



Everything About Tires

The most important pieces of real estate on your car are those four small contact patches that grip the road — yeah, your tires. Those few square inches of rubber determine, well, just about everything.

Of Wheels and Men

The first wheels were probably made of wood, despite Fred Flintstone's granite-shod convertible. And automobiles used wooden carriage wheels for quite a while. Increased power and weight soon outstripped wood's capabilities, and wheels were upgraded to steel, either a hub-spoke-and-rim design or a stamped, welded dish. Lightweight steel-spoked wheels lingered until the '50s, especially on fussy little foreign sports cars. But American cars needed the stronger, heavier stamped and welded steel wheels.



How Big?

There are two ways to increase the size of the tire's contact patch — make it longer or wider. A longer patch would require the tire's overall diameter to increase — which makes some sense on a 4wd truck. But increase the diameter of the tire on most passenger cars and you have problems.

First, the tire hits stuff (like the fender). Second, because the radius of the overall tire is larger, the effective gearing gets taller, slowing down the engine at any given speed — and robbing your car of acceleration. Third, because of increased angular momentum — weight concentrated near the rim — the ABS calibration goes wacky.

Wretched Excess

As the aspect ratio of a tire drops (lower profile), a number of things change. The shorter sidewalls stabilize the tread, improving grip and enhancing road feel through the steering because they're stiffer and less compliant. That's good. But it's not all good:

The contact patch becomes more square than oval. The increased width of the tire on the pavement makes the tire more prone to hydroplaning on wet roads. Even at modest speeds, it's possible for the rubber to ride on top of the water instead of plowing through the water to the pavement. This reduces grip to nearly zero, which is a very bad thing. At the same time, ride quality suffers.

One major downside to shorter sidewalls is an increase in wheel damage — those short sidewalls put the rim a lot closer to the potholes and curbs. The short, wide patch has more contact area on the road, but that's only if the wheel remains perpendicular (or nearly so) to the ground. The suspension's job has just gotten tougher.

A taller, more compliant sidewall has an easier time keeping the contact patch on the ground. With a wider patch and more grip, the car rolls more, lifting the inner part of the tread off the pavement and suddenly reducing grip. So, without retuning the suspension, handling can actually suffer.



Plus Sizing

A 1-in.-larger rim diameter and 1-in.-wider rim width is a "Plus 1" size upgrade. Choose a tire that's close to stock height.

Tires and Lug Nuts

Speaking of tires, as noted at the outset, you can go wider, but make sure they're compatible with the recommendation of the tire manufacturer on a size. The aspect ratio (relationship between a tire's height and width) is very important and can be a safety issue.

When you shop for tires, check if they are compatible with the wheels, especially on trucks, where having the correct load rating is important as well.



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