

Wire-Wheel Maintenance

By **Steve Warmath** contributing editor Mark Zimmerman



I'm going to deviate slightly away from any specific safety topic this month and instead provide some basic insight on something just short of voodoo science- **wire wheels**. With today's alloy wheel rims and tubeless tires, wheel maintenance has become a lot less complicated and worry free. If you love and/or own a bike with those classic laced wheels, read on.

Despite technology that's nearly a century and a half old, the wire-spoke wheel still has a lot going for it. Wire wheels are light, and when properly configured and maintained, strong and stiff, although not so stiff that they don't flex slightly when loaded, a feature that was particularly desirable in the days

before front and rear suspension made the scene-and still isn't a bad thing. The traditional look of a wire wheel is also undeniably attractive, which goes a long way toward keeping them popular, especially with the cruiser/retro/vintage crowd. On the downside, wire wheels do require slightly more maintenance than their cast or machined cousins. But unless you've let things get completely out of hand, it's relatively easy to perform and needs doing only occasionally.

The Theory- Wire wheels are composed of three main components-the hub, rim and spokes. The hub is basically an aluminum-alloy tube that connects the wheel to the bike. It contains the wheel bearings, and normally has two flanges on either side that are drilled to accept the spokes. Besides providing the motorcycle-to-wheel connection, the hub also acts as a convenient spot to hang things like sprockets, brakes and sometimes the speedometer drive. Outside of the occasional bearing check, most hubs need just about zero maintenance.

The rim is little more than a band of metal formed into a circle. Constructed of either aluminum alloy or steel, its job is to hold the tire in place (and give us something difficult to polish). Rims can be dented if struck hard enough, and develop cracks between the spoke holes, especially after coming off a harsh encounter with a New York City pothole. Like hubs though, rims are relatively trouble-free and will perform well enough even with a few dings in them.



Cracks usually radiate outward from the spoke nipple seats

Lastly, if you've ever looked at a spoke wheel and wondered how those spindly little wires on the bottom could support an entire motorcycle, let alone the combined weight of the bike, rider(s) and luggage, the answer is they can't. Spokes work very well in tension but have very little

compressive strength. Essentially, the motorcycle hangs from the upper spokes while the other spokes simply keep everything aligned and prevent the rim from wandering away. This is key, because once spokes lose tension, the rim and hub quickly falls out of line. Ride a bike with loose spokes for any length of time and chances are good

you'll soon be rebuilding the wheel, which is neither cheap nor something a novice should be tackling unless he's got a lot of time and a real interest in becoming a wheelwright.

The Practice- Wire-wheel maintenance involves a few simple tasks and even fewer tools. The wheel needs to be inspected on a periodic basis for physical damage, loose or worn components, alignment problems and, most importantly, spoke tension. So what's periodic? Certainly, give your rims the once-over if you whacked a pothole or big frost heave or maybe ran over the neighbor's kid's bicycle, but the only time you really give them a formal inspection is when you do major service or install new tires. So, in this case, I'd say that

periodic means every 3000 miles or once a year, unless your owner's manual specifies otherwise. Of course, since the whole job takes maybe 15 minutes to half an hour, you may want to perform it on a more regular basis. While a decent job of inspecting the wheels can be done with the bike on its kickstand, it'll be far easier if the bike is upright, with both wheels off the ground. If your bike doesn't have a center stand (and whose does these days?), use a lift or whatever it takes to get the bike into position.



A cracked rim is rare but not unheard of, so I like to start by inspecting that hoop for fractures. Most are small, hairline fissures that radiate outward from the spoke holes and in most cases will run from one hole to another. If any are found, the rim will need replacement, but like I said, cracks are rare. Hub cracks are even less common, but it never hurts to give everything a look, just in case you're one of the lucky ones.

The last type of wheel check is for true or run out (jargon for out-of-round). There are two types of run out: axial, which is a side-to-side wobble, and radial, which is an up-and-down hop. Both checks can be performed well enough by eye, at least initially, as all you're going to do is give the wheel a spin and watch it rotate. If the wheel appears to be rotating true, chances are pretty good everything's fine. Since no wheel is 100 percent perfect, manufacturers typically allow between 1 and 3mm of run out in either direction. If there's any doubt, fix a pointer to the frame or fork (a tie-wrap will do fine), and allow it to just kiss the rim at the closest point. For axial run out, position the pointer to the side of the rim. To measure radial run out, select a point on the rim's inner or outer edge. Slowly rotate the rim until the gap between the pointer and the rim is at its greatest. If the dimension exceeds the manufacturer's recommendation, the wheel will need to be trued.

Assuming no problems are found, the final and most critical phase of the operation is to check the spokes. The time-honored method is to give each one a tap with a small wrench or screwdriver handle and listen to the sound. A nice, clear ping indicates the spoke is reasonably tight, while a flat, dull thunk means it's loose, and, as you can guess, a loose spoke is little more than a broken one that hasn't had the good sense to come apart yet. Frankly, I don't use the ping-and-ring method anymore; it's a little too subjective. However, it is a good way to make a cursory check. Just remember, you're not tuning a zither, so don't expect every spoke to hit a perfect C-sharp.

A far more accurate method of checking spoke tension is to use a spoke nipple wrench or, even better, a spoke nipple torque wrench. If you've never seen one, a spoke wrench is a short wrench with square-cut jaws designed to fit snugly over the spoke nipple. They're available from any motorcycle dealer for less than 10 bucks, and if you don't know what size to order, you can get a universal wrench that'll cover the most commonly used sizes. Special-designed spoke torque wrenches work best, but they're more expensive; a really good one, like Fasst Company's adjustable model with interchangeable heads, runs nearly 300 bucks, so unless you plan on truing a lot of wheels, a torque wrench is something of an extravagance.

Starting with the spoke nearest the tire valve stem, apply moderate pressure with your wrench. Moderate means just that; typically, spokes are tightened to somewhere between 20 and 60 in.-lbs., which equates to

1.6 to 5 lbs.-ft. That's not much, and it's easy to over-tighten the spoke if you get ham-fisted. I should also warn you that it's difficult (if not impossible) to accurately torque a corrosion-seized spoke. If the nipples are rusty or obviously loose and resist tightening, it's time to have the wheel looked at by a pro. Chances are the nipples have seized, and if that's the case, you'll need to consider plan B, especially if the wheel is badly out of true.

If the nipple turns easily, give it no more than a quarter turn. Skipping the next three spokes, repeat the procedure at the fourth spoke in line. The butt end of that one should be on the opposite side of the rim from the first. Work your way around the rim giving every fourth spoke no more than a quarter turn. When you get back to the original spoke, move to the next one in line, again tightening every fourth spoke. Repeat the procedure until all the spokes are nice and snug. Doing it this way may seem tedious compared with just tightening every spoke in line, but going at it the easy way may pull the wheel out of true. The every-fourth-spoke method takes longer but ensures the rim stays round, and as we all know, a round wheel is a happy wheel, a happy wheel makes for a happy motorcycle and a happy motorcycle always has a happy rider.



True or Not? - What has not been discussed here in any detail is truing an out-of-round wheel. Part of the problem is that truing a wheel requires a level of expertise and patience that goes beyond that of ordinary preventive maintenance. Also, a novice can take a slightly out-of-true rim and turn it into a wobbly mess in less time than it took to write this sentence. For that reason, I'd suggest that if you're unlucky enough to encounter a seriously warped or damaged wheel, you have it professionally rebuilt. Of course, if you'd like to learn how to do it on your own, there are several excellent books and videos out there that detail the procedure.

Be careful out there....it's a jungle.

Steve