



## Tires 101

What good is a high performing, revved-up engine without reliable and durable tires to bring out your bike's highest potential? Tires are where all your bike's power and traction is transferred. Whether you're a casual-easy rider or a diehard motocross daredevil, Tires are the foundation that a motorcycle's all-around performance is built upon. It is important to know the specifications of the tires currently on your bike, and to consider the specifications of the tires that you're interested in either replacing them with or upgrading to. There are many different tires on the market, and finding the right one for your riding style and bike is crucial.

### Tire Construction

**Tread:** An area of the tire that hits the ground, the part that indicates when it's time for a tire change. Different types of tires have different tread designs and accommodate for different driving styles, vehicles, terrains, and elements.

**Carcass:** A major factor in how a race tire will perform is the construction of the tire carcass. The carcass lies underneath the tread and is made of a fiber material or steel cords that run from bead-to-bead. Essentially, it's the backbone of the tire. The main variance between tire carcasses is they can either be Bias-Ply or Radial Ply. Bias plies run at an angle, where as radial plies are laid from side to side. You can read more on the benefits of each later.

**Bead:** The bead is the part of the tire that connects the tire to the wheel rim, and holds the entire wheel together. Multiple steel cables are located in these areas to make for a secure fit with no leakage. The bead is held tight by inflation.

**Sidewall:** Each of your tires has useful information molded right into its sidewall such as Maximum Load, PSI, Brand, size, etc. However the sidewalls purpose is not solely for displaying vital information, but more importantly, it's designed to support your bike's weight and aid in much of the handling.

**Bias-ply tires:** The carcass of a bias-ply is made of layers of fabric such as nylon or polyester, wrapped over each other in a criss cross pattern. The multiple layers' flex and create a cushioning effect, which makes bias-ply tires comfortable to ride on and good at handling heavy loads. On the down side, they have more rolling resistance, less control at high speeds, and retain more heat.

**Radial tires:** The carcass is made of stiff cords that go straight across the tread, running perpendicularly from one bead to the other, with belts of steel, polyester, or aramid fibers (like Kevlar) criss crossing atop them. Radials tend to be stiffer, allowing better high speed performance, longer tread life, and more precise handling, but the down side is usually a stiffer ride.

### Tire Sizing

With all the numerous tire options available to you, it can be confusing at times. As a rule-of-thumb and to make the decision making process somewhat easier, when it comes to tire size, the best option is usually sticking with what came stock on your motorcycle. That's how they were designed and intended for. Sometimes altering or changing to a new tire with an entirely new load rating or ply style is not only risky for your bike, but can also be unsafe for you, the rider.

## **Tire Pressure**

Checking your bikes tire pressure is hands down one of the most overlooked routine preemptive care that motorcyclist can often times overlook or neglect to check. Incorrect tire pressure will compromise everything from Braking and stability, Handling, Tire Longevity, and most importantly, even your safety. Here's some tips and tricks on making sure you keep your tire pressure exactly where it needs to be:

- 1) **USE RECOMMENDED PRESSURE:** It's important to note that you should always use the pressure recommended by your vehicle's manufacturer to ensure optimal vehicle performance. This means you need to ensure that your tires are appropriate for your vehicle, and that the PSI recommended for the tire matches what your vehicle's manufacturer recommends for your bike. If you're going to be carrying more passengers or a heavier weight load, we recommend adding a bit more air to your tires, making sure NOT to exceed the highest recommended tire pressure indicated on your tires sidewall.
- 2) **INVEST IN TIRE GAUGE:** You can get a cheap tire gauges anywhere, but having a quality tire pressure gauge would be a wise tool to invest on. Many factors effecting your tires overall performance are linked to tire pressure. Even the smallest discrepancy in PSI can dramatically affect your motorcycles handling. (\*\*Please Note: Always check tire pressure when the tire is cooled down and not immediately after riding\*\*)
- 3) **PERIODICALLY CHECK TIRE PRESSURE:** Here's a FACT- Tires which are checked regularly last longer. As often as daily to weekly, you can never check your tire pressure enough. The elements, terrain conditions, and how often you ride should dictate how often you check your tires pressure.

