

Uniform Tire Quality Grading (UTQG)...

Treadwear

The treadwear grade is a comparative rating based on the wear rate of the tire when tested under controlled conditions on a specified government test course. For example, a tire graded 150 would wear 1.5 times as well on the government course as a tire graded 100. The relative performance of tires depends upon the actual conditions of their use, and may depart significantly from the norm due to variations in driving habits, vehicle condition, road characteristics, and climate. When tires are tested for treadwear they actually accumulate a total of 6,400 miles, and the total treadwear is projected by calculation. In addition, the tires are rotated every 800 miles and the vehicle wheel alignment is always set to optimum specifications.

Traction

The traction grades from highest to lowest are AA, A, B and C. They represent a tire's ability to stop on wet pavement as measured under controlled conditions on specified government test surfaces of asphalt and concrete. A tire marked "C" may have poor traction performance. **WARNING:** The traction grade assigned is based on braking straight ahead and does not include cornering (turning) action.

Temperature

The temperature grades are also A, B and C, representing the tire's resistance to heat generation and its ability to dissipate heat when tested under controlled conditions on a specified indoor laboratory test wheel. Sustained high temperature can cause the material of the tire to degenerate and reduce tire life; excessive temperature can lead to sudden tire failure. The grade C corresponds to a level of performance which all passenger tires must meet under Federal

safety laws. **WARNING:** The temperature grade is established for a tire that is properly inflated and not overloaded. Excessive speed, underinflation, or excessive loading will cause heat buildup in the tire and possible tire failure.

The information regarding UTQG Treadwear, Traction, and Temperature must be molded into the tire sidewalls, included on labels affixed to the tread surface, and made available in consumer brochures.

The Treadwear grade is always expressed as a number such as "520" and the Traction and Temperature grades are always expressed as a letter; either A, B, or C.

The NHTSA has made a proposal to adopt an additional Traction grade of "AA" by 1998 for those tires which offer the very highest wet traction characteristics.

Speed Ratings

Most passenger tires sold in the U.S. today are rated for specific maximum speeds as designated by a speed rating. The most common speed ratings (see figure 1) found today are “S”, “T”, “H”, “V”, “Z”, and more recently “W”.

The system for speed ratings originated in Europe where countries such as Germany have very high speed limits on certain highways.

Speed ratings are determined by indoor laboratory testing methods which measure high speed tire durability under controlled test conditions. These test procedures do not take into account underinflation, tire

damage, vehicle characteristics, or road conditions which can lead to sudden tire failure or loss of vehicle control at much lower speeds than indicated by the tire’s speed rating.

The validity of using speed rated tires in the U.S. is based on the idea that the tire’s top speed capability must at least equal the vehicle’s top speed capability, since it cannot be assumed that the driver will always observe the speed limit.

More and more, the speed rating is being referred to as the “performance rating” of the tire, since the higher speed rated tires generally offer improved handling and maneuverability compared to lower speed rated tires.

Speed Ratings Are Shown On The Tire In One of Three Ways:

1. Within the tire size designation.

P205/60HR15

Speed Symbol

2. In the service description.

205/60R15 90H

Service Description
Speed Symbol

3. Both in the tire size designation and in the service description. In this case, the speed symbol in the service description dictates the tire’s maximum speed limit. Eventually, the “Z” symbol will be eliminated in the size description and be replaced by “W” in the service description.

45/45ZR17 95W

Service Description
Speed Symbol

fig. 1

Speed Symbol	Speed Category	Open-Ended Speed Category
S	180 km/h (112 mph)	
T	190 km/h (118 mph)	
U	200 km/h (124 mph)	
H	210 km/h (130 mph)	
V	240 km/h (149 mph)	
W	270 km/h (168 mph)	Z
Y	300 km/h (186 mph)	Z
	Above 300 km/h (186 mph)	Z

P-Metric Designated Tires for Light Trucks

The prefix letters “P” and LT” are used as part of the tire size designation to differentiate between tires designed for service on Passenger cars or Light Truck vehicles. The load/inflation formulas developed for “LT” tires are different from those for “P” tires, since it is expected that “LT” tires will experience more severe loading and operating conditions.

