

Shopping For Tires¹

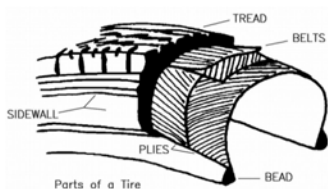
Mary N. Harrison²

There is an old saying, “Where the rubber hits the road,” that means facing reality. Its also a good statement to apply to the importance of selecting tires for your car or truck. Those four small areas of rubber are the only part of your vehicle touching the road and are the difference between safe travel and tragedy.

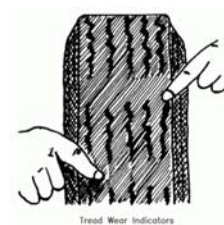
When Do I Shop for Tires?

Some people think of tires, wheels and hubcaps as cosmetic additions to a vehicle. They even want to change wheel type and tire size. Such alterations may create major safety and warranty problems.

Manufacturers design vehicles to operate safely and efficiently. Altered wheel and tire size can create steering problems, change the vehicles center of gravity and decrease the stability of the vehicle. It also may void the manufacturers warranty and decrease insurance protection.



Shop for tires when the tread has worn or the tire is damaged. Florida auto safety regulations state a tire should be replaced when the tread has worn to 3/32 of an inch. If the tread reaches 1/16 of an inch at any location it should be replaced immediately. Ninety percent of tire failures occur when the tread has worn to about 1/16 of an inch. Some tires have wear indicators that are built in and appear as smooth bands when the tread wears to about 1/16 of an inch.



A gauge that is specifically designed to measure tread depth can be purchased from an auto supply store or tire center. Sometimes these devices are distributed free as a form of advertising. A very easy way to measure tread depth is to use a penny. Place the penny in a groove with the top of Lincolns head toward the tire. If you can see the top of Lincolns head with the penny in the groove, your tread is less than 1/16 inch.

1. This document is FCS5017, one of a series of the Family Youth and Community Sciences Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Original publication date August 1, 1995. Revised June 1, 2005. Visit the EDIS Web Site at <http://edis.ifas.ufl.edu>.

2. Mary N. Harrison, professor, Department of Family, Youth and Community Sciences, Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, FL 32611.

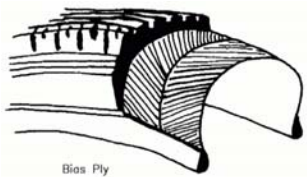


Are There Different Types of Tires?

There are three basic types of tires, bias ply, belted bias, and radial. Although bias ply and belted bias tires were the best sellers for many years, they are now vanishing from the market. Most tires sold today are radials. All tires are constructed of a combination of cords woven into layers called plies. The way the plies are combined and the use of belts determines the type of tire, its useful life and safety potential.

Bias Ply (Sometimes Called "Regular" Tires):

- are constructed of an even number of plies overlapping at a 45-degree angle.
- usually contain four plies, (two sets of two plies per set) that overlap. Heavy-duty truck tires may have six or eight plies.
- have rigid tread and sidewalls.
- have less tread surface on road than do other types of tires of similar quality.

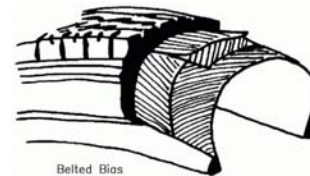


Belted Bias Tires:

- are similar in construction to the bias ply, with two plies overlapping at a 45-degree angle (on the bias) to form the tire body.
- have two belts, which determine the width of the tread area. They are attached to the body of the tire directly underneath the tread. The belts may be made of fiberglass, steel, nylon, rayon, or other materials. Frequently the belts and body of the tire are made of different materials. For

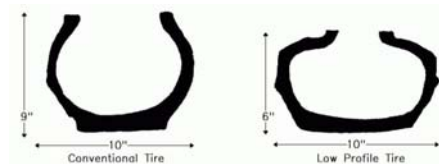
example, a polyglass tire may have polyester plies and fiberglass belts.

- have a wider tread area than the bias ply. This provides better traction and stopping power.
 - have more flexible sidewalls than the bias ply. They do not build up as much internal heat during driving, reducing the likelihood of tire failure.
- usually provide more miles of wear than bias ply tires of similar quality.



