

# BUMPER 2 BUMPER TIRES



A GUIDE CREATED BY:  
TBS FACTORING  
SERVICE

# BUMPER **2** BUMPER

## TIRES

## ...CREATED BY TBS FACTORING SERVICE

[TBS Factoring Service, LLC](#) is a leading provider of freight-bill factoring to growth-oriented companies in the transportation industry. Founded in 2004, the Oklahoma City-based company currently serves nearly 4,000 clients nationwide with simple and flexible cash-flow solutions.

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The TBS family ownership group has more than 50 years of experience serving independent truckers. Our clients receive outstanding service from a seasoned and dependable staff.

TBS Factoring Service is among the most highly regarded freight-factoring companies in the USA.

 **LET'S BE FRIENDS**





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# BUMPER **2** BUMPER

## TIRES

You can tell a lot about mechanics by the way they take care of their tools — and your rig may be the most expensive tool you'll ever own. Staying roadworthy is more than just a good business practice; your livelihood depends on it. We have created this series of free handy reference guides to help you keep your rig revved and ready to make you money from bumper to bumper.

To get the most out of tires — maximum mileage, safety and wear — they need to first be spec'd appropriately for the intended application, and then be properly maintained.

Selecting the proper tire size, tire type and tread design is very important to ensure satisfactory performance. Tires are application specific and designed to deliver different performance criteria in different applications and under different conditions. Consequently, it is important that the fleet/owner operator understands vehicle application, road conditions and operating environment.

Other considerations are the manufacturer of the tire, the tire dealer, price, availability and the warranty coverage.

Safe travels!

## SURVEY SAYS

According to the 2012 Atlas Van Lines "King of the Road" survey, truckers prefer the following tires:

Bridgestone ... 44%

Michelin ... 41%

Goodyear ... 16%

Yokohama ... 4%

(Exceeds 100% due to multiple responses)



# CHAPTER #1

## INFLATION

By far, the single most critical factor for maximizing tire life and minimizing the chance of catastrophic tire failure is maintaining the proper inflation pressure for a given tire size and load. Once proper tire inflation has been determined, it should be maintained at that level as consistently as possible.

Be advised: Inflation pressure cannot be accurately estimated by kicking or thumping a tire. Trying to determine if a tire needs air by thumping it is as effective as trying to determine if a vehicle's engine needs oil by thumping on its hood.

Tire inflation pressure should be checked using a calibrated tire gauge and when a tire is "cold" — meaning when a tire is at approximately the same temperature as the surrounding air, typically before a vehicle has been driven, or driven less than one mile.

## INFLATION PRESSURE

Tire inflation pressure should be checked using a calibrated tire gauge and when a tire is "cold."

Photo courtesy of Michelin

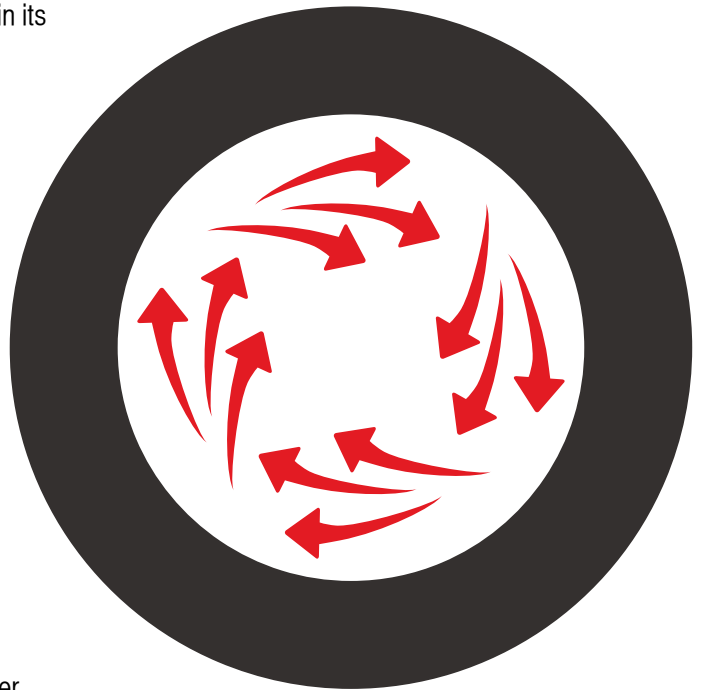


## THE AIR INSIDE

It is important to realize that it is not the tire, but the air inside the tire, that carries the weight of a vehicle, absorbs shock and keeps the tire in its proper shape so it may perform as designed. Moreover, inflation pressures influence handling, traction, braking, load-carrying capability and fuel economy.

