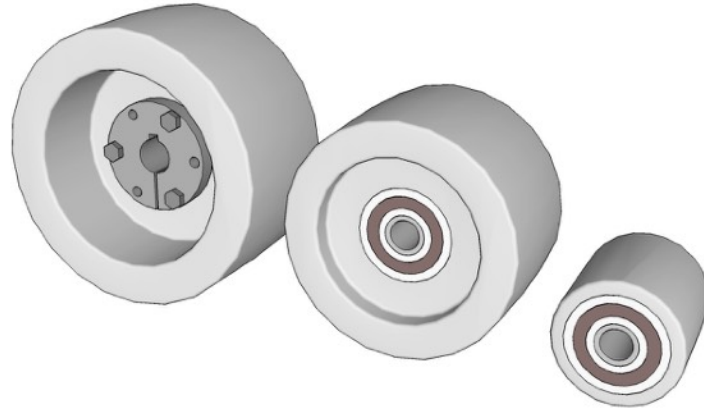
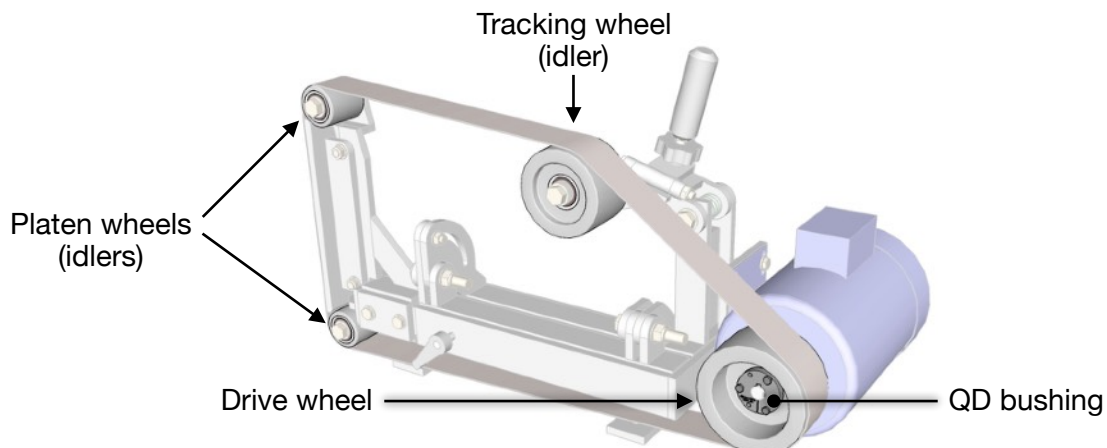


Belt grinder wheels



Notes:

1. I recommend buying belt grinder wheels rather than building them, unless you just want to build them for the fun of it. You can buy a set of wheels that work perfectly with my belt grinder at <https://www.knifegrinderparts.com> I have tried these and they are great quality, and cheap enough that it isn't worth building them to save money.
2. To use these wheels, you will first have to build my 2x72" tilting belt grinder. Plans for it, the platen attachment, and the table holder are available here: <http://etsy.me/2sm5uvg> Plans & Sketchup models for all other attachments & jigs, including these wheels, are available on my website, here: <http://jerswoodshop.com/2x72-tilting-belt-grinder/>
3. It is assumed that you will build and use the belt grinder and its attachments in a safe manner, therefore, few safety precautions are set forth in these plans. Build and use at your own risk. I am not responsible for any injuries caused by the manufacture and use of the belt grinder or these wheels.
4. If you find any errors or see potential improvement to this plan, you can email me at jerswoodshop@gmail.com

