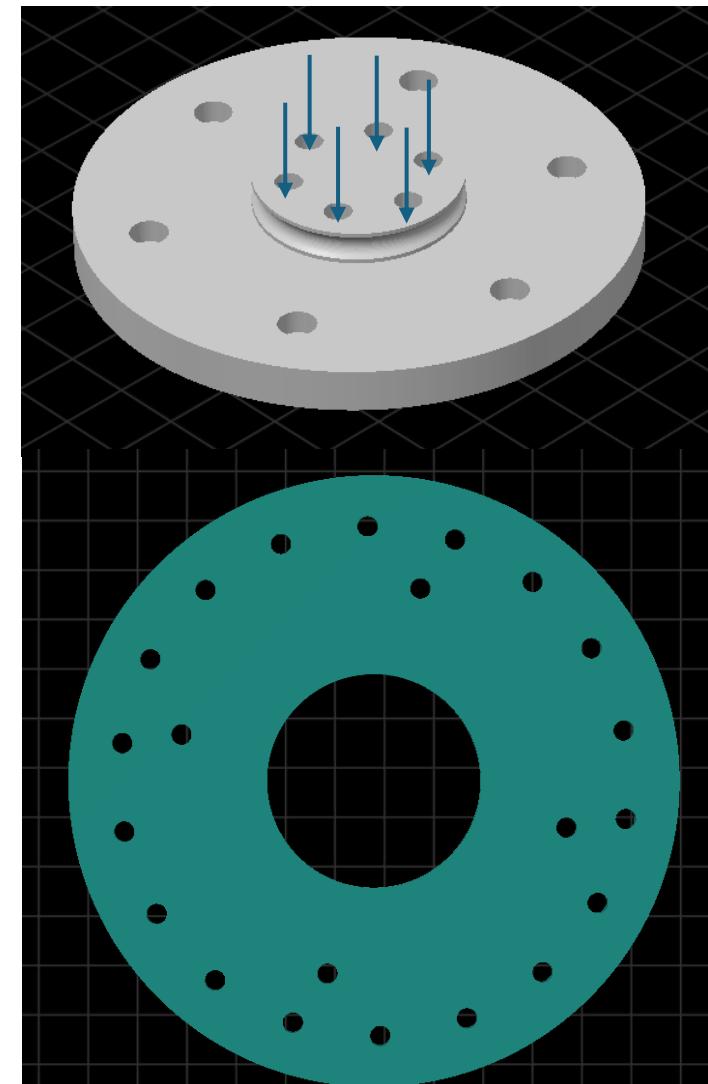
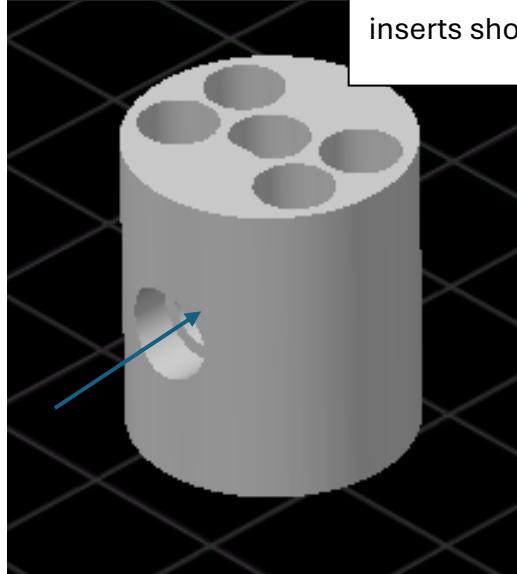
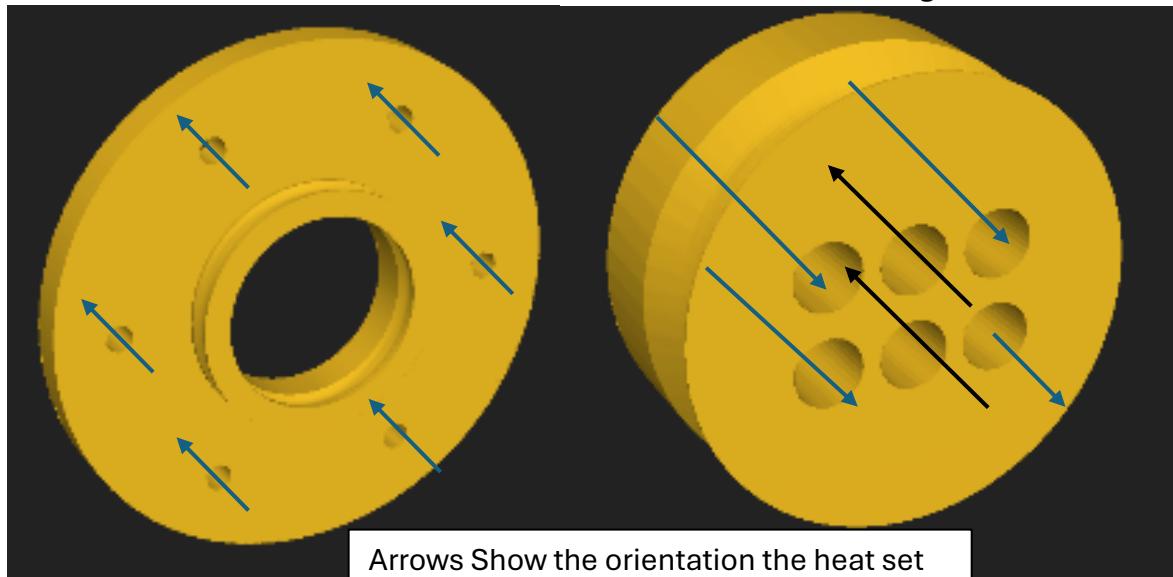


