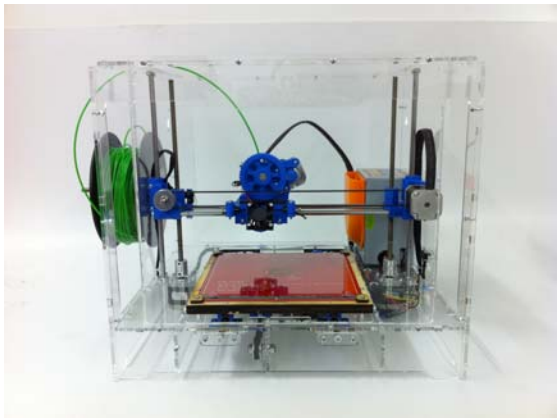
PLASTIBOT

Mendel 3D Printer Assembly



Section 3

Z-Carriage Assembly

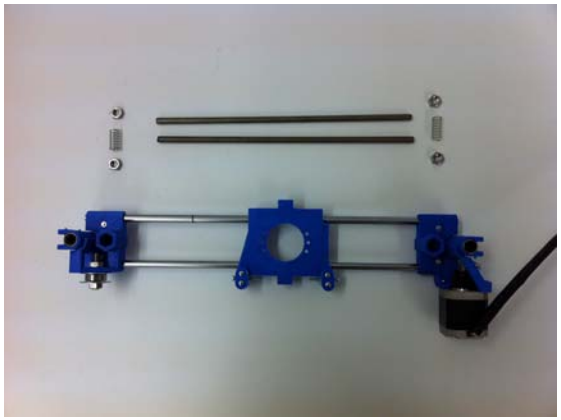
Step 1: Adding the backlash mechanism

Parts Needed:

- X-carriage assembly
- 12” threaded rods (1 pcs)
- backlash springs (1 pcs)
- M8 nuts (2 pcs)

Tools Needed:

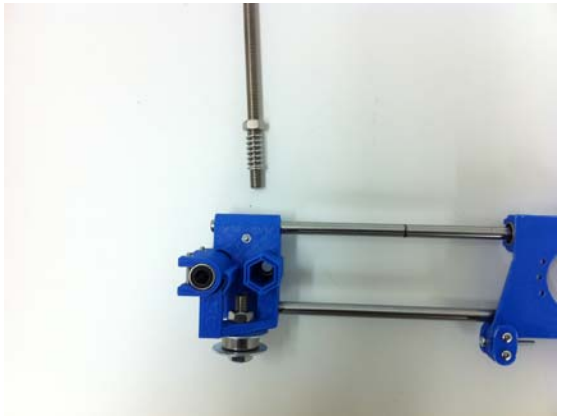
- your hands



Locate the items shown above.

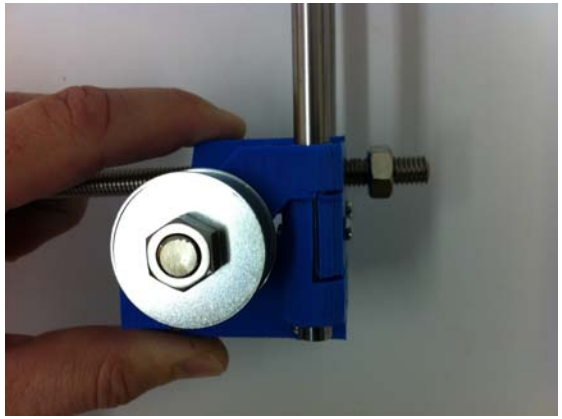
Insert the M8 nut on the bottom of the X-end-idler

Take one of the M8 threaded rods and screw in one M8 nut then insert a backlash spring as shown in the picture above.



Flip over the X-idler and insert the threaded rod holding the spring with one of your fingers.

Screw the threaded rod into the bottom nut.



Apply pressure to the spring so that the bottom nut pops out about one body length and then screw in the nut. Then release pressure and let it go back into the nut trap.

Step 2: Adding the backlash mechanism (Cont).

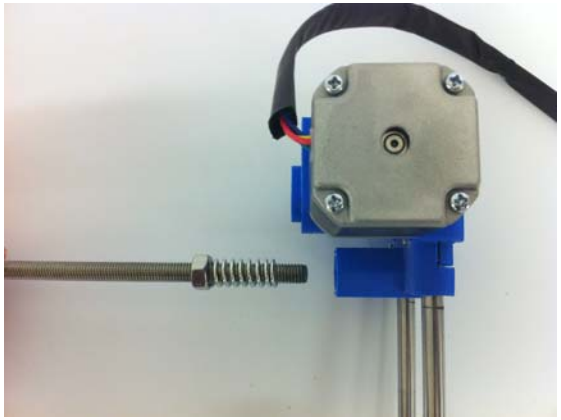
Parts Needed:

- X-carriage assembly
- 12” threaded rods (1 pcs)
- backlash springs (1 pcs)
- M8 nuts (2 pcs)

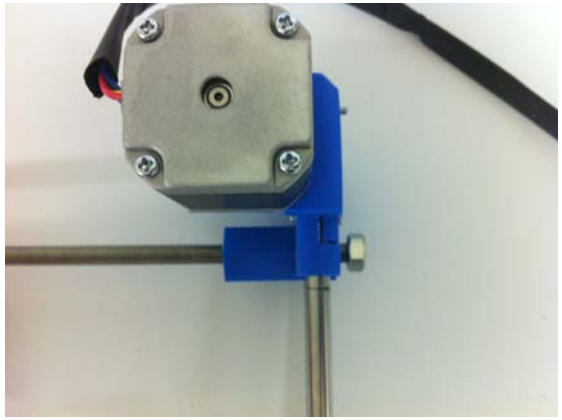
Tools Needed:

