

Between banjo strings and pretzel sticks . . .

WHEEL LACING

The proper method and why your stock wheels don't work.

By Brad Zimmerman

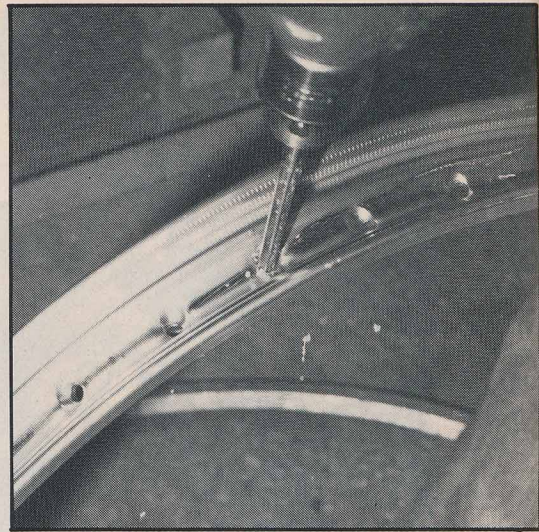
Let's face it, your basic Japanese wheel, including spokes, nipples and rim, is junk. They don't work well, aren't designed for competition, and can't stand up to the punishment.

Why? The answer lies in mass production. You see, the Japanese manufacturers make more street machines than they do dirt machines. So when it comes time to buy spokes, nipples and rims in gigantic quantities, they can get a better deal on one general size and thickness than they could if they specified different types. Therefore your dirt bike comes with wheels that are designed to be used on the street, and not put

under the strain of motocross, desert or enduro competition.

Most wheels work under the same pattern. Your front wheel is usually a cross-three (a designation derived from the fact that a spoke, exiting from the hub, crosses over or under three other spokes before it reaches the rim), while the rear wheel is done in a cross-two pattern.

Here's our stock Suzuki RM-A wheel before modification. Notice that out of the 36 spokes in the hub, 18 of them are running out from the hub on the outside edge. This portion is eliminated with the new lacing pattern.



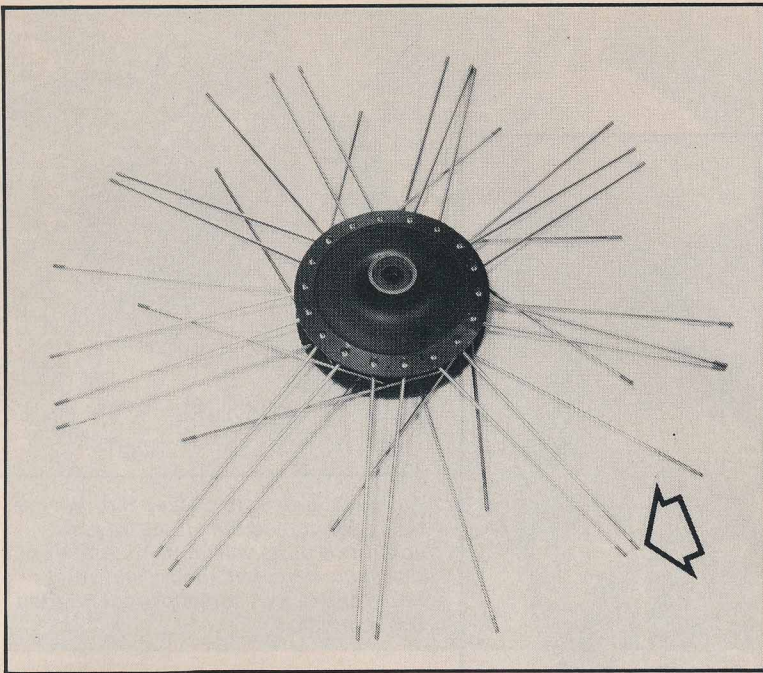
Utilizing a #5 tapered reamer in a drill, enlarge the holes in the rim enough that the new nipples from the Wheel Clinic will fit without binding up on the rim before the spokes are tightened.