Heat Set Inserts

You will need a total Of 41 m3 x 4x 5 heat set inserts and a soldering iron.



Roller Bearings Assembly

What you will Need:

Roller-A x18

Roller-B x 18

Roller-C x 18

Roller-D x 18

MR74ZZ x 36

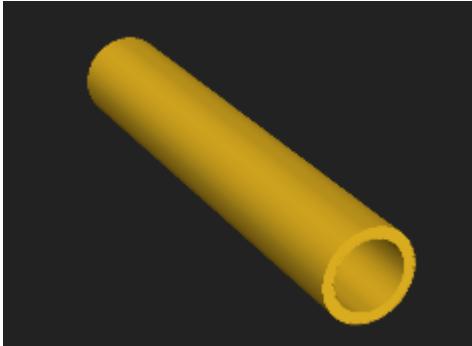


Figure 1 Roller-A



Figure 3 Roller-B

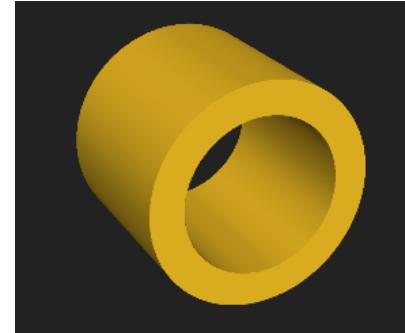


Figure 2 Roller-C

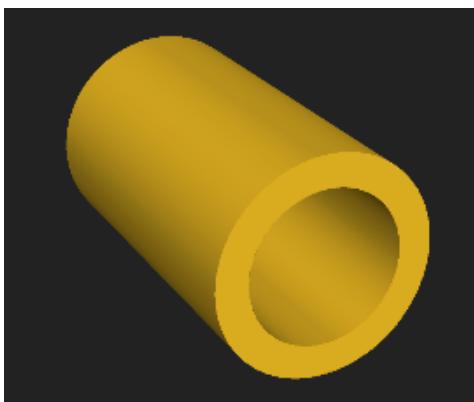


Figure 5 Roller-D



Figure 4 MR74ZZ



Step 1. You will need 1 of each of the following components: Roller-A, Roller-B, Roller-C, Roller-D. You will also need 2 MR74ZZ.



Step 2. Press Roller-B (Smallest Spacer) onto Roller-A (Shaft) using a pair of pliers or your fingers until flush with the bottom of Roller-A.



Step 3. Using your fingers or pliers press 1 x MR74ZZ onto Roller-A (Shaft).



Step 4. Using your fingers or pliers press 1 x Roller-C (Medium Spacer) onto Roller-A (Shaft).



Step 5. Using your fingers or pliers press 1 x MR74ZZ onto Roller-A (Shaft).



Step 6. Using your fingers or pliers press 1 x Roller-D (Large Spacer) onto Roller-A (Shaft). (Repeat from Step 1 until you have 18 x Roller Bearings.)

