

Plastic Phantom Press Assembly

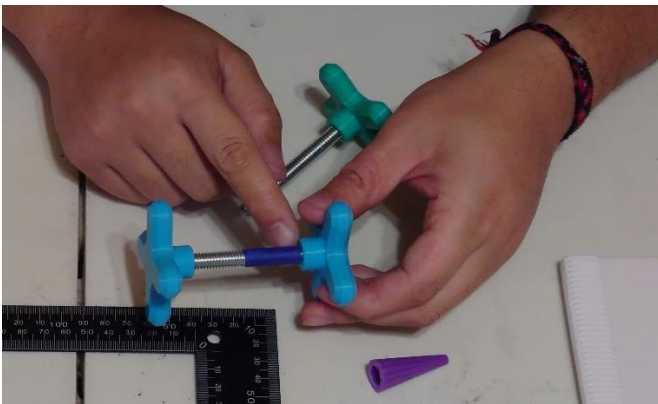
Requires: Two 5/16" x 3" threaded rods & either Two 3/4 x 2-3/16 x .063WG compression springs or Two 5/16" lock nuts. For my metric friends you will use Two 8mm x 100 threaded rods and two matching lock nuts. I don't have a metric equivalent spring. Super Glue for plastic, and lubricant also required.

Pressure Knob Assembly

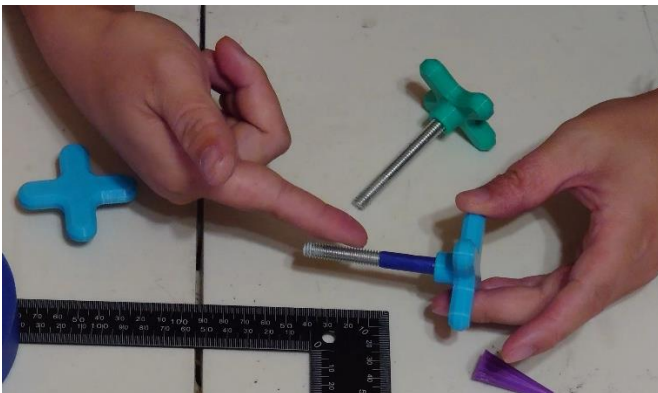


First measure 15mm off the end of the threaded rod and mark it. That is how deep we are going to thread the knobs onto it. The tape on the threaded rod in this picture marks 15mm for me.

Then put a few drops of epoxy or super glue into the cavity of the knob. A slower epoxy like e6000 works well for this.

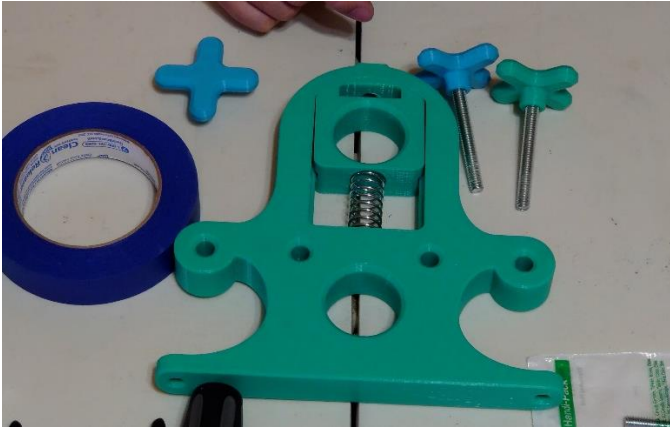


Then thread a knob on both sides and keep twisting them together until your knob reaches the 15mm mark. Avoid using pliers on the threaded rod because you don't want to crush the threads.



Once the glue has settled take off the other knob and then repeat the process for the second pressure knob.

Option 1: Block support Spring method



This is my preferred method to keep the bearing block suspended. It keeps the top roller in one spot with no slack. Simply place the spring in the cavities between the bearing block and the press body. The downside is that two springs cost me \$5, where two lock nuts cost me \$1.50.

Option 2: Block support lock nut method



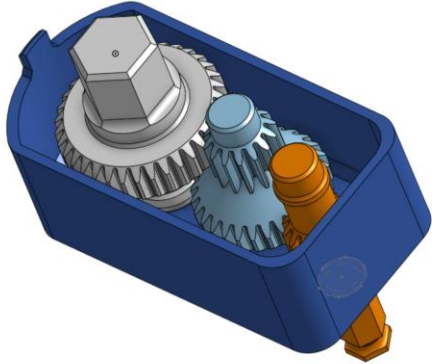
This method is cheaper and uses widely available parts at any hardware store. Simply thread your knob all the way through the press half and then using a pair of pliers hold the lock nut in place while you tighten it to the bolt. Or jam a screwdriver between the wall and the nut to prevent it from turning. You want to put the lock nut on tightly so that it does not unscrew itself when raising and lowering pressure, but not tightened so far that it sticks out the other side of the nut.

Sand the rollers



Using 60 or 80 grit sandpaper, sand away the Z seam off the rollers and sand the entire face of the roller to give it a rough texture. This will help prevent your press from slipping while printing. Do not sand the ends of the roller where it interfaces with the bearing block.

Assembling the gearbox



Place the longer crank gear through the bottom hole of the gearbox cover first, then the middle gear with the big gear side in, and then the smaller side of the hex gear last.



Place a thin line a super glue on the rim of the box. I usually don't put glue on the top notch. And then attach the mounting plate to the gearbox cover. Lubricate the joints where the gears interface with the mounting plate and gearbox cover.

