

How to Build a Motorcycle Wheel

How To Build a Motorcycle Wheel with EDM Shop Girl Sara



For many riders, wheel building is likely the last thing they think of when a bike related project comes to mind. In most cases, if we are going to do a service that is more than just a basic oil change and filter cleaning it will be a top end rebuild or fork oil change. If the bike is really lucky a linkage service. Wheel building, to many, is a black art. The kind of thing very few mortals can accomplish.

At EDM we believe nearly all services should be performed by the bike owner and we are here today to tell you wheel building can be fun and performed by just about anyone. And to prove it we asked our shop girl, Sara if she would be kind enough to show everyone just how simple it is to replace those taco 'd, wobbly, dented, bent rims.

If you have a truing stand for this great, if not, you can make do using your fork for the front wheel. Simply tape a zip tie to the fork leg at a right angle pointing toward the rim. You will use this as your guide – do the same on your swing arm for the rear wheel.



If your rims look anything like these, it really is time for new ones.



Be sure to get new spokes with your rims.

Step 1. Order your parts. Don't make the mistake of disassembling your wheels before you order the necessary parts. You will save yourself a ton of time by waiting.

If you want to get started while you wait for the parts to come in, spray penetrating lube on the spokes where the nipples meet the rim. Spoke nipples are subjected to heaps of dirt, water and soap with little to no maintenance. It may require multiple applications to break the spoke nipples free. Step 2. Once you have your rim/ spoke set you will need to remove the wheel from the bike and take the tire off.



No these shoes are not OSHA approved!

Step 3. With the wheel off the bike and the tire off the rim, lay the rim on a flat surface and measure the distance from the outside edge of the rim to the edge of the surface (see photos below). Do this for both sides and write it down, you will want this info later. The reason for doing this is sometimes the rim sits off center to the hub. It is this way with nearly all rear wheels and some fronts. The term for this is "dish". Rear wheels have it because of the offset caused by the sprocket. The rim actually sits a bit closer to the drive side of the bike. If you don't do this correctly, it is possible the rear tire will rub the swing arm when you are finished... not good. Another way to check this is to measure the distance between the swing arm and the rim, flip the wheel around in the truing stand or swing arm/ fork and measure at the same point. If the measurement matches, you are good to go, if not then you need to



This side shows 2 1/4 inch from the edge of the hub with the spacers in.



This side shows substantially less at 1 3/8. This step is critical to your success.

Step 4. From here you want to determine the cross pattern of your wheel. Look at the side of the wheel and count how many times the spokes on one side of the hub cross. This is the cross pattern for your wheel. It's usually two for motorcycles, but it can be more so make sure you count your own wheel. Count them again just to be sure.

Step 5. Remove all of your old spokes. This is usually the biggest nightmare of the entire process. As you can see we had trouble getting these nipples to break free. You want to loosen each two or three turns at a time and go around the entire wheel loosening the spokes in this pattern. If you take out one spoke at a time without relieving the tension on the wheel you might cause damage to your hub.



Once you have all the all the old spokes removed from your hub, give it a good washing and inspect it for any cracks or damage. You might even want to replace the bearings. You should at least grease them!

Step 6. Inspect the new spokes you have and determine if the are all the same length. If they are not, the short ones will be used for the side of the rim that sits closer to the hub, see step 3

Step 7. With a light oil, lubricate the threads at the ends of the spokes.

Here comes the fun part, lacing the wheel. Every wheel has a set of spokes which is actually a group of four sets. All wheels contain four sets of spokes, two for each hub side, or flange. One set that pulls and one that pushes. This is what creates the cross pattern and gives the wheel its strength. Knowing this enables us to break down the lacing process into four stages, two outside and two inside, for each flange. If your wheel has 36 spokes you will have four sets of 9, breaking down the lacing it into segments should help make things a little easier.

Step 8. If your wheel has 36 spokes, count 9 spokes and set the rest aside. Lay your rim flat and place the hub in the center. Starting with one side of the hub, place a spoke into one of the outside holes, most hubs are drilled so the spoke can only point in one direction. The same thing is done to the rim. Now find a hole in the rim that faces the direction of the spoke (it really is difficult to get this wrong) and attach a nipple to it. Only run it in a few turns, you want to leave about 1/4 inch of threads showing on the spoke.