When not properly inflated, tires flex more than they were designed to. This flexing bends the tire's rubber and the steel (used within the rubber to provide additional operating characteristics) and generates heat. Heat — a tire's worst enemy — accelerates tire wear dramatically, shortening the life of the tire and increases rolling resistance, which reduces fuel consumption and wastes fuel.

More than 80 percent of fleet tire problems are caused by improper inflation. The number one cause of road breakdowns is tire related.



## ***SPEED = HEAT***

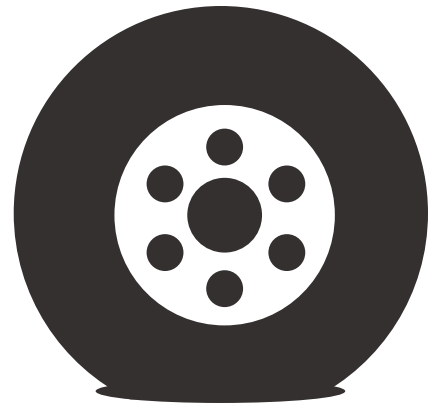
The speed you're going to run has a huge effect on how hot your tires get. Basically, a tire has two shapes: Its "unloaded" shape and its "loaded" shape, or "unsquashed" and "squashed." As the tire rotates, some 500 times per mile, every part of the tire is constantly going back and forth between the squashed and unsquashed shape. This causes the sidewalls to flex, generating heat.

It's a bit like taking a piece of coat-hanger wire and bending it rapidly. Do it for a while, and the wire can become very hot. Do it long enough and fast enough, and the wire breaks. With too little inflation pressure, the tire flexes between shapes that are too extreme, which in turn generates too much heat. In severe cases, it can cause a failure. At the very least, it can severely shorten casing life.

## UNDER INFLATION

By far, under inflation is a more common problem. There is a direct correlation between how much a tire is under inflated and how much faster it wears.

Plus, under inflated tires have more frequent punctures and are more prone to premature failures, increasing the risk of tire failures that could lead to costly road service, downtime and loss of revenue.



## OVER INFLATION

Over inflating tires makes them hard and stiff, which makes for a rougher ride. It also puts tires at greater risk for an impact break. When an over inflated tire strikes a sharp edge (like the edge of a pothole) at fairly high speed, it can literally “break” the tread and casing, often opening a huge gash across the width of the tread. The damage is usually so bad the tire cannot be repaired or retreaded.

Over inflated tires can also suffer irregular wear, especially in the crown area, because the crown shape is distorted by excessive air pressure. In addition, over inflated tires can have reduced dry traction because the excessive pressure reduces the amount of rubber in proper contact with the road.

**60% OF TRUCK TIRES ARE UNDER INFLATED**

**50% OF COMBINATION VEHICLE TIRES ARE WITHIN  
5% OF RECOMMENDED INFLATION PRESSURE**



# CHAPTER #2

## TIRE PRESSURE SYSTEMS

Automatic tire pressure and/or monitoring increases tire life, maximizes the casing value and reduces tire maintenance costs, vehicle downtime and expense. Fuel efficiency and safety are also improved.

There are essentially two types of arrangements that address tire pressure: Tire pressure monitoring systems (TPMS) and automatic tire inflation system (ATIS) systems. TPMS only monitor inflation pressure and warn the driver about low tire pressure through a warning light. It is the responsibility of the driver to stop and get air.

ATIS monitor and automatically add air when the tire is below the fleet/owner operator specified air pressure, maintaining proper tire inflation automatically while the truck is in motion. Such systems either use the vehicle's own air brake compressor to supply air to all the tires, or self-contained compressors mounted on each hub that are powered by the rolling motion of the wheels. There is no need for the driver to stop and add air pressure.

These systems eliminate the need to check tire pressure manually, which saves time and labor while ensuring consistent and proper tire inflation.

## BREAKDOWNS

The number one cause of road breakdowns is tire related.

Photo courtesy of Goodyear





# CHAPTER #3

## NITROGEN VS. COMPRESSED AIR



Over the years, some fleets and owner operators have adopted nitrogen tire inflation. Nitrogen is an inert, non-combustible, non-flammable, non-corrosive gas. More simply, nitrogen is dry air with the oxygen removed. Air contains nearly 79 percent nitrogen and 21 percent oxygen.