Output Bearing Assembly

What you will Need:

6 x H-1

12 x H-2

12 X 687-2RS Bearings

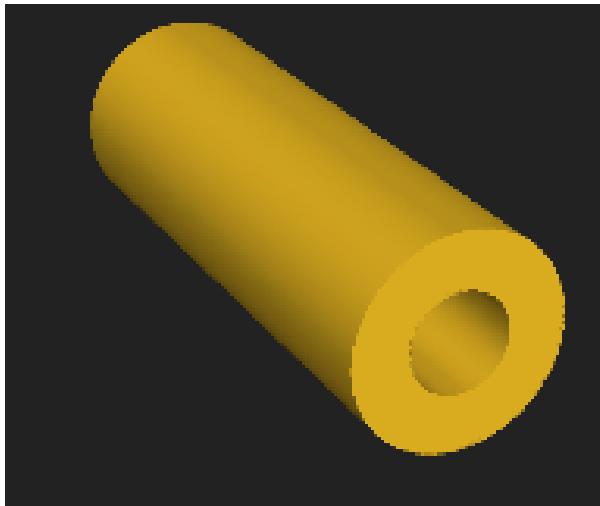


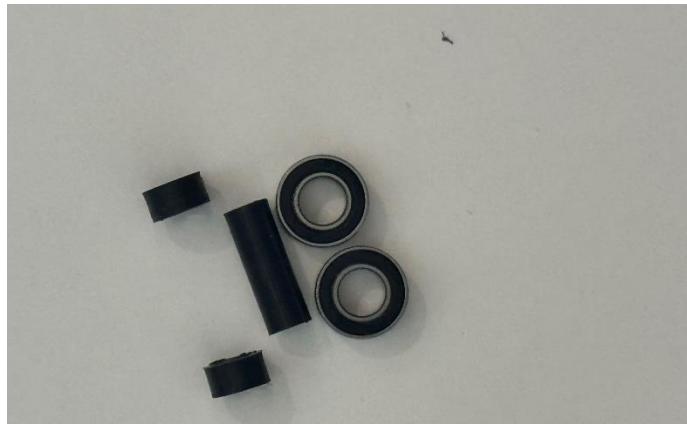
Figure 7 H-1 (Output Bearing Shaft)



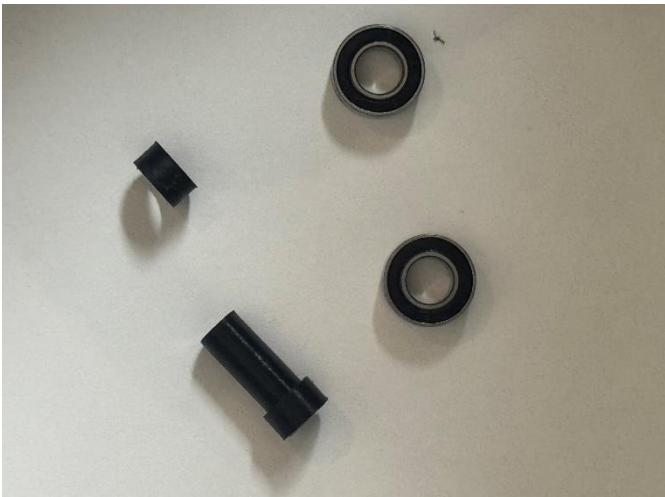
Figure 6 H-2 (Output Bearing Spacer)



Figure 8 687-2RS Bearing



Step 1. Gather 1 H-1(Output bearing Shaft), 2 H-2(output Bearing Shaft spacers) and 2 687-2RS bearings.



Step 2. Press 1 H-2 (spacer) onto the Shaft.



Step 3. Press two 687-2RS onto the Shaft.



Step 4. Press one H-2 (spacer) onto the Shaft.
(Repeat from Step 1 until you have 6 Output Bearings.)

Output Flange Bearing Assembly

What you will need:

1 x B (Bottom Output Flange)

1 X B-C Cage(12 Ball Bearing Cage)

12 x 4mm Stainless Steel Ball Bearings

1 x C (Input Shaft)

A pair of tweezers or a small Flat head screwdriver.

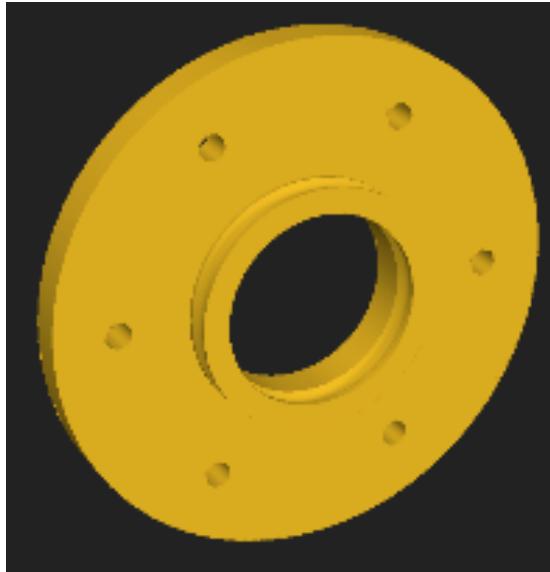


Figure 10 B (Bottom Output Flange/Disk)



