the solution is our Maximized Conservation Concept (MC²) technology. Utilizing advanced technology that minimizes the effects of heat on the casing and tread, MC² tires lower rolling resistance by 10% to reduce your cost-per-mile.

SEVERE SNOW RATED

Yokohama tires marked with this symbol meet the industry's required performance criteria for severe snow service.

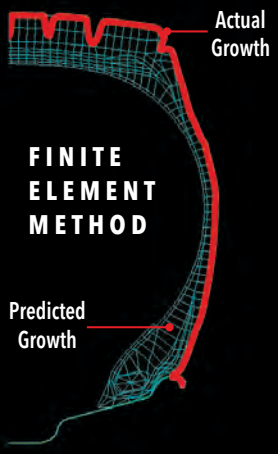
PROUD TO BE SMARTWAY® VERIFIED

Yokohama offers a number of tires designed to meet SmartWay's stringent low rolling resistance criteria.

OUR CASING

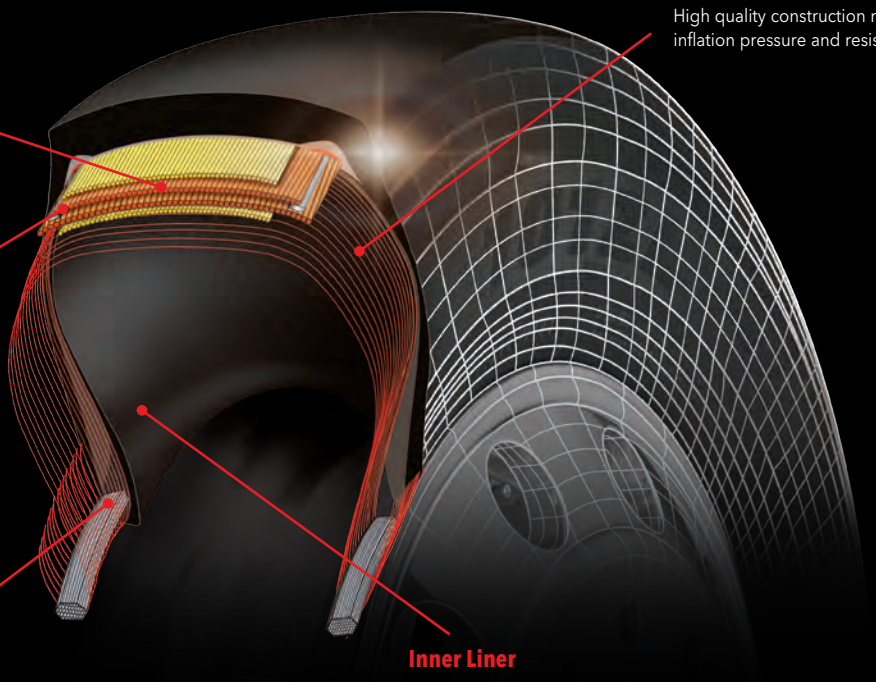
The life of a tire is dependent on many elements, but perhaps most important is the strength and integrity of its casing. It's the foundation of the tire, the base on which everything rests. At Yokohama, we take pride in our commitment to building casings that maximize original tread longevity, performance, and ensure retreadability.

Building the best casing in the industry is no simple feat. Using Finite Element Method, our engineers can accurately predict the natural growth that occurs during the first 30,000 miles of operation. With that information they're able to design a product that adapts to the operational stresses and strains the tire will encounter in operation.



Steel Belts
Our steel belt packages not only provide puncture resistance but are specifically engineered to minimize distortion of the contact area and increase fuel efficiency.

Body Ply
High quality construction maintains inflation pressure and resists shocks.

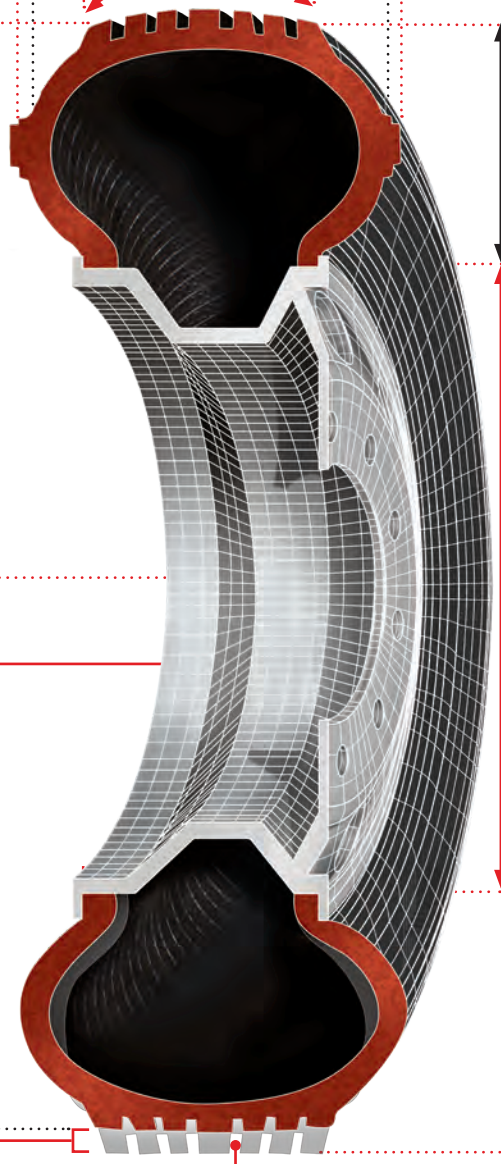


Belt Edge Cushions
Strategically placed to help manage strain between belt edges caused by the scissoring effect of the belts under load.

Inner Liner
Yokohama inner liners are widely recognized as one of the best in the business at preventing air and moisture from penetrating the casing.

Bead Assembly
Our unique bead assemblies are combinations of steel and nylon chafers (reinforcing cord layers) wrapped around the bead (a bundle of high-tensile steel wires) and the bead filler (apex rubber). These combinations reinforce the bead area to secure the inflated tire against the rim. In a tubeless tire, this fit must be tight enough that air does not leak from the tire during normal operation.

TIRE DIMENSIONS



Overall Width
The exterior measurement of a tire's width from the inner to the outer sidewall (including protective ribs and decorations) when properly mounted and inflated.

Tread Width
The distance from the outer edge to the inner edge of the tread.

Tread Radius
The design curvature of the tread profile.

Section Height
The measurement of the vertical distance between the tire's bead seat and outer tread surface when properly mounted and inflated, but with no load placed on the tire.

Section Width
The measurement of a tire's width from sidewall to sidewall (excluding protective ribs or decorations) when properly mounted and inflated, but with no load placed upon the tire.

Free Radius
The distance from the wheel axle center line to the outer tread surface of the unloaded, properly inflated tire.

Nominal Rim Diameter
Approximate diameter of the bead seat.

Rim Width
The linear distance between the outer and inner rim flanges on which the tire bead sits.

Overall Diameter
The linear distance between the tire's tread surfaces measured at the widest point. This measurement is taken with the tire mounted on the measuring rim and no load applied.

Static Loaded Radius
The distance from the wheel axle center line to the tread contact surface. Measured after the tire has been mounted on its measuring rim, inflated to the test pressure and placed under a prescribed load.

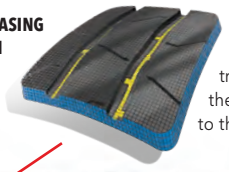
Deflection
The measured difference between the tire's free radius and loaded radius when mounted on the measuring rim, inflated to the test pressure and placed under a prescribed load.

Tread Depth
Distance form tread surface to major groove base at designated measuring point.

YOKOHAMA TIRE CONSTRUCTION

All radial tires consist of a sidewall, tread, shoulder and bead areas with each individual component contributing to the integrity of the overall product. The technological advancements in our products, including unique combinations of rubber compounds and innovative construction methods, offer better handling, ride comfort, treadwear and fuel economy than ever before.

