FACT SHEET

Module 4.1 Tires and Traction Control

TIRES
Tires are the vehicle's lifelines to the roadway.
Tires have two functions:

- They are air-filled cushions that absorb most of the shocks caused by road hazards.
- The tires flex, or give, as they meet these irregularities.
- This reduces the effect of the shocks on the vehicle and the passengers.

Secondly,

- The tires grip the road to provide traction.
- This enables the driver to accelerate, brake, and steer the vehicle.
- This reduces the effect of the shocks on the vehicle and the passengers.

Some Basic Definitions
Ply—layers of material (cords impregnated with rubber) under the tread. Each ply strengthens the tire and gives it shape.
There are two basic tire types:

1) Bias ply—plies are criss-crossed. This makes the casing strong in all directions. However, these tires wear more rapidly and provide less traction.
Radial ply—plies are parallel and perpendicular to the tread.

2) Belts (usually steel) are attached in the same position as the tread, which is then applied to the sidewall and results in more flexibility.

Traction—The actual gripping power between the tires and the roadway surface.
Traction provides:

- Improved tread mileage.
- Improved fuel economy.

Information about the tire's construction, size, recommended inflation levels, and carrying capacity is clearly marked on the sidewall of the tire.

New tires usually have a paper label attached with additional information.
Maintain the manufacturer's recommended air pressure in the tires at all times.
Keep a reliable tire gauge in the vehicle and use it regularly. Maintaining proper air pressure in the tire will yield maximum fuel efficiency and tire mileage. Too little air pressure can make handling the vehicle more difficult. Tires will not get as much mileage either.

Caution: The risk of a blowout with underinflated tires is greater.

Always check the tires for wear whenever the vehicle is serviced. If abnormal wear is noticed, have a service technician correct the problem.

TIRE QUALITY AND GRADING

All tires sold in the United States are rated on the Uniform Tire Quality Grading System. This can be read on the sidewall of the tire.

Tires are rated by:

- Traction - measured by the ability to stop a car in straight-ahead motion on a wet surface. A tire graded A has the best traction performance, B grading is an above average rating, and C grading indicates the tire meets government standards.
- Temperature - indicates the tire's ability to withstand heat. A tire graded A is the most heat resistant and less likely to suffer a blowout under the same conditions as tires with grades of B or C.
- Tread wear-The higher the tread wear rating, the greater the mileage. A tire with a tread wear rating of 150 is expected to last 50 percent longer than one graded at 100.

Keep safety in mind when new tires are needed. Compare and decide which type of tire offers the best value for the kind of driving done. Check the owner's manual for recommendations on tires for the vehicle.

TRACTION

Traction is the actual gripping power between the tires and the roadway surface:

- The more traction there is, the greater the gripping power.
- Friction is the force that keeps each tire from sliding on the road.
- The friction created by the tire on the road is traction.
- Traction makes it possible for the vehicle to grip the road so the driver can change speed and direction.

Two things are necessary to maintain ideal levels of traction:

- Vehicle must be in good condition;
- Road must be smooth, paved, level, and clean.

Vehicle condition

As a vehicle ages, it must be maintained in order to perform correctly.

- If tires, shock absorbers, or steering system parts are allowed to wear, traction and control will be reduced.
- Good shock absorbers are very important for maintaining traction.
- Worn shock absorbers will limit vehicle control; have them replaced as soon as possible.
- Worn or improperly inflated tires also will limit control. Check tire pressure and tread frequently, and replace tires as needed.

Tire Pressure and Loading

Checking Tire Pressure

It is important to check your vehicle's tire pressure at **least once a month** for the following reasons:

- Most tires may naturally lose air over time.
- Tires can lose air suddenly if you drive over a pothole or other object or if you strike the curb when parking.

With radial tires, it is usually **not possible to determine under inflation by visual inspection.**

Steps for Maintaining Proper Tire Pressure

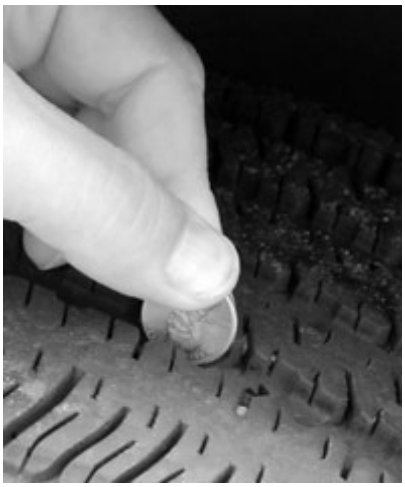
- **Step 1:** Locate the recommended tire pressure on the vehicle's tire information placard, certification label, or in the owner's manual.
- **Step 2:** Record the tire pressure of all tires.
- **Step 3:** If the tire pressure is too high in any of the tires, slowly release air by gently pressing on the tire valve stem with the edge of your tire gauge until you get to the correct pressure.
- **Step 4:** If the tire pressure is too low, note the difference between the measured tire pressure and the correct tire pressure. These "missing" pounds of pressure are what you will need to add.
- **Step 5:** At a service station, add the missing pounds of air pressure to each tire that is under inflated.