Figure 9 B-C Cage (12 Ball Bearing Cage)

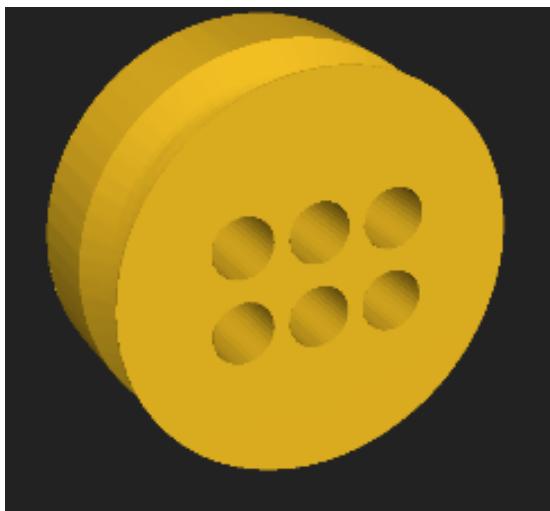


Figure 11 C (Input Shaft)



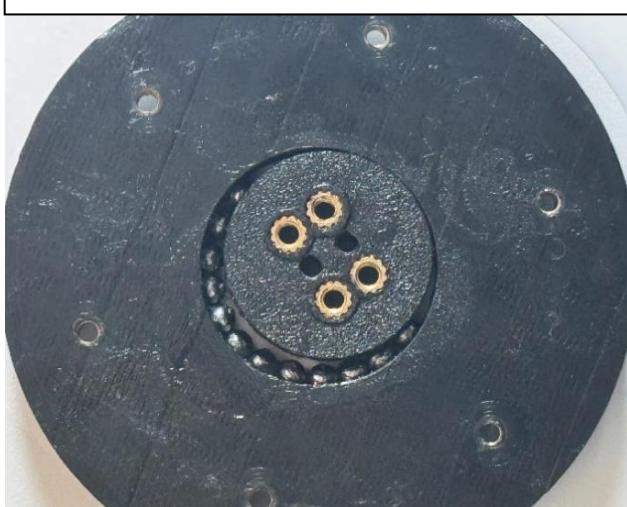
Step 1. Gather one B (Bottom Output Flange), One B-C Cage (12 ball Bearing Cage), 12 4mm ball bearings and 1 C(Input Shaft).



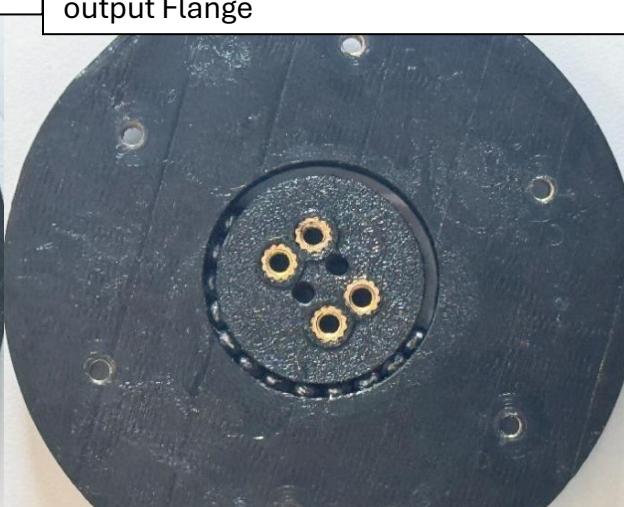
Step 2. Orient the input shaft(C) and output flange(B) as shown. Make Sure the input shaft is tangent to the inner Diameter of the output Flange



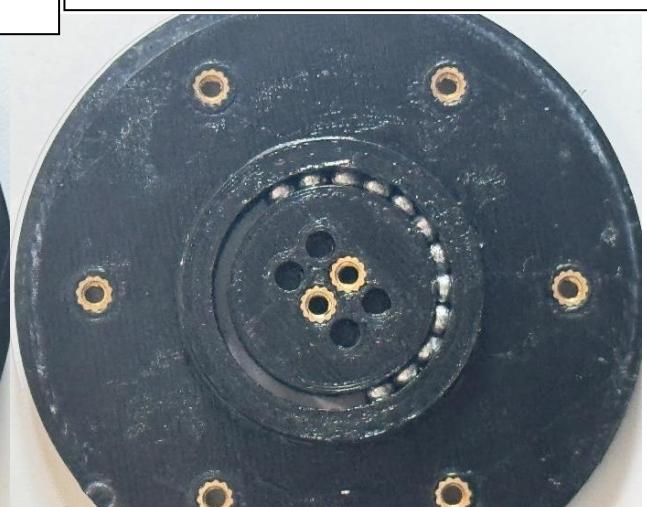
Step 3. Start inserting Ball Bearings into the empty space between the input shaft and the output flange.