## **Tire Replacement**

It's easy to look at your tires and say "it's not that bad, I have a good amount of thread left before it goes bald". We strongly recommend that you should always change your tires even before the limit is reached. The tire is the only point of contact between your motorcycle and the road. Here's a few pointers on how to inspect your wheels and see if it's time for a change:

- 1) **Tread Depth:** Use the "wear bars" that tire manufacturers incorporate onto a tire's tread. If the wear bar is leveled with the thread, it's time to replace that tire. You can also try the "Penny Test". Insert a penny into the tire tread grooves with Lincoln's head facing down. If you can see the top of Lincoln's head, your tires are at 2/32nds of an inch or less of remaining tread. You need new tires immediately!
- 2) **Tire Age:** It's difficult to predict how long a tire can be used, but as a general rule-of-thumb, a tire's active life span should not exceed five years. Some experts even suggest 5-10 years after the manufactured date of the tire, no matter the tread wear.
- 3) **Cracking:** Sun and other external factors your tires become exposed to for extended periods may cause cracking and/or dry-rotting along the sidewalls.
- 4) **Cuts and Punctures:** Although tires are strong and can withstand a lot of impact, Frequently check for any punctures or cuts that may be present on your tire.
- 5) **Decreasing/loosing Air Pressure:** If your tire is continually loosing air pressure upon each pressure check you perform, this can be sign of many issues. One common issue with leaky tires is it may be a sign that your bead is worn out and leaking air.

6) Feeling “Off”: Often enough, the best way to detect a worn out tire is with your own hands. If you’ve noticed a shift in your bikes handling, or vibrating, pulsating, pushing, pulling, or any unusual sensations when riding, it most likely could be your tires.

7) Abnormal Tread Wear: This is often a sign of a mechanical problem (worn shock absorbers, transmission, brackets, etc.) but It can also be the consequence of unsuitable inflation pressure (as mentioned above). You will find excessive tire wear in the center or sides if the tire was not aired properly.

8. Valve Stems Old or damaged valve stems and cores may cause air loss. Replace them when mounting new tires. Use caps (finger tight) on the valve stems to keep dust, dirt, and moisture away from the valve.

9. Tubes: When fitting a new tire on a rim requiring a tube, a new tube should be fitted at the same time. Old tubes become stretched, and if an old tube is fitted within a new tire, it can crease and fail due to thinning of the tube rubber. Tubes should be repaired only by an expert. Secure tube valve assembly to rim with care. Inspect rim band, and consult motorcycle dealer for correct rim band replacement. Always check the size markings on the tube to ensure that the tire size appears on the tube. Do not fit tubes in radial motorcycle tires, nor fit radials on rims requiring tubes, unless the tubes bear matching size and radial (R) markings. Keep in mind that hard cornering, passengers, heavy loads, and sustained high speeds will require higher pressures (up to that indicated on the sidewall).

## **Tire safety tips**

1) Match the Front & Rear Tires: You should never mount a front tire in the rear tires position and never mount a rear tire in the front. It’s also very important to make sure to match the front and rear tires for optimal handling and performance. Always try to purchase both front and rear tires at the same time. Sometimes mixing a new tire with a worn out tire can cause instability and effect your bike’s handling.

2) Don’t Ever Ride on Damaged Tires: This is not only dangerous for you, but also extremely hazardous for other drivers who share the road. Make sure to have your tires inspected regularly by a professional. Also bear in mind to always be alert and observant of any blunt objects that may come into contact with your tires. Any type of hard impact can be damaging to your tires. If this happens to you, be sure to always follow up immediately and have the tires removed and inspected.

3) Tires & Safe Loading: Do not overload your bike beyond the recommended weight limit. Riding a motorcycle with a heavy load is not only dangerous, but It can reduce the longevity of your tires, and even cause them to fail or rupture. Always be knowledgeable of the manufacturers recommended weight limits, which are found in the owners manual or on the sidewall of the tires.

4) Break-In Period: It’s recommended to drive cautiously for the first 100 miles (160 km) in order for the tread surface to be fully “broken in”. Immediately after your new tires are installed, try to avoid any abrupt acceleration and braking, and try not to take any hard turns. After the one hundred-mile mark, your tires should be fully ready to achieve their maximum gripping potential!

5) Treating your Sidewalls: Always avoid using harsh chemicals or cleaners to your tire’s sidewalls. This can negatively affect the rubber and make it harder to detect visible signs of cracking or other tire flaws. In extreme cases, it may cause the tires to suddenly fail or become permanently damaged. Use a mild soap and water solution for any sidewall or tire cleaning.