- **Step 6:** Check all the tires to make sure they have the same air pressure (except in cases in which the front and rear tires are supposed to have different amounts of pressure).

If you have been driving your vehicle and think that a tire is under inflated, fill it to the recommended cold inflation pressure indicated on your vehicle's tire information placard or certification label. While your tire may still be slightly under inflated due to the extra pounds of pressure in the warm tire, it is safer to drive with air pressure that is slightly lower than the vehicle manufacturer's recommended cold inflation pressure than to drive with a significantly under inflated tire. Since this is a temporary fix, don't forget to recheck and adjust the tire's pressure when you can obtain a cold reading.

Tire Tread

The tire tread provides the gripping action and traction that prevent your vehicle from slipping or sliding, especially when the road is wet or icy. In general, tires are not safe and should be replaced when the tread is worn down to 1/16 of an inch. Tires have built-in treadwear indicators that let you know when it is time to replace your tires. These indicators are raised sections spaced intermittently in the bottom of the tread grooves. When they appear "even" with the outside of the tread, it is time to replace your tires.



Another method for checking tread depth is to place a penny in the tread with Lincoln's head upside down and facing you. If you can see the top of Lincoln's head, you are ready for new tires.

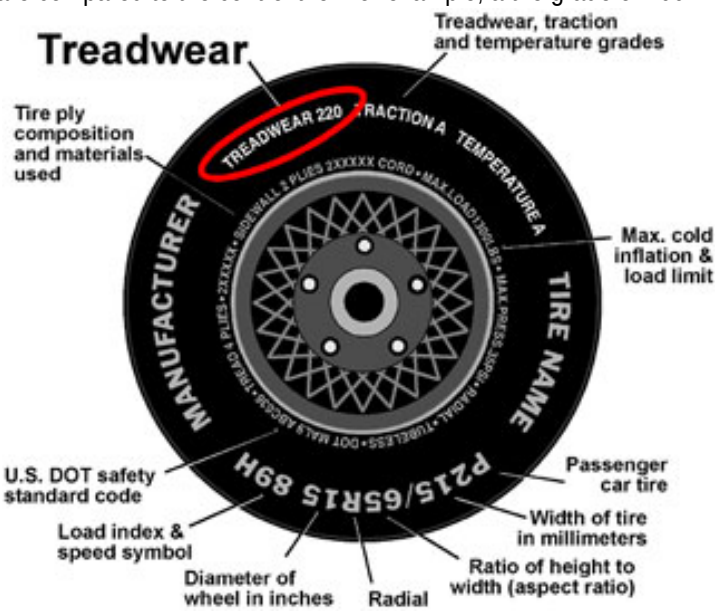
Tire Ratings - Treadwear

Treadwear grades are an indication of a tire's relative wear rate. The higher the treadwear number is, the longer it should take for the tread to wear down.

A control tire is assigned a grade of 100. Other tires are compared to the control tire. For example, a tire grade of 200 should wear twice as long as the control tire.

Of current tires:

- 15% are rated below 200
- 25% are rated 201 - 300
- 32% are rated 301 - 400
- 20% are rated 401 - 500
- 6% are rated 501 - 600
- 2% are rated above 600



Tire Ratings - Traction

Traction grades are an indication of a tire's ability to stop on wet pavement. A higher graded tire should allow a car to stop on wet roads in a shorter distance than a tire with a lower grade. Traction is graded from highest to lowest as "AA", "A", "B", and "C".

Of current tires:

- 3% are rated “AA”
- 75% are rated “A”
- 22% are rated “B”
- only 1 line of tires rated “C”

Tire Ratings - Temperature
Temperature grades are an indication of a tire's resistance to heat. Sustained high temperature (for example, driving long distances in hot weather), can cause a tire to deteriorate, leading to blowouts and tread separation. From highest to lowest, a tire's resistance to heat is graded as “A”, “B”, or “C”.
Of current tires:
- 27% are rated “A”
- 59% are rated “B”
- 11% are rated “C”

Tire Labeling
Federal law requires tire manufacturers to place standardized information on the sidewall of all tires. This information identifies and describes the fundamental characteristics of the tire and also provides a tire identification number for safety standard certification and in case of a recall.