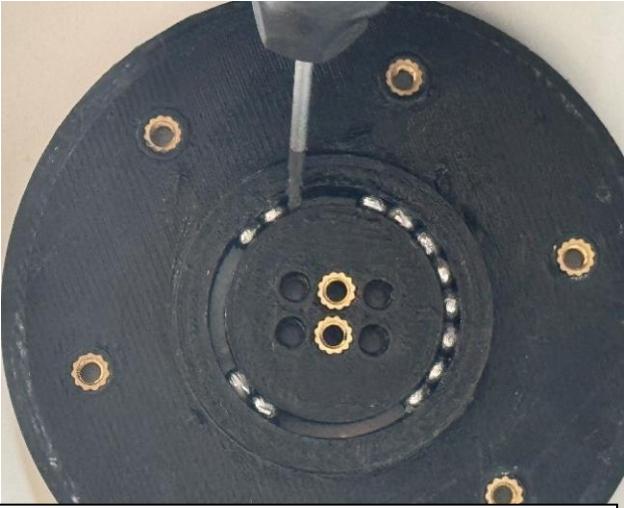
Step 4. Carry on inserting ball bearings until all 12 ball bearings are inserted.



Step 5. Pull the input shaft until it is resting upon the ball bearings. (the Gap should be even)



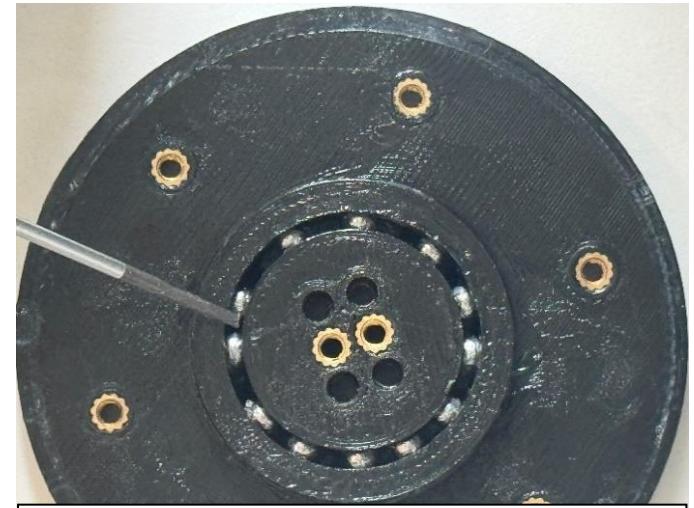
Step 6. Flip the assembly over, so that the outer bearing race on the Bottom output Flange(B) is facing the ceiling.



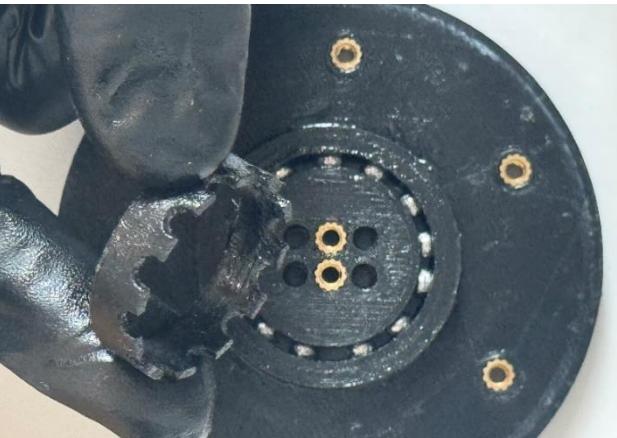
Step 7. Start aligning the ball bearings in to pairs with either a flat head screwdriver or a pair of tweezers.



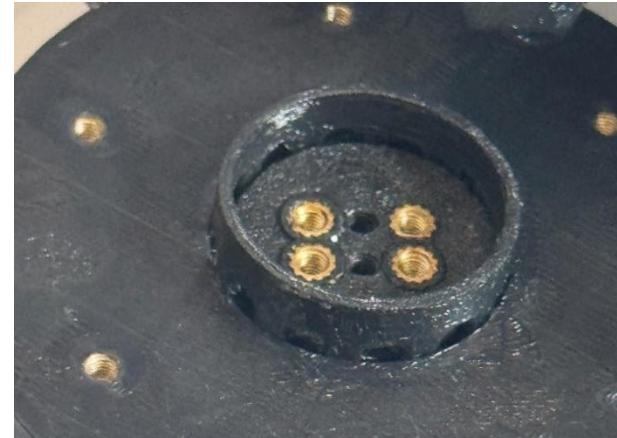
Step 8. Carry on until all ball bearings are evenly spaced.