Step 9. Placing your second spoke in the hub. You are going to skip one hole and use the following one. Now take this spoke and point it in the same direction as the first one, it will create a triangle. On the rim, count 3 holes and push the spoke into the fourth hole. Following this pattern, repeat for the next 7 spokes. When you have finished this step your wheel should look like the one below. Again the pattern is every 2nd hole for the hub and every 4th hole for the rim. If your wheel looks like this one congratulations! Your are doing things right. If it doesn't, stop. Take it all apart and go back to step 8. You must get the pattern correct at this point for the rest of the build to go smoothly.



Step 10. Count another 9 spokes. Flip the wheel over and place a spoke into the flange that has no spokes. Make sure the hole is facing the same direction as first set of spokes you installed. The hole you choose will be either in front of the already installed spoke or it will be the hole behind it. Use this information to determine which hole to use in the rim. If the second spoke is in front of the first it will be in front of it on the rim or vice-versa. It is one or the other. The important thing is, it will be right next to the first spoke on the rim. Place a nipple on the end of the spoke to hold it into the rim. Using the same pattern as the other side of the hub, skip a hole in the hub and place your second spoke through the flange and push it toward the rim. Count four holes in the rim and place this spoke into the hole. You will include the existing spoke in the count of four. Repeat this process until you have used all 9 spokes. It should start to look like a wheel at this point.



Note the parallel spokes

The pattern should go something like this if you are looking at the rim; one spoke from one side of the hub then a spoke from the other side of the hub, then two empty holes, then two more spokes. Look at the example above.

Step 11. Next we are going to be inserting the crossing spokes. Count another 9 spokes for this step. Slip a spoke through one of the holes in the flange and cross it under the other spoke coming from the same flange side. It should line up with a hole in the rim that is beveled to the direction of the spoke.

You will be using the same four count pattern to determine the correct hole in the rim for the second spoke. All of these next spokes will cross over 2 spokes to find the corresponding hole. Once you have completed installing the first set of crossing spokes you wheel will look like the one below.



You should have 9 holes left to fill in both the rim and the hub.

Step 12. Begin by inserting the first of the final 9 spokes and pushing it in the direction of the rim. This spoke will also cross over 2 spokes before it goes into the rim. Place a nipple onto the spoke to hold it in place, remember to leave 1/4 inch of thread showing on the spoke. We will deal with that in the next step.

step13. Once you have all the spokes correctly installed, you need to get some tension on them. Start by turning in the nipples with a screwdriver until there is only one thread showing.



Once you have done this there should be a small amount of tension on the spokes and all nipples should be resting against the rim. If there is not, tighten each nipple 1/2 turn until you begin to feel tension on it. This step is very important in keeping the rim round! After you have achieved tension, place your wheel into a truing stand and put a drop of oil between the nipple and the rim. This will make it much easier to turn the nipples.

If one is sticking out, you may have made a mistake. Chances are if one is sticking out there are others doing the same. Put the wheel down for a minute and get a bite to eat. When you come back try to find a pattern to the mistake and correct the offending spokes.



Step 14. At this point we are going to continue adding tension to the wheel by turning the nipples 1/2 turn each spoke, all the way around the rim. It's a good idea to place a piece of tape on one of the spokes so you know when you have made a complete revolution. Each time you complete the wheel, spin it to see if it is still round and true.



If it is not, adjust spoke tension as needed to bring the wheel back into true. If the rim has a bump to the left, tighten the spoke or two spokes on opposite the side of the rim. Or loosen one or two spokes on the bumpside of the rim. The same theory holds true for up and down bumps. Except that you have to work with two spokes at a time, one from each side of the hub. This way you only affect the out of round not the side to side. Always do this in 1/4 turn increments, This way you don't make too big of a change all at once. Practice will make you better. And patience will make things easier. This is not a fast process. Take your time and enjoy yourself!