SUPERIOR CASING PROTECTION

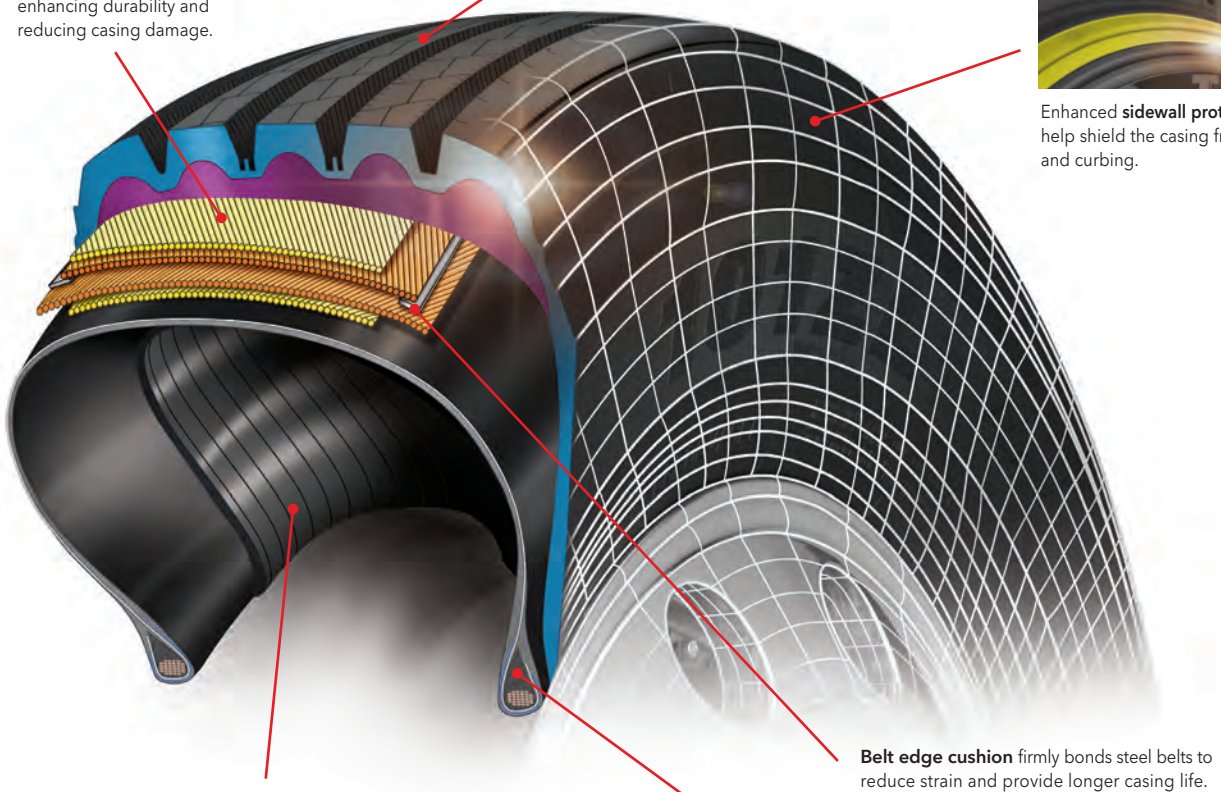


Features like **rock shield platforms** prevent stones from traveling to the bottom of the grooves, reducing damage to the casing by 25%.

An **ultra wide top steel belt** increases rigidity across the entire tread surface, enhancing durability and reducing casing damage.

DURABLE, PROTECTIVE SIDEWALL

Enhanced **sidewall protector bars** help shield the casing from scrubbing and curbing.



Belt edge cushion firmly bonds steel belts to reduce strain and provide longer casing life.

Specially designed **inner liner** helps maintain proper inflation and protects steel belts from oxidation by minimizing air seepage.

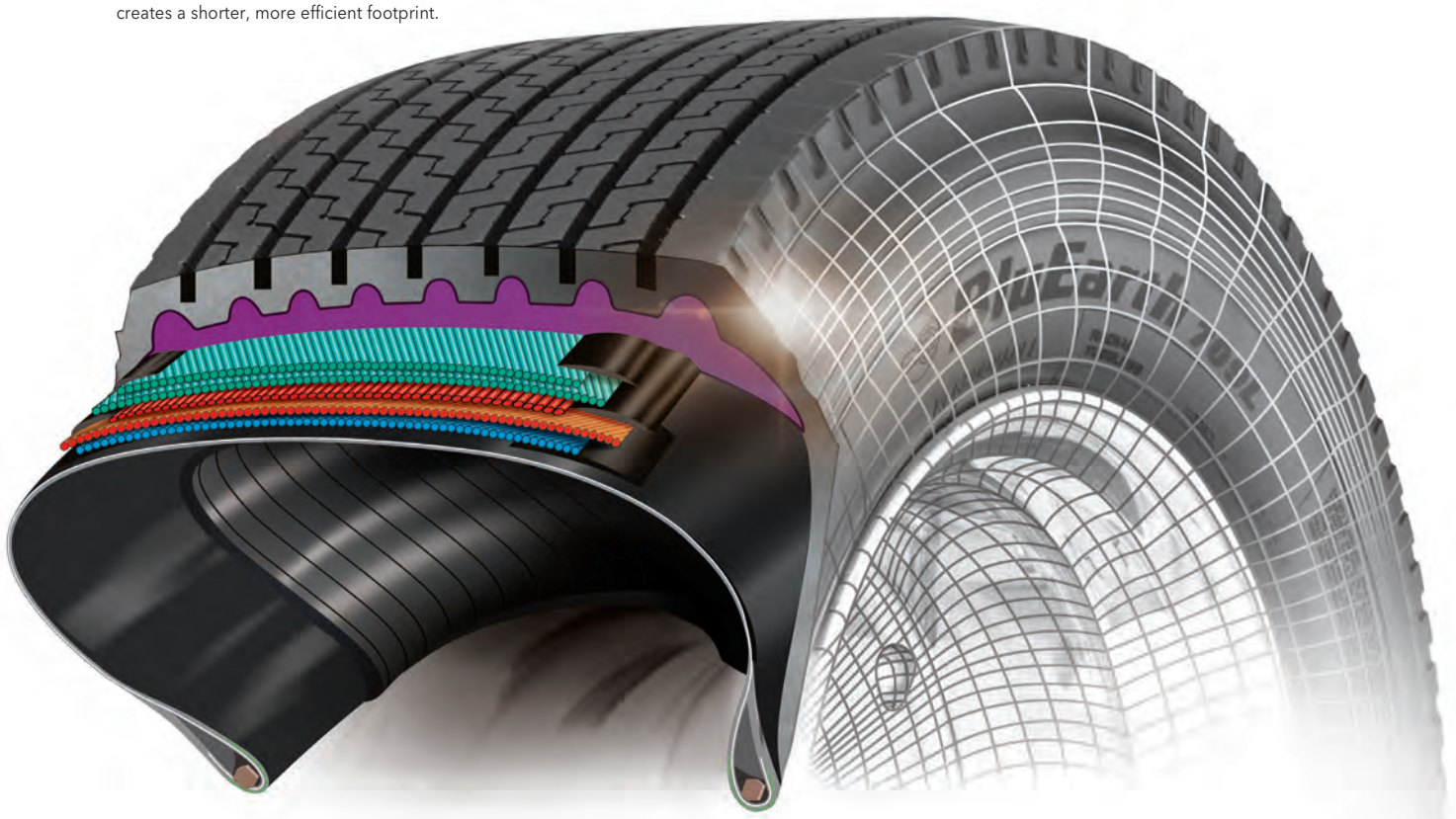
Contoured bead area allows the tire to sit evenly against the rim for extremely uniform rolling. Provides long, even wear, reduced friction and a smoother ride.

ULTRA WIDE BASE CONSTRUCTION

Fleets around the world have turned to ultra wide base tires to help lower operating expenses. From ease of maintenance to increased cargo capacity and decreased fuel consumption, these products are built to improve the efficiency of your vehicle.

Durable **five-belt package** allows for better casing design, creating a flatter casing line, which helps maintain original shape. This creates a shorter, more efficient footprint.

An **advanced profile** is optimized to manage the strain that occurs during normal operation allowing better durability and less casing fatigue.



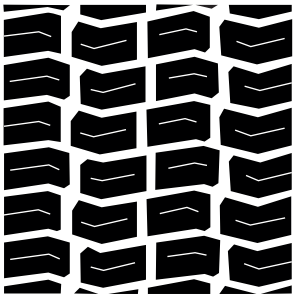
Zero degree belt, engineered specifically to provide even pressure across the contact patch, allows for even weight distribution and vastly increased tread life.

Oversized hexagonal bead and double nylon chafer allow for easier mounting and provide even pressure along the wheel's circumference to reduce strain and increase the life of the tire.

TREAD DESIGN

It's the pattern of the tread combined with specially formulated rubber compounds that gives each tire its specific performance characteristics. Recognized as a leader in tread design, we're continually researching new and innovative ways to improve tire performance and fuel efficiency.