Step 9. Split the pairs of ball bearings until they are roughly evenly spaced.



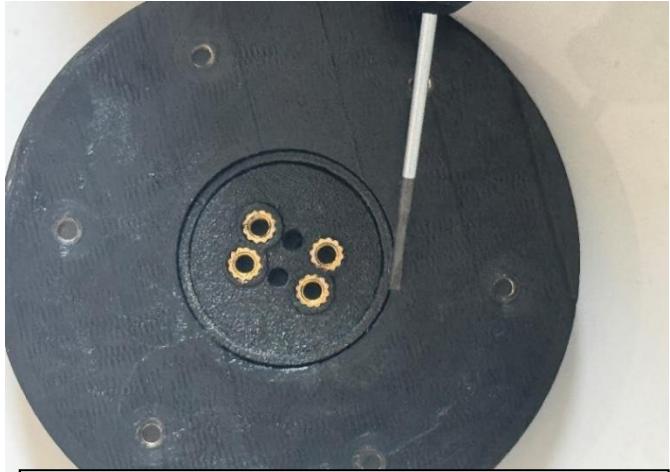
Step 10. Grab bearing cage.



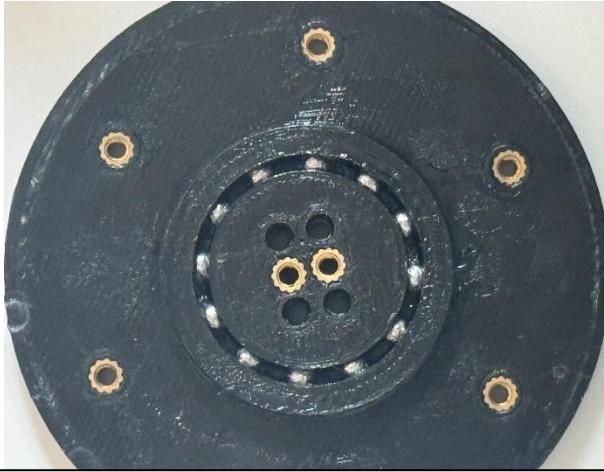
Step 11. Rest bearing Cage on top of ball bearings.



Step 12. Push bearing cage through. Making sure ball bearings align with cage slots. (do this slowly as to not break the cage. It is recommended to Flip the assembly once more to adjust the ball bearings)



Step 13. Once ball bearings are aligned,
Using either tweezers or a flat head screw
driver seat the cage until it is fully seated.



Step 14. Flip the Assembly over once more.
Add grease in between bearing races.
Rotate the centre shaft whilst gripping the
outer flange to ensure an even coating.

Bottom Output Disk to Output disk Assembly

What you will need:

18 x 4mm Stainless Steel Ball Bearings

1 x A (Outer Housing)

1 x Output Bottom flange/disk Assembly

1 x A-B Cage (18 Ball Bearing Cage)

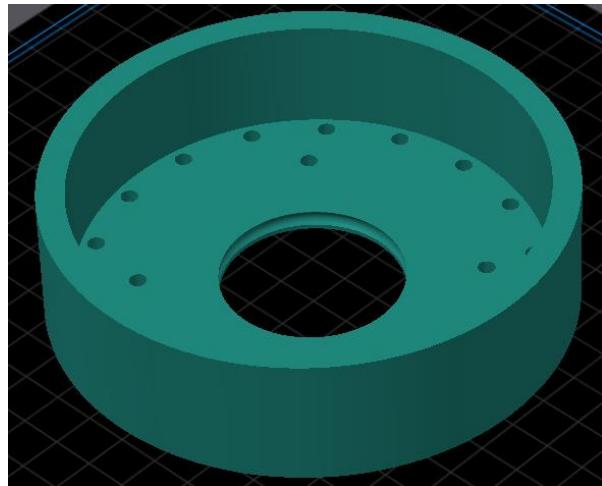


Figure 12 Outer Housing (A)

