

DIY Static Balancer

Alan Lapp 12/26/05

Drawing not to scale

Main frame - 1" Sq. Tubing. Round tube will work equally well. How cool would a DeltaBox-style formed sheet Alu. frame be?

Wheel balancing axle - 5/8" or 1/2" drill rod. If you only plan to balance modern ('90+) wheels, which have large axles, use the larger drill rod. If you're a perfectionist, hydraulic shafting would be even better as it's hardened, hard chromed and ground true.

Balancing adaptor cones - mild steel, make at least one cone 3" in diameter to accommodate most single-sided swingarm wheels. Some SSA wheels require special adaptors. 2" dia. cones will be adequate for non-SSA wheels.

Bearings - I used ABEC 5 bearings meant for in-line skates.

Bearing axle - size to suit your bearings. Mild steel or drill rod. DO NOT substitute aluminum as it will surely bend.

Bearing spacers - mild steel, aluminum, delrin. Anything, really.

Bearing house - I used 1.5" .25" wall structural tube with the top side cut off, which is overkill. A welded assembly works equally well if care is taken to align the parts.

Leveling feet - any old nuts & bolts will do. Balancer works best when level.

The only precise part of the job is making sure the bearing axles are parallel and coplanar, or the balancing axle will "walk" off the end of balancer. Extra axle length is good for this reason.

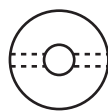
Safety fingers prevent the balancing axle from falling out.

Bearing axles should be positioned so the bearings create a shallow "V" for the balancing axle to ride in.

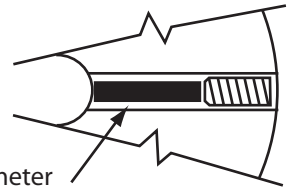
Round off corners and break edges for safety.



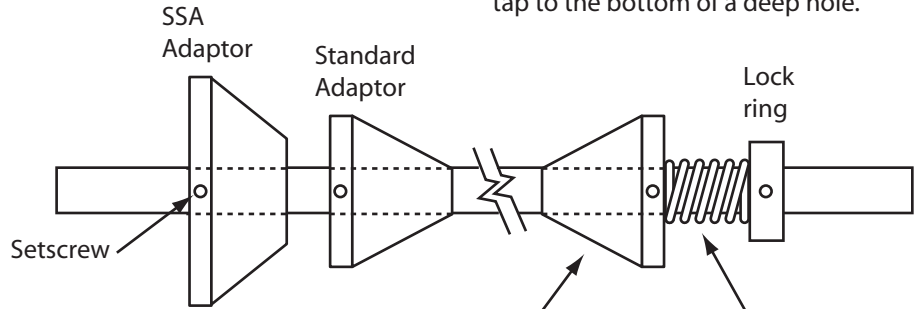
Positioning the bearings too far apart may bind, which will cause unreliable results.



Drill & tap setscrew holes through both sides of adaptors & rings. Have a setscrew in both holes to maintain balance, especially on large adaptors.

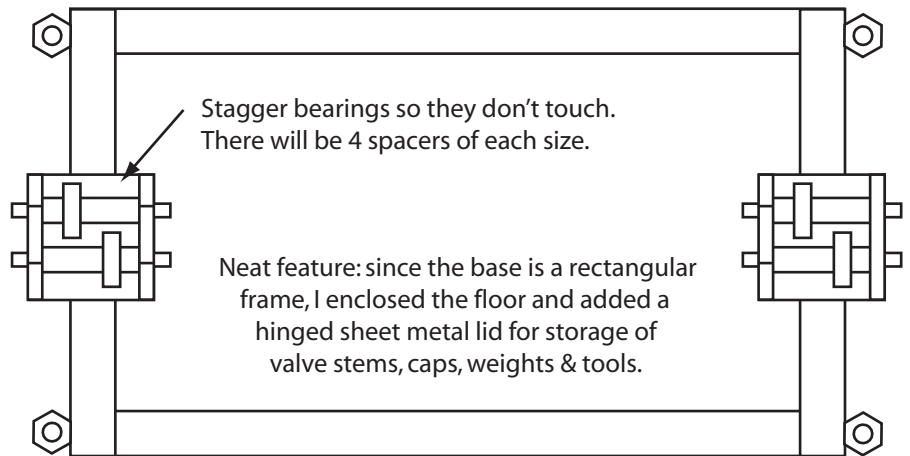


On large-diameter adaptors, it may be necessary to use a pusher rod because you can't tap to the bottom of a deep hole.



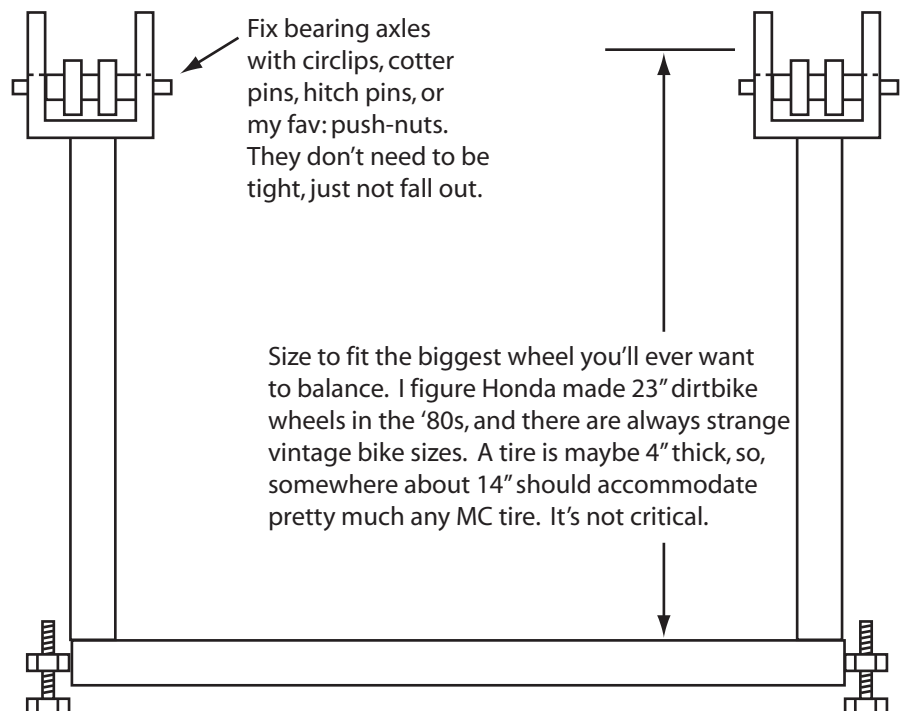
Note that the cone angle is fairly steep in order to bypass the seals and have solid contact with the inner bearing race on the wheel.

a STOUT close-fitting spring will ensure the wheel remains centered on the balancing axle.**



Stagger bearings so they don't touch. There will be 4 spacers of each size.

Neat feature: since the base is a rectangular frame, I enclosed the floor and added a hinged sheet metal lid for storage of valve stems, caps, weights & tools.



Fix bearing axles with circlips, cotter pins, hitch pins, or my fav: push-nuts. They don't need to be tight, just not fall out.

Size to fit the biggest wheel you'll ever want to balance. I figure Honda made 23" dirtbike wheels in the '80s, and there are always strange vintage bike sizes. A tire is maybe 4" thick, so, somewhere about 14" should accommodate pretty much any MC tire. It's not critical.

** Added after trying to balance a mysteriously unbalancable wheel. Let the weight of the wheel help compress the spring when assembling the wheel & cones onto the axle.