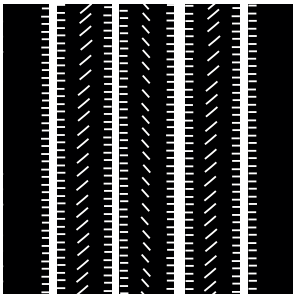
TREAD DESIGN



BLOCK TYPE

This tread pattern is composed of independent blocks and has the following advantages:

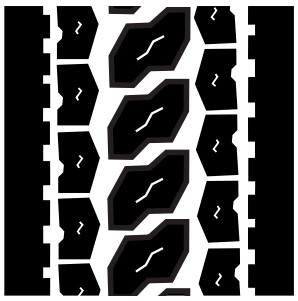
- Outstanding braking force and traction
- Good traction on snow or in muddy terrain



RIB TYPE

In the rib type pattern the tread and grooves follow the circumference of the tire and have the following advantages:

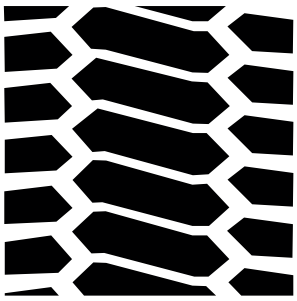
- Low rolling resistance
- Comfortable ride
- Good steering
- Relatively low noise generation



RIB-BLOCK TYPE

This pattern combines a block type tread in the center with a shoulder rib design and has the following advantages:

- Low rolling resistance
- Comfortable ride
- Relatively low noise generation
- Good traction on snow or in muddy terrain



LUG TYPE

In this pattern, the grooves are cut across the tread to provide the following advantages:

- High braking force
- Excellent traction on unpaved surfaces

TIRE APPLICATION

While the components of a tire determine its inherent performance characteristics, it is the correct application of the tire that guarantees a satisfied customer. Because of this, it is important to carefully consider all the factors that affect tire performance in an application: the size of the vehicle, its specific use, weather, road conditions and terrain.

COMMERCIAL TIRE CATEGORIES

Conventional Tires

The taller sidewall allows for more flexibility to resist sidewall damage. Their higher static load radius allows for a smoother ride, while their higher diameter measurement delivers decreased rolling resistance.

Low-Profile Tire

Engineered with shorter, more responsive sidewalls, our low-profile tires ensure more uniform ground pressure resulting in less tread distortion. The lower height and lighter weight allow you to maximize your payload.

Wide Base Tires

Yokohama has developed wide base tires for on-road as well as off-road applications. They are especially cost-effective in applications for heavy load-carrying vehicles.

Ultra Wide Base Tires

Utilizing a unique casing that optimizes the operating profile to reduce strain energy, our ultra wide base tires provide better fuel efficiency, longer tread life and unsurpassed retreadability.

TIRE IDENTIFICATION

The following letters may be used as part of truck tire size designations to identify the type of service or rim for which the tire is designed.

LT	Identifies a light truck tire for service on trucks, buses, trailers and multipurpose passenger vehicles for normal highway service and to be used on a five degree tapered bead seat or on a 15-degree bead seat rim.
TR	Differentiates certain tires from passenger car, light truck and other vehicles which use similar designations but are designed to fit rims of different bead seat diameters.
ML	Identifies mining and logging tires used in intermittent highway service.
MH	Identifies tires for mobile homes.
NHS	Designates tires "not for highway service."
ST	Indicates special tires for trailers in highway service.
HC	Designates tires for heavy trucks having 15-degree tapered bead seat rims of 17.5" diameter designated "HC". The HC suffix differentiates these tires from light truck tires with 17.5" bead diameter.

EXPLANATION OF TRUCK TIRE DESIGNATIONS

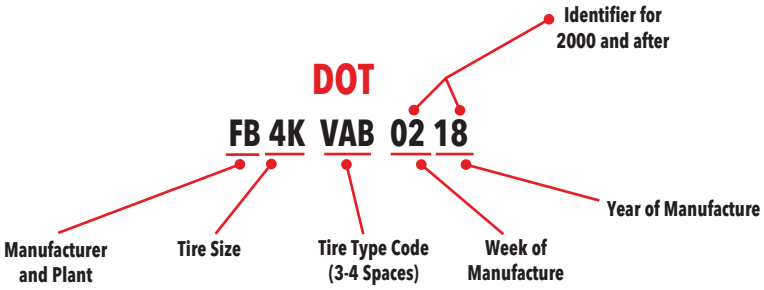
Examples of light truck and commercial truck tire size designations.

TIRE TYPE	TIRE SIZE DESIGNATION			RIM DIAMETER	LOAD IDENTIFICATION	OPTIONAL SERVICE DESCRIPTION	
	NOMINAL SIZE WIDTH (MM)	NOMINAL ASPECT RATIO	CONSTRUCTION CODE R = RADIAL		LOAD RANGE	LOAD INDEX SINGLE/DUAL	SPEED SYMBOL
METRIC SIZES	255	70	R	22.5	G	138/134	M
CONVENTIONAL SIZES	10.00		R	20	H	146/142	L
	11.00		R	22.5	H	146/142	L
	11.00		R	15TR*	H	144/142	
	8.00		R	17.5HC**	F	112/117	L
	10.00		R	20 ML	F		
	11.00		R	22.5 ML	F		

TR* – Indicates a tire for rims having a specified rim diameter plus .156 or .250 • HC** – for use on "HC" rims • ML – Mining and Logging tires

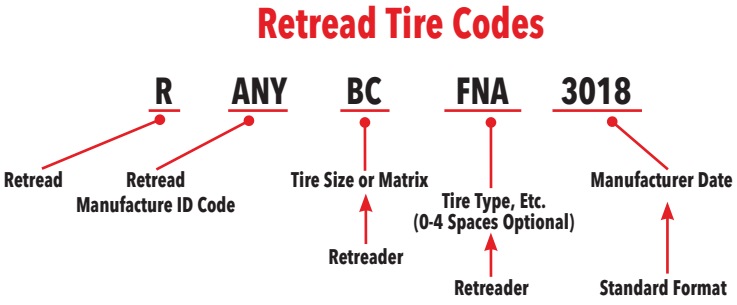
DOT TIRE IDENTIFICATION CODES

All new tires sold in the United States must have a Tire Identification Number cured into the lower sidewall of one side of the tire. This code has a standard format which has been designated by the federal government.



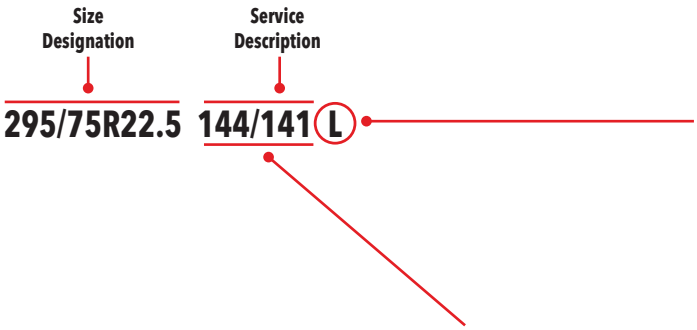
Some manufacturers place an additional code with a specific serial which identifies the specific tire model (a tire type code). This optional number is located on the sidewall opposite the DOT number.

Commercial treads also include codes which are used to detail retread information. This code is generally found on the lower sidewall near the original DOT code.



SIZE DESIGNATION AND SERVICE DESCRIPTION

There are many factors that contribute to how your vehicle performs, but few have as direct an impact as its tires. It's vital to have a good understanding of your tires' capabilities, and more importantly, their limitations. A tire's load and speed limits are indicated by the tire service description: a short code located on the sidewall. This short code, which consists of a two or three digit number along with a single letter, designates just how much weight your tires are capable of carrying safely (**load index**) and the maximum speed the tires are designed for (**speed category**).



SPEED CATEGORY CHART

Speed Symbol	Speed Category
F	50 mph (80 km/h)
G	55 mph (90 km/h)
J	62 mph (100 km/h)
K	68 mph (110 km/h)
L	75 mph (120 km/h)
M	81 mph (130 km/h)
N	87 mph (140 km/h)

LOAD INDEX CHART

Load Index	KG	LBS
120	1400	3085
121	1450	3195
122	1500	3305
123	1550	3415
124	1600	3525
125	1650	3640
126	1700	3750
127	1750	3860
128	1800	3970
129	1850	4080
130	1900	4190
131	1950	4300
132	2000	4410
133	2060	4540
134	2120	4675
135	2180	4805
136	2240	4940

Load Index	KG	LBS
137	2300	5070
138	2360	5205
139	2430	5355
140	2500	5510
141	2575	5675
142	2650	5840
143	2725	6005
144	2800	6175
145	2900	6395
146	3000	6610
147	3075	6780
148	3150	6940
149	3250	7160
150	3350	7390
151	3450	7610
152	3550	7830
153	3650	8050

Load Index	KG	LBS
154	3750	8270
155	3875	8540
156	4000	8820
157	4125	9090
158	4250	9370
159	4375	9650
160	4500	9920
161	4625	10200
162	4750	10500
163	4875	10700
164	5000	11000
165	5150	11400
166	5300	11700
167	5450	12000
168	5600	12300
169	5800	12800
170	6000	13200

The maximum load a tire can carry at various cold inflation pressures.

