

916-03280 - WheelWise™ Tool Kit - 5-Lug Standard Bolt Pattern

916-13284 - WheelWise™ Tool Kit - 4-Lug Bolt Pattern

916-13285 - WheelWise™ Tool Kit - 5-Lug Metric Bolt Pattern

916-13286 - WheelWise™ Tool Kit - 6-Lug Bolt Pattern

Measuring Wheel Offset and Backspacing:

Wheel offset and backspace are two of the most misunderstood wheel terms, but they are at the center of your wheel measurement needs to ensure your custom wheels fit your application. Our new wheel fitment simulator tool helps immensely, but you still must do some basic math. The tool verifies a specific tire size and placement, and then you take some final measurements from this tool and input them into some basic math formulas we'll walk you through below.

First, let's provide a few quick definitions here to help you.

Overall Wheel Width:

This is the total width outside of the wheel lip flange, usually 1-inch wider than the inside "stated width" wheel lip measurement the tire seats. This is measured without a tire mounted using a ruler or measuring tape across the wheel and is expressed in inches.

Wheel Centerline:

This is the overall wheel width measurement divided by 2 to halve the dimension, giving us the true centerline dimension of the wheel, expressed in inches.

Backspace:

This is simply the distance from the wheel mounting face (where it sits on your brake rotor or drum) to the rear outside wheel lip flange. This is measured using a straight edge across the back of the wheel (without a tire mounted helps) and a ruler or measuring tape from the mounting face to the straight edge and is also expressed in inches.

Offset:

This is the measurement between the wheel mounting face and the centerline of the wheel's width. This one is a little harder to measure, especially on wheels that are solid or have small window openings between the spokes, and confusing enough to some it is expressed in millimeters that can be either a positive or negative dimension.

With these definitions now in your gray matter we can use them in the real world with a sample wheel and some basic math. As we stated above, offset is the hardest to determine, so using the two easier to obtain dimensions, overall wheel width and backspace, we can then determine the wheel's offset. This is helpful even when using our wheel fitment simulator tool. (For example, see page 8.)

