

FRONT WHEEL & TIRE

THE ULTIMATE CHEAT SHEET

PHOTOS & WORDS BY IAN BOWMAN



Wrapping up our Wheel and Tire extravaganza we started last month, we're moving on to front wheels this time around.

Front wheels can be just as tricky to size up, if not more since they move on multiple planes unlike the rear. But, the same basic principles play in that applied to the rear.

We're going to re-hash some terminology to begin, that you'll see in this part of the series as well, and how it is relative to your wheel choice.

WIDTH: The cross-section of either the tire or the wheel. Both get taken into account when choosing a new combination.

DIAMETER: The outside dimension of either the wheel or the tire. Also referred to as

"height." 14", 15", and beyond, your tastes will determine the flavor here.

BACKSPACING: The distance from the mounting surface of the wheel (where it bolts to the axle/brake) to the outside of the tire mounting surface on the BACK side of the wheel. This is not to be confused with "offset," which more and more manufacturers use as their specification these days (see the provided illustration on conversion). I'm particularly old-school about it, so I always run with backspacing when it comes to spec'ing a set.

Wheel Offset and Backspacing Conversion Chart

	3.25"	3.50"	3.75"	4.00"	4.25"	4.50"	4.75"	5.00"	5.25"	5.50"	5.75"
5.5"	0	+6mm	+12mm	+18mm	+26mm	+30mm	+36mm	+42mm	+48mm	+54mm	+60mm
6.0"	-6mm	0	+6mm	+12mm	+18mm	+26mm	+30mm	+36mm	+42mm	+48mm	+54mm
6.5"	-12mm	-6mm	0	+6mm	+12mm	+18mm	+26mm	+30mm	+36mm	+42mm	+48mm
7.0"	-18mm	-12mm	-6mm	0	+6mm	+12mm	+18mm	+26mm	+30mm	+36mm	+42mm
7.5"	-24mm	-18mm	-12mm	-6mm	0	+6mm	+12mm	+18mm	+26mm	+30mm	+36mm
8.0"	-30mm	-24mm	-18mm	-12mm	-6mm	0	+6mm	+12mm	+18mm	+26mm	+30mm
8.5"	-36mm	-30mm	-24mm	-18mm	-12mm	-6mm	0	+6mm	+12mm	+18mm	+26mm
9.0"	-42mm	-36mm	-30mm	-24mm	-18mm	-12mm	-6mm	0	+6mm	+12mm	+18mm
9.5"	-48mm	-42mm	-36mm	-30mm	-24mm	-18mm	-12mm	-6mm	0	+6mm	+12mm
10.0"	-54mm	-48mm	-42mm	-36mm	-30mm	-24mm	-18mm	-12mm	-6mm	0	+6mm
10.5"	-60mm	-54mm	-48mm	-42mm	-36mm	-30mm	-24mm	-18mm	-12mm	-6mm	0
11.0"	-66mm	-60mm	-54mm	-48mm	-42mm	-36mm	-30mm	-24mm	-18mm	-12mm	-6mm
11.5"	-72mm	-66mm	-60mm	-54mm	-48mm	-42mm	-36mm	-30mm	-24mm	-18mm	-12mm
12.0"	-78mm	-72mm	-66mm	-60mm	-54mm	-48mm	-42mm	-36mm	-30mm	-24mm	-18mm

Continuing the technicalities, let's take a look at what all the numbers on a modern tire really mean. This is one place there's always a fair amount of confusion/misconception. We're going to look at modern metric tire sizes, since this is how 99% of us will be buying rubber, and later on, will look at configuring these numbers into standard measurements.

We'll use a 215/70r15 as my example (one of my go-to's for front tire size)

215: This indicates the cross section of the tire is 215 millimeters wide. I know, some people just groaned at the metric system being used, but I think we can all agree that a finite level of measurement, as opposed to the old standard of 6.70-15 or G70-15 will make a job like this where precision is key a world easier to figure out.

70: This is called "aspect ratio." The common misconception here, is that aspect ratio somehow plays into the width, when in all reality, it's the other way around. The aspect ratio refers to the sidewall height, as a percentage of the section width. In this case, the "70" is 70% percent of 215mm, yielding an overall sidewall height of 150.5mm, or roughly 6". This would be all the way around the tire, so it'd be 301mm/11.8" total. Add that to your wheel diameter of 15", and you wind up at 26.8" overall height. If you took this same tire and made it a 50-series tire, it'd effectively become 107.5mm/4.25", yielding a combination of 23.5" overall. Keeping that in mind, the sidewall percentage doesn't change for the rim size, so every inch of rim diameter you add directly equates to an inch of overall tire height. AKA, a 215/70r18 would be 3" taller overall than a 215/70r15.