PROPER MATCHING AND SPACING OF DUALS

Paired tires should be of the same size designation, construction, tread design and as close as possible to the same outside diameter. Mismatching duals forces the larger diameter tire to carry an overload, causing it to overdeflect and overheat. The smaller diameter tire, lacking proper road contact, wears faster and irregularly.

MAXIMUM ALLOWABLE DIAMETER DIFFERENCES BETWEEN A TIRE AND ITS DUAL MATE AT EQUAL INFLATION PRESSURES:

Radial Tire Size	Radius (inches)	Diameter (inches)	Circumference (inches)	(+) Depth (-)*
All	0-1/8"	0-1/4"	0-3/4"	4/32

Note: Determine the actual difference in diameter by measuring the tires (with a steel tape) at least 24 hours after initial inflation. Matching should be done before installing tires on the vehicle.
*Applies only if tires are of the same tread.

Tire Mixing

Using the same tire size and construction that was specified as the original equipment for that vehicle will normally produce the best performance from the vehicle and the tires. However, there are times when mixing of different tire sizes and constructions on a vehicle is necessary. Some mixing of tires can be allowed, if certain rules are followed:

1. Never mix different tire sizes or construction types on the same axle.
2. Bias ply tires can be mounted on steer axles and radial tires on single axle drive positions of two axle vehicles. Reversing these positions may result in handling problems.
3. Either bias ply or radial tires can be mounted on the steer axles, if the vehicle has multiple drive axles.
4. All multiple drive axles should have the same size and construction tires.
5. Tires mounted on trailers may be bias or radial, as long as all tires on each individual axle are the same size and construction.
6. No mixing of tire sizes and constructions are allowed on four-wheel-drive type vehicles (4WD).

If there are any other questions about possible tire mixing combinations, the vehicle manufacturer should be consulted before actual changes are made.

DEMOUNTING FOR TUBELESS TRUCK AND BUS TIRES

FOR TIRE SAFETY PROCEDURES, WE RECOMMEND REFERENCING OSHA STANDARDS, WHICH CAN BE FOUND AT THE FOLLOWING: WWW.OSHA.GOV

MOUNTING PROCEDURES

Use of Bead Lubricant

Preferred materials for use as bead lubricants are animal- or plant-based and mixed with proper water ratios per manufacturers' instructions. When dry, the lubricant should have no residual lubricity and should not flake from the surface upon which it is applied. To avoid damage to tires and rims, the following should be avoided: petroleum oils or grease, improper ratios of approved lubricants and water, silicone oils and emulsions, and solvent-based lubricants.

Use of Sealants

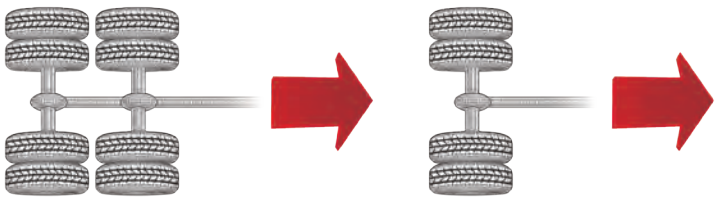
Yokohama does not recommend or endorse the use of additives installed in the interior chamber of its mounted tires. The use of flammable materials is prohibited. The Yokohama Standard Limited Warranty remains in effect with the use of these additives, providing the additive is not the cause of a tire condition submitted for a warranty claim. Damages attributed to the use of an additive will be denied warranty consideration.

MOUNTING DIRECTIONAL TIRES

When mounted properly, directional treads prevent block squirm, effectively reducing irregular wear and improving tread life.

Direction of Rotation

When viewed from the top, the tread pattern should face in the following direction:



Directional treads should be mounted facing opposite directions to ensure their "direction of rotation" arrows are each pointed to the front of the vehicle. This arrow can be found on the sidewall.

RUN-OUT AND MATCH-MOUNTING

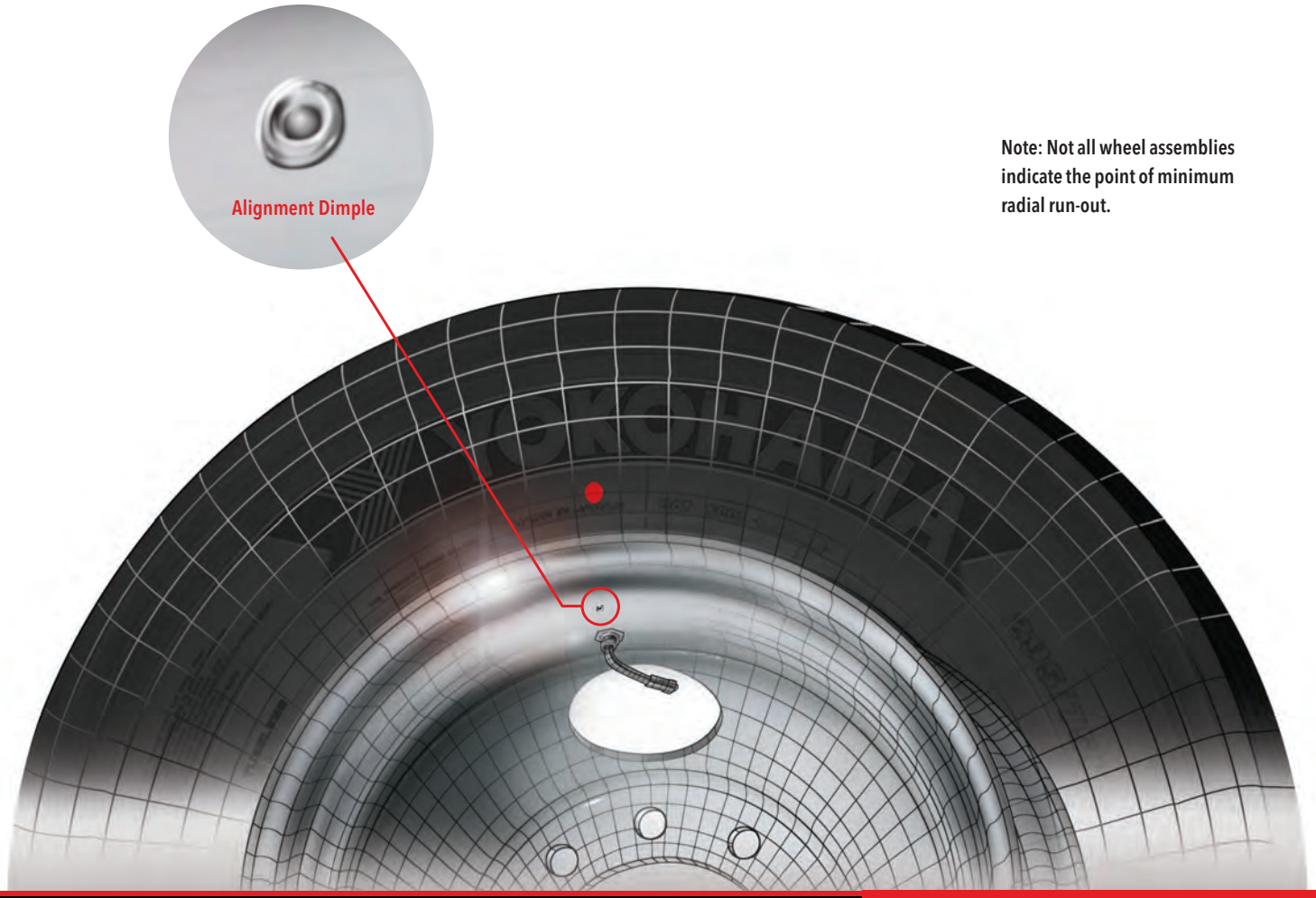
Yokohama places red and yellow marks on the sidewalls of some truck tires to enable the best possible match-mounting of the tire and wheel assembly. There are two methods to ensure they are mounted properly:

Uniformity Method

When performing uniformity match-mounting, the red mark on the tire, indicating the point of maximum radial run-out, should be aligned with the wheel assembly's point of minimum radial run-out, which is generally indicated by a dimple somewhere on the wheel assembly (consult manufacturer for details).

Weight Method

When performing weight match-mounting, the yellow mark on the tire, indicating the point of lightest weight, should be aligned with the valve stem.



