

# Lacing and Truing Wheels

Craig and Rob (with Larry's help)

# Tools

- Brake cleaner or mineral spirits
- Flat table
- Vernier caliper
- Spoke wrench
- Round wire brushes
- Round file (if needed)
- Anti-seize/spoke oil
- Nuts sized to offset
- Truing stand with velcro'd ruler (ruler optional)
- Marking tape
- Hammer and Flat punch
- Rotary (i.e., Dremel) tool/flat file (if needed)
- Spoke torque wrench (optional)

# Inspection and Prep

- Check rim and hub for cracks/splits.
- Check rim on a flat surface for reasonable runout. Measure with caliper if unsure (Larry: < 5mm difference is usable).
- Check rim for proper rotation (hop) visually or with a carpenter's bar clamp (Larry: 5-6mm difference is unusable?).
- Clean out rim holes and hub holes (nylon or brass wire brush).
- Spin spoke through each hub hole to check for proper seating.
- Spin a nipple in each rim hole to check for proper seating.
- If nipple doesn't seat in rim correctly, ream out hole a little with a round file.
- Check spokes for consistent length or lengths.
- Take photos and study existing wheel's spoke pattern.
- YMMV

# Measure Wheel Offset

- Assumption is that your bike's currently laced wheel is correct.
- Lay the good wheel with brake drum side down on a flat surface.
- Measure with caliper between the rim and flat surface, or check Snowbum's offset measurements.
- Get nuts or shims that fit nicely between rim and flat surface, or match the offset measurements.

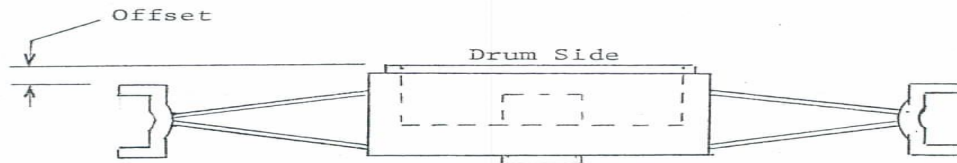
# Measure Wheel Offset



# Snowbum's Chart

## BMW WHEEL RIM LOCATION

<u>R50/5 - R75/5 &amp; R60/6</u>	<u>Tool No.</u>	<u>Offset</u>
Front Rim 1.85"	36-3-820	10.0mm
Rear Rim 1.85"	36-3-820	6.5mm
Rear Rim 2.15"	36-3-850	6.5-7.5mm
<u>R75/6 - R90/6 - R905</u> <u>R75/7 - R 80/7*</u> <u>R100/7 - R1005* &amp; R100RS*</u>	<u>Tool No.</u>	<u>Offset</u>
Front Rim 1.85"	36-3-850	5.5-6mm
Rear Rim 2.15"	36-3-850	6.5-7.5mm



\*Up to 1977

# Lacing

- Use spoke wrench.
- In finally tightening of spokes, start at valve stem hole so you remember where to end.
- Push nipple fully into rim and spin spoke into nipple.
- Lay wheel with brake drum side down (will end up with wheel brake drum side down for offset).

# Lacing

- There are two sets of spokes on each side of rim, inside and outside. Organized spokes if there are different lengths.
- After inserting spokes, lubricate threads with spoke oil (provided in Buchanan's set) or anti-seize,  $\frac{1}{2}$  thread length from the end.
- Insert spokes on inside of rim on first side, then do outside of rim on same side. Finger tighten nipples halfway up the threads. Back and forth 180 degrees at a time may work well for initial tightening.
- Insert spokes on inside of rim on second side, then do outside of rim on same side. Finger tighten nipples halfway up the threads.
- Finger tighten nipples to just cover threads if possible (snug). If not possible, tighten all spokes the same number of turns until snug (start at the valve stem hole so you remember where to end).



# Lacing

- Set spoke heads into hub on both sides with a firm hammer or a flat punch.
- Check if spokes are still snug.
- If not tight enough, tighten all spokes the same number of turns (i.e.,  $\frac{1}{4}$  turns with wrench) until snug (start at the valve stem hole so you remember where to end).
- Goal: Rim is **same distance** from hub all around (assuming all spokes are consistent lengths), and spokes are **snug**.



# Adjust Rim to Offset Measurement

- Lay wheel brake drum side down on the nuts or shims.
- Starting at valve stem hole, tighten or loosen ALL inside and outside nipples on the correct side  $\frac{1}{4}$  turn starting and ending at valve stem hole.
- Nuts or shims should slide under the rim smoothly.
- Goal: Get the correct offset so wheel/tires rotate in center of bike/fender without rubbing anything.

# Offset





# Truing - Lateral/Runout

- Place wheel on truing stand.
- Ensure axle is snug on wheel and level.
- Get your truing pointer ready for lateral/runout (side-to-side) truing.
- Set the pointer close to one side of the rim without touching.
- Spin the wheel slowly and lightly, watching the distance to the pointer.
- Use tape to mark.
- Tighten the side (one set of 2, 3, or 4 spokes around tape) to pull the rim; loosen the side (one set of 2, 3, or 4 spokes) to push the rim.
- Alternate sides: Tighten one side the first adjustment, loosen the other side for the next adjustment.
- Goal: Continue until less than 3mm difference in runout.

# Truing - Rotation/Hop

- Get your pointer ready for rotation/hop (up and down) truing.
- Spin the wheel slowly and lightly, watching the distance to the pointer.
- Check for low spots.
- Mark low spot with tape.
- Tighten 4 spokes directly above the **low** spot to pull the rim up. If getting too tight, loosen spokes 180 degrees from them first, then tighten them.
- Loosen 4 spokes directly above the **high** spot to push rim down. If getting too loose, tighten spokes 180 degrees from them.
- Goal: Continue until you're less than 4mm out.
- Recheck runout (should be OK if you were consistently adjusting all four spokes).

# Finale

- Check all nipples with wrench to snug up. Shouldn't affect runout or hop because the tight spokes set the wheel. If torquing Larry recommends 4.5 foot pounds.
- Check tightness with screwdriver handle. If any spokes are loose, tighten all spokes equally  $\frac{1}{4}$  turn at a time to keep true.
- Recheck runout and hop if you made any adjustments.
- Snowbum recommends to let the rim sit in hot and cold for a couple days so it settles, and check spoke tightness and truing again.
- If you have any spoke protruding past the nipple, grind/file it off smoothly with a dremel or small file.
- Goal: Have as much spoke in the nipple without being too tight, and be true!