- Your hands

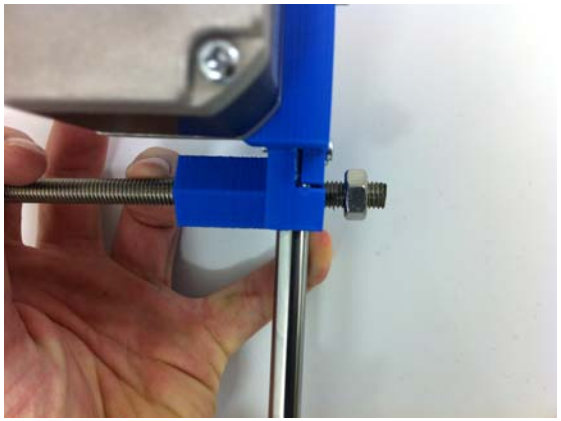
Repeat the same steps done on previous page this time for X-end-Motor. Take the second threaded rod, screw-in a nut and insert the backlash spring.



Insert the threaded rod with the nut and backlash spring from the top of the X-end-motor assembly

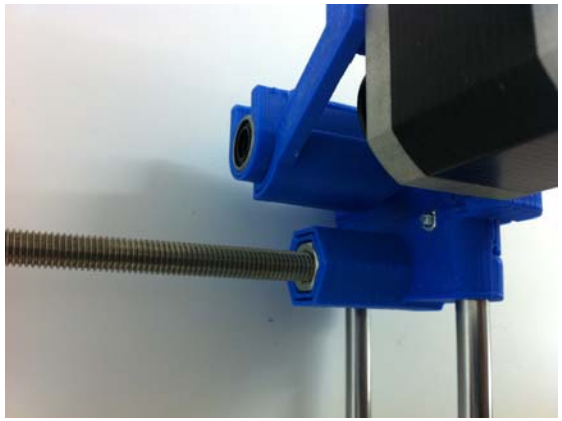


Screw in the bottom nut.



Apply pressure to the spring so that the bottom nut pops out about one body length and then screw in the nut.

Then release pressure and let it go back into the nut trap.



This is how it should look now.

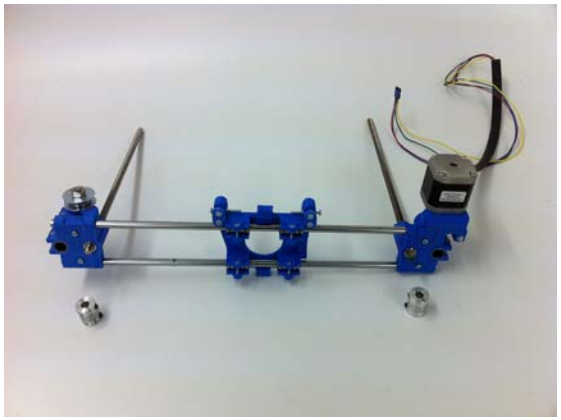
Step 3: Adding couplings

Parts Needed:

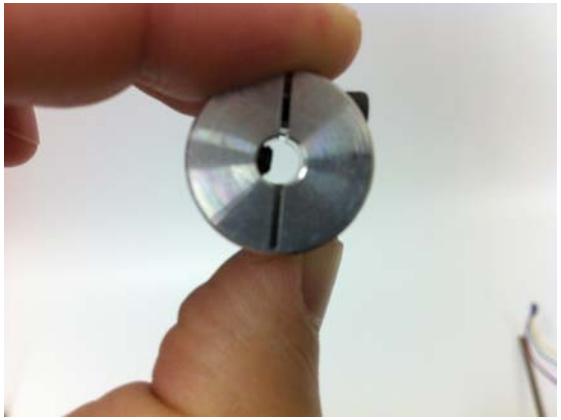
- X-carriage assembly
- Couplings (2 pcs)

Tools Needed:

- Allen Key #2 (Metric)

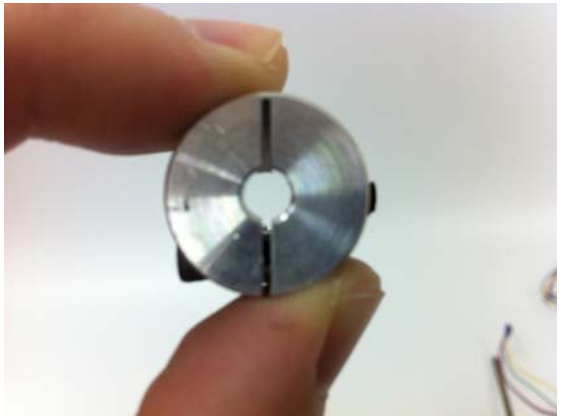


Locate the parts shown above.



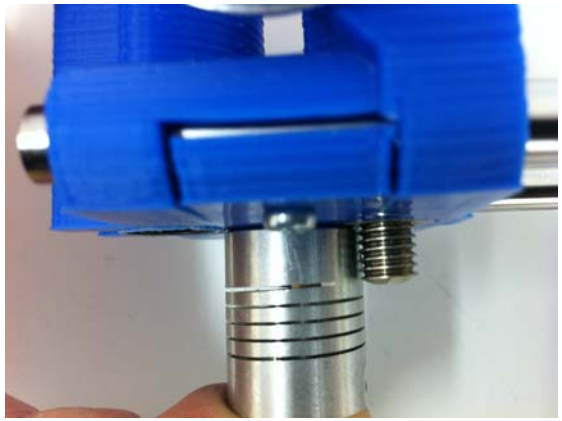
Make sure the setscrews on the couplings are not obstructing the hole. In this case you can see the setscrew protruding.

