

# TIRE MAINTENANCE & REPAIR GUIDE

We've come a long way since the earliest "tires," which were no more than bands of iron fitted to wooden wagon wheels. That's where the word comes from. Wheels were dressed by wheelwrights and the banding was known as "attire."

More recent history is studded with names that, to this day, we still take for granted as industry leaders. 1846 saw the first solid rubber tire produced by Thomas Hancock. In 1888, John Dunlop invented the first air-filled tire (to be used on bicycles). In 1895, Peugeot was the first automotive manufacturer to equip a petrol-powered vehicle with air-filled tires designed by Andre Michelin.

The current state of tire technology is, of course, vastly removed from those inaugural attempts to make wheels last longer. Having a working knowledge of tire terminology and market choices is important not only for the ease and comfort in driving your vehicle, but for your safety.



## SIDEWALL MARKINGS

Most commercial codes can seem foreign to you if you do not understand what they mean. In fact, some information may not be coded. It's no longer uncommon for modern sidewall markings to simply state "Max Pressure..." and give a poundage figure, for instance. The name of the manufacturer, and the model of the tire, feature prominently, but beyond that these are the things to look for:

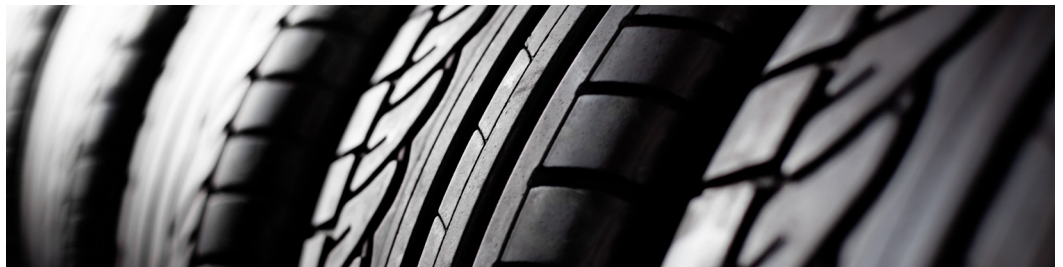


- **Usage Mode-** This is the recommended use that a tire should be put to, and is described by a single upper-case letter at the beginning of the code string.
- **“P”** indicates you’re looking at a passenger-car tire;
- **“T”** means the tire is designed for temporary use only (it’s a spare);
- **“LT”** means it’s suitable for light trucks;
- **“C”** indicates it’ll hold up to commercial use
- **Width-** The first number after the mode indicator measures the tire’s width, in millimeters.
- **Profile-** “Profile” means the tire’s sidewall height, relative to its width. That’s why it follows the width measurement after a forward-slash mark. It expresses the sidewall’s aspect ratio as a percentage of the width.
- **Tire Type-** Radial tires are now so ubiquitous that you’re unlikely to see a type marking other than “R,” meaning just that: radial. Some tires also have a code letter after the “R,” indicating the maximum speed recommended by the manufacturer (“Z,” for example, means it’s safe to exceed 150 miles per hour, which is not something you should consider.)
- **Service Description-** The next information is a number followed by a letter. The number is a code representing the maximum load each separate tire can safely support, in pounds, and the letter is its speed rating. The latter is redundant in the U.S., where the lowest rating -- N, meaning 87 MPH -- exceeds the national maximum speed limit.
- **Seasonal Suitability-** All-season tires next have the code “M&S” or “M+S,” meaning mud and snow. Summer-only tires lack the M+S, while winter tires show that descriptor and add an icon (an image of a mountain with a snowflake).

# UNIFORM TIRE QUALITY GRADE

Closer to the tire's tread, another series of abbreviations conveys the National Highway Traffic Safety Administration's (NHTSA's) uniform tire-quality grading system (which isn't, in fact, entirely uniform, in that it isn't mandated for spares, snow tires or light-truck tires). Three pieces of information are given:

- **Treadwear-** Treadwear takes the number 100 as a base performance level, and increments according to the manufacturer's estimated service life. The tread of a tire with a treadwear factor of "300" can be expected to last three times longer than one marked "100" in comparable usage conditions.
- **Traction-** Traction describes the performance you can expect in straight-line acceleration and braking on a wet road. "AA" is the best, with inferior performance shown, in descending order, by "A," "B" and "C."
- **Temperature-** The "Temperature" figure describes the tire's resistance to the buildup of heat caused by road friction. "A" is the best, "B" is next and "C" is the lowest legal rating. Similar to the Service Description, though, this information is redundant in the U.S., because even the lowest rating -- "C" -- correlates to speeds measured between 85 and 100 MPH, all illegal on America's roads.