Using an 8-gauge spoke as a guide, the hub holes are angled slightly upward and outward, allowing the inside spokes to be tightened without binding on their flanged ends, due to the small hole diameter.

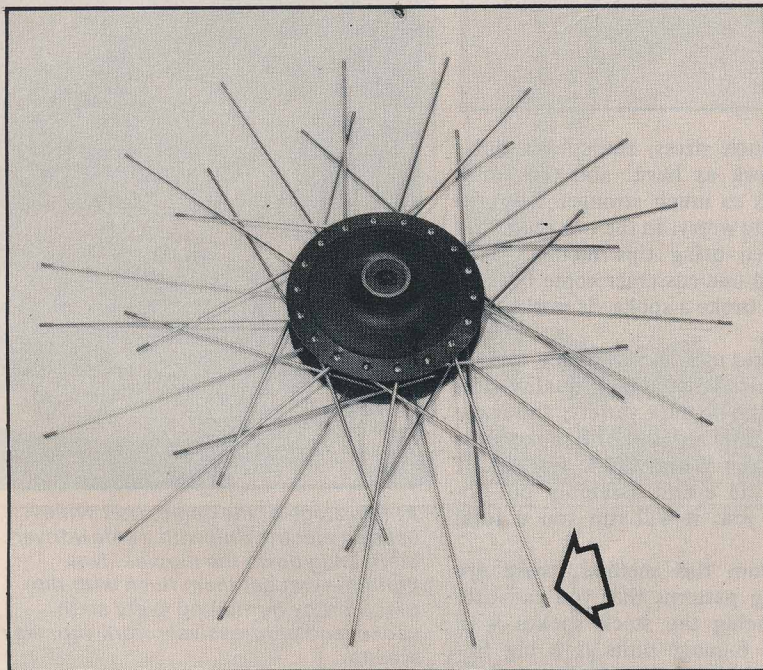
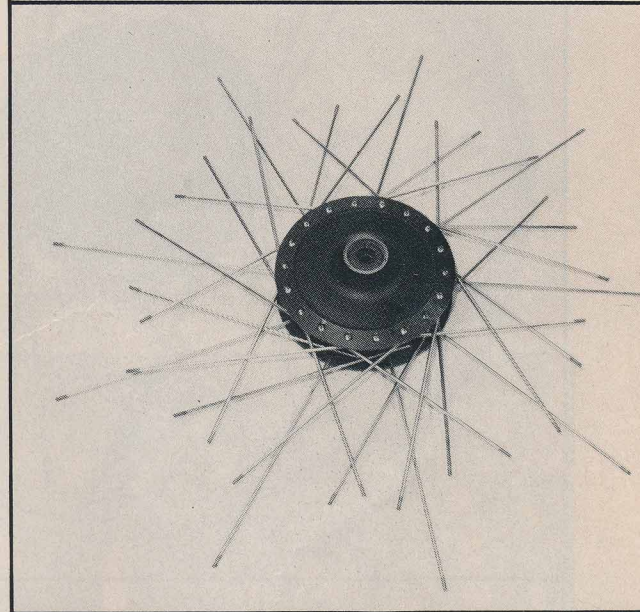
In many instances this might be satisfactory. The only problem is that the spokes are not only too thin, they're too flexible. For example, your Honda CR 125 comes with an 11-gauge spoke. That's the same spoke as the one used on an XR 75.

Besides the spoke problem, there's the rim situation. For example, using the Honda CR 125, the 1974 model came out with a good, beefy DID rim. It works well, can stand up to punishment (provided it's re-laced with good spokes) and generally gets the job done. But for the two following years ('75-'76), Honda opted for the cheaper DID touring rim, the type found on the XL series and on many of their street bikes. The rim is too flimsy, flexes too much and doesn't work.

