# Trailer Tires CHECKUP

*By Bill Hancock*

Regardless of our brand of boat, most of us share the need for trailer tires. There is a lot to understand about trailer tires, so let's examine some of the more important areas. We will begin with basic tire knowledge and then move to selection, and finish with maintenance and safety.

Tires come in all sizes, widths, and load ranges, so lets look at what we need to know about trailer tires. The primary designation starts with the intended usage, which in the case of a trailer is "ST", denoting Special Trailer. These ST tires have stiffer sidewall construction to enable them to provide exceptional lateral stability while reducing sidewall flexing. Passenger car tires need to be able to withstand the rigors of acceleration, braking and cornering forces, so they have a much more flexible sidewall construction. Ride quality and noise reduction are also paramount in the selection of a passenger car tire. For the most part, a trailer tire has to simply support the boat and trailer provide lateral stiffness, and in some cases provide some braking effort. Ride quality and cornering ability are not much of a factor.

Tire nomenclature can be somewhat daunting to the newcomer, so let's begin by decoding some of the required nomenclature found on the sidewall of every tire. For our purposes, there are several key pieces of information. There are several designation protocols, the most common of which is called the metric designation. Let's start with the typical information contained in the "Brand" (think of a brand on a horse). This brand, not to be confused with the name of the manufacturer, is a series of raised letters and numbers found on the sidewall of the tire which designates the size as well as other important info such as the date of manufacture.



## ST205/75-R14

Here is a typical brand found on the sidewall of a tire. Let's break this code down and see what it means.

- **ST** Stands for Special Trailer
- **205** is the width of the tire in millimeters
- **75** is the aspect ratio. This denotes 75% of the tread width is the height of the tire section
- **R** denotes radial whereas D-would indicate a bias ply construction
- **14** is the rim diameter of the required wheel in inches

Load carrying capability becomes the critical factor for any tire selection, followed by tire construction. To properly select tires for your trailer, it is imperative that you know the fully loaded or gross vehicle weight of your trailer combination.

Once you have your trailer properly loaded, get your individual axle weights, and follow along with the example below:

| | |
|---|---|
| **Trailer weight** | **Total 4375 lbs** |
| **Front axle** | **2140 lbs** |
| **Rear axle** | **2235 lbs** |

The weight data tells us that we should select a tire which has a load capacity of at least half of the heaviest axle. In this case, we divide the load for the heaviest axle in half so in our case we divide 2235 lbs. by 2 and get 1117 lbs. per tire. Therefore, we should pick a tire with the minimum individual load capacity of at least 1118 lbs.

Next, you should determine what rim size your trailer uses. In our example, our trailer uses a 14" rim. Your rim diameter is determined by several factors: intended load, fender clearance, brake rotor or drum diameter and bearing speed. The rim diameter is measured at the bead seat of the rim. The bead seat is where the tire rides on the rim. It is held in place by the flanges on the outboard edges of the rim. Once inflated, the tire grips the rim and flanges, forming an airtight seal as it is forced over the bead seat on the rim diameter and outward against the flanges.

Now here is where the trailer tire story gets complicated. In order to figure out which tire we need, we have determined that we need a 14 inch tire , so we begin looking at the various 14 inch tires in our load range.

| | |
|---|---|
| **Trailer weight** | **Total 4375 lbs** |
| **Front axle** | **2140 lbs** |
| **Rear axle** | **2235 lbs** |

## GVW-Gross Vehicle Weight

This is the fully loaded weight of the trailer as it goes down the road. Take the time to get your vehicle weighed at a public scale. It is a simple process. Locate a scale, drive your vehicle across, pay the small fee, and get the real weight. I always recommend that if you have a multi-axle trailer, weigh each axle separately. This will allow you to adjust or equalize your weight distribution if necessary. Having more then one axle is of little value if the load is not equally divided among the axles. When weighing your loaded trailer, it is also important to have everything you might normally carry in the boat. A full fuel tank, cooler full of ice, ladders, ect. are all part of the load the tires will see. Make sure you weigh the trailer while it is hooked up to the trailer hitch and tow vehicle you normally use, since some of the weight will be supported by the tow vehicle. If your individual axle weights are more than 10% different, front to rear, you should equalize them by either shifting the axles fore or aft relative to the trailer, or raising or lowering the hitch ball on your tow vehicle.

## Axle and Bearing Capacity

In some cases it is possible to put a tire and wheel combination on a trailer that will allow you to use a tire which has a load carrying capability far in excess of the axle and wheel bearing capacity. Always check with the trailer manufacturer if in doubt. Make sure your trailer bearings are rated equal to or higher in capacity than the tire they are supporting.

*Here is what we find:*

## Tire

| | | |
|---|---|---|
| 205/75D14 | 1760@ 50psi | $55.00 |
| 215/75D4 | 1870@ 50psi | $62.00 |
| 205/75R14 | 1760@ 50psi | $81.00 |
| 215/75R14 | 1870@ 50psi | $87.50 |

The differences appear in tire construction; Radial vs Bias ply and width 205 vs 215. As we can see, the load carrying capability is the same between radial and bias ply for the given sizes, with the wider tires giving us 100+ more lbs of load carrying capacity or in some cases a little more insurance against overloading. So the question becomes why choose radials over bias ply. Generally speaking, radials are a better tire for rolling resistance and hence fuel economy. They have a steel belt around the outer diameter which gives greater strength to the tire.