# DATE OF MANUFACTURE

This is the important one especially when buying a used vehicle.

Advertisements for vehicles often involve images of tires with wonderfully unworn treads, but this means almost nothing. It's the sidewall integrity you need to know about. Older tires can have been damaged by static weight, and by exposure to the ultraviolet rays in sunlight. The Department of Transportation's (DoT's) Tire Identification Number (TIN) gives both the week and year when the tire was manufactured, making its age simple to calculate.



The TIN is a series of letters and numbers, usually between ten and twelve digits long, most of which are of little interest to us, the end-user. The last four numbers, however, record week and year of manufacture. If the TIN is absent, or is a three-digit code rather than having four numbers, the tire was manufactured before year 2000, and is likely to be unsafe. Taking the code DOT H25R YC24 4305 as an example:

- The number “43” indicates the tire’s week of manufacture, and
- The number “05” means it was made in 2005; the 43rd week of 2005



## PLY RATINGS

A tire’s ply rating describes the maximum load the manufacturer recommends the tire be used to carry (at a specified pressure). This familiar notation, perhaps surprisingly, is not a measure of the actual number of reinforcing plies in the tire’s carcass. This used to be the case, but the numbers we’re used to -- 10-, 12- or 14-ply, for instance -- now describe an equivalent sidewall strength expressed in the old way. Even a 14-ply tire, as sold today, may only have a single steel ply and maybe two or three fabric plies.

In essence, a better ply-rated tire will carry heavier loads at higher inflation pressures. A tire that’s insufficient for its purpose can quickly overheat and self-destruct. It is imperative to calculate the correct minimum ply rating suitable for the gross vehicle weight rating (GVWR) of your vehicle, and this should be done by a professional.



# TIRE MAINTENANCE

To determine the correct tire pressure for your vehicle as recommended by the manufacturer, locate the certification label inside the vehicle by the driver's seat. Use the information indicated here rather than the psi indicated on the tire itself. The psi number indicated on the tire is the maximum allowed pressure at the tire rated load. Keep in mind that tire pressure fluctuates based on weather conditions (hot vs. cold temps) and driving conditions (city and highway). Check pressure often.

With components as vital to safety as road-wheel tires, it's important to understand the difference between maintenance and repair. As a responsible road user you should arrange for regular maintenance and inspection.

Rinse down your tires with a regular garden hose, then use a tire cleaner to finish the job. After they dry, here's what to look for:

- **Tread** - The days of measuring tread with a coin are long gone. All modern "P," "LT" and medium commercial tires have integral wear indicators, built into the tread. These indicators are molded into several locations around the tread grooves. When the tread ribs become worn to the point where they're adjacent to an indicator, it's time for a new tire.
- **Pressure** - There's no need for expensive digital readers. Use a simple rotary gauge at least once a month when the tires are cold (even a one-mile drive can result in an inaccurate reading). If you find you're regularly losing pressure from a tire, it's time to call in professional help to locate and rectify the problem.
- **Balancing** - New tires are balanced by the installer, using the perhaps-familiar semi-circular lead weights that can often be seen clamped to wheel rims. Tire balancing eliminates vibration which would otherwise contribute to driver fatigue, premature tire wear, and suspension failure. Missing weights should be replaced immediately.
- **Rotation** - Rotating your tires on your vehicle is important to keep wear patterns even. If your operator's manual doesn't give a specific guidance, it's a good idea to do this once every six to ten thousand miles.
- **Mixing Tires** -To ensure good driver control, and to encourage vehicle stability, tires with different tread patterns, different sizes and mismatched internal constructions should never be mixed.

# TIRE REPAIR

As noted, tire repairs should ONLY be carried out by professionals. This includes wheel alignment, an important component in ensuring maximum tire life. If wheels are misaligned you may notice uneven wear patterns in your tires. Inspecting for, and noticing these symptoms, is good maintenance. Having the root-cause fixed -- the repair -- is a job for the professionals.



## KNOW THE SIGNS

Making tire inspection a part of your vehicle's routine maintenance is important to your safety. Whether you are taking a quick sprint to the beach or a long tour around the country, you should first inspect the condition of your tires. Have repairs carried out as soon as you notice they're needed. Putting it off can be a serious mistake.