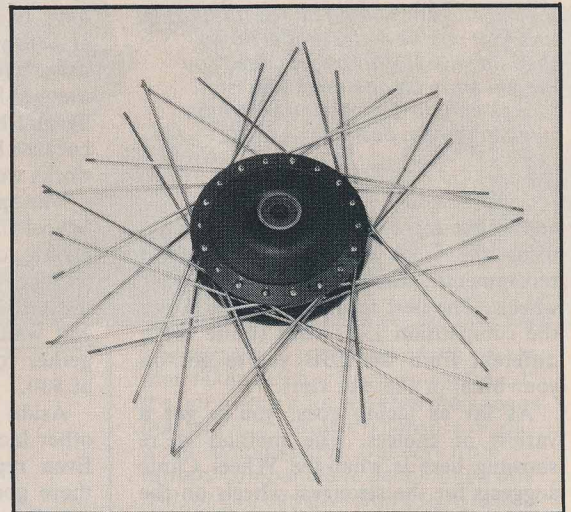


It looks confusing at first, but study the photo. The arrow points to the spokes closest to you. The 18 spokes on this side of the hub have all been laid out straight. Below them, on the other half of the rim, some of the spokes have already been properly angled.

Now those spokes that were standing straight out are put into a clockwise pattern, crossing over the other spokes that were angled in the preceding photo. Study the origin of each spoke, see where it heads and you can get an idea of the pattern and strength that results.



Now it gets even trickier. Every other spoke has now been angled in a counter-clockwise position. The arrow points to the spokes still standing straight out.



With all your spokes properly turned on both sides of the hub, you should end up with a situation like this. In this photo everything is turned and directed properly and is ready to be installed.

Consider another problem with wheels. When they're assembled in the factory, there's a pneumatic machine that tightens the spokes down. It drops over the top of the rim and, with 36 separate bits, tightens up each spoke to the same prescribed torque setting.

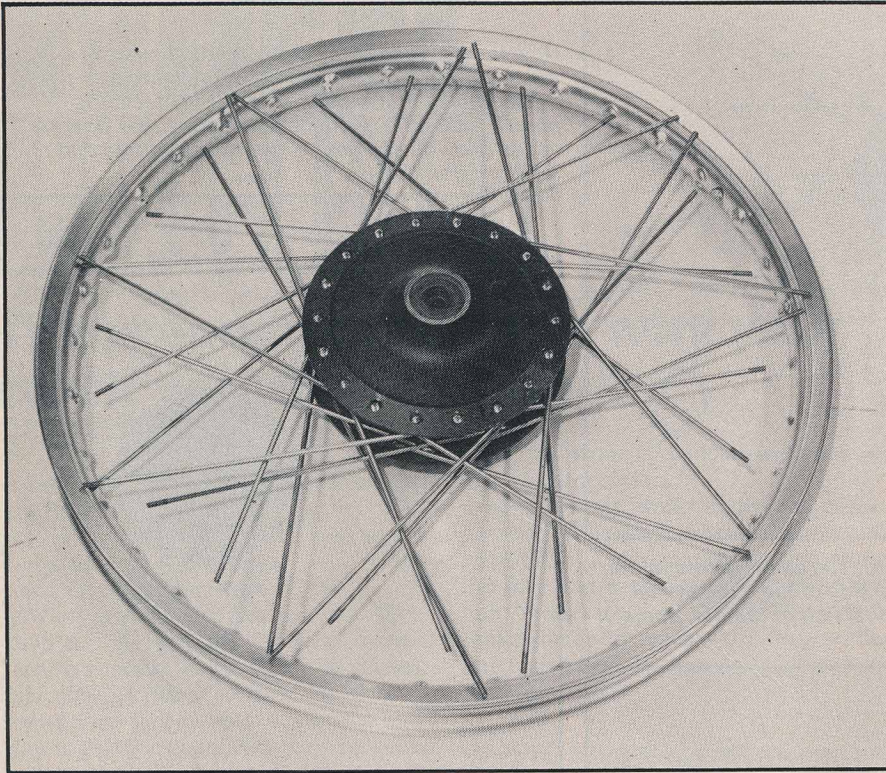
Unfortunately, all spokes aren't the same. Some have more elastic properties to them. The memory (or rebound)

factor is different. But all the spokes are tightened to the same torque setting.