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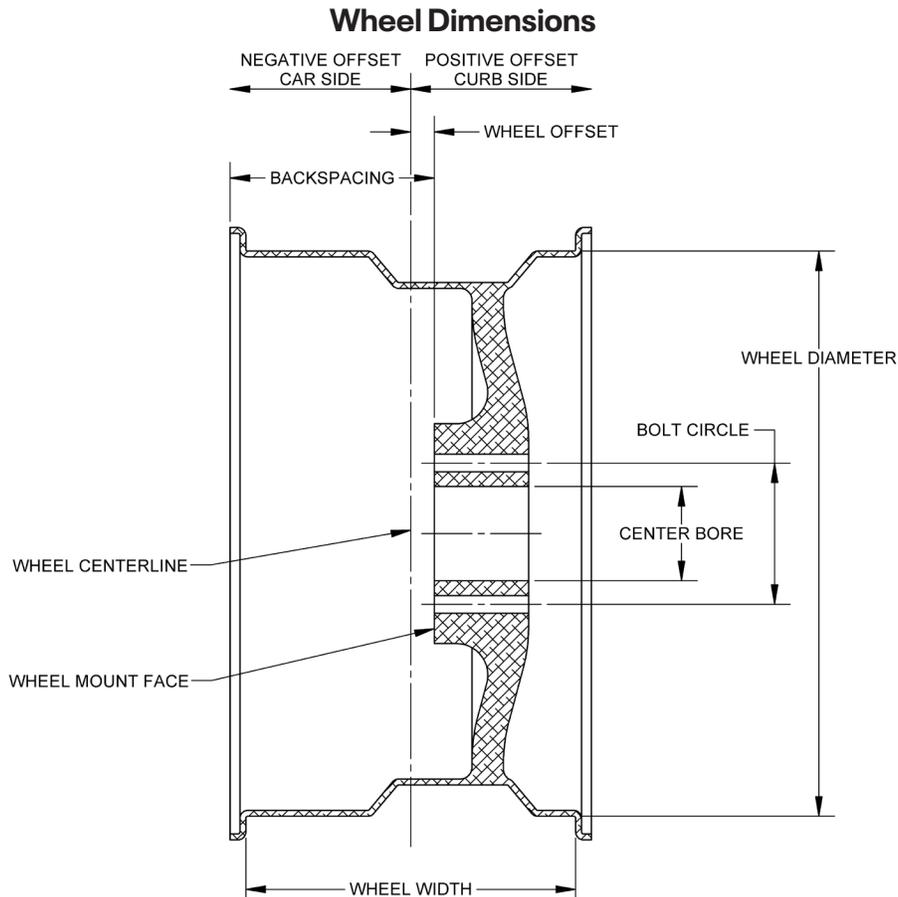
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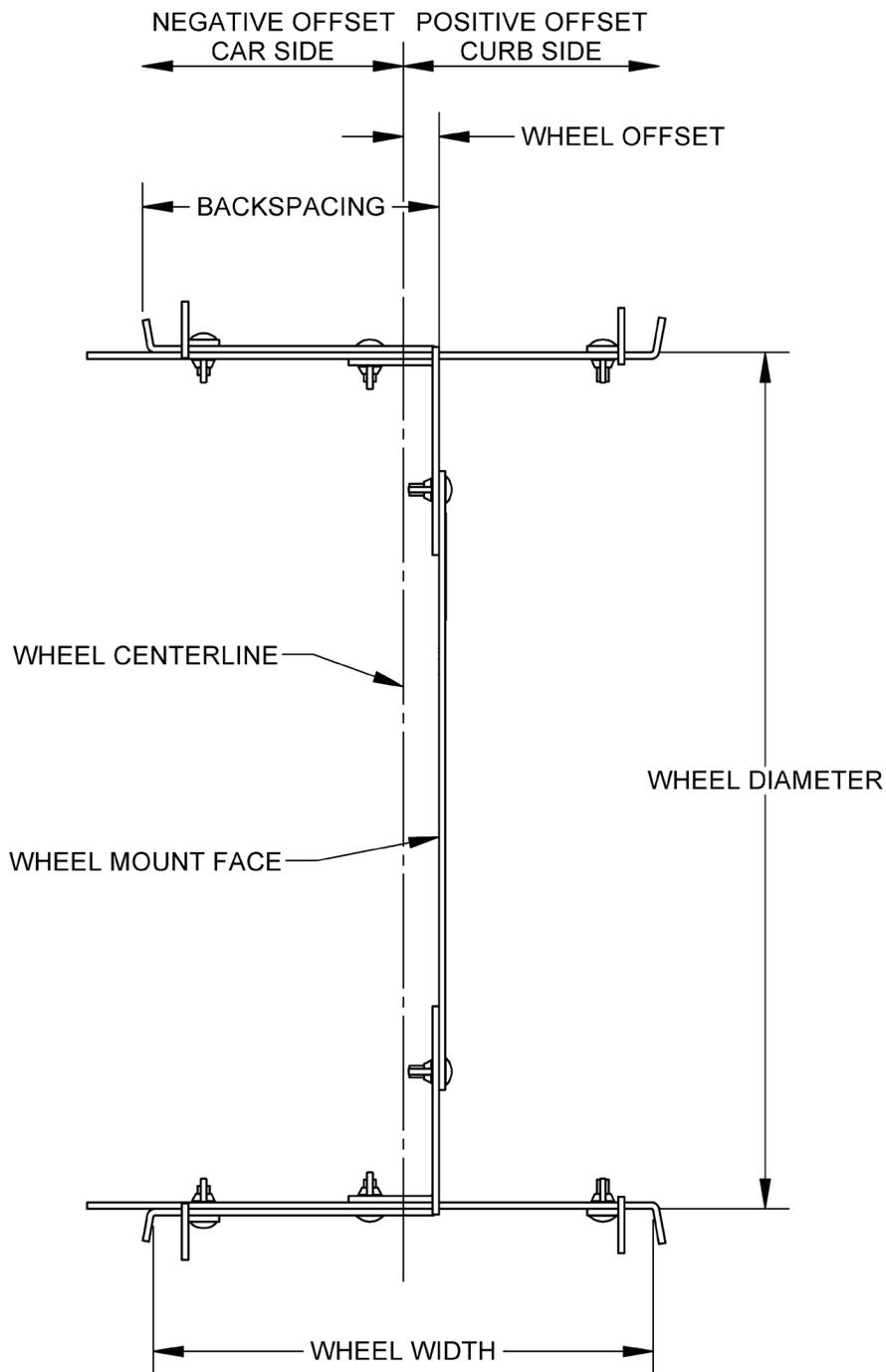
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916-13286 - WheelWise™ Tool Kit - 6-Lug Bolt Pattern