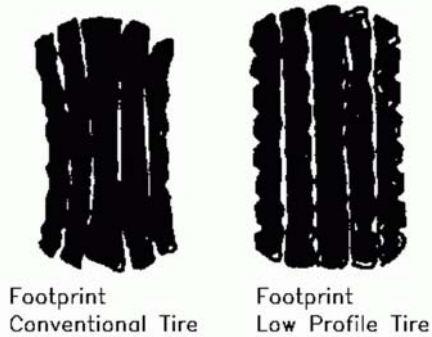
Radial Tires:

- are completely different in body structure from bias ply and belted bias tires. Plies used in the body of a radial tire run at 90-degree angles to the center line or tread of the tire.
- may be constructed of one, two, or three plies.
 - have up to a maximum of four belts that are attached over the body of the tire, directly under the tread. A variety of materials can be used to make the belts including steel, fiberglass, and nylon. Belts and plies frequently are constructed of different materials.



- are a low profile tire, sidewalls are very flexible, appearing to "bulge out," The tread area is wider in relation to the tire wall height than are the other two types of tires.
- build up less heat and exhibit less flexing of the tire than do the other two types.
- have more tread in contact with the road. This provides better traction.

- have decreased rolling resistance, improving gas mileage up to 3 percent over bias ply tires.



Space Saver Tires (Half Size Tires):

- are designed to conserve space in the trunk or cargo section of car or station wagon.
 - are for temporary or emergency use only. They are not rotated with other tires. Some have a life expectancy of only a few hundred miles.
- generally are about half as wide (across tread section) as conventional tires and are used as the spare tire of some cars.
- are more expensive per mile of service than are conventional tires, are not sold as widely, and have limited mileage lives.

How Can You Compare Tire Quality?

The Federal government has required tire manufacturers to test and label car and truck tires since 1968 to make sure they meet minimum safety standards. In 2002 these regulations were upgraded and strengthened to better address today's highway speeds and road conditions.

New revisions require tires manufactured during 2006 and thereafter to contain a tire pressure monitor. This will enable the driver to tell if a tire is under inflated. Low air pressure, heavy loads, and high speed all cause heat to build up in tires. Heat causes tires to fail.

All four tires on a vehicle should be the same size and type. Select the type and quality tires needed for the intended use of the vehicle. How fast do you drive, what type of loads do you carry, what about breaking/stopping quality and how many miles do



you want your tires to last? Information printed on the sidewall and label of tires can help you compare different brands and types of tires. This information includes:

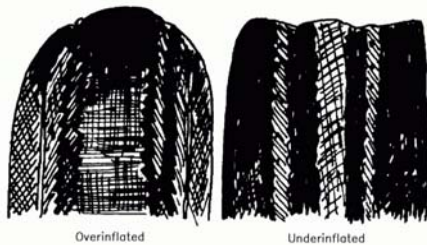
- Tire size – written as a series of letters and numbers, example **P195/70R14 90S**. The 195 is the cross-section measurement of the tire in millimeters and 70 is the height of the tires sidewall compared to the tires width. The sidewall is 70% as high as the tire is wide.
- Type of tire – in the **P195/70R14** example P stands for passenger car tire. If the tire was for a light truck such as a pick-up it would be LT instead of P.
- Construction - in the **P195/70R14** R stands for radial ply tire. Most tires are radials.
- Wheel size – in the **P195/70R14** example 14 is the diameter of the wheel in inches. If it were a 12-inch wheel the number would be P195/70R12.
- Load range – in the **9195/70R14 90S** example 90 is the code for the maximum load or weight the wheel will carry safely (1312 pounds). Notice this information is also repeated on the sidewall, “max load 595 kg (1312 pounds). Different numbers are used to identify different load ranges.
- Speed rating – in the **P195/R14 90S** example S identifies the maximum number of miles per hour the traveler can travel safely. S stands for 112 miles per hour. Other ratings are: T = 118 mph; H = 130, V = 149, and ZR = 150 or more.
- Maximum air pressure – (taken when cold) stated as pounds per square inch (PSI). The air pressure should not exceed the number of PSI listed on the sidewall of the tire, example 35 PSI. For general driving you should use the air pressure recommended in your cars operator manual or on the sticker on the door jam or the glove compartment.