6) Tire Storage: Tires and vehicles should be kept indoors in a cool and dry place, such as garages, sheds, carports, etc. Sources of heat (Hot pipes, furnaces, generators, etc) or water (rain, humidity, etc.) should always be avoided. Likewise, storage floors should be clean and free of all liquids and oils (\*\*Read below for additional information\*\*). Not storing your bike in the proper conditions can damage your tires, and even have negative effects on your motorcycle.

7) Vehicle Fluids and Chemicals: When providing maintenance, be sure to avoid exposing your motorcycle and tires to any liquids or harsh chemicals for any lengthy amount of time. If contact does occur, use a damp cloth with a mild soap for cleaning.

## Dirt Bike tire measurements:

Dirt Bike tires are commonly measured in millimeters by Width / Aspect Ratio x Rim Diameter (inches).



### EXAMPLE:

**WIDTH / ASPECT RATIO x RIM DIAMETER**

**110 X 90 X 18**

### Aspect Ratio:

The aspect ratio is the height of the sidewall in relation to the width of the tread. For example, on the tire size above, the aspect ratio is 90% of the tread width (the first number in the tire size)

Motorcycle Off-Road Tire Size Conversion Chart		
Front Tires		
Metric	Alpha	Inch
60/100	90/80	2.50/2.75
70/100	90/90	2.75/3.00
80/100	100/80	3.00/3.25
Rear Tires		
Metric	Alpha	Inch
80/100	80/90	2.50/3.60
90/100	110/90	3.60/4.10
100/100	120/80	4.00/4.10
110/100	130/80	4.00/4.50
120/100	140/80	5.00/5.10

## Street tire measurements:

Street tires are commonly measured in millimeters by Width / Aspect Ratio x Rim Diameter (inches).



### EXAMPLE:

**WIDTH / ASPECT RATIO x RIM DIAMETER**

**160/60R - 17**

**(69W)**

**CONSTRUCTION**

R=RADIAL, B=BIAS BELTED, NO LETTER=BIASED

## LOAD INDEX

This number represents the load carrying maximum capacity at maximum pressure. See chart below for load ratings conversions See load rating chart

## SPEED RATING

This letter represents the maximum speed under recommended load capacity See chart below for speed ratings conversions See speed rating chart

## Aspect Ratio:

The aspect ratio is the height of the sidewall in relation to the width of the tread. For example, if you have a tire that is 160/60R-17, the aspect ratio is 60% of the tread width (the first number in the tire size)

## Bias-ply tires:

The carcass of a bias-ply is made of layers of fabric such as nylon or polyester, wrapped over each other in a criss cross pattern. The multiple layers' flex and create a cushioning effect, which makes bias-ply tires comfortable to ride on and good at handling heavy loads. On the downside, they have more rolling resistance, less control at high speeds, and retain more heat.

## Radial tires:

The carcass is made of stiff cords that go straight across the tread, running perpendicularly from one bead to the other, with belts of steel, polyester, or aramid fibers (like Kevlar) criss crossing atop them. Radials tend to be stiffer, allowing better high speed performance, longer tread life, and more precise handling, but the down side is usually a stiffer ride

## WARNING:

The charts and information on this page is general information to help you understand the working parts of a tire. Always consult your owner's manual to determine correct replacements and compatibility. Incorrect selection can result in serious injury or death.

## LOAD INDEXES [L.I.]

L.I.	lbs.	L.I.	lbs.	L.I.	lbs.
33	254	49	408	65	639
34	260	50	419	66	661
36	276	52	441	68	694
37	282	53	454	69	716
38	291	54	467	70	739
39	300	55	481	71	761
40	309	56	494	72	783
41	320	57	507	73	805
42	331	58	520	74	827
43	342	59	536	75	853
44	353	60	551	76	882
45	364	61	567	77	908
46	375	62	584	78	937
47	386	63	600	79	963
48	397	64	617	80	992

## MOTORCYCLE SPEED RATINGS

Speed Symbol	Max Speed	Speed Symbol	Max Speed	Speed Symbol	Max Speed
J	62 mph	K	68 mph	L	75 mph
M	81 mph	N	87 mph	P	93 mph
Q	99 mph	R	106 mph	S	112 mph
T	118 mph	U	124 mph	H	130 mph
V	149 mph	W	168 mph	Y	186 mph