When you first go out riding the machine, there will be at least one spoke that, although it's got the same torque setting as the others, isn't pulling evenly on the rim. It tends to flex a bit, sets up a vibration and eventually allows the nipple in the rim to rotate, loosening the spoke even more.

Now the other 35 spokes have to work harder. Another spoke near the loose one takes on more responsibility and stress. It too begins to loosen, and so forth down the line until the entire wheel is flopping about.

To overcome all these problems,



It's now time to lay the rim over the spokes and start lining up the holes. Be sure that you have the proper holes lined up with the proper spokes. You can put a rim on upside down. High spokes should correspond with high holes in the rim pattern.

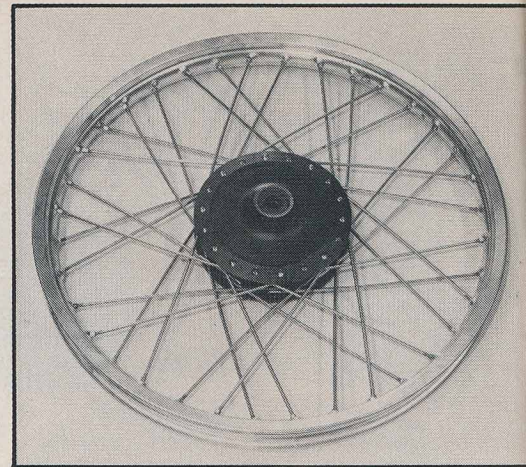
you've got to re-lace your wheels. Even using the stock rim (which we don't recommend), you can strengthen your wheels. The best setup for rims is either the competition DID rims (quite often different from the DID you've got on your bike) or the Sun rims.

As far as lacing goes, you've got a variety of choices. The method we're showing here is what the Wheel Clinic suggests for the strongest wheels on the market. It utilizes a new rim and a totally inside (instead of inside and outside) spoke pattern. This way the hub doesn't

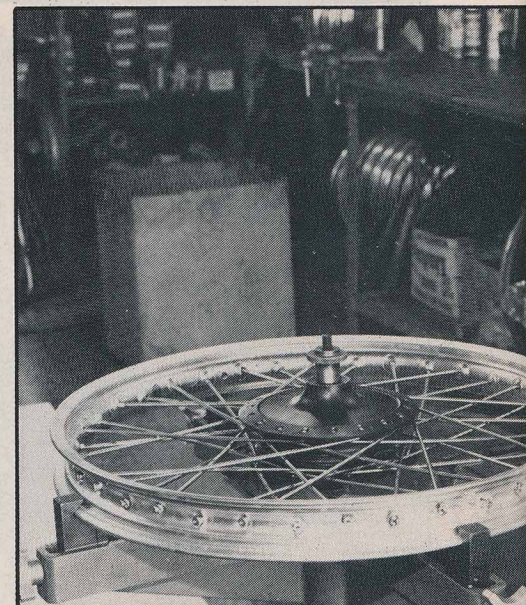
have as much stress, the spokes don't have to work as hard, and the entire assembly is so much stronger that you never have to worry. In the two years that they've been using this method, they haven't had one customer come back in because he broke a spoke. It works, and works well.

The spokes used are available only at Wheel Clinic. They're high quality steel spokes, of the 8-gauge variety, and come with heavy-duty nipples. The spoke kit is available from Wheel Clinic for \$15. If you want the entire assembly put together for you, it will run you a total of \$30.

Aside from this method, there are other lacing patterns that you can use. Even replacing the stock spokes with these good 8-gauge units is a big improvement. If you follow the instructions carefully as laid out in these photos, you can get a cross pattern, complete with all



Put the appropriate spokes through the holes and thread the nipple on just about two turns worth. If you run into problems here, backtrack, and you'll find a spoke that somehow got into the wrong hole.



