Wheel and Tire 101 - Measuring and Fitting Properly

The proper way to measure your wheels and tires, and how to determine what fits your ride! Selecting Wheels and tires is a crucial element when it comes to styling your ride… as every pro builder will tell you, there's nothing more important than the car's stance and attitude, both of which are directly connected to the wheel and tire choices.

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If you're going to run Wheels and Tires that are the same size as stock, than the choice is simple. But if you're going to upsize the combination, there are a couple things to keep in mind when measuring the for the right sizes.

There are a couple terms that apply to wheel size… the main ones are width, diameter and bolt pattern, and then there's backspace and offset. Diameter is the overall diameter of the wheel, and width refers to the width of the wheel. The bolt pattern is the number of bolts and the measurement of the bolt circle. Ford cars from the 1960's usually run a 5 hole, 4.5" bolt circle, where GM used a 4 ¾ bolt circle on intermediates and a 5 inch circle on full size cars. You can check it with a bolt circle gauge, or you can measure across the bolt holes to determine your size. Just measure from the edge of one bolt hole, SKIP A HOLE, and go to the CENTER of the next hole.

The next size measurement is the backspace. This is the distance of the wheel face to the backside edge of the wheel. This measurement is crucial because it determines the clearance of the wheel in the well and the amount of the wheel sticking out of the well. You can measure a wheel by running a straight edge across the rim bead and dropping another straight edge down to the wheel face and measure that distance. In this case, the backspace is 4.5 inches.

Offset refers to the amount of wheel behind the face and the amount of wheel in front of the face. A positive offset puts the face towards the outside of the wheel, a negative offset has a deeper dished look. Zero offset is centered in the rim.

Tires are another story. We're running these BFGoodrich G-Force TA KDW tires, and they're available in 93 different sizes! The G-Force KDW is a high-performance tire capable of sticking hard in the turns, but also delivering a smooth ride on the street. Plus they look cool! The numbers go like this: The first number is the section width in millimeters. The section width is measured from sidewall to sidewall with the tire unloaded. These are 225's, so the width is 225 millimeters, or about 8.85 inches

The next number is the aspect ratio. This is the height of the side wall expressed as a percentage of the tread width. For simple math, say you had a 225/50 tire, the sidewall would measure 50% of the section width. 50% of 225 is 112.5mm, or 4.4 inches of sidewall. The last number is the rim size. You can double the sidewall size and add the rim size to get the overall tire diameter. Our example has a sidewall of 4.4… double that makes 8.8, plus 17" rim size and you get 25.8". That's how high the tire stands off the floor.

Luckily, companies like BFGoodrich publish tech sheets that have all this info printed in them, and you can download them off the internet, but it's important to know what the numbers mean. It's also important to size the Tires so you have similar sidewall heights – or the rear a little taller than the front – to make the car look natural and aggressive.

All these measurements are easy to take from a wheel, but what do you do when you are trying to measure a car to see what wheel will fit and look right?

We found this tool called the Wheelrite from Percy's High Performance. The Wheelrite is a wheel and tire simulator which bolts to the hub and lets you fit a wheel and tire to the car and actually check the clearance before you order your wheels. Chances are, if you order the wrong wheel size, you either bought it or you're waiting for a replacement, so this tool is nice to have to get things right the first time. Here's how it works.

First, you bolt the Wheelrite to the hub, and make sure you have the brake Rotor and any pacers installed.

Next, you set the diameter measurement on the front of the tool. We're running 17 inch tires, so we set it to 17 inches.

Next, you set the overall width of the wheelrite to simulate the width of your wheel and tire. The Wheelrite has a scale so it's easy to set the width. Under this scale is another for backspace. Loosen this knob and slide the two scales to match your wheel size to see if your existing Wheels will fit. This wire is a simple tire simulator… using the dimensions from the tech sheet, form the wire to match the profile of your tire. IN our case, it's a 4.4 inch sidewall height and a 8.8 inch width.

Now you can see if your chosen combo will fit! Make sure the Wheelrite won't hit anything or rub anything when you spin it! Be sure to measure this with the car at ride height.. we installed these Spacers to set the wheel in the approximate ride height position. Be sure to turn the wheel back and forth and check that clearance, too. If you're getting new Wheels made, set the Wheelrite to fit the car best, then take measurements off the Wheelrite and order the Wheels to match.

Now we still have to center our rear axle under the car, but Our Wheelrite has plenty of clearance when set to 18" diameter, 8" width, and 4.5" backspacing with a BFG235/50/18 tire mounted on it. To check it, we have an actual wheel and tire of the same size… check it out! The wheel rite is right on.

Custom Wheels are expensive, and the Wheelrite helps make sure you don't end up owning a set that doesn't fit!

SOURCES

PERCY'S HIGH PERFORMANCE, INC.

SUMMIT RACING EQUIPMENT

BFGoodrich Tires