Use the #2 Allen key to unscrew the setscrew until it doesn't show anymore..



This I show the hole should look after unscrewing the setscrew. Make sure you do this on both holes of each coupling.

Find the hole on the coupling with the bigger diameter



Face the coupling against the bottom surface right next to the threaded rod and screw in or out the threaded rod so that the end of the threaded rod is where the spiral on the coupling starts.

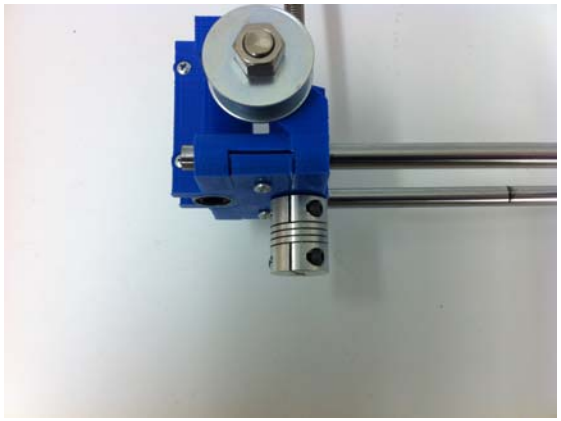
Step 4: Adding couplings (cont.)

Parts Needed:

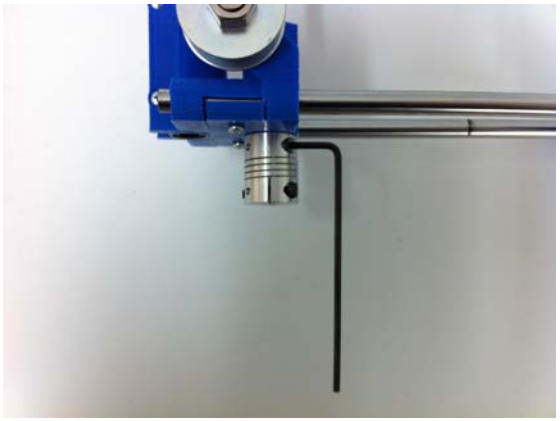
- X-carriage assembly
- Couplings (2 pcs)

Tools Needed:

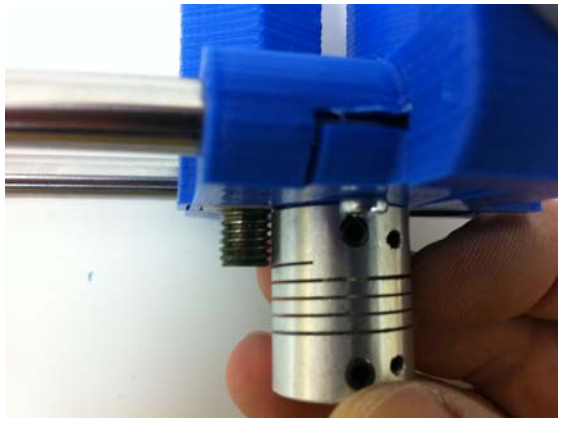
- Allen Key #2 (Metric)
- Allen Key #2.5 (Metric)



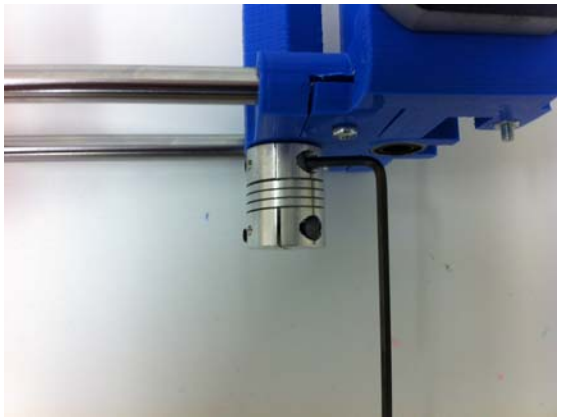
Insert coupling on threaded shaft.



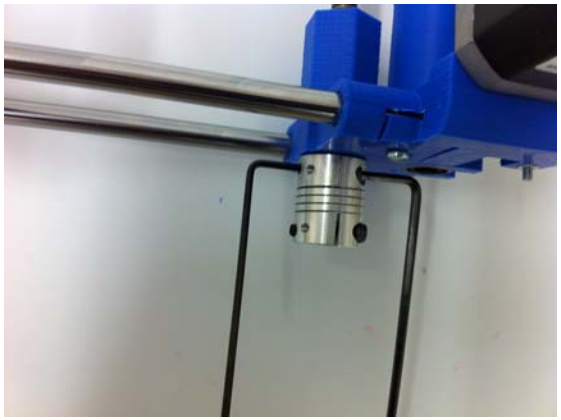
Use #2 Allen key to tighten until threaded rod can turn separate from coupling.