POSSIBLE KIT CONTENTS BASED ON PART NUMBER			
Qty	Hub Plate P/N	Description	Kit P/N
1	916-03280.1	Hub Mount Plate for 5-Lug Standard Bolt Pattern	916-03280
1	916-3284	Hub Mount Plate for 4-Lug Bolt Pattern	916-13284
1	916-3285	Hub Mount Plate for 5-Lug Metric Bolt Pattern	916-13285
1	916-3286	Hub Mount Plate for 6-Lug Bolt Pattern	916-13286
STANDARD KIT COMPONENTS			
Qty	Description		P/N
2	Short Extension		916-03280.2
2	Long Extension		916-03280.3
4	Tire Clamp		916-03280.4
2	Wheel Diameter Angle		916-03280.5
Qty	HARDWARE		Thread Lock
10	Wing nut, 1/4-20		No
10	Carriage Bolt, 1/4-20 x 3/4		No



Wheel dimensions using WheelWise™ Tool

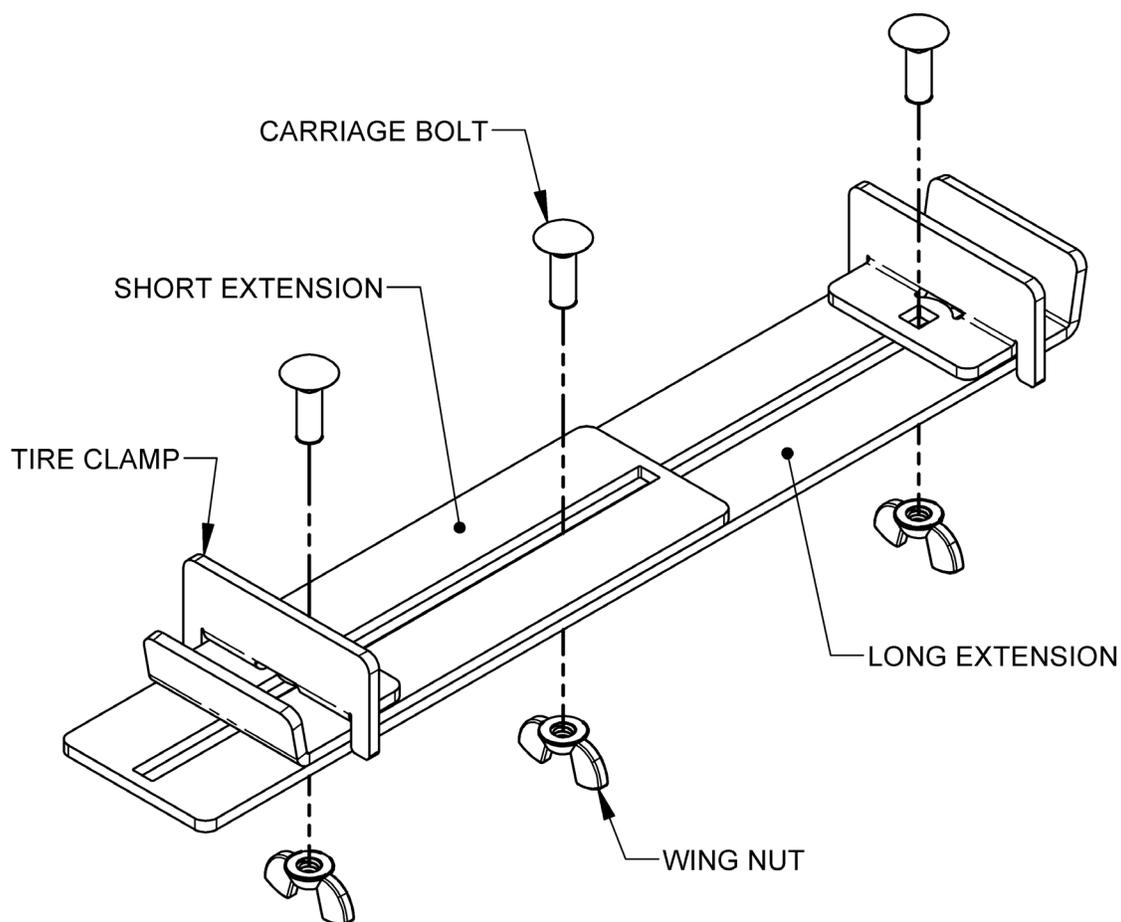


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1. Assemble the extensions and tire clamps as shown but leave the wing nuts loose. Repeat for the other assembly.



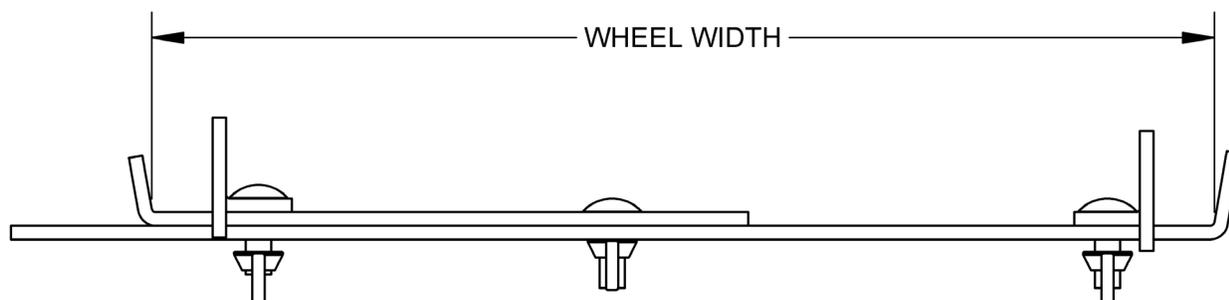
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2. Below is a chart giving recommendations for wheel width compared to tire width. Using a tape measure set the desired wheel width and tighten the middle wing nut. Repeat for the other assembly.