Note: Not all wheel assemblies indicate the point of minimum radial run-out.

DIAGNOSING VIBRATION

No factor contributes to a negative operating experience more than vehicle vibration: it torments operators everywhere, degrades ride quality, shortens tire life and strains vehicle components. Fortunately, steps can be taken to avoid operating under these conditions.

VIBRATION

1. Visually inspect tires, wheels/rims and vehicle components for irregular wear and damage. Replace or adjust as required.
2. Check to be certain that tires are inflated according to vehicle manufacturer recommendations and the vehicle suspension is working correctly and vehicle is not tilting. Either bias ply or radial tires can be mounted on the steer axles if the vehicle has multiple drive axles.
3. Check each tire to be certain it is mounted properly on the wheel/rim. The rim check line should be concentric with the rim flange. If the tire has a yellow or red mark on the tire, it should be oriented to the rim correctly. See "Run-Out and Match-Mounting" section on page 18.
4. Test drive vehicle on a smooth road surface and diagnose symptoms. A five to ten mile warm-up is recommended to remove any flat spotting. Steering wheel vibration diagnosis should begin with front axle, wheel and tire conditions. Floor or seat vibration diagnosis should begin with drive axle. Powertrain and brake conditions can be diagnosed by alternate brake application and placing the transmission into neutral during vibration.
5. Check each tire wheel/rim assembly balance and adjust as required. If unable to balance, completely deflate tire, unseat tire beads and rotate tire 180 degrees on the wheel/rim. Inflate, rebalance and reinstall on vehicle.
6. If vibration is not eliminated, measure tire and wheel/rim assembly for excessive lateral or radial run-out. Replace as required.
7. Rebalance tire and wheel/rim assembly and test drive vehicle.

By design, Yokohama's radial tires are constructed with lower aspect ratios than ever before. This allows them to respond to lateral forces more effectively, meaning it takes less time to transmit the steering input from the wheel to tread. This improved steering response means better performance on the

TIRE BALANCE, VEHICLE RIDE AND VIBRATION

road, but requires special attention be paid to proper tire mounting, balancing and installation procedures to ensure that optimal ride quality is achieved. Vigilant attention to these details along with regular maintenance will maximize your vehicle's performance and guarantee a smooth, comfortable ride—mile after mile.

VEHICLE VIBRATION IS THE ENEMY OF COMFORT

Often operators attribute vibration to a faulty tire when the cause might be with a wear issue or the mechanical condition of the vehicle itself.

LONGER TIRE WEAR. LOWER OPERATING COSTS.

Today's commercial tires are better than ever, constructed to deliver longer original tread life, designed with durable casings and built to provide more retreads. Despite these ongoing product improvements there are still things that you can do to get the most out of your tires.

LONGER TIRE WEAR

One way to get the most out of your vehicle is to be certain your tires roll smoothly through an optimized footprint. Unfortunately the tiniest of imperfections in one of hundreds of mechanisms involved will make your vehicle operate less efficiently. Vigilant inspection, regular service and prudent operation are paramount to ensuring that your cost-per-mile stays as low as possible.

There are three primary factors that prevent optimum performance from being achieved with otherwise mechanically sound vehicles:

- Incorrect Air Pressure
- Improper Alignment
- Operational Inefficiencies

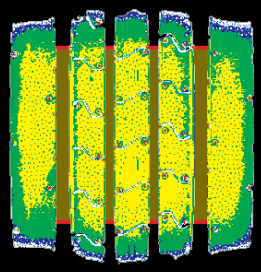
TIRE PRESSURE

Tires perform best when inflated to match axle loads. Steer tires often require maximum inflation pressure to carry the steer axle load, while drive and trailer tires should be set at pressure corresponding to actual tire loading. Load/inflation tables should be used to set pressure based on the highest load carried. The **Yokohama Tire Inflation Pressure Calculator** is an online tool that can simplify the process of identifying the proper pressure: **www.yokohamatruck.com/commercial/tire-tools/inflation-pressure-calculator**

Proper Air Pressure

How a tire wears depends on the forces that act upon the contact patch of that tire as it meets the road. Therefore, it is important to maintain proper inflation pressure. If a tire's load is equal on all ribs or elements, it tends to have a square footprint shape.

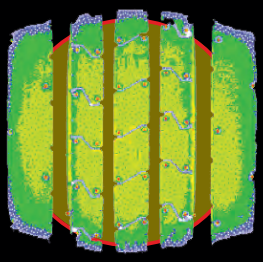
AIR PRESSURE MATCHED TO LOAD



Overinflation

An overinflated tire tends to have a short shoulder rib contact area (shorter than the center rib). As the tire rotates, the footprint center maintains close contact, but the shoulder area does not. This causes scrubbing action and uneven wearing of the shoulder rib while placing more strain on the contact area.

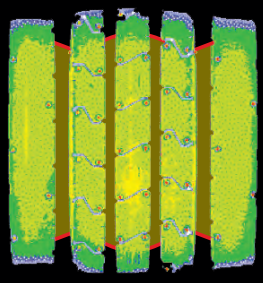
TIRE OVERINFLATED FOR LOAD



Underinflation

An underinflated tire tends to have shorter interior ribs relative to the shoulder rib. Underinflated tires frequently scrub as they roll, which creates rib punch wear and other forms of irregular wear. Underinflation is also likely to decrease casing life, increase tread damage and harm vehicle fuel efficiency.

TIRE UNDERINFLATED FOR LOAD



- *20% underinflation can reduce tire life 30%*
- *30% underinflation can reduce tire life 40%*
- *40% underinflation can reduce tire life 50%*

YOKOHAMA TIRE INFLATION RECOMMENDATIONS

Setting tire pressure based on actual loads carried is always best. When that is not possible, this generalized recommendation for an 80,000-lb. tractor-trailer combination can be used:

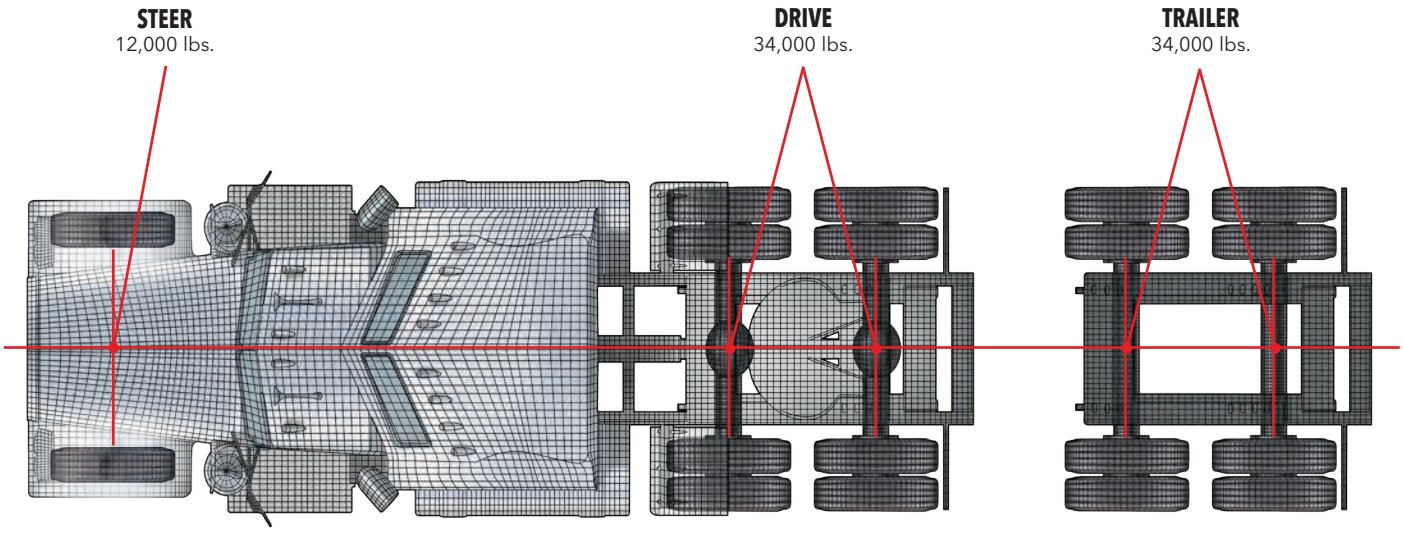
6x4 Tractor, 53-foot long box trailer

Recommended Cold Inflation Pressures - requires truck to be parked 3-4 hours

Tire Size	Steer Single	Drive Duals	Trailer Duals
295/75R22.5 (14PR)	110 psi	90 psi	90 psi
285/75R24.5 (14PR)	110 psi	90 psi	90 psi
11R22.5 (14PR)	105 psi	90 psi	90 psi
11R24.5 (14PR)	100 psi	90 psi	90 psi

Steer tires in the first three examples are set at maximum cold inflation. In all examples, the drive and trailer duals are set at 80 psi, plus 10 psi for compensation between airing.