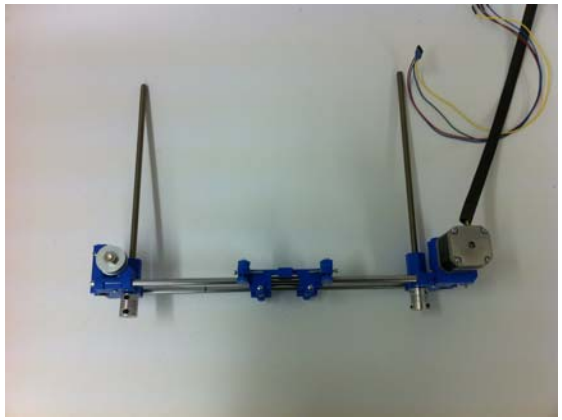
Face the coupling against the bottom surface and screw in or out the threaded rod so that the end of the threaded rod is where the spiral on the coupling starts.



Insert the coupling into the threaded rod and use an Allen key to tighten.



Using the second Allen Key tighten the setscrew. Tighten the setscrew on the other end as well.



The assembly should now look like this.

Step 5: Adding Left side Z Smooth rod

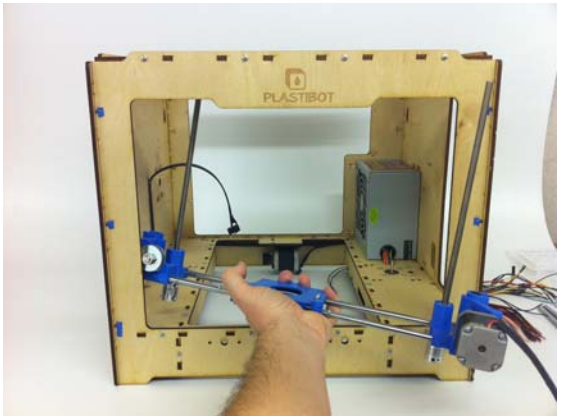
NOTE: If the smooth rods are not completely parallel when inserted into the linear bearings, some of the balls on the linear bearing will pop out. That is normal as long as you only get a couple or so out.

Parts Needed:

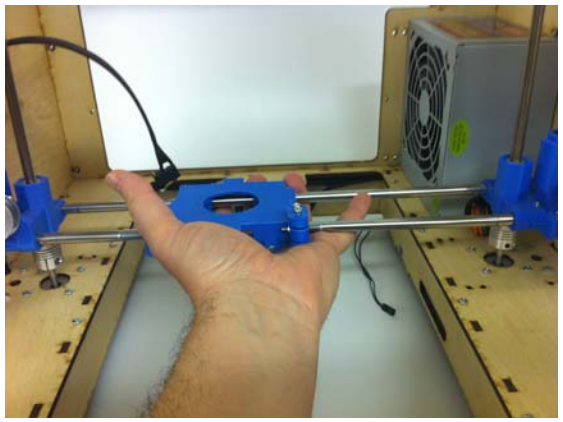
- X-carriage assembly
- Frame Assembly
- Z smooth rods (2 pcs)

Tools Needed:

- Your hands

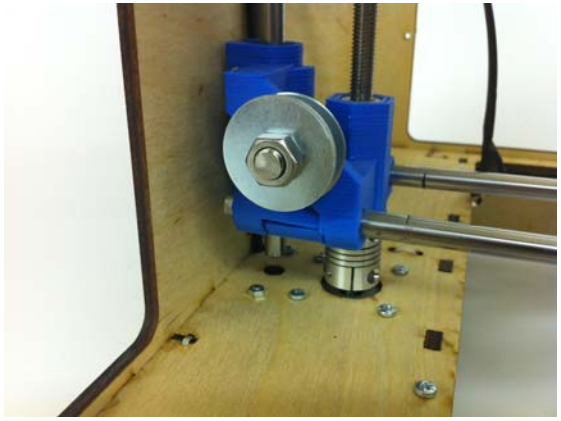


Take the assembly previously finished and carefully insert it into the frame using the Front window (window with the plastibot logo)



Align the couplings to the Z-motor shafts and let them sit on top of the shafts

Insert the Left side Z smooth rod into the hole on the Top Assembly and Lower it to just before the X-end-idle Linear bearings.



Align the left side linear bearings with the smooth rod. **Keep them as parallel as possible** and insert the rod thru the linear bearings.

Align the smooth rod with the bottom hole and push the smooth rod all the way into the bottom panel.

Continue to push down the smooth rod from the top until the rod is flush (or a couple mm) on the top panel

Step 6: Adding right side Z Smooth rod

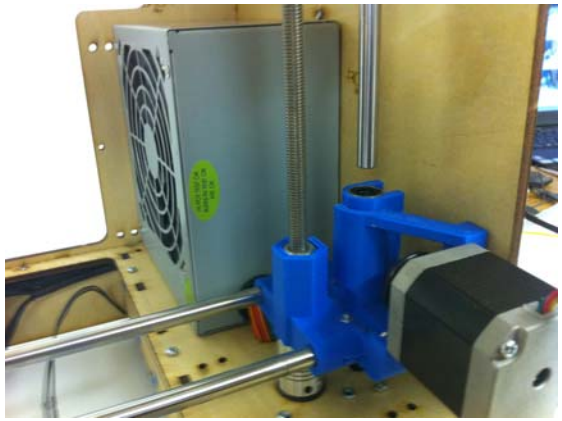
NOTE: If the smooth rods are not completely parallel when inserted into the linear bearings, some of the balls on the linear bearing will pop out. That is normal as long as you only get a couple or so out.