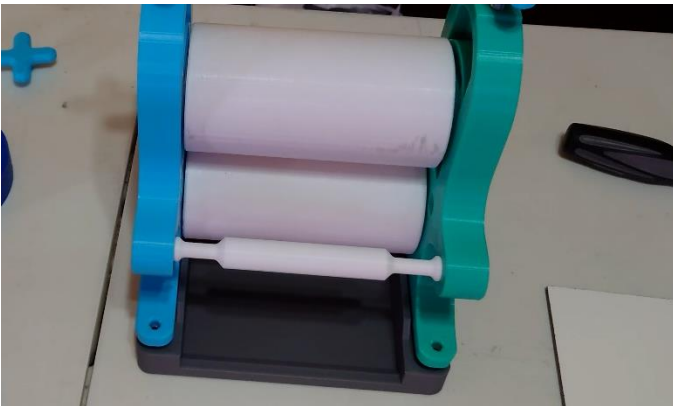
Assembling the Press



The nameplate is designed so it can be mounted to the side of $\frac{3}{4}$ wood. Simply glue it into place. It also fits between the base of the press so that can be used as a spacer between the two halves of the body.



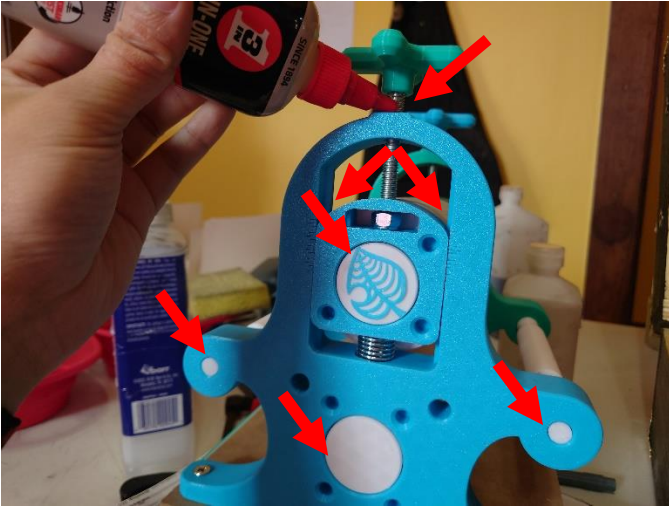
To assemble the press, I wanted it to be as simple as possible so you should just be able to load all the center components into one half and then sandwich the other half on top. Here you must decide whether you want your press to be driven by the top roller or bottom roller and place the roller with the hex hole accordingly. I personally prefer the press to be driven by the top roller.



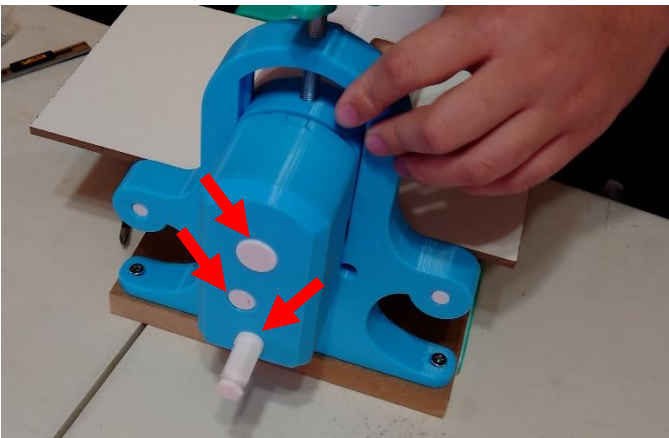
If you 3d Printed a base then simply place your press sandwich and mount it over the pegs on the base. Be warned the pegs are fragile and probably wont survive being separated from the press. This is most likely a 1 time thing.



If you mount the press to a piece of wood I recommend an $8 \frac{1}{4}'' \times 8 \frac{1}{4}''$ piece of $\frac{3}{4}''$ wood. Simply place your press on top and drill pilot holes where the holes in the base are and screw into place. It will be tough and you will have to screw at an angle since there is no direct overhead clearance for the screw.



This might be a good time to grease or oil the press. Luckily PLA is resistant to most petrochemicals so you can grease your press with most lubricants. Just don't use vegetable oil, as plant based oils will grow sticky over time when exposed to air. Add lubricant to the threads of the pressure knobs, and every part of the press where two moving parts meet.



Don't forget the joints on the gearbox and the joints on the mounting plate before you glue it into place



Put some glue in the mounting holes on the bearing block. Then line the hex key on the bearing block with the hex hole on the roller. Then push the gearbox firmly into the press.



If you are driving the press by the bottom roller be advised that the gear box only attaches in one orientation. Insert the gearbox with the curved side on the right. Failure to recognize this may result in breaking the pins.

Calibrating the Pressure



If you are using 5/16" – 18 threaded rods then a quarter turn of the pressure knobs will raise/lower the roller by 1/72 of an inch. So we can at least calibrate the rollers to be parallel within 1/72 of an inch. Go ahead and place your press bed onto the rollers and lower both sides of the top roller until it is touching the press bed.



Grab a strip of copy paper and try to slide it under the left half and the right half of the roller. It should not be able to slide under either side, if it can then lower the rollers until it cannot slide under. Raise both sides of the press bed a quarter turn at a time until you can slide the paper under either of the two sides.



If you can slide the paper under one side but not the other: Raise the side of the roller that is blocking your paper a quarter turn. If you cannot slide the paper underneath still, then repeat.

If you can slide the paper under both sides: then lower both sides of the press a quarter turn at a time and see if you cannot slide the paper underneath. If you cannot slide the paper under then congratulations your rollers are in sync.



You will want to keep your rollers in sync so you know you are keeping even pressure across your press. To keep track of this, use some tape or a marker to mark a set of knob arms. Choose an arm on both knobs that are pointing in the same direction. In the future when changing pressure try to move both knobs at the same time and keep them oriented in the same direction to ensure even pressure.

Congratulations! Your press is ready to use!