Wheel Width	Minimum Tire Width	Ideal Tire Width	Maximum Tire Width
7 inches	195 mm	205 or 215 mm	225 mm
7-1/2 inches	205 mm	215 or 225 mm	235 mm
8 inches	215 mm	225 or 235 mm	245 mm
8-1/2 inches	225 mm	235 or 245 mm	255 mm
9 inches	235 mm	245 or 255 mm	265 mm
9-1/2 inches	245 mm	255 or 265 mm	275 mm
10 inches	255 mm	265 or 275 mm	285 mm
10-1/2 inches	265 mm	275 or 285 mm	295 mm
11 inches	275 mm	285 or 295 mm	305 mm
11-1/2 inches	285 mm	295 or 305 mm	315 mm
12 inches	295 mm	305 or 315 mm	325 mm
12-1/2 inches	305 mm	315 or 325 mm	335 mm
13 inches	315 mm	325 or 335 mm	345 mm
13-1/2 inches	325 mm	335 or 345 mm	355 mm
14 inches	335 mm	345 or 355 mm	365 mm
14-1/2 inches	345 mm	355 or 365 mm	375 mm
15 inches	355 mm	365 or 375 mm	385 mm
15-1/2 inches	365 mm	375 or 385 mm	395 mm
16 inches	375 mm	385 or 395 mm	405 mm
16-1/2 inches	385 mm	395 or 405 mm	415 mm
17 inches	395 mm	405 or 415 mm	425 mm