Parts Needed:

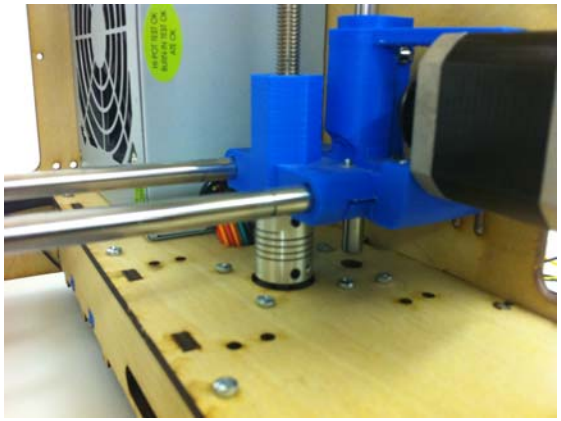
- X-carriage assembly
- Frame Assembly
- Z smooth rods (2 pcs)
- Zip Ties (2 pcs)

Tools Needed:

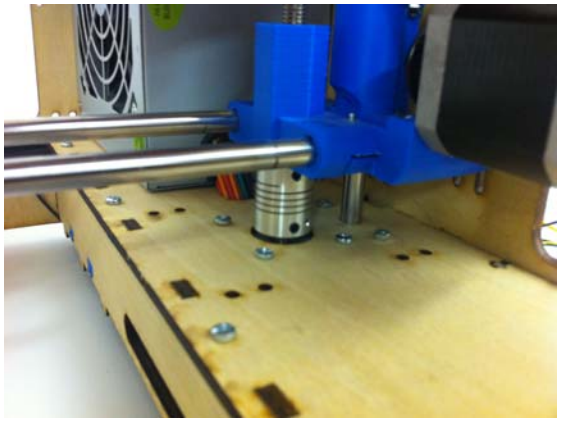
- Your hands



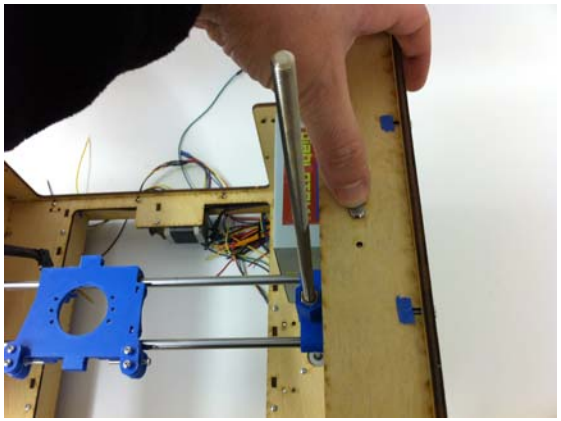
Insert the Right side Z smooth rod into the hole on the Top Assembly and Lower it to just before the X-end-motor Linear bearings



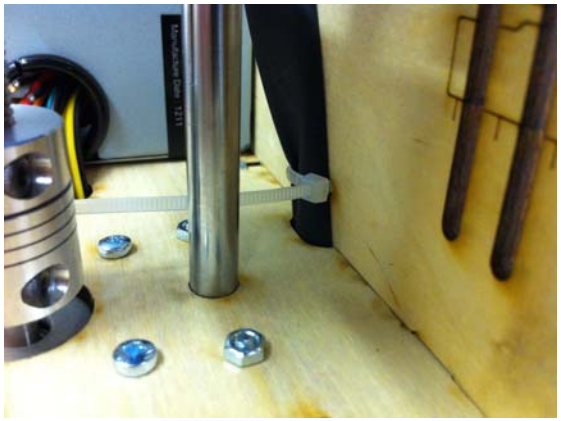
Align the Right side linear bearings with the smooth rod. **Keep them as parallel as possible** and insert the rod thru the linear bearings.



Align the smooth rod with the bottom hole and push the smooth rod all the way into the bottom panel.



Continue to push down the smooth rod from the top until the rod is flush (or a couple mm) on the top panel.



Use a zip tie to secure the wire harness in place to the left panel at the bottom section.

Use a second zip tie to secure to the left panel at the middle section.

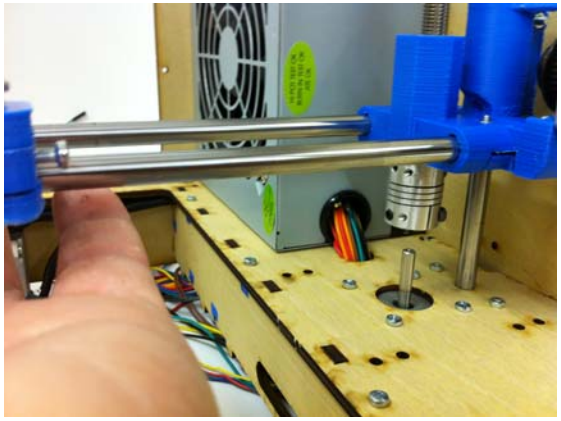
Step 7: Tightening couplings to motor shaft

Parts Needed:

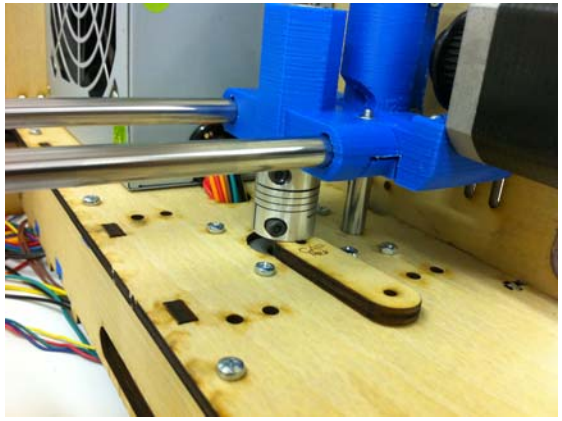
- Frame assembly
- laser cut caps (2 pcs)