Over time, the pressurized air inside a tire slowly migrates through the rubber. Evidence shows that even a well-maintained truck tire, on average, will lose about one or two pounds per square inch (psi) per month as a result of air passing through its sidewalls.

Air is affected by changes in temperature, which affects the rate of air loss from a tire. The air inside a tire expands when heated and contracts when cooled. More air is lost in hot weather.

## PURE NITROGEN

Pure nitrogen has been used to inflate critical tire applications for years, primarily because it doesn't support moisture or combustion. These include:

- IndyCar
- NASCAR
- Earthmovers
- Formula 1
- Aircraft Tires
- Mining Equipment



## NITROGEN VS. COMPRESSED AIR (CONTINUED....)

Nitrogen is slower to migrate out of a tire because its molecules are slightly larger (denser) and less permeable than oxygen. Under the same circumstances, it might take a truck tire inflated with nitrogen about three months to lose 2 psi. Nitrogen will not fluctuate as much as air. Nitrogen provides constant pressure and is less susceptible to diffusion caused by changing temperatures.

Furthermore, because nitrogen is a non-corrosive, dry gas, nitrogen inflation minimizes moisture and oxygen in a tire so there is less rubber degradation and no corrosive properties as found in compressed air. A reduction in rubber oxidation slows a tire's "aging," improving the casing's structural durability, lengthening its useful life and yielding a higher proportion of retreadable casings. All of this helps to lower operating costs.

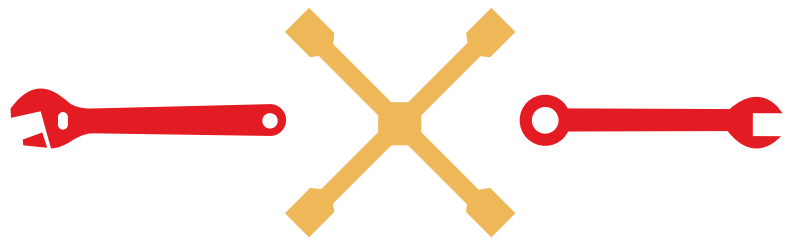
If necessary, nitrogen and compressed air can be mixed, such as in cases when a nitrogen-inflated tire needs some additional pressure and nitrogen is not available. Manufacturers of nitrogen inflation systems advise that any tire containing both nitrogen and air be purged and then re-inflated with the proper amount of nitrogen as soon as possible.

## BENEFITS OF NITROGEN-FILLED TIRES

1. Longer tire life
2. Increased fuel efficiency
3. Decreased downtime
4. Provides green venture
5. Decreased cost per mile
6. Lower maintenance cost

(Source: [getnitrogen.org](http://getnitrogen.org))

# CHAPTER #4



## TIRE MAINTENANCE PRACTICES

According to Goodyear Tire & Rubber Co., following a set of basic tire maintenance procedures will lower per-mile tire costs through extended tread life, fewer premature tire removals and better retreadability. The practices include:

1. Determine proper inflation levels for your application. The biggest influence on tire life is inflation pressure because tires are designed to run at specific pressures based on the total load. This information can be found in tire load charts that are available from the tire manufacturer.
2. Establish a good inflation maintenance program. Tire pressure is difficult to maintain because tires naturally lose air over time and leakage can occur through valve caps or through small punctures. Air pressure should be checked at least once a week using a calibrated air gauge.
3. Protect sidewalls from curb damage. Alert drivers to the importance of avoiding sidewall impact and encourage drivers and technicians to inspect tires regularly for sidewall wear and damage.

## TREAD TREND

*What's so "super" about super singles?*

The first real truck tire innovation in years, super singles – or highway singles, as some prefer to call them – are doublewide tires used on non-drive axles, said to reduce fuel costs by at least 3 percent by reducing roll resistance. The single wheel also covers less of the brake unit, which allows faster cooling and reduces brake fade. Increasingly popular among fleet owners, who can reap big savings over multiple vehicles, highway singles are being heavily pushed for all truckers by tire vendors – especially Michelin. The savings are real, but these tires aren't cheap. Another concern: Unlike dual singles, which will allow you to limp in to a truckstop when one tire goes flat, a flat on a super single is a guaranteed roadside repair.