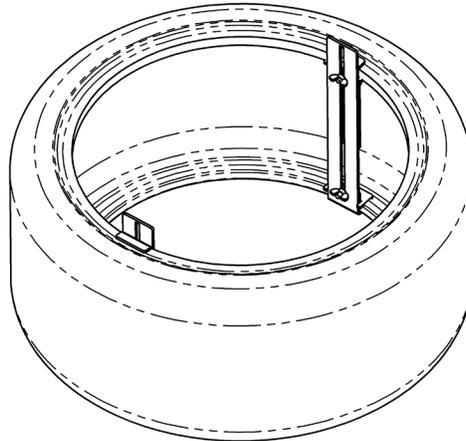


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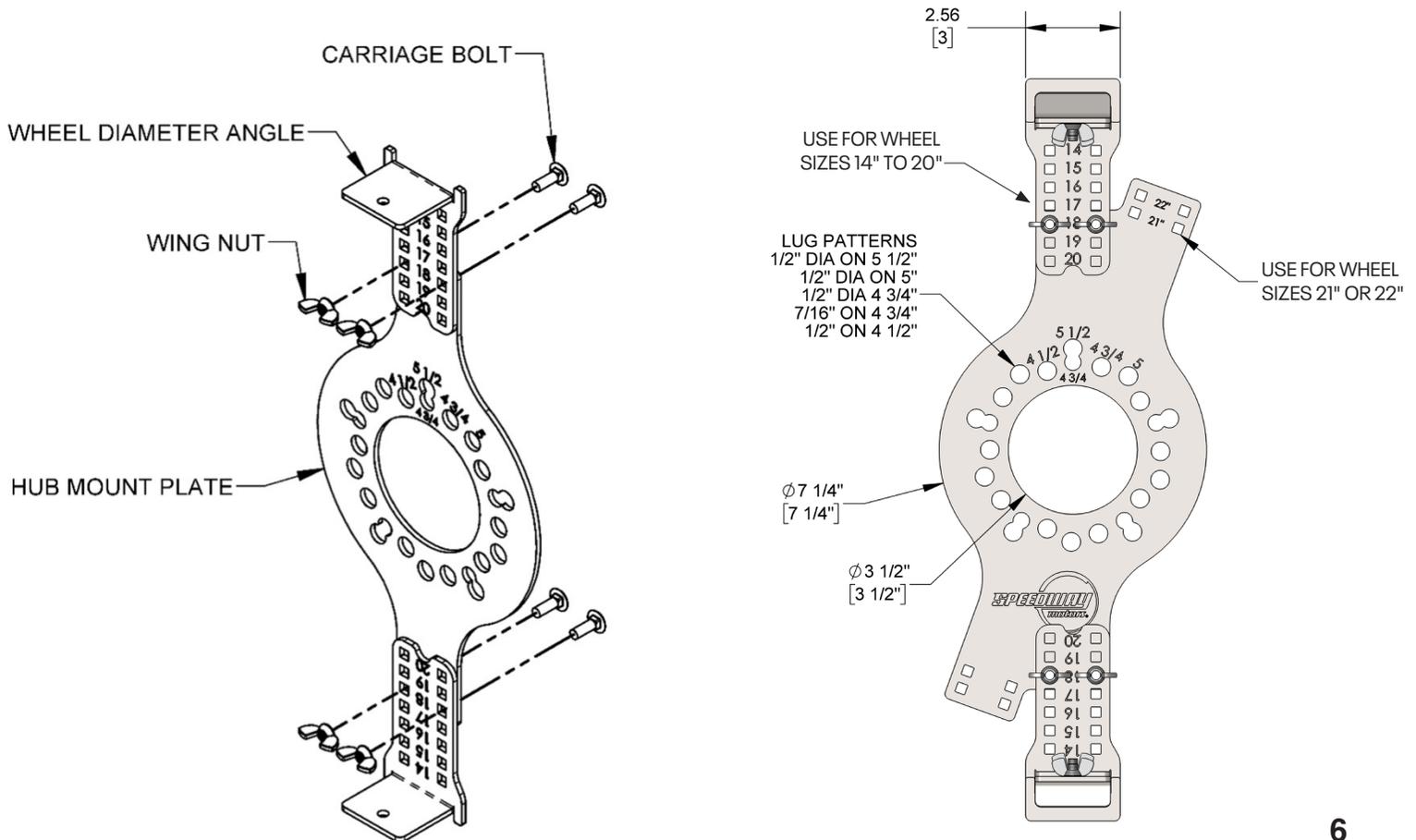
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3. Install the extensions onto the tire 180 degrees from each other. Slide the tire clamps against the tire and tighten the wing nuts. Remove the center carriage bolts and wing nuts after the clamps are tight against the tire.