Note: Never bleed excessive air from a "hot" tire.



Actual Vehicle Weight

1. Determine actual tire loads.

- Weigh several tractor/trailer vehicle combinations that best represent actual maximum load conditions for these vehicles while in operation.
- Determine average weights per axle of these weights and divide that value by the number of tires on that axle to determine actual tire loading.

2. Determine minimum cold inflation pressures for each tire per axle.

- Use the actual load per tire (per axle) to determine the cold inflation pressures for the tires by size, ply and type.
- The actual tire load should be compared to the tire load limits on the chart for the particular tire size and ply rating.
- The corresponding recommended cold inflation pressure is indicated for the load in the chart heading.
- If the actual tire loads are heavier than the ply rating of the applied tire, it may be necessary to install a tire with a higher ply rating.

3. Use the determined inflation pressures as minimum inflation values to set up the vehicle for improved handling.

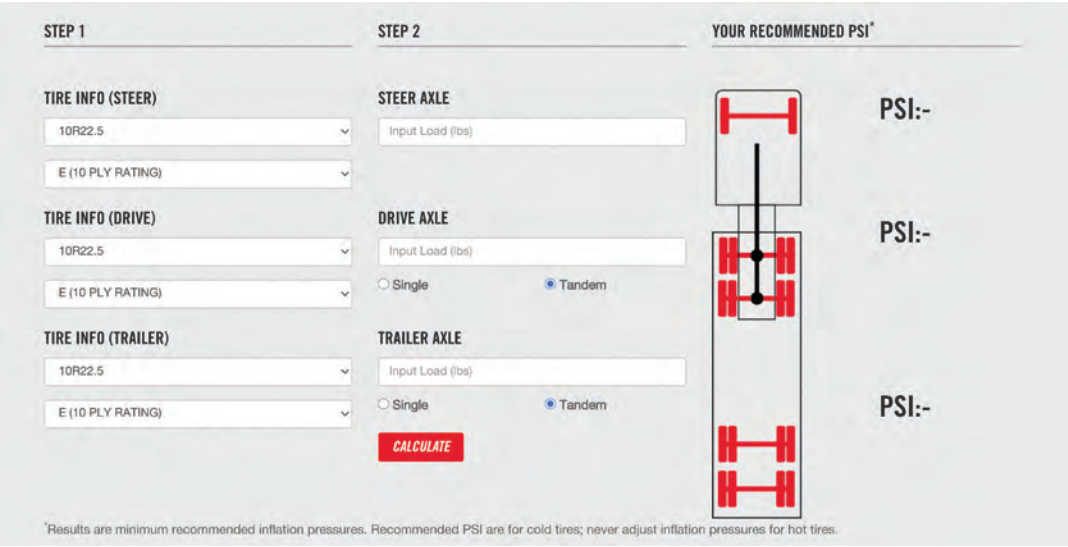
- In all cases, the determined inflation pressures based on actual load conditions should be considered minimum pressures.
- Operational air pressures can be set higher, but under no circumstances should they be set lower.

Air Pressure Calculator

These recommendations, as outlined, should be adopted and used for all Yokohama truck/bus tires when the tires are new and first installed on the vehicle. Correcting inflation pressure after irregular wear has begun will not correct the wear pattern.

The pressures will only be effective in preventing wear if used from the point of the original mounting.

For specific recommendations, please refer to the Yokohama Tire Inflation Pressure Calculator at *www.yokohamatruck.com/commercial/tire-tools/inflation-pressure-calculator*



LOAD INFLATION CHARTS

LOAD / INFLATION PRESSURE TABLES

Tubeless		Tire Load Limits (lbs.) at Various Cold Inflation Pressures (psi) (Tire pressure is minimum for the load)										
Tire Size Designation		**80**	**85**	**90**	**95**	**100**	**105**	**110**	**115**	**120**	**125**	**130**
9R22.5	S	3730	3890	4080(E)	4235	4390	4540(F)	4675	4810	4940(G)		
	D	3550	3690	3860(E)	4005	4150	4300(F)	4425	4550	4675(G)		
10R22.5	S	4480	4675(E)	4850	5025	5205(F)	5360	5515	5675(G)			
	D	4230	4410(E)	4585	4760	4940(F)	5075	5210	5355(G)			
11R22.5	S	4990	5220	5510(F)	5730	5950	6175(G)	6320	6465	6610(H)		
	D	4760	4950	5205(F)	5415	5625	5840(G)	5895	5950	6005(H)		
11R24.5	S	5310	5550	5840(F)	6095	6350	6610(G)	6790	6970	7160(H)		
	D	5070	5260	5510(F)	5675	5840	6005(G)	6205	6405	6610(H)		
12R22.5	S	5450	5690	6005(F)	6205	6405	6610(G)	6870	7130	7390(H)		
	D	5190	5390	5675(F)	5785	5895	6005(G)	6265	6525	6780(H)		
225/70R19.5	S	3195(E)	3315	3450	3640(F)	3715	3845	3970(G)				
	D	3000(E)	3115	3245	3415(F)	3490	3615	3750(G)				
245/70R19.5	S	3640	3740	3890	4080(F)	4190	4335	4540(G)	4620	4805(H)		
	D	3415	3515	3655	3860(F)	3940	4075	4300(G)	4345	4540(H)		
265/70R19.5	S	3970	4180	4355	4540	4685	4850	5070(G)				
	D	3750	3930	4095	4300	4405	4415	4675(G)				
285/70R19.5	S				4900	5115	5330	5540	5750	5960	**	
	D				4575	4775	4975	5175	5370	5565	**	
245/75R22.5	S	3860	3975	4140	4300	4455	4610	4675(G)				
	D	3525	3615	3765	3970	4055	4195	4300(G)				
265/75R22.5	S	4300	4440	4620	4805	4975	5150	5205(G)				
	D	3860	4040	4205	4410	4525	4685	4805(G)				
255/70R22.5	S	4190	4370	4550	4675	4895	5065	5205(G)	5400	5510(H)		
	D	3970	4110	4275	4410	4455	4610	4675(G)	4915	5070(H)		
275/70R22.5	S	4705	4940	5170	5400	5625	5850	6070	6290	6510	6725	6940(H)
	D	4335	4550	4765	4975	5185	5390	5595	5800	6000	6195	6395(H)
295/75R22.5 *Excludes 101ZL Spec-2 & 108R Load Range H	S	4940	5155	5370	5510(F)	5780	5980	6175(G)	6370	6610(H)		
	D	4540	4690	4885	5070(F)	5260	5440	5675(G)	5795	6005(H)		
295/75R22.5 *Data only applies to 101ZL Spec-2 & 108R Load Range H	S	4940	5155	5370	5510	5780	5980	6175(G)	6665	7160(H)		
	D	4540	4690	4885	5070	5260	5440	5675(G)	6140	6610(H)		
295/80R22.5	S	5550	5825	6100	6370	6635	6900	7160	7420	7675	*	
	D	4925	5170	5410	5650	5885	6120	6350	6580	6810	*	
315/80R22.5 506U	S		7450	7705	8045	8300	8555	8885	9125	9445	9610	10000(L)
	D		6770	7000	7310	7545	7775	8075	8295	8585	8735	9090(L)
315/80R22.5 *Excludes 506U	S	6175	6415	6670	6940	7190	7440	7610	7920	8270	8690	9090(L)
	D	5675	5840	6070	6395	6545	6770	6940	7210	7610	7910	8270(L)
285/75R24.5	S	4940	5210	5420	5675(F)	5835	6040	6175(G)	6440	6780(H)		
	D	4540	4740	4930	5205(F)	5310	5495	5675(G)	5860	6175(H)		

*** 295/80R22.5 104ZR Load Range H - Max Load Single 7830 lb @ 123 PSI, Dual 6945 lb @ 123 PSI. ** 285/70R19.5 104ZR & TY303 Load Range H - Max Load Single 6615@131, Dual 6175@131.**

Wide Base, Tubeless		Tire Load Limits (lbs.) at Various Cold Inflation Pressures (psi) (Tire pressure is minimum for the load)								
Tire Size Designation		**80**	**85**	**90**	**95**	**100**	**105**	**110**	**115**	**120**
385/65R22.5	S	6940	7350	7650	8050	8230	8510	8820	9050	9370(J)
425/65R22.5	S	8270	8740	9100	9370	9790	10100	10500(J)	10700	11400(L)
445/65R22.5	S	9090	9480	9870	10200	10600	11000	11400	11700	12300(L)