R: This indicates the tire is of radial construction. In modern sizes and high-performance tires, you may see a "ZR" here, meaning the tire is rated for 150+ MPH continuous use.

15: Easy enough, this means the tire is designed for a 15" wheel.

Alright, with our refresher course out of the way, let's talk technical....

KNOW YOUR BRAKES!

This is one of the most important things to know when sizing up front wheels, even if you're not trying to fit the widest rollers possible.... what brakes are on your setup? Factory drums? Aftermarket discs? If so, what brand? What diameter? Many manufacturers like Wilwood will have brake kit measurements on their site to further assist with the wheel sizing. And why is so important? Hub-type rotors like the majority of front disc brake conversions generally increase track width about 3/8 of an inch PER SIDE. What that means, is the wheel winds up closer to the fender than an original setup, and may require wheels with more backspacing than other brake setups to get things centered in the wheelwell area. Kits like Wilwood (save for their "Classic" series brakes), CPP's "big brake," and others that use a separate aluminum hub and a slip-on rotor, which allows them to keep closer to factory track width.

KNOW YOUR COMBINATION

It may sound silly....but in a day and age of buying a car that may have had modifications made throughout the years, It's best to make a close inspection and know what you're dealing with. If you have aftermarket control arms, are they factory width? Does your car have an aftermarket chassis? All things to verify before embarking on a wheel and tire journey. Is your car lowered? If so, how is it lowered, aka, do you have adjustment up front if need be? Speaking of being lowered....

HOW LOW CAN YOU GO?

Stance is one thing that absolutely positively must be taken into account when sizing up front tires. If you're looking to run it as low as you can on a factory chassis, some level of care must be taken, as interference with the wheelwell at full lock will become an issue if too wide and too low, or if the backspace simply won't play nice. The taller you run your ride height, the more "fudge"

room you'll have with your specs heading towards the outside of the car.

MEASURE TWICE, ORDER ONCE

You can do everything you need to know by simply getting your favorite measuring device from the toolbox and going to town. By holding your tape measure across the wheel opening, and referencing the wheel mounting surface, you can effectively figure up every measurement you need to take, including backspacing and total width.

KNOWN WINNERS

Worried about being safe as opposed to sorry? Up front, we know some pretty standard winners: 6" or under, you can use just about any standard, non-reversed backspacing. 7" width, you can get away with up to a 225 or 235 width as long as the height isn't aggressive (read, more than 26") or you like 'em low. Hubbed rotor brake kits typically like a 4-4.5 backspace due to increased track width. Factory width kits or drum brakes can use a 3.5-4.25" backspace wheel without issue.

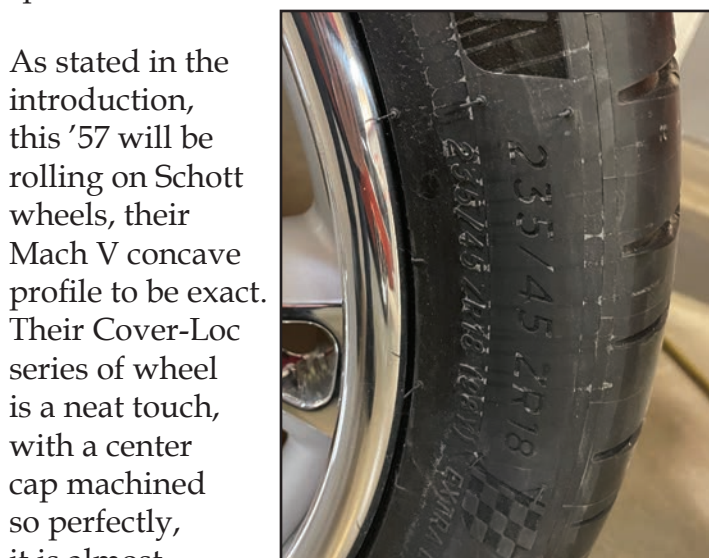
TRIAL FITMENT

Now, not EVERYONE may have access to means like this, but even if you're starting from scratch and have no wheel whatsoever, most people have a buddy who has a spare, loose wheel and tire of some sort laying around. This can serve as the perfect jump-off point for sizing up a new set of wheels, even if it's not the size you intend to run. Simply having a visual representation with a fixed measurement can be an invaluable tool rather than sizing up from nothing.

So, let's go ahead and size one up!

Our test mule in this case is the new '57 painted roller (pictured on the previous page) in the shop at Woody's Hot Rodz. Granted, it already has a beautiful set of Schott Wheels and Michelin tires, we're going to use it as example just the same of how you'd size up a combo for your car.