Bias ply tires are also a good choice and get their name because the plys are molded in a cross wise or bias configuration around the diameter of the tire. We could devote a whole article tire construction and the benefits of one tire versus another. If you are interested, read the available literature from the various manufacturers.

Now that we have defined the tires let's look at our trailer and see how to apply our knowledge to ensure trouble free towing. Here is a list of steps which will make your tires last longer and perform up to their potential:

Check the manufactuing date of your tires. Never use a trailer tire that is older than the manufacturers recommendations. Tires deteriorate due to a variety of factors. Old tires are dangerous, and nobody wants a blowout on the highway, since it will invariably be in an out of the way location, after hours, and usually when you have no time to spare.

Make sure your tires always meet or exceed the load range requirements for your loaded trailer.

Always check your air pressure before leaving on a trip and at several intevals along the way if the journey is long. Always use airtight metal air stem caps to protect the valves and provide an additional seal against any valve leaks.

Use a hand held infrared temperature gage to measure the tire and wheel bearing temperatures when you stop along the way. When everything is correct, all of the tire temperatures should all be somewhat equal. The wheel bearing temperatures will typically read differently from the tire temperature but the bearing temperatures should also be all close to each other. Again, you are looking for the difference in temperature between the bearings. If you get in the habit of doing this, you will be able to spot trouble before it becomes a disaster. The tire temperatures should be similar to those on your tow vehicle.

Hand held infrared thermometer

**Date Codes** The DOT requires all manufacturers to brand their tires with a date stamp indicating when the tire was manufactured. This brand is typically in a small oval and consists of four digits. The first two digits denote the week of the year and the last two digits denote the year, so for example a brand of 3609 would indicate that the tire was manufactured in the 36th week of 2009. 36 corresponds to roughly the first week in September. Always make sure the tires you are purchasing are fresh. Beware because tires having an older date are often discounted by the manufacturer and or distributor in order to move them out of inventory before they are no longer saleable. Always check the tires before they are mounted because once they are mounted and balanced, it becomes a hassle to return them. If the store won't let you check the date codes prior to mounting and balancing, find another store.



## Tire Pressure & Heat

Tire Pressure determines to a large part, the load carrying and handling capability of a tire. As the tire rotates, the sidewall gets flexed or squashed with each rotation. With insufficient air pressure, the sidewall will flex excessively during each revolution as it rotates. This constant flexing of the sidewall will quickly overheat the tire and ultimately cause it to fail. Keeping the tire properly inflated prevents excessive heat buildup. The tractive effort of a tire is largely determined by its contact patch (the "footprint" of the tire where the rubber meets the road). If the contact patch area is too small, the trailer will tend to sway. Under or over inflation will result in an improper contact patch. Recommended tire pressures are given for a cold tire. If you are on the road, your tire pressure will typically rise 3-4 psi, unless you have seriously overheated your tire. Always set your tire pressures when the tires are cold, do not lower them out on the road while the tires are still hot.

Lug Nuts – Get in the habit of checking the torque on your lug nuts. Unless they are properly tightened, they tend to loosen. Be especially vigilant, and remember to check after you have changed a tire. Check the torque on the lug nuts after you have traveled 50 miles.

Speed – Trailer tires are generally recommended not to exceed speeds of more than 55 mph. If you are going to tow at speeds greater than 55, seek advice from the tire manufacturer for recommendations. Higher speed means that the sidewalls are flexing more times per minute, hence more heat is being built up.

Air pressure gauge, tread depth indicator, and metal valve stem caps

Tread Depth – DOT regulations require all tires to have a minimum tread depth of 2/32". As your tires wear, keep an eye on not only minimum depth, but also how the tire is wearing across the entire tread width. Wear at the edges suggests under inflation, while more wear in the middle of the tread indicates too much air pressure. Wear on only one side may indicate a bent or misaligned axle or a bent spindle.

Spare tire – while everybody realizes the benefit of carrying a spare tire, however, it is of little value if it is under inflated, so always check your spare tire when checking tire pressures. Also, consider carrying a complete hub, spare bearings and seals, in case you lose a bearing along the way.

Spare Tire, wheel, brake rotor, hub and bearing assembly. This ensures that everything you need except the spindle is available.

When storing your trailer for extended periods, it pays to take the weight off the tires to avoid flat spots, so jack it up your trailer, and put it on jack stands or blocks. If you can't do that, increase the air pressure by 20 psi. If you choose this option however, you must remember to lower the pressure before using the trailer.

When not using your trailer, try to shield the tires from the harmful rays of the sun, by either storing it undercover or by utilizing tire covers which can be purchased at RV stores.

Finally, there is a system on the market which allows you to have temperature and pressure sensors installed in your trailer tires and provides a cab mounted readout. ◆

*Happy Towing!*