# TIRE MAINTENANCE PRACTICES (CONTINUED....)



4. Keep vehicles properly aligned. Irregular tire wear is most commonly caused by poor vehicle alignment. If tires are not running straight ahead, accelerated tread wear occurs.
5. Mount tires correctly. The rounder or more concentric the tire, the better it will wear. To keep tire runout (a condition in which a tire or rim is out of round when rolling) to a minimum, tires should always be mounted correctly on the wheel.
6. Learn to “read” tires. Regular inspections of tires, both visually and by running a hand over the tread and feeling for abnormalities, can provide a lot of useful information and catch wear trends before they have done too much damage. If corrected early enough, bad wear patterns can be countered and tire life extended.
7. Rotate tires. Tire rotation promotes even tread wear and can net a lot of extra miles in tread life. Drive tires should be rotated between forward and back positions at least once to even out wear. Rear tires of a tandem axle typically will wear quicker than the forward positions.
8. Replace tires with matching ones. For optimum tread wear, tires need to be as alike as possible across the same positions. If a tire must be pulled due to irregular wear or a road hazard, it should be replaced with a tire that matches the existing one. On dual assemblies, the outside diameters and tread depths should be as close as possible. A good rule of thumb is no more than 2/32-inch tread-depth difference between duals. It’s also best to have the same tread design on both positions of an axle.
9. Check and replace worn wheel and suspension components. These can be the hidden enemies of tire life.
10. Keep good tire records and use the data wisely. Because every fleet is different, there are no hard and fast formulas for tire management. In fact, copying another fleet’s practices may do more harm than good.

## ROLL GREEN

So far, California is the only state to require truckers to use EPA-certified SmartWay low rolling resistance tires. But look for others to follow. Most major tire makers offer a SmartWay tire – from low-resistance double-wides to certified singles. The good news is these tires have been shown to reduce fuel costs by 3 percent. Low rolling resistance tires can be used with lower-weight aluminum wheels to further improve fuel savings.



# CHAPTER #5



## CSA INSPECTIONS

The Compliance, Safety, Accountability (CSA) program from the U.S. Department of Transportation's Federal Motor Carrier Safety Administration examines carrier and driver safety performance and potential crash risk under the Safety Measurement System (SMS). SMS, which replaced the SafeStat system for identifying unsafe carriers through safety audits, uses seven Behavior Analysis and Safety Improvement Categories (BASIC) to do this.

One of these categories is Vehicle Maintenance, and the U.S. DOT considers this BASIC a Red Flag Violation — the most serious safety violations. Tires are covered by the Vehicle Maintenance BASIC and they have a major impact on CSA “scores.”

One of the issues fleets/owner operators have with CSA is that while under inflated tires are considered a violation, there is no precise definition of an under inflated tire. Consequently, under inflation is completely subjective for CSA compliance officers doing roadside vehicle inspections.

## VEHICLE INSPECTIONS

There is no definition of a flat tire for CSA compliance officers to use when conducting vehicle inspections.

Photo courtesy of CVSA



# CSA INSPECTIONS (CONTINUED....)

In an effort to develop an industry standard for what an under inflated tire is, the Technology & Maintenance Council (TMC) has created a definition of an under inflated tire that it will submit to the Commercial Vehicle Safety Alliance (CVSA) for adoption.

TMC is North America's premier technical society for truck equipment technology and maintenance professionals. CVSA is an international, not-for-profit, voluntary organization comprised of local, state, provincial, territorial and federal officials from the U.S., Canada and Mexico that have responsibility for commercial vehicle safety operations.

CSA compliance officers use the CVSA's North American Standard Out-of-Service Criteria manual as a guide for vehicle inspections. The manual defines a flat tire as a tire that is 50 percent below the maximum tire pressure as marked on the tire sidewall, or has a noticeable (can be heard or felt) leak. It does not, however, specify what an under inflated tire is.

## TREAD DEPTH

TMC is recommending some guidance to CVSA about where tire tread depth measurements should be taken. Here again, compliance officers have no guidance.

TMC is suggesting that such measurements be taken between two adjacent major tread ribs where there are no tread wear indicators. Tread wear indicators are designated on the upper sidewall/shoulder of a tire.



## DEFINITION OF AN UNDER INFLATED TIRE

TMC's recommended definition is that a tire is under inflated if its hot inflation pressure is less than 70 percent to 51 percent below the stated maximum inflation pressure that is molded on the sidewall of a tire. For example, if the pressure on the tire sidewall is 120 psi, it would be considered underinflated at 84 to 61 psi (70 to 51 percent of 120 psi).

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