### Motorcycle Street Tire Size Conversion Chart

Front Tires		
Metric	Alpha	Inch
80/90	MH	2.50/2.75
90/90	MJ90	2.75/3.00
100/90	MM90	3.25/3.50
110/90	MN90	3.75/4.00
120/80	N/A	4.25/4.50
120/90	MR90	4.25/4.50
130/90	MT90	5.00/5.10
Rear Tires		
Metric	Alpha	Inch
110/90	MP85	4.50/4.75
120/90	MR90	4.50/4.75
130/80	N/A	5.00/5.10
130/90	MT90	5.00/5.10
140/80	N/A	5.50/6.00
140/90	MU90	5.50/6.00
150/80	MV85	6.00/6.25
150/90	MV85	6.00/6.25

## ATV/UTV tire measurements:

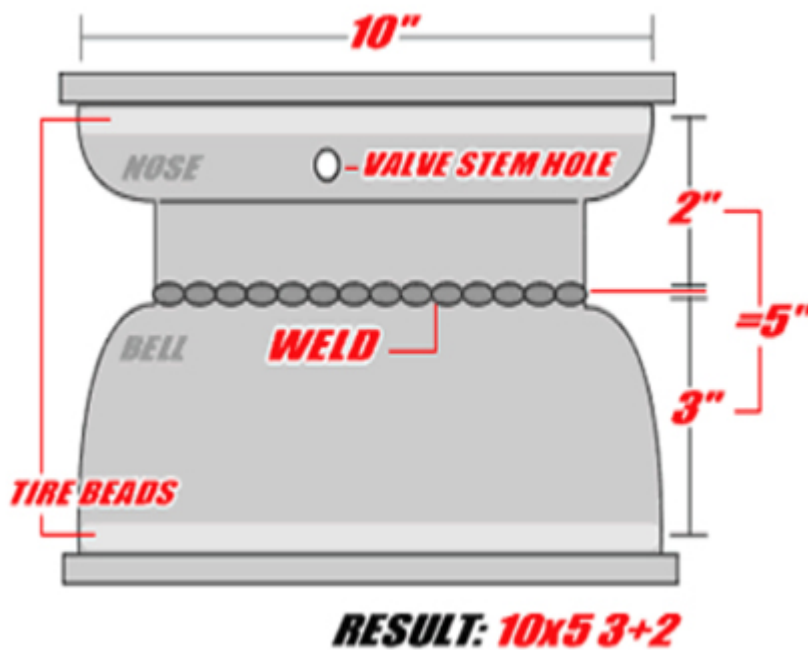
ATV/UTV tires are typically measured by Height x Width x Inner Wheel Diameter in inches.



### EXAMPLE:

HEIGHT x WIDTH x WHEEL DIAMETER

20x11x10



## ATV/UTV Wheel size and Offset

**Diameter of a wheel:** Measure the width of the bead area of the wheel (not the outer rim). In the diagram above, the diameter measures 10 inches.

**Offset and width of a wheel:** Measure from the center weld to the center of the tire bead area on both sides of the wheel. The outer measurement is always the valve stem side. Offset of a wheel is stated by reading the measurement of the inside first, then the measurement of the outside. For example above, the offset is 3+2; meaning the inside half of the wheel measured 3 inches, and the outside side measured 2 inches. Add these 2 numbers together to find the total width of the rim 5 inches.



**Note:** If the rim has a tire on it, usually the tire will have the rim diameter imprinted on it (8", 9", 10"...). You can also measure the rim from inside using the diagram above and getting the measurements as close as possible.

### **Type:**

**Bias-ply tires:** The carcass of a bias-ply is made of layers of fabric such as nylon or polyester, wrapped over each other in a criss cross pattern. The multiple layers' flex and create a cushioning effect, which makes bias-ply tires comfortable to ride on and good at handling heavy loads. On the down side, they have more rolling resistance, less control at high speeds, and retain more heat.

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### **ATV/UTV Terrain Types**

**All Purpose:** Medium tread pattern for general use on various terrains. **Sport/Race:** Lower profile style with tighter, aggressive tread patterns. **Sand:** Paddle type rear tires and smooth/ribbed front tires for flotation and traction **Rocks:** Heavy-duty tires that usually have higher ply ratings. Medium tread pattern. **Mud/Snow:** Aggressive, wide and deep tread pattern. Heavy duty construction. **Ply rating:** ATV/UTV tires come in different ply ratings: 2,4,6,8-ply rating, etc. The higher the ply rating, the stronger, but heavier the tire.