ConsumerReports.org

Tire Safety

Learn to recognize early warning signs of tire failure.

Tire-safety checks are easy to perform and could save you and your family from a potentially deadly danger.

As the only parts of the car that physically touch the ground, they are one of the key factors affecting a vehicle's handling and braking, and overall highway safety. What steps can you take to ensure that your tires stay in optimal condition? Performing regular checks is quick and easy, and a worthwhile investment of time in your and your family's safety.

Trouble Signs to Look For

Visually inspect your tires on a regular basis. If you note any of the following early warning signs, have a professional inspection performed, check and correct items that may be causing the condition, or replace your tires.

Cracking or cuts in the sidewalls.

Uneven tread wear. This can be caused by improper inflation, misaligned wheels, damaged tires, or by problems with suspension parts.

Excessively worn tread. Most modern tires have tread-wear indicator bars running across the tread, which signal the minimum allowable tread depth of 1/16-inch. When the tread wears down to these bars, it's time for new tires. Inexpensive tread-wear gauges are available at auto-parts and tire stores.

Alternatively, you can use a Lincoln-head penny as a tread-wear indicator. Insert the penny into a tire groove with Lincoln's head toward the tire. If you can see the top of Abe's head, the tread is too worn.

Bulges or blisters. If you see a bulge or blister on the sidewall, replace the tire at once. These signal potential weak spots that could lead to tire failure.
Excessive vibration. Tire vibration may be a sign a wheel is misaligned, unbalanced, or bent. It could also signify internal tire damage. Don't ignore vibration: Have the vehicle serviced at once.

The Problem of Underinflation

Surveys have shown that as many as half the cars on the road may be riding on one or more underinflated tires. Part of the problem is that tires lose air through the rubber and at interfaces with the wheel and valve, sometimes so slowly that many people don't realize it has happened. Seasonal temperature changes may also cause the tire pressure to drop.

Because the sidewall flexes more at lower tire pressures, underinflation compromises the driving control that a tire is designed to provide. Even a small pressure loss—such as 4 psi—can affect a car's handling, making it harder to control. It can also make the ride softer and the car wallow. In addition, underinflated tires lower a vehicle's fuel economy, which can cost you more money at the pump.

A sidewall that flexes too much can also cause heat to build up excessively, which can shorten a tire's life and possibly lead to a tread separation or blowout. Using a computer simulation program, the Crash Safety Research Center at Penn State's Pennsylvania Transportation Institute has shed more light on how a tire performs with lower air pressure. Every tire has a speed at which a deformation called a "standing wave" occurs along its circumference, causing a rise in temperature and eventual failure.

The research center has found that when the tire pressure is lowered, the energy used by the tire is increased significantly. The result is a rapid rise in temperature, rolling resistance, and tire fatigue.

Tire-Inflation Maintenance Tips

Don't judge the pressure by eyeballing a tire. Modern radial tires bulge slightly, making them look a little underinflated, even when they're not.

At least once a month, use a tire gauge to check the pressure in all four tires and the spare. A tire-pressure gauge is available for as little as $3 to $5 at auto-parts stores.

Set the tires to the automaker's recommended tire pressure. This is printed on a placard in the car, either on a doorjamb, the fuel-filler door, or on the inside of the glove-compartment lid. Don't go by the "maximum inflation pressure" imprinted on the tire. If your car has a limited-service spare, also check that it's inflated to the pressure specified on the placard—usually 60 psi. Measure the pressure with the tires cold, before they've been driven more than a mile or two. As the vehicle is driven, the tires heat up and the pressure rises, which makes it more difficult to set them to the correct cold-tire pressure.

The full Ratings and recommendations for more than 200 vehicles, along with the latest information on thousands of other products and services, are available to *ConsumerReports.org* subscribers. Find out how to **subscribe today**.