- **Traction** – is a rating score for government required tests on wet pavement . Traction is the stopping and holding capabilities of the tires. Ratings range from C to AA. Look for at least an A in traction.
- **Temperature** – is also a government required rating score for heat buildup inside a tire. This is especially important when a tire is under-inflated or carrying a heavy load. Heat destroys tires and can cause blow-outs. Look for at least a B in temperature rating.
- **Treadwear** – relates to how quickly the tread wears on a tire and how many miles the tire will last. This is expressed as a number. The minimum standard is 100. The higher the number the longer the tread will last. A tire with a 400 rating will last much longer than the tire with a 200 rating.
- **DOT** – stands for Department of Transportation. This code identifies the plant and date including week and year that the tire was manufactured. This code is used if a tire is recalled.

Do Tires Influence Fuel Economy?

Three aspects of tires are important to fuel economy.

- Type of construction. Radials tend to roll more easily and have better traction than other types of tires.



- Inflation pressure. the correct air pressure for tires varies according to tire type, automobile size, and driving conditions. Recommended inflation pressure is found in the owners manual and should be followed, since improper inflation decreases the life of the tire. Under inflated tires tend to wear on the outside edge and reduce fuel efficiency. Over inflated tires produce better fuel

economy than under inflated ones, but over inflation results in excessive wear in the center of the tire.

- Abuse of tires necessitates their early replacement, thus wasting the fuel used to produce and distribute them.

What About Warranties (Guarantees)?

Most tires are warranted against tire failures caused from road hazards, and defects in workmanship and materials. This includes an assurance that the tire will remain usable (hold together) until the tread has worn below the replacement level. This ensures that the tire will continue to fit the rim, the sidewalls of the tire will hold up, and the belts wont come loose. If any of these situations occur, return the tire to the seller (or in some instances any retailer selling that make of tire), and you will receive a discount on the purchase of a new tire. The discount is based on the prorated value of the tread remaining on the tire. Tread is measured at the place where it is worn the most.

Some tires carry a treadwear warranty for a designated number of miles. For example, a radial may be warranted to last for 60,000 miles. Usually if a tire carries this type of warranty and does not fulfill the promise, a prestated discount will be given on the purchase of a new tire, for example, 15 percent of the cost of an equivalent new tire.

If a warranted tire must be replaced, compare prices of competing tires of equivalent quality. Another make or an “on sale” tire may sell for less than the amount charged for a replacement tire, minus the prorated adjustment or the percentage discount.

Always compare warranties before buying tires. Find out who will do what for how long. Keep warranty information in case a claim must be made.

Shopping Tips

Don't try to squeeze extra miles out of a badly worn tire. Approximately 90 percent of all flat tires happen after a part of the tires tread has worn to 1/16th of an inch. A flat tire can be unsafe and expensive.

Start to shop around when tires begin to show wear. Tire prices may vary from dealer to dealer, and sales are usually available. Select a dealer who is well informed and who has a good service reputation. Compare the quality and cost of competing tires. Use the tire labeling information to find the best quality tires. Remember, cost is not an indicator of quality. Look for unbiased information.

Tire Care

- If a long trip is planned and the car is heavily loaded, add about 2 pounds of air to the tires, because added air pressure helps tires run cooler. However, do not exceed the maximum pressure printed on the tires sidewalls.
- Keep tires at the pressure recommended in the drivers manual. Be sure to check pressure when tires are cool. Under and over inflation cause uneven tread wear and cut the life of a tire.
 - Pocket gauges tend to be more accurate for testing air pressure than the tower gauges used at gas stations.
- Check tires regularly for evidence of uneven wear. Make sure the front end alignment of the car is checked periodically. This helps prevent uneven tire wear. Worn shock absorbers and poorly adjusted brakes can also cause tire wear
- Rotate tires for even wear. Follow recommendations found in the cars operator manual.
 - When driving accelerate and slow smoothly to avoid tire wear.

References

Consumer Reports. *Tires for Cars and SUVs*. Consumers Union, Yonkers, New York, Nov. 2001.

Consumer Reports. *All Season Tires*. Consumers Union, Yonkers, New York, Nov. 2001.

Consumer Reports. *Winter Tires*. Consumers Union, Yonkers, New York, Nov. 2002.

Consumer Reports. *Touring Performance*. Consumers Union, Yonkers, New York, Nov. 2002.

Consumer Reports. *High Performance Tires*. Consumers Union, Yonkers, New York, Nov. 2003.

Consumer Reports. *Plus Size Tires*. Consumers Union, Yonkers, New York, Nov. 2004.

Harrison, M. N. *Shopping and Care for Tires*. EDIS. University of Florida, Gainesville, March 2002.