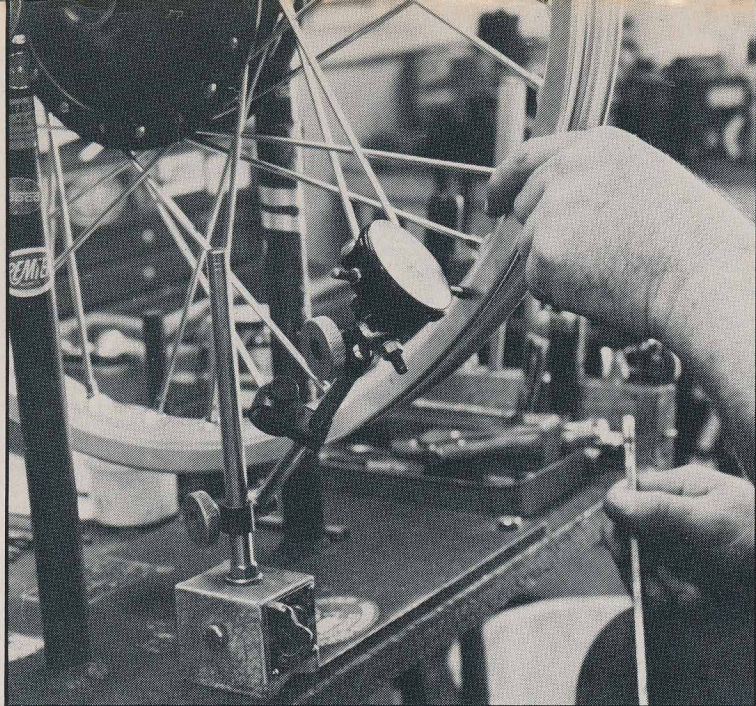
At this stage of the game, Don Willey uses an electric drill with a screwdriver bit to snug down the nipples. Not tighten—just get them flush with the rim. Start by tightening every sixth spoke, and progressively work your way around.

inside spokes, into your Honda, Suzuki, Yamaha, Kawasaki and the majority of European make wheels, within a few hours.