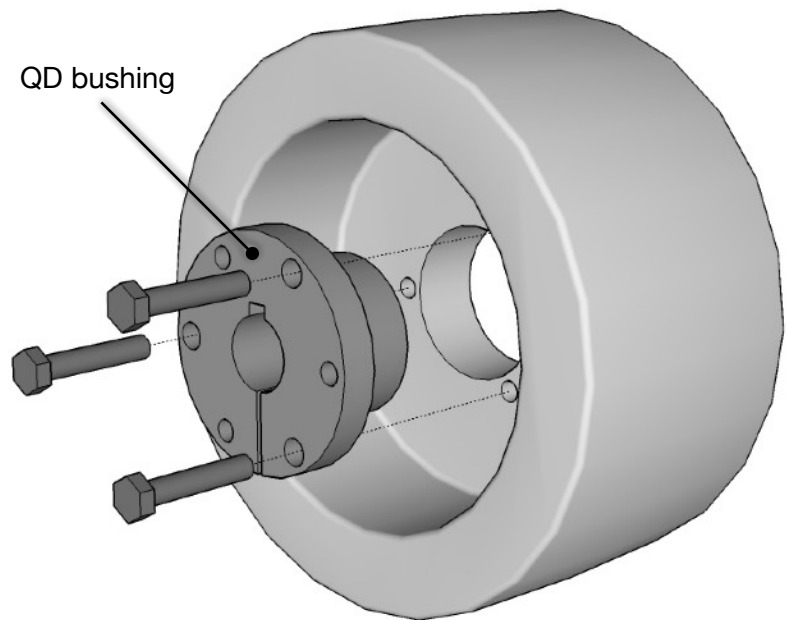
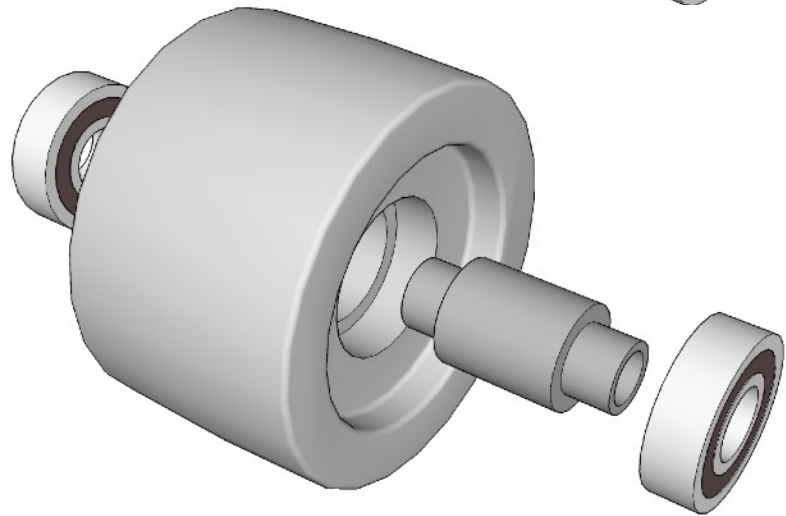
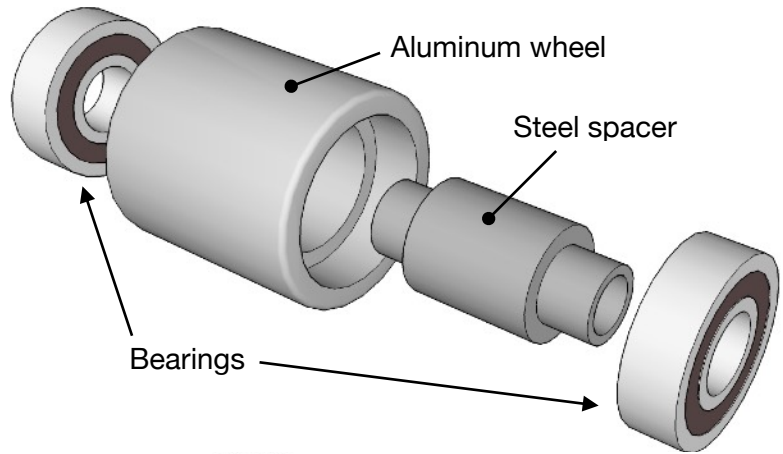


Bearings The bearings I used are Timken P203PP, 17mm ID, 40mm OD, 12mm width, double sealed. This is a very common size of bearing. They are rated for a max RPM of 11,050, which is important since the platen wheels will spin 2.5x as fast as the motor.

Aluminum wheel Aluminum is typically the material of choice for belt grinder wheels. It lasts longer than plastic and can withstand higher temperatures. (These wheels can get *very hot* during use!) Being a lightweight metal it has lower inertia than steel, so the grinder can start and stop quickly. I've also heard static building up in belt grinders, which I have not experienced, and I suspect the conductive wheel material helps with that, but I'm not sure.