If the vehicle’s tire information placard calls for “LT” tires, you should replace them with the same size and type tire with an “LT” prefix. If the customer prefers to use a “P” tire as a replacement on a light truck, it **MUST** have at least the same load carrying capacity as the tire it replaces. For use on a light truck, the load capacity of “P” tires at any inflation must be reduced by 9% and the maximum load capacity molded on the sidewall must also be reduced by 9%. Here’s an example:

P235/75R15 (35 psi)
Max. Load Capacity:
Passenger Car = 2,028 lbs
Light Truck = 1,845 lbs

However, any “P” tire sizes recommended by the vehicle manufacturer on light trucks (as stated on the tire information placard) have already been discounted by the 9% and can

be replaced with the same tires at the vehicle manufacturer’s recommended inflation pressure.

Tire Rotation

Since tires wear at different rates on the steer and drive axles of cars, it is imperative that they be rotated at regular intervals to obtain maximum wear life. On rear-wheel-drive cars, the rear tires generally wear faster than the front tires. On front-wheel-drive cars, the front wear much quicker than the rear. Today, almost without exception, tire manufacturers’ mileage warranties require routine tire rotations such as every 5,000-8,000 miles.

Here are some important rules regarding tire rotation:

1. Some tires (“unidirectional”) are designed to run/rotate in only one direction as indicated by arrows on the sidewall. Be sure to maintain the proper turning direction.
2. Follow the rotation procedures in the vehicle owner’s manual or use the suggested rotation patterns on this page.
3. Be sure to adjust the inflation pressure front and rear according to the vehicle’s tire information placard.

4. Do not include small “temporary” spare tires in the rotation pattern. Full size spares may be included.
5. Different size tires front and rear require special treatment. Consult the vehicle owner’s manual.
6. Some luxury cars may have “left side only” and “right side only” wheels. Always check the owner’s manual before rotating.

Tire Mixing

“Mixing” means the application of compatible tires on each wheel end. Improper mixing of different types of tires on any passenger or light truck vehicle can produce unacceptable or dangerous handling conditions.

Here are some important rules regarding tire mixing:

1. It is preferable that all four tires on a car or light truck be of the same size (except cars which come with original equipment sizes that are different from front to rear axle) and speed rating. In the event that the car has bias ply or bias belted tires mixed with radial tires, the radials must be mounted on the rear axle in pairs.
2. On light truck vehicles with dual tires on the rear axle, radials may be fitted on either axle.
3. Snow tires should be applied to all four wheel positions whenever possible whether studless types or studded type. Never mix non-radial snow tires on the rear axle with radial tires on the front axle.
4. On 4X4 vehicles, it is important that all four tires are the same size to avoid “axle fight” while in 4WD driving mode.

Different Series/Profile on Same Vehicle *(Front or Rear Wheel Drive)*

- Same size and type on an axle.
- Place the lower series/profile tires on rear.

Radials & Non-Radials on Same Vehicle *(Front or Rear Wheel Drive)*

- Same size and type on an axle.
- Radials on rear axle, non-radials on front axle.

All Four Same Size & Type on Same Vehicle

- (Front, Rear or Four Wheel Drive)*
- All radial or all non-radial.

Wheel Basics

Here are the five main points you need to know for making correct and safe wheel/tire recommendations.

Wheel Width. Distance between inside of flanges rounded to nearest 1/2-inch. Ensure that wheel width is proper for tire size you intend to mount on it. All tire sizes have minimum and maximum wheel width limits. Correct wheel width is about 75% of tire cross section width. See Tire and Rim Association Year Book (Appendix, page 61) for acceptable ranges. “Measuring” rim width is used to show tire dimensions like overall width. “Recommended” are optimum. “Permitted” include absolute minimum and maximum.

Wheel Diameter. Distance from bead seat to bead seat across diameter of wheel. Must be exactly the same as tire rim diameter. Mounting a tire of one diameter on a wheel of another diameter can result in violent explosion causing serious injury or even death. Always verify diameter stamped on the wheel and match the tire exactly.

Wheel Offset. Distance between wheel mounting surface where bolted to hub of drum and centerline of rim. Determines vehicle “track” or distance between tires on each axle. Wheels with more negative offset than original wheels move outboard on car. Keep the wheel offsets as close to original as possible to avoid steering difficulties or wheel bearing fatigues. Negative offset on rear increases “track” and may improve stability and handling.