The '57 in questions is equipped with Wilwood brakes up front, made for CPP spindles (P/N 140-12307). These monster 13" rotors and 6 piston calipers require a minimum 17" diameter wheel,



but maintain factory track width. The bigger the rotor, the bigger the wheel will be required. Again, your brake manufacturer will be able to provide these specifications.

As stated in the introduction, this '57 will be rolling on Schott wheels, their Mach V concave profile to be exact. Their Cover-Loc series of wheel is a neat touch, with a center cap machined so perfectly, it is almost undetectable, and hides the lug nuts totally and completely! This particular wheel is 18" diameter, 7" width.

Our "test wheel" was built to a 4" backspace. This is measured from the back of the mounting "pad" to the rear wheel lip, as shown.



wide wheel, they wind up more like 8.5" due to the "pinch," which will factor into overall. This particular tire was selected to give some "meat" opposed to a more traditional low-profile look.



Now, onto the measurements! First, we go from the face of the brake rotor, to the fender lip. Take your favorite straight-edge, place it on the rotor where the wheel would set against, and measure out. We see here we maintain a distance of 5". With our 7" wheel having 4" backspace, and .75" of bulge, 3.75" total from the face of wheel lets us know we more than pass the finger-width test.... at least while going straight!

Wrapped around these beauties are Michelin Pilot Cup Sport tires, in 235/45ZR18. These are true to equate to 26.3" tall, and have an overall width of 9.25" static. Now, installed on a 7"



Rear inner fender clearance measurement is a little more difficult to do. You'll be looking for the tightest point, which will wind up being the back curve of the inner fender. This measurement of 12.75" means basically whatever we stick in here will work....until we start turning.....

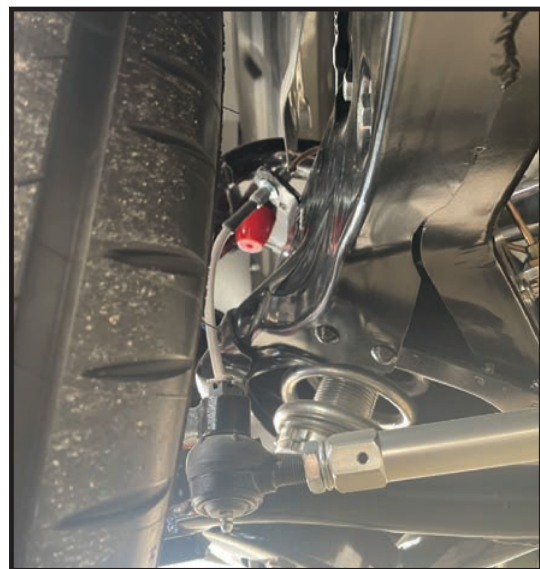


With the wheel and tire bolted up, we find what is undoubtedly the tightest point of the system: the front sway bar. Too much backspace, and the front wheel rubs at full lock. No sway bar? Not as big of a problem, but being as this is one of the most common modifications, and those big modern hoops would be a waste without one, this is going to be commonplace for most. This measurement being as tight as it is, is partially

why aftermarket frame setups provide the clearance for 8" wheels and wider tires up front, even at low ride heights. Sway bar mounting points being located further towards the center of the car allow for more backspace and a wider wheel to be ran, or narrower track width and less/same backspace, all are viable options to getting a wider wheel/tire in.



With $\frac{3}{4}$ " at play, it clears more than enough for this application. The sway bar moves on the same plane as the control arms, so no worry of changing clearances here. We know from our hub-to-fender measurement and this measurement we'd have *some* amount of room to go wider overall....but this is really pushing it.



No need to even measure, we've got PLENTY of room at the back of the inner fender on this particular setup.

But what do you get when you push it? Give and take. This wheel fits everywhere straight, and everywhere inside at full lock....but if you wanted it really low, this would give you trouble. One of two things correct this: More ride height, or more clearance, and the former creates the latter. Otherwise, you're looking at a narrower wheel and tire combination. This particular car, however, is equipped with Viking Coilovers, as a part of Woody's Hot Rodz WHR-4CORNER



coilover suspension packages. And shown here, is spun almost all the way down on the adjusters. So, a quick couple turns up of the collars, and a happy medium is found.



The aforementioned "low." With our coilovers turned up far enough to simply close up any gap between the fender and tire while pointed straight, instead of "tucking" the top of the tire, this setup will have plenty of clearance at lock, even on an uneven surface.

Still scratching your head after all that info? There's more than one applicable reference out there who has "been there and done that!" If you don't have a hot rod shop available who has experience in this department, Woody's Hot Rodz (855.567.1957) is available 5 days a week from 8AM-5PM EST to put your mind at ease!