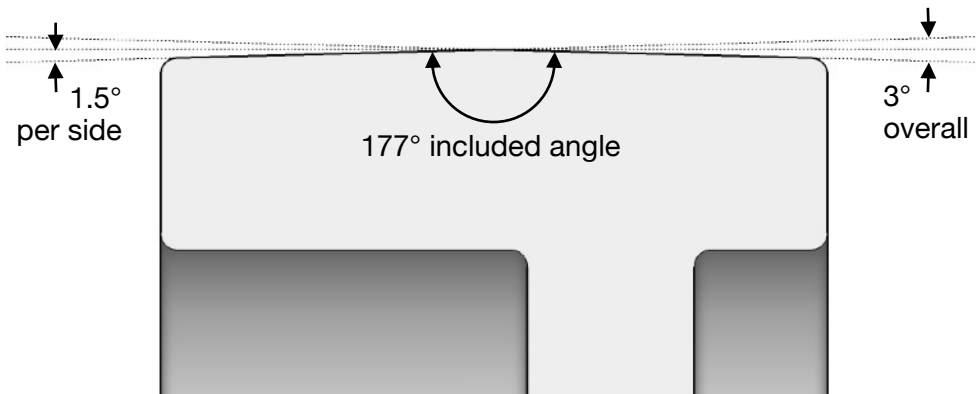
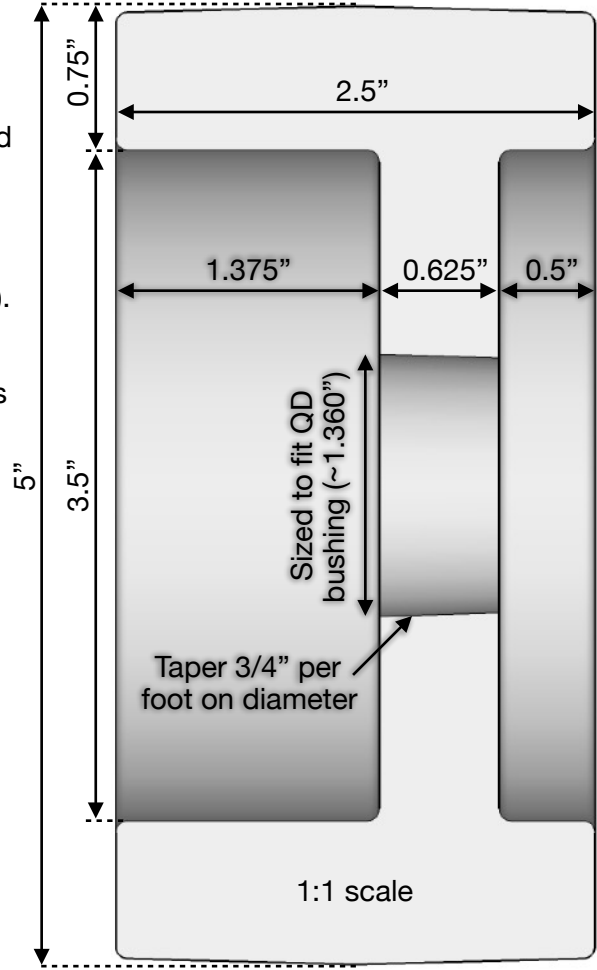
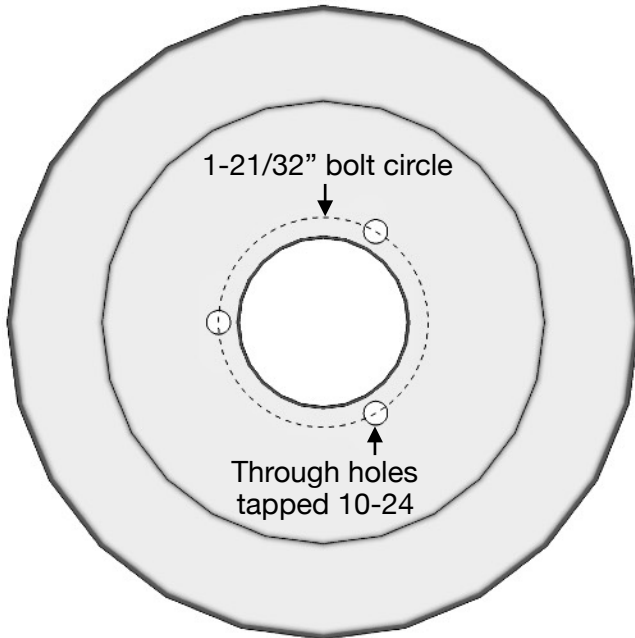
Steel spacer This is a very important component of the idler wheels. It takes the load of tightening the bolt that holds the wheel. Without it, you would destroy the bearings when you tighten the bolt.

QD bushing Most belt grinder wheels use a simple keyway and set screw to hold the drive wheel to the motor. This works fine, but the taper drive bushing has a few advantages. It holds the wheel more concentric to the motor for smoother operation, it doesn't come loose as easily, and if you ever replace the motor with one that has a different shaft diameter, you can simply swap the QD bushing for one with the right bore. The bushing that I used is a size "JA", with a 5/8" bore to match my motor. I think it is actually easier to use a QD bushing if you're making the wheel yourself, because you don't need to bother with cutting a keyway in the wheel.