Ultra Wide Base, Tubeless		Tire Load Limits (lbs.) at Various Cold Inflation Pressures (psi) (Tire pressure is minimum for the load)								
Tire Size Designation		**80**	**85**	**90**	**95**	**100**	**105**	**110**	**115**	**120**
445/50R22.5	S	7310	7680	8030	8390	8740	9090	9370(J)	9780	10200(L)
455/55R22.5	S	7900	8290	8680	9060	9440	9820	10200(J)	10600	11000(L)

Medium Truck Tube Type*		Tire Load Limits (lbs.) at Various Cold Inflation Pressures (psi) (Tire pressure is minimum for the load)										
Tire Size Designation		80	85	90	95	100	105	110	115	120	125	130
12.00R24	S	6980	7280	7580	8050(G)	8310	8570	8820(H)	9100	9370(J)		
	D	6650	6910	7160	7390(G)	7610	7830	8050(H)	8300	8540(J)		

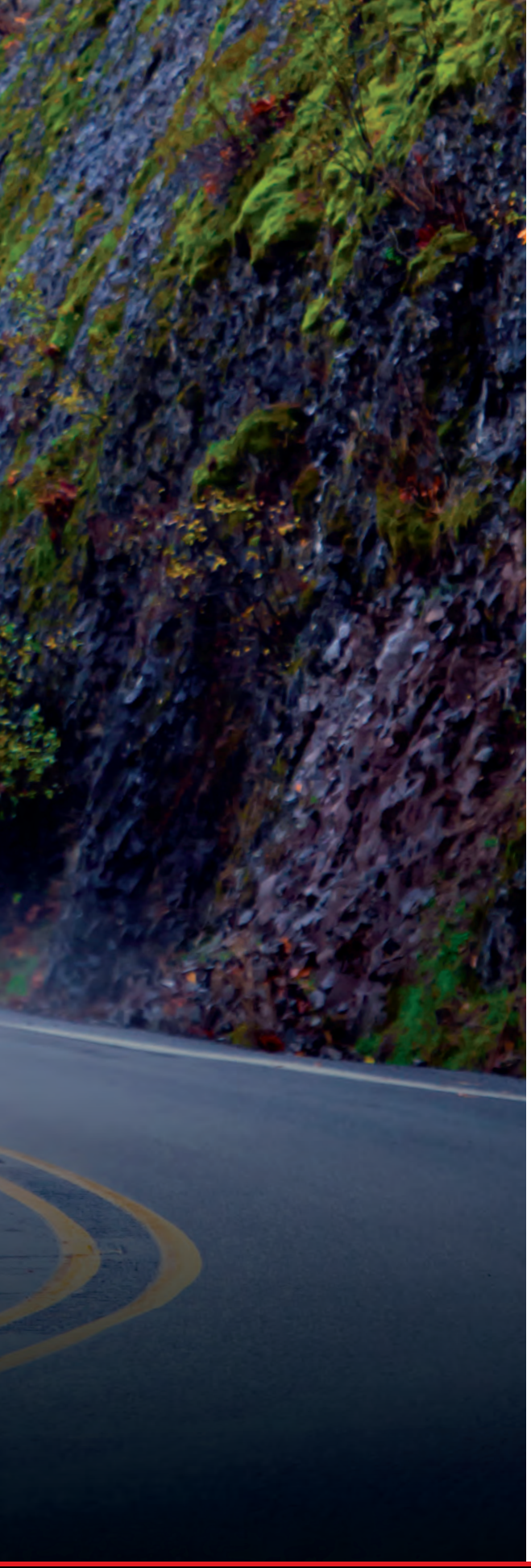
Light Truck Commercial Tubeless		Tire Load Limits (lbs.) at Various Cold Inflation Pressures (psi) (Tire pressure is minimum for the load)										
Tire Size Designation		35	40	45	50	55	60	65	70	75	80	85
7.00R15	S	1350	1480	1610	1710	1830	1940	2040(D)				
	D	1190	1310	1420	1520	1620	1715	1820(D)				
LT215/85R16	S	1495	1640	1785	1940	2050	2180	2335(D)	2430	2550	2680E)	
	D	1360	1490	1625	1765	1865	1985	2150(D)	2210	2320	2470(E)	

High Capacity Trailer Tubeless-Metric		Tire Load Limits (lbs.) at Various Cold Inflation Pressures (psi) (Tire pressure is minimum for the load)										
Tire Size Designation		75	80	85	90	95	100	105	110	115	120	125	130
215/75R17.5 H	S						4065	4225	4385	4545	4705	4805(H)	
	D						3840	3995	4145	4295	4445	4540(H)	
235/75R17.5 H	S							5285	5485	5685	5880	6005(H)	
	D							4995	5180	5370	5555	5675(H)	

Tire load limits at various inflation pressures are based upon Tire and Rim Association (TRA) standards and tables, except where there is no specification established by the TRA. In these few cases, the tire design is based upon the European Tire and Rim Technical Organization (ETRTO) whose standards govern these tire designs. To obtain recommendations for tires run in non-standard applications, customers and dealers should contact the Yokohama Technical Service department.

ALIGNMENT ISSUES

Proper alignment is an important factor in lowering operational costs. Ideally, when a truck is traveling in a straight line, all of the axles are parallel—and perpendicular to the vehicle centerline—and all the tires are rolling in a straight line, too. Not only will tires on a properly aligned vehicle last longer, but some manufacturers suggest that there are significant improvements in fuel economy, component wear, and even driver fatigue.



ALIGNMENT ISSUES

It is generally known that alignment plays as critical a role in vehicle efficiency as does any other factor. Still, many commercial vehicles on the road today are misaligned! Maintaining proper alignment settings is well worth the time and expense. Most alignment issues can be attributed to one of three factors:

- Camber Settings
- Toe Settings
- Drive Axle Alignment

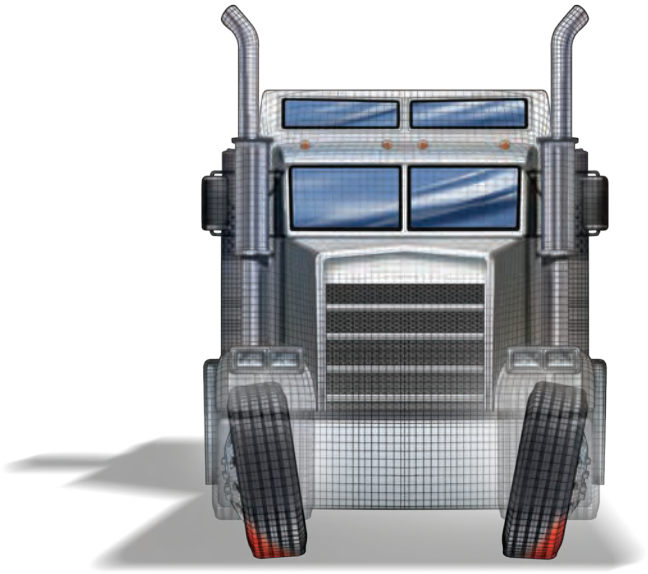
CAMBER

Camber angle is the measure in degrees of the difference between the wheel's vertical alignment perpendicular to the surface. If a wheel is perfectly perpendicular to the surface, its camber would be zero degrees. Camber is negative when the tops of the tires tilt inward (towards the vehicle) and positive when the tops of the tires tilt outward.

On newer trucks, camber wear should not be a major issue. Most trucks leave the factory with zero to slightly positive camber. Excessive positive camber will result in excessive shoulder wear, while negative camber will wear the inner half of your tire.

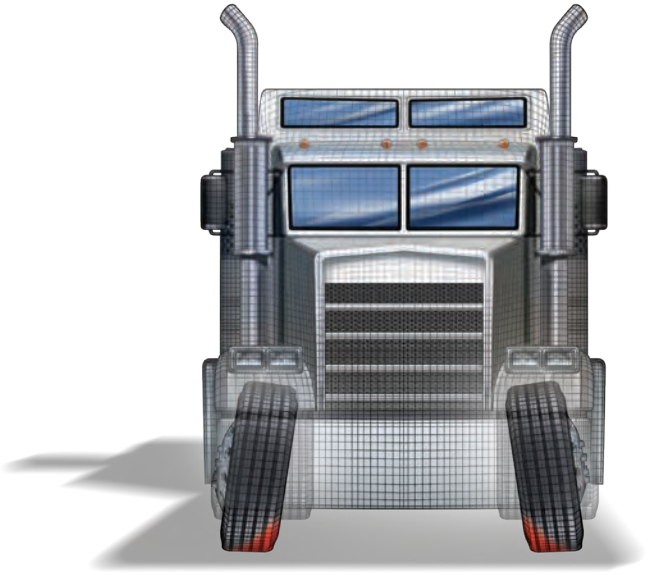
Correcting camber settings requires a bending of the front axle (which voids most manufacturer warranties). If an alignment shop indicated that camber is out of spec, the vehicle's front bearing should be checked.