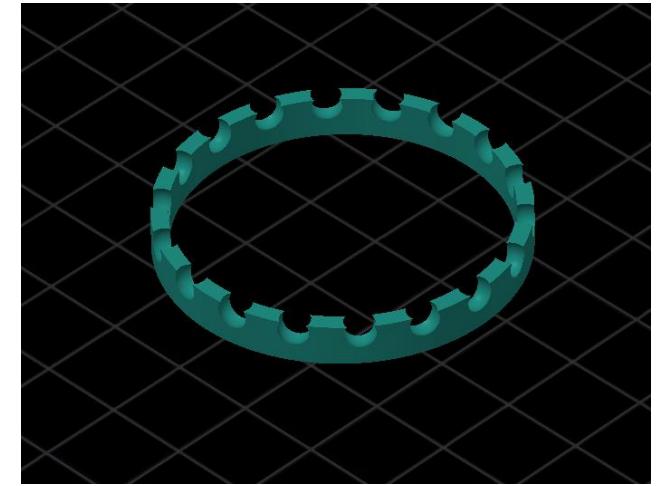


Figure 13 18 Bearing Cage (A-B)

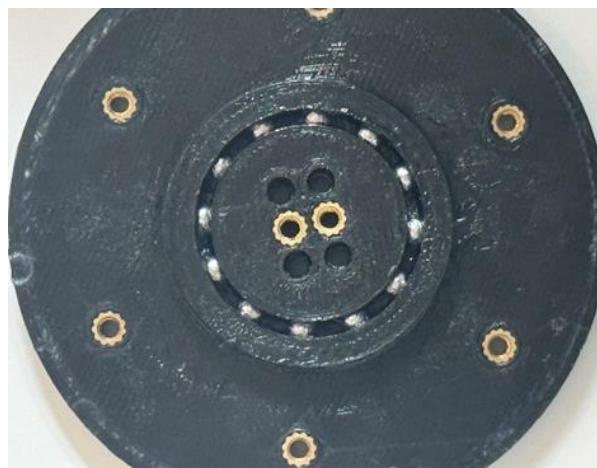


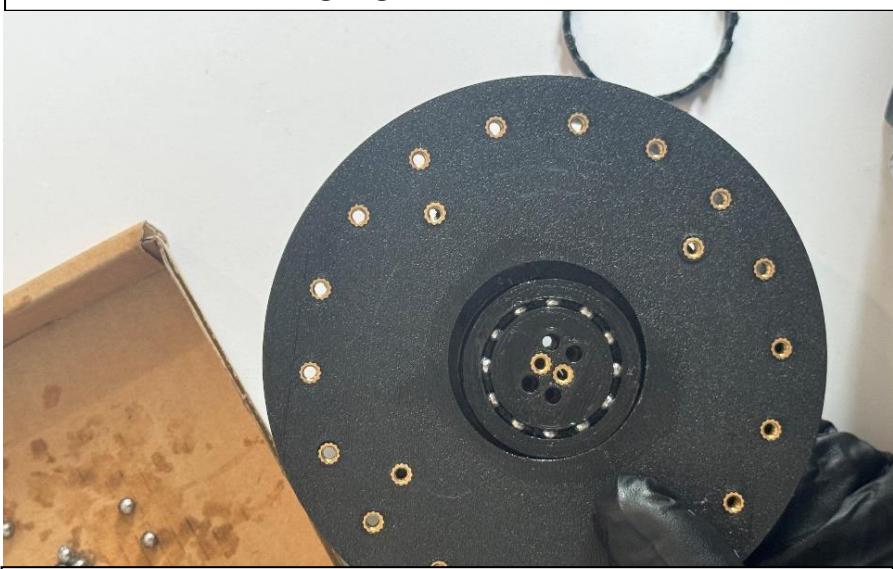
Figure 14 Bottom Output flange Assembly



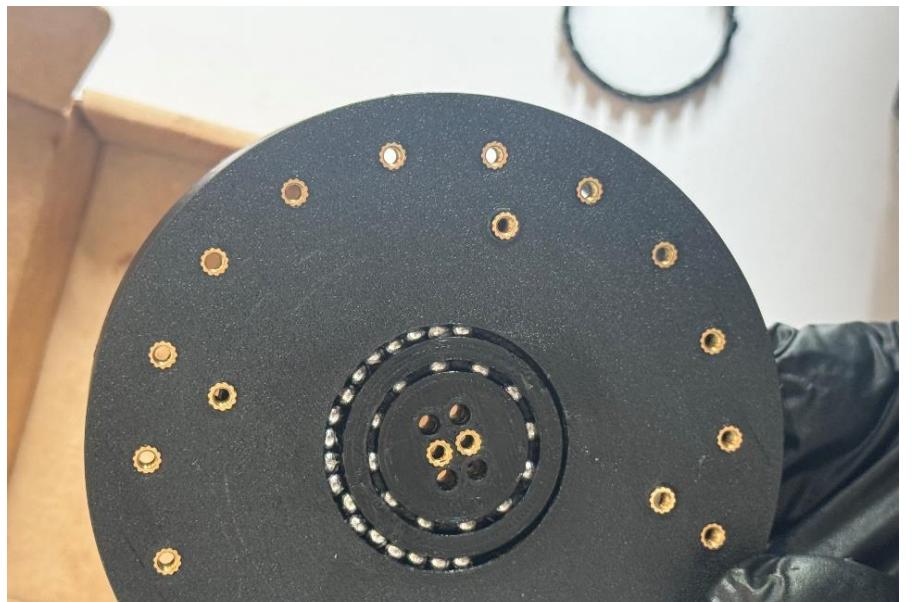
Step 1. Gather the previously assembled bottom output flange/disk, 18 4mm ball bearings, the outer housing(A) and the A-B 18 ball bearing cage.