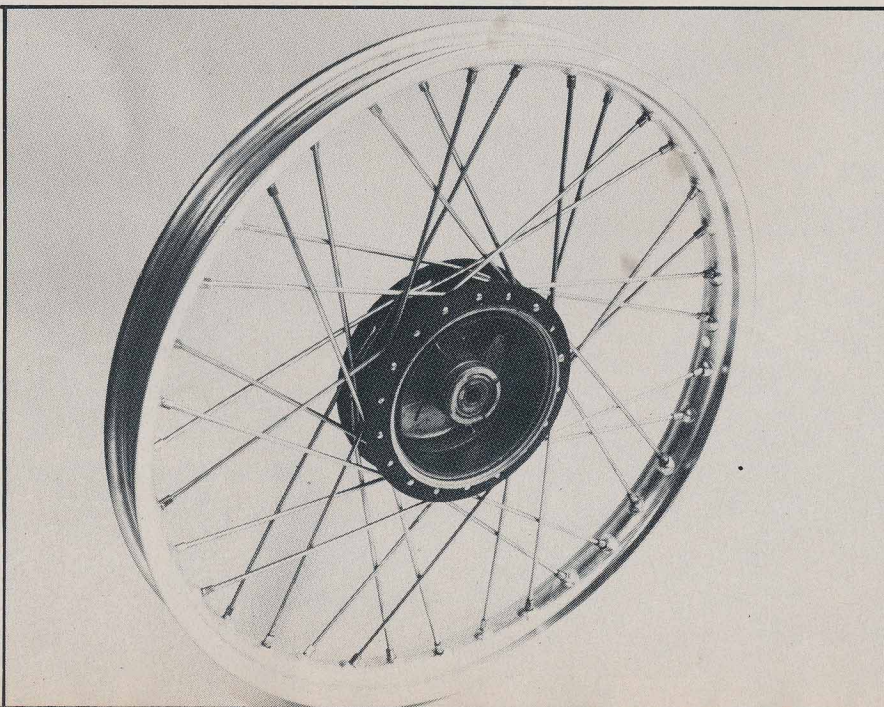
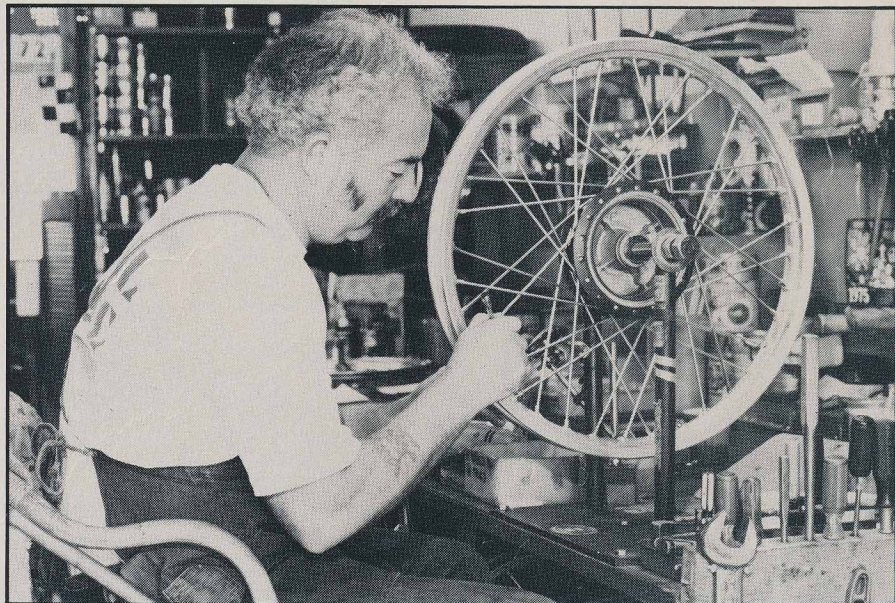
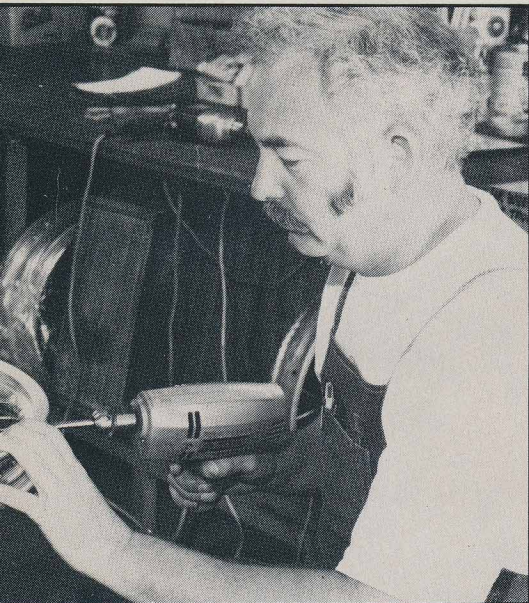
There are a couple of things to remember. Go carefully, follow the directions, remember that you really can't overtighten one of these spokes and, if you do run into problems, take the whole thing apart and start all over again. For spokes, nipples, lacing, trueing and correct advice, you can find the Wheel Clinic at 7561 Industrial Way, Stanton, CA 90680.



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Using a dial indicator, the side play is gotten out of the trim. If it's bending toward the left, tighten a few of the right side spokes in the general vicinity of the wobble until the rim straightens out.



The egg shape problems of the rim are then taken out by the same method. If it's got a high spot, tighten the spokes that will pull it down. There are many wheel lacing stands available from various companies to accomplish this feat, or you can give Don \$15 to lace and true the wheel for you.

Hopefully, your finished product will look like this. All 36 spokes originate on the inside of the hub. This is the strongest setup we've ever come across for motocross, desert and enduro situations. Don's yet to have a customer break a spoke using this pattern and his 8-gauge spokes.