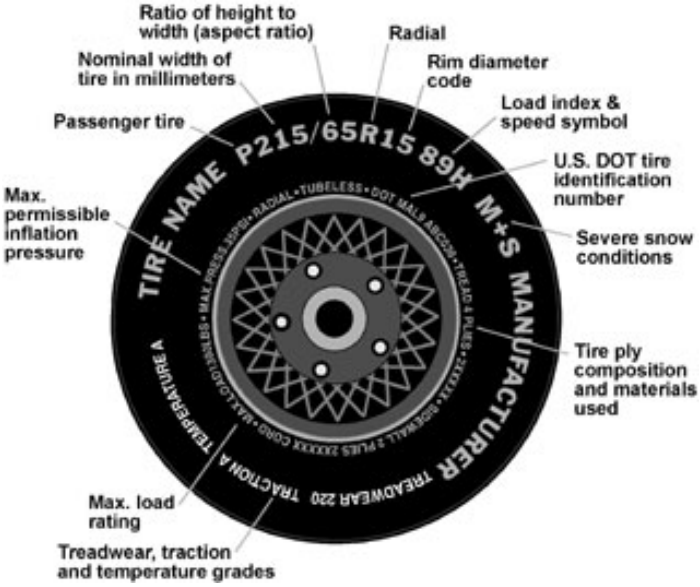
Tire Labeling - Passenger Vehicles
PASSENGER VEHICLE SIDEWALL OUTER CIRCLE

P The "P" indicates the tire is for passenger vehicles.

Nominal Width This three-digit number gives the width in millimeters of the tire from sidewall edge to sidewall edge. In general, the larger the number, the wider the tire.

Aspect Ratio This two-digit number, known as the aspect ratio, gives the tire's ratio of height to width. Numbers of 70 or lower indicate a short sidewall for improved steering response and better overall handling on dry pavement.

R The "R" stands for radial. Radial ply construction of tires has been the industry standard for the past 20 years.



Rim diameter code This two-digit number is the wheel or rim diameter in inches. If you change your wheel size, you will have to purchase new tires to match the new wheel diameter.

Load index This two- or three-digit number is the tire's load index. It is a measurement of how much weight each tire can support. You may find this information in your owner's manual. If not, contact a local tire dealer. Note: You may not find this information on all tires because it is not required by law.

Severe snow conditions The "M+S" or "M/S" indicates that the tire has some mud and snow capability. Most radial tires have these markings; hence, they have some mud and snow capability.

Speed Rating The speed rating denotes the speed at which a tire is designed to be driven for extended periods of time. The ratings range from 99 miles per hour (mph) to 186 mph. These ratings are listed below.

Note: You may not find this information on all tires because it is not required by law.

Q	99 mph	**H**	130 mph
R	106 mph	**V**	149 mph
S	112 mph	**W**	168 mph*
T	118 mph	**Y**	186 mph*
U	124 mph		

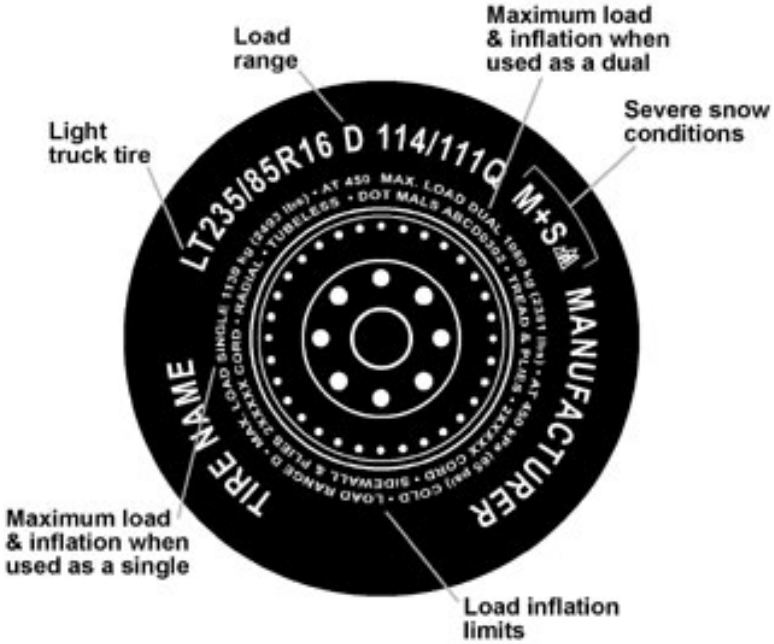
*For tires with a maximum speed capability over 149 mph, tire manufacturers sometimes use the letters ZR. For those with a maximum speed capability over 186 mph, tire manufacturers always use the letters ZR.

Tire Labeling - Light Trucks
Other Markings
LT The "LT" indicates the tire is for light trucks.

Max. Load Dual kg(lbs) at kPa(psi) Cold
This information indicates the maximum load and tire pressure when the tire is used as a dual, that is, when four tires are put on each rear axle (a total of six or more tires on the vehicle).

Max. Load Single kg(lbs) at kPa(psi) Cold
This information indicates the maximum load and tire pressure when the tire is used as a single.

Load Range This information identifies the tire's load-carrying capabilities and its inflation limits.



For additional information: http://www.nhtsa.dot.gov/ncap/