POSITIVE CAMBER WHEEL IS TILTED OUTWARD AT THE TOP



Result: Smooth, fast wear on the outer half of the steer tires.

NEGATIVE CAMBER WHEEL IS TILTED INWARD AT THE TOP



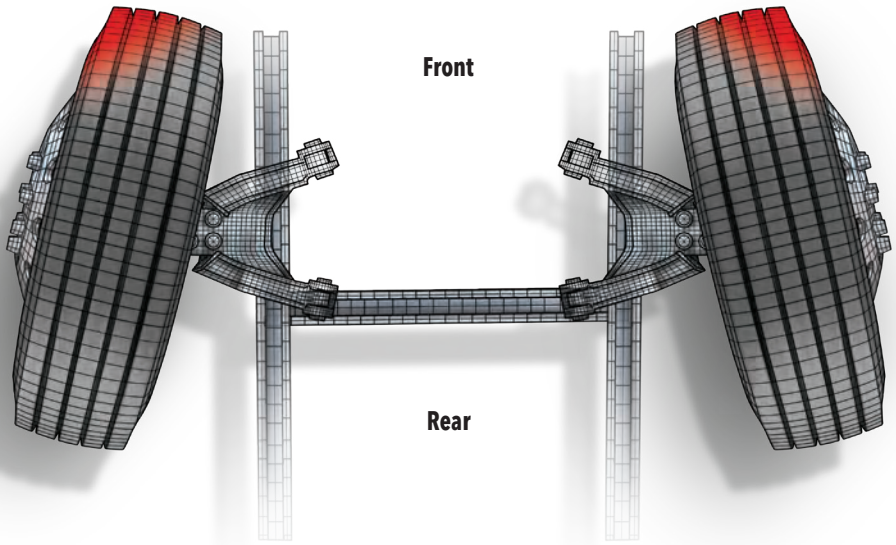
Result: Smooth, fast wear on the inner half of the steer tires.

TOE SETTINGS

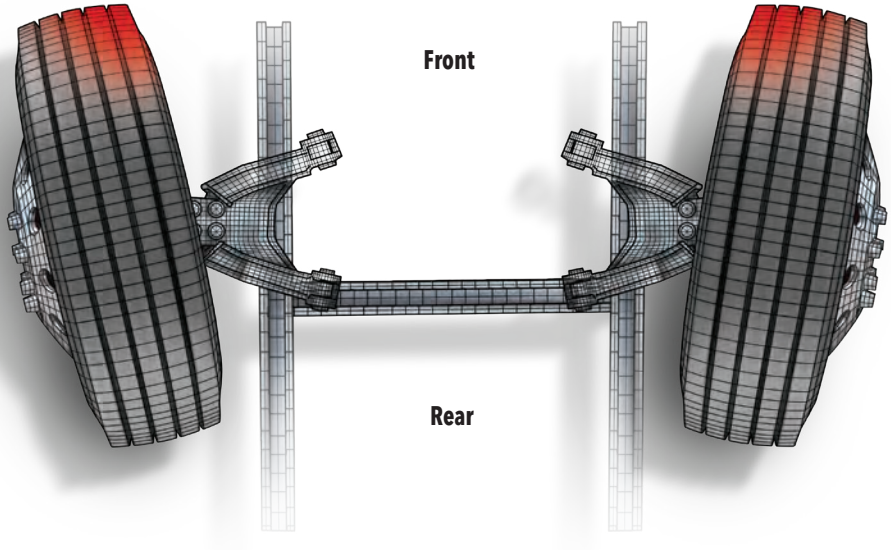
The toe angle identifies the direction of the tires compared to the centerline of the vehicle. It is expressed in either degrees or fractions of an inch, and an axle is said to have "positive toe-in" when the imaginary lines created by the tires intersect in front of the vehicle and "negative toe-out" if they diverge. When drive tires propel a vehicle with improper toe settings forward, there is an increase in rolling resistance that negatively impacts fuel efficiency, ride comfort and ultimately shortens the life of your tires.

The vehicle's toe is the most critical alignment setting relative to tire wear and toe misalignment is the most common alignment condition affecting commercial vehicles. If the toe setting is just 1/32-inch off of its appropriate setting, each tire on that axle will scrub almost 3-1/2 feet sideways every mile, significantly reducing tire life.

TOE-IN IS THE MOST BASIC FRONT-END SETTING.
Typically toe is set at 1/16" toe-in (+ 1/16").
Measured and set in a static state, toe-in allows the wheels to run straight, when the vehicle is loaded rolling down the highway.



TOE-IN The distance between the front of the tires is less than the distance between the rear of the tires.



TOE-OUT The distance between the front of the tires is greater than the distance between the rear of the tires.

MISALIGNED DRIVE AXLES

Generally when you think about the benefits of a properly aligned vehicle, you think about lowering operating costs via longer tire life – but that's only the beginning. Not only will proper alignment extend tire life, but it has also shown to improve fuel economy, component wear and even driver fatigue.

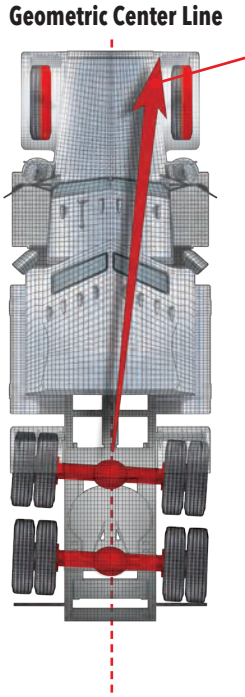
Vehicle alignment isn't a matter of just aligning the steer axle. It means aligning the drive and trailing axles, too. In a perfect world, trucks would travel in perfectly straight lines from one location to another. If this were the case, as the truck went down the road the axles would remain parallel, perfectly perpendicular to the vehicle centerline and worries about tire life would be a thing of the past. Unfortunately driving forces, mechanical complications and other issues can cause axles to fall out of place, negatively impacting the wear of the tire, and making drive axle misalignment the second most common alignment-related issue for commercial vehicles.

STEER TIRE WEAR CAUSED BY MISALIGNED DRIVE AXLES

RIGHT THRUST

Cause: Occurs if the vehicle's drive axles are pushing the truck to the right.

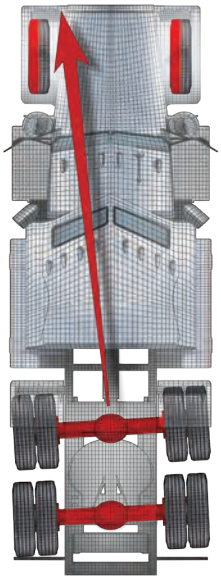
Result: Wear on the right steer tire will mimic toe-in wear while the left side will exhibit the feathering on the right shoulder associated with toe-out alignment.



LEFT THRUST

Cause: Occurs if the vehicle's drive axles are pushing the truck to the left.

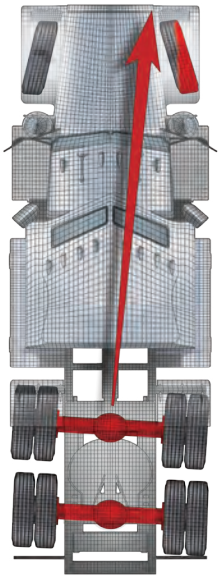
Result: Wear on the left steer tire will mimic toe-out wear while the right side will exhibit toe-in wear.



RIGHT THRUST, TOE-IN

Cause: There are also combinations of both toe and axle misalignment which will put stress on just one steer tire.

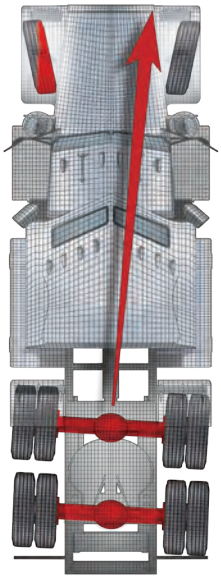
Result: The toe-in setting combined with right thrust misalignment causes the left front to wear normally while the right front feel like toe-in.



RIGHT THRUST, TOE-OUT

Cause: On the other hand, toe-out combined with right thrust will cause the front right to wear normally but places stress on the left.

Result: Standard wear on the right side with wear resembling toe-out on the left side.



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