4. Assemble the center section as shown below at your desired wheel diameter.

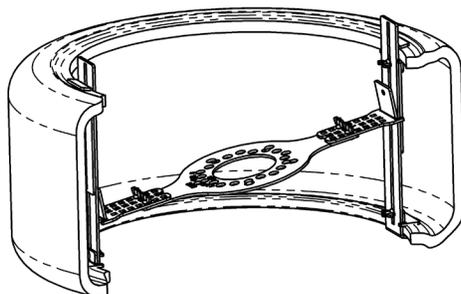


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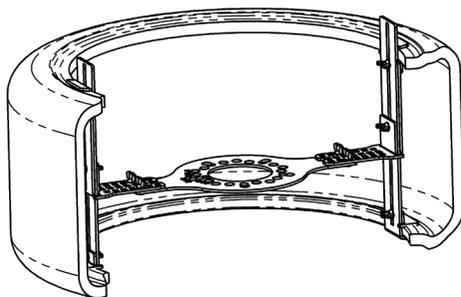
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5. Insert the center section at an angle and rotate until perpendicular to the extensions.



6. Insert the carriage bolts and wing nuts attaching the center section and the extensions. Slide the center section to your desired backspacing and tighten the wing nuts. Measure from the inside of the tire to the edge of the WheelWise™ Tool on both sides to ensure it is centered in the tire.



7. Support the vehicle with jack stands. Install the WheelWise™ Tool and tire assembly onto the vehicle. Check tire and wheel clearances by turning the wheel left to right and raising and lowering the suspension. Adjust the backspacing as needed to gain proper clearance.

8. Once you have gained proper clearance remove the assembly.

Note the following:

- i. Bolt Hole Pattern (Etched on the hub mount plate)
- ii. Wheel Diameter (Etched on the angles)
- iii. Wheel Width (Dimension from step 2)
- iv. Wheel Backspacing (Measure as shown on page 3)

Example:

Taking our sample 9 inch wheel width measurement from the tool and adding 1 inch to account for wheel flange thickness, our overall wheel width is 10 inches. This makes our wheel centerline dimension to be 5 inches (10 divided by 2= 5). Measuring the backspacing as indicated above, we have a measurement of 5-3/4-inches. At this point we've taken two simple measurements and we have everything we need to calculate offset with some simple math.

Formula:

Backspace – wheel centerline = offset

Any fractional answer (the 3/4 in the backspace) needs to be converted to a decimal equivalent by division first.

3 divided by 4 = .750

Our wheel sample:

5.750 – 5 = .750-inch

However, since offset is stated in millimeters, we have one more calculation to run. There are 25.4 millimeters in an inch, so multiply your answer from your first formula by 25.4 to obtain your offset in millimeters.

$.750 \times 25.4 = 19.05\text{mm}$ positive offset
(wheel mounting surface towards the outside of the wheel)

If the backspace measurement is smaller than the wheel centerline measurement, your offset would be negative (wheel mounting surface towards the inside of the wheel).

The deeper, more concave appearance you want in your wheel face, the more negative your offset needs to be. Conversely, a more positive offset will provide for a flatter wheel face appearance. Finally, know that a positive offset provides for more backspacing, while a negative offset reduces backspacing.