Tools Needed:

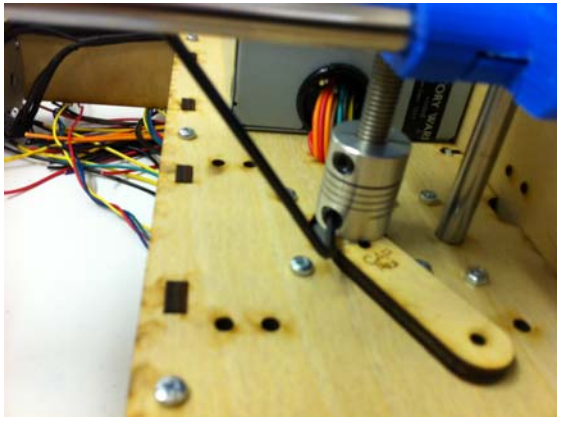
- Allen Key #2 (Metric)
- Allen Key #2.5 (Metric)



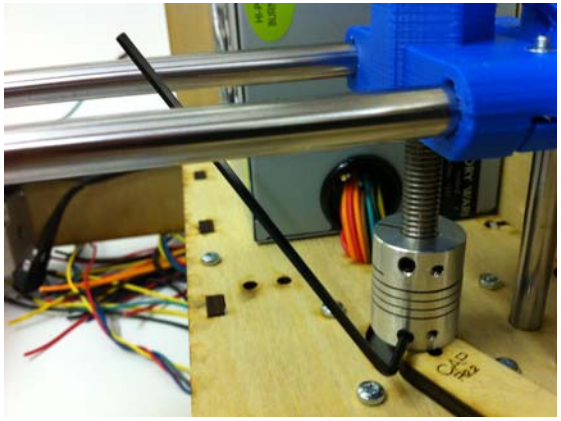
Align the couplings on both ends to the motor shafts and insert if they arent inserted already.



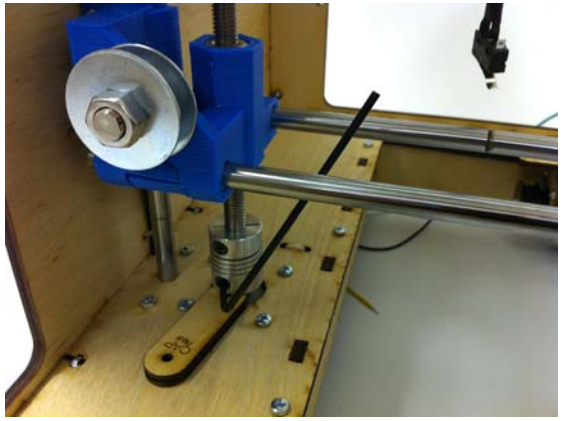
Put one of the laser cut plywood cap under the coupling as a spacer gage as shown here. Do the same on the other coupling.



Use #2.5 Allen key to tighten the coupler to the motor shaft. If there isn't enough room to turn the Allen key, then turn the 2 threaded rods to raise the Z axis



Use Allen key #2 to tighten the setscrew, then remove the laser cut cap



Repeat for the other side. Use #2.5 Allen key to tighten the coupler to the motor shaft

Use Allen key #2 to tighten the setscrew, then remove the laser cut cap.

Step 8: Installing the belt

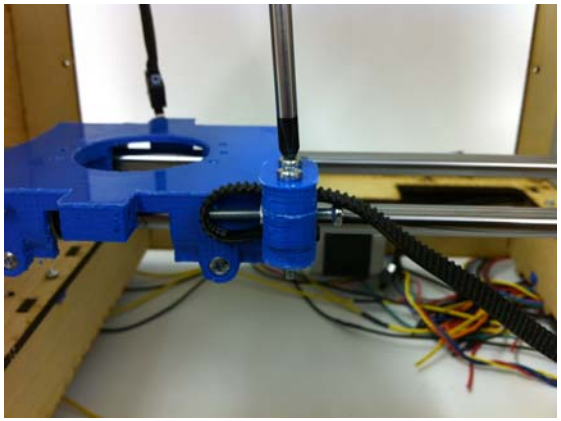
Parts Needed:

- Frame Assembly
- Timing belt

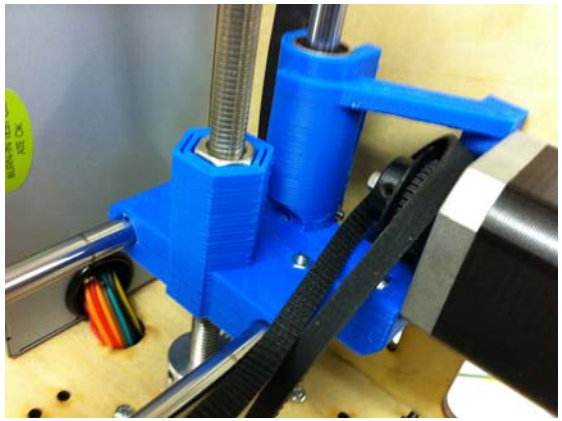
Tools Needed:

- philips screwdriver

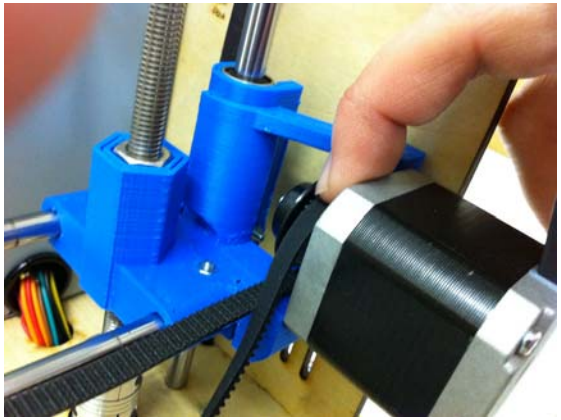
Locate one of the timing belts and unroll it.