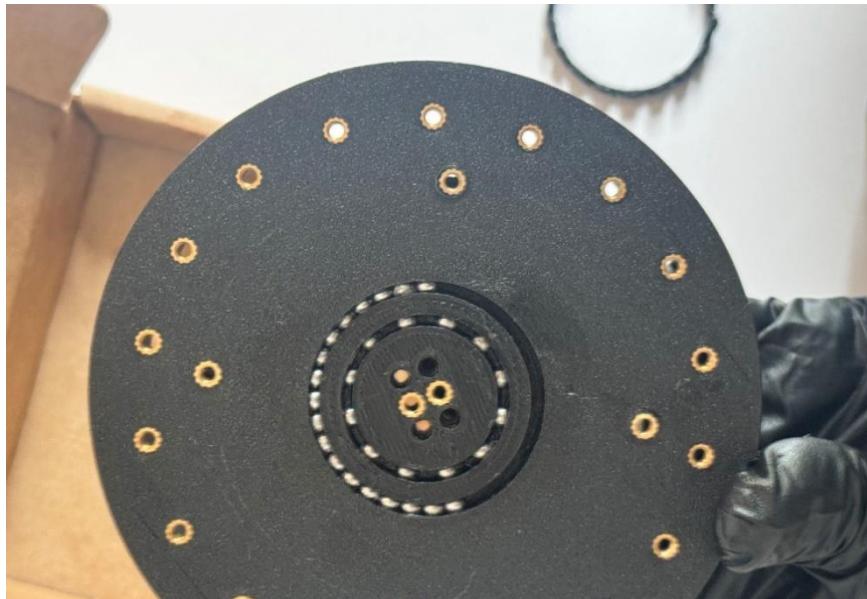
Step 2. Place the assembled output flange/disk flat side up, aligning its outer bearing race opposite the inner bearing race of the outer housing.



Step 3. Flip the orientation of the assembly. While holding the output flange/disk, draw it laterally until its outer diameter is tangent to the inner diameter.



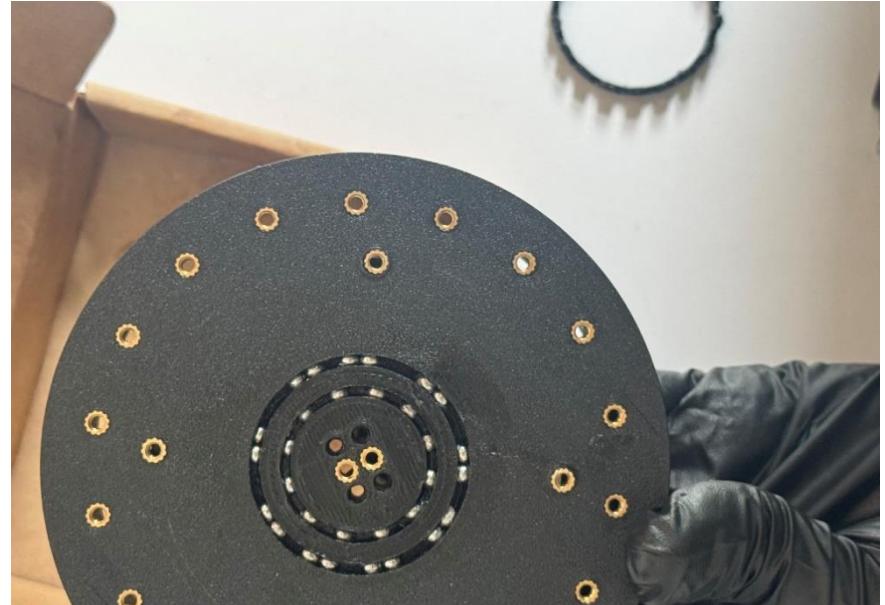
Step 4. Insert 18 ball bearings into the gap created.