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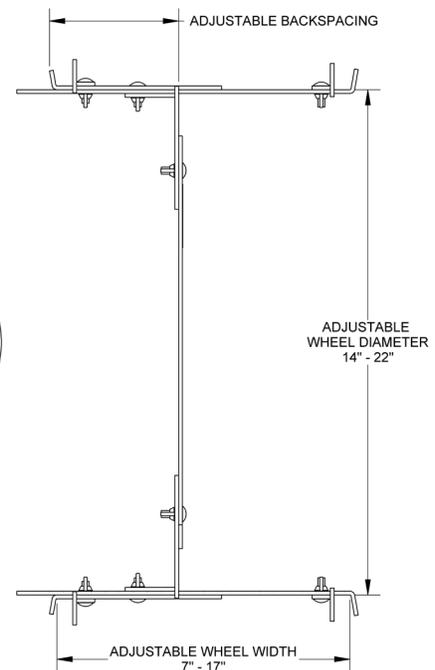
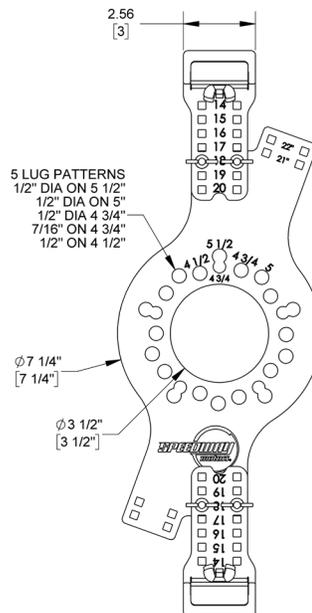
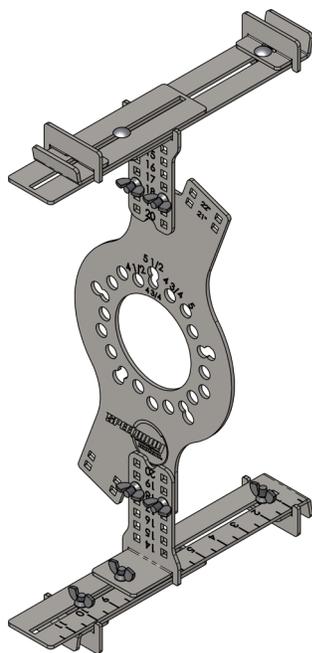
Quick Reference Offset Chart

Backspacing (in inches)

Wheel Width	Backspacing (in inches)											
	3.25	3.5	3.75	4.00	4.25	4.50	4.75	5.00	5.25	5.50	5.75	6.00
7 inches	-19	-12	-6	0	6	12	19	25	32	38	44	51
7-1/2 inches	-25	-19	-12	-6	0	6	12	19	25	32	38	44
8 inches	-32	-25	-19	-12	-6	0	6	12	19	25	32	38
8-1/2 inches	-38	-32	-25	-19	-12	-6	0	6	12	19	25	32
9 inches	-44	-38	-32	-25	-19	-12	-6	0	6	12	19	25
9-1/2 inches	-51	-44	-38	-32	-25	-19	-12	-6	0	6	12	19
10 inches	-57	-51	-44	-38	-32	-25	-19	-12	-6	0	6	12
10-1/2 inches	-63	-57	-51	-44	-38	-32	-25	-19	-12	-6	0	6
11 inches	-69	-63	-57	-51	-44	-38	-32	-25	-19	-12	-6	0
11-1/2 inches	-75	-69	-63	-57	-51	-44	-38	-32	-25	-19	-12	-6
12 inches	-81	-75	-69	-63	-57	-51	-44	-38	-32	-25	-19	-12
12-1/2 inches	-88	-81	-75	-69	-63	-57	-51	-44	-38	-32	-25	-19
13 inches	-95	-88	-81	-75	-69	-63	-57	-51	-44	-38	-32	-25
13-1/2 inches	-101	-95	-88	-81	-75	-69	-63	-57	-51	-44	-38	-32
14 inches	-108	-101	-95	-88	-81	-75	-69	-63	-57	-51	-44	-38
14-1/2 inches	-114	-108	-101	-95	-88	-81	-75	-69	-63	-57	-51	-44
15 inches	-120	-114	-108	-101	-95	-88	-81	-75	-69	-63	-57	-51
15-1/2 inches	-127	-120	-114	-108	-101	-95	-88	-81	-75	-69	-63	-57
16 inches	-133	-127	-120	-114	-108	-101	-95	-88	-81	-75	-69	-63
16-1/2 inches	-139	-133	-127	-120	-114	-108	-101	-95	-88	-81	-75	-69
17 inches	-146	-139	-133	-127	-120	-114	-108	-101	-95	-88	-81	-75

While performing the math shown previously on page 8 will determine the most accurate offset measurement, this reference chart will allow you to see the changes in offset and backspacing as one affects the other.

(Offset values listed in millimeters)



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