

Guywires

THE ART OF WHEEL BUILDING

Don Hollingshead

For those who haven't ridden with me, I used to break a spoke now and again. So, I carry a half dozen at all times in my seat tube, along with a freehub extractor and spoke wrench.



Peter and his rolling Kurbmaster bike shop

Last July ('01) while riding a stage of Tour BC (tour-bc.net), I replaced three rear spokes at once. That night, I mentioned my plight to Peter Pazdera, also known as



Measuring roundness of wheel

Guywires (www.gonecycling.com/guywires.html), the bicycle mechanic accompanying Tour BC. Peter claimed he could build me a wheel that he would guarantee not to require spoke replacement.

Peter drives a GM Kurbmaster truck full of spare parts and exotic bike tools and unfortunately for EVCC, is stationed in Vancouver. During the tour, Peter's presence on air (on the CB radios used by organizers to stay in touch) signature was a couple of toots from his squeeze bulb bicycle horn. While passing participants on route, his assistant, Lori rings a selection of bicycle bells attached to the passenger side



Measuring spoke tension with tensiometer

rear view mirror support. Last time we talked, Peter was setting up an amplified bullhorn and mp3 combo to play a midi version of “Turkey in the Straw”—the quintessential ice cream truck music.

Peter is an experienced wheel builder and mechanic who once practised his craft at Rocky Mountain Bicycles. His speciality is hand-built wheels. (He’s also a CanBike



Engraving serial number inside of rim

nipple seat to nipple seat (outside ferrule to outside ferrule). He took several measurements from the hub then plugged these and the other dimensions into a formula.

Having quickly laced the spokes between the hub and rim, and with the spokes still slack, Peter mounted the wheel in a true-ing jig. He then used a 1 inch diameter wooden dowel to force each spoke crossing toward the hub. This appears to loosen any binding between the spoke head and its hole in the hub and to set the line of the spokes before tensioning with the nipples.

Purple Loc-tite® was used on spoke threads to prevent the nipples from unscrew-



Applying labels to rim

instructor.)

I watched Peter use bolt cutters to remove the old spokes from my rear wheel. He suggested that I move to a double wall box construction rim instead of the single wall that I had. I had a relatively new 36 hole hub so he used that.

After a few minutes of measuring hub dimensions, he asked me whether I wanted 3 or 4 cross spokes. I said I preferred 4 cross for the softer ride. A few minutes later, the wheel was laced using 14 gauge spokes with pulling spoke heads on the inside of the hub flange (a feature apparently unobtainable on machine laced wheels).

Determining spoke length is not a trivial problem. Peter used a wheel gauge to measure the diameter of the wheel from



Serial number engraved on outside of rim

ing once the wheel was complete. Peter mentioned that boiled linseed oil works well for thread lock too. (Easy to work while fresh but eventually hardens, preventing the nipple from easily loosening.)

After turning in the spoke nipples with a home made nipple starter, he continued with a spoke wrench. Once all the spokes had some tension, he used a plastic mallet to hit the spoke crossings of each pair of spokes, setting the spokes into the rim and hub holes. Constant squeezing of adjacent spokes and crossed spokes prevents torque from building up in the spokes. Also, to turn the nipple 90 degrees, he turned it 120 degrees then backed off 30 degrees.

The true-ing process took 10-20 minutes. Peter's deft fingers and spoke key danced over the spoke nipples while he squeezed pairs of spokes.

Using a dishing tool, a spoke wrench and a tensiometer to get the perfect final spoke tension and wheel true, he aims for 100 kilograms of tension on the chain side of the wheel and as much tension as he can on the other side of the wheel while still keeping the wheel centred in the frame. My non-chain side worked out to be 70 kilograms. A tensiometer is a sprung dial gauge that attaches to the spoke. Two fixed fingers hold the spoke while a centre finger of the gauge bends the spoke with a constant force. The amount of bending is indicated on the instrument as kilograms of tension (actually a displacement is indicated that has to be looked up on an equivalent force table).

Once the wheel was true, Peter cleaned the surface of the rim facing the hub with alcohol and applied his decals to it. Then, using a vibrating metal engraver, he engraved a serial number on the rim by the



Peter, his Kurbmaster rolling bike shop and my finished rear wheel wheel. A dude who loves what he does and is very good at it—a true craftsman.

valve whole and inside the rim as well under the rim strip.

I never asked for the guarantee in writing and I still carry the insurance spokes. I avoid pot holes and rumble strips and I've ridden the wheel moderately for a year now (no touring loads), checking the trueness from time to time. The wheel is still perfectly plane and round.

Next time you are cycling on the coast and are about to be overtaken by a vehicle playing "Turkey in the Straw", it may not be an ice cream truck!

Custom built wheels are available by mail order from Guywires. Email Peter at peterguy@axion.net. Visit his web site at www.gonecycling.com/guywires.html

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