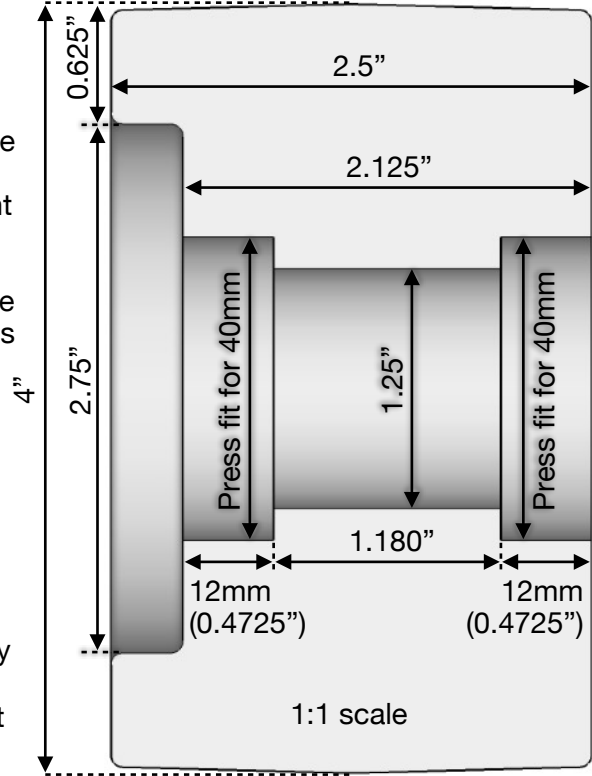
The drive wheel

The drive wheel is 5" diameter and 2.5" width, and has a slight crown on the outer diameter to help with belt tracking. The crown is a simple taper on each side, forming a peak in the middle of the wheel. The taper is 1.5° per side, or about 5/16" taper per foot on the radius (5/8" on the diameter). See the drawing at the bottom of the page. The inner bore is sized to fit the QD bushing, with a taper of 3/4" per foot on the diameter. Three holes need to be drilled & tapped for the bolts that hold the QD bushing, which are a 10-24 thread, and the bolt circle is 1-21/32".



The tracking wheel

The tracking wheel is 4" diameter, 2.5" width, and it has the same crown on the outer diameter as the drive wheel has. It is important that the width of the shoulder between the bearings be exactly right (1.180"), so you can make the width of the shoulder on the spacer the exact same width. If you accidentally make this shoulder too narrow, be sure to make the shoulder on the spacer narrow as well so they are identical. This will ensure the bearings do not experience axial load, which could make them fail prematurely.

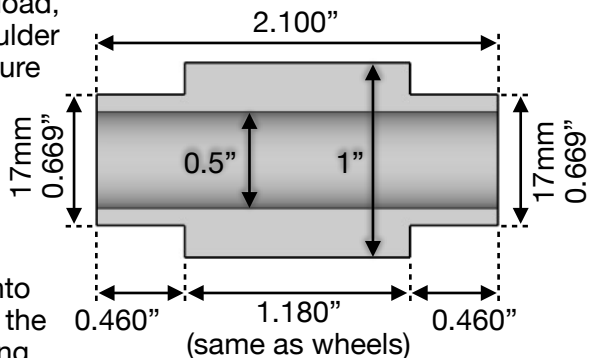
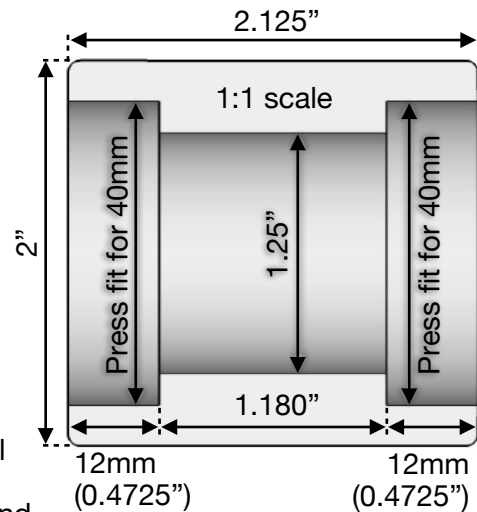


The platen wheels

The platen attachment has two 2" idler wheels, and the small wheel attachment has one. These wheels are 2" diameter and 2.125" width, and they do **not** have a crown, the outer diameter is just a cylinder. As with the tracking wheel, it is important to make the shoulder between the bearings just the right width, or at least keep track of the exact width, so you can make the shoulder on the spacer identical.

The spacers

All of the idler wheels use the same spacers. These are made from 1" diameter mild steel, and they are slightly narrower than the wheels, to ensure the bolt clamps the inner race of the bearing in place rather than bottoming out on the spacer. This is why the spot where the bearing sits is 0.460" wide instead of 0.472". The O.D. of the ends that say 17mm does not need to be a press fit, since the bolt will clamp the race in place to be sure it cannot rotate on the spacer. And I'll say one more time, it is important that the 1.180" shoulder be exactly the same width on both the wheel and the spacer, otherwise the bearings will have axial load, which they are not made for. If you made this shoulder too wide or too narrow on one of the wheels, be sure to make the spacer the same and keep track of which wheel it belongs on.



Assembly

Assemble the wheels by first pressing a bearing into one side of the wheel, then insert the spacer from the opposite side, and then press in the second bearing.