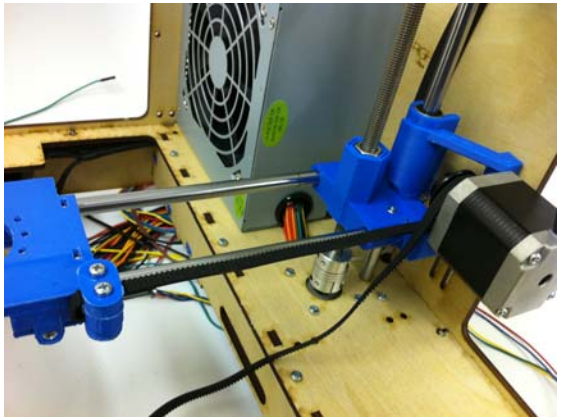
Start by clamping one end of the belt on the right side clamp. The belt teeth should be facing up. Use a screwdriver to tighten.



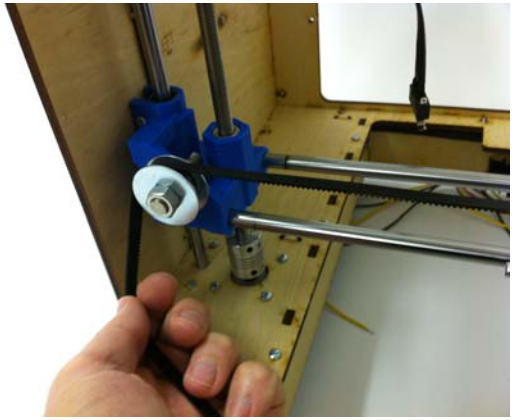
Take the belt and wrap it around the pulley from bottom to top. Most likely you won't be able to get the belt inserted on the bottom as there is little gap. That is fine.



Put your finger on top of the belt on the upper side of the pulley. Use your other hand to pull away the X-Carriage so that the pulley rotates while guiding the belt with your finger.



The belt will align into position on the bottom.



Take the opposite end of the belt and wrap it around the idler.

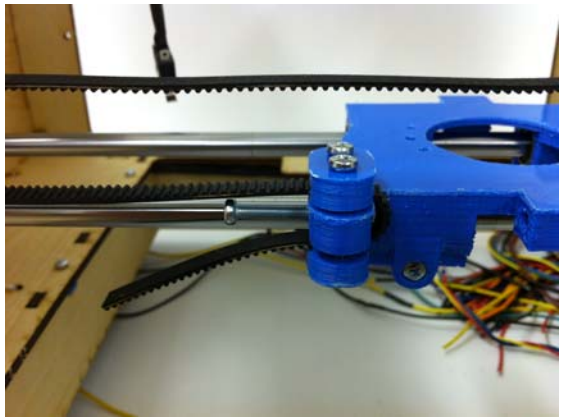
Step 9: Installing the belt (cont.)

Parts Needed:

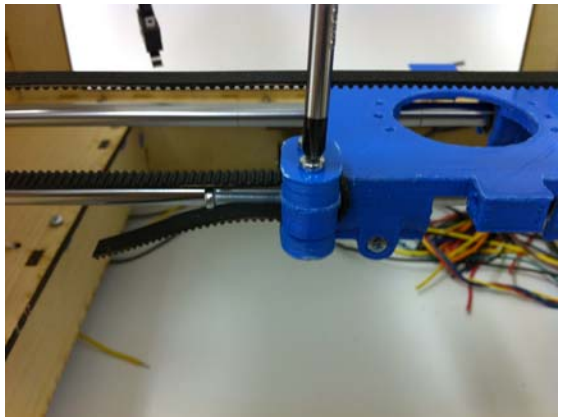
- Frame Assembly
- Timing belt
- Laser Cut plywood caps (2 pcs)
- M3 x 12mm screw (4 pcs)
- M3 Hex nut (4 pcs)

Tools Needed:

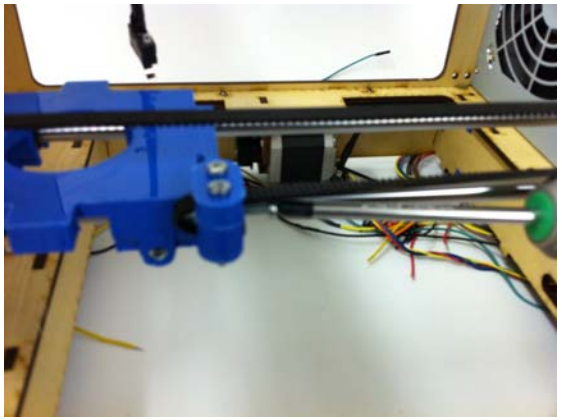
- philips screwdriver



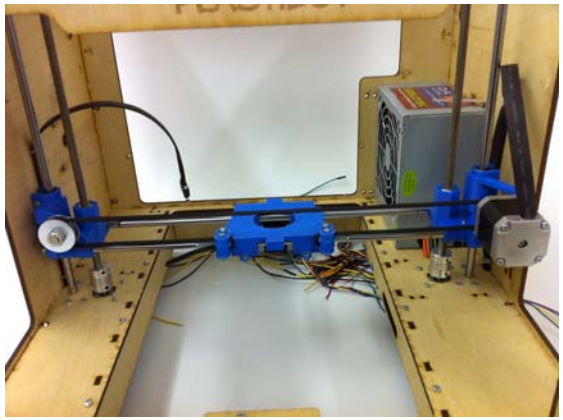
Insert the belt on the left side clamp and u-turn it thru the clamp as shown.



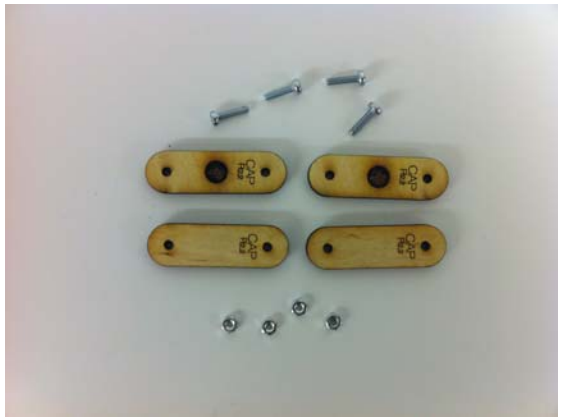
Pull the belt tight and use the screwdriver to secure in place.



Use the screwdriver to tension the belt. It should be firm. Not extremely tight neither sloppy.



This is how the belt should look once finished.



Locate to the following parts: Plywood caps (either flat or carved as needed as per next steps), M3 x 12 Screws and M3 Hex nuts.

If your smooth rod protrudes like this picture above, use one of the carved caps. Otherwise if it's flush like in the next picture use aflat cap.

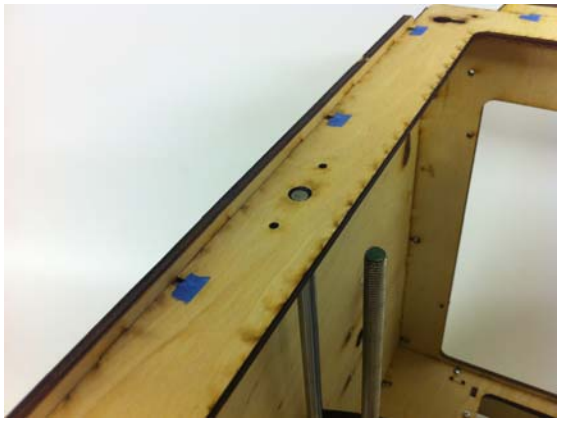
Step 10 Adding Rod caps

Parts Needed:

- Frame assembly
- Laser cut rod caps
- M3 x 12 screws (4 pcs)
- M3 nuts (4 pcs)

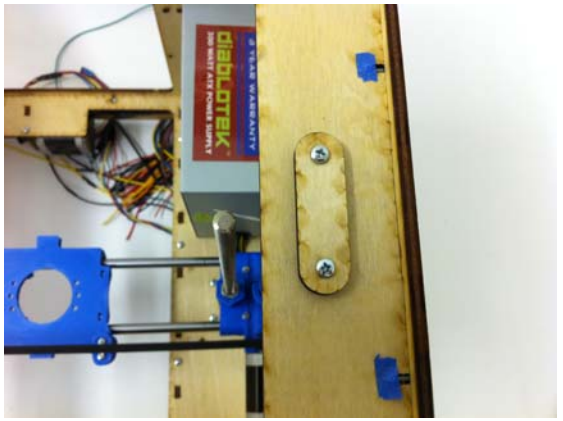
Tools Needed:

- Vise grip pliers
- philips screwdriver

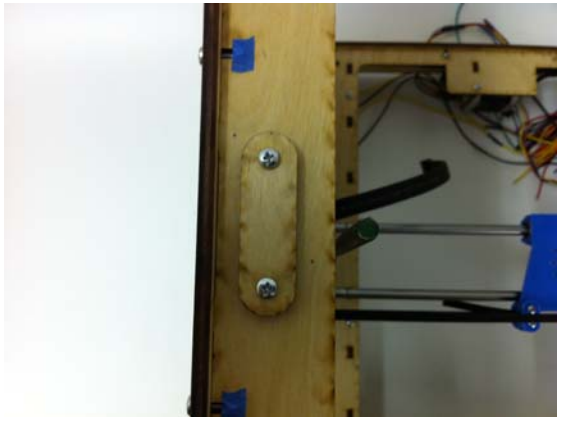


Here is an example of a flush smooth rod. Use a flat cap if it looks like this.

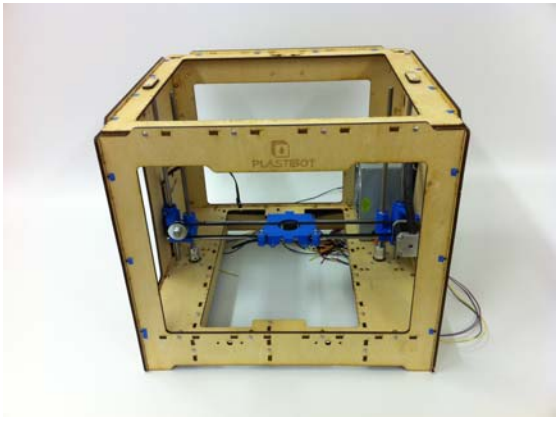
Insert M3 x 12mm screws into caps as shown and use the caps to cover the Z smooth rod holes on Top panel as shown.



Place cap in position and use the M3 Hex nuts to fasten in place.



Repeat for the other side.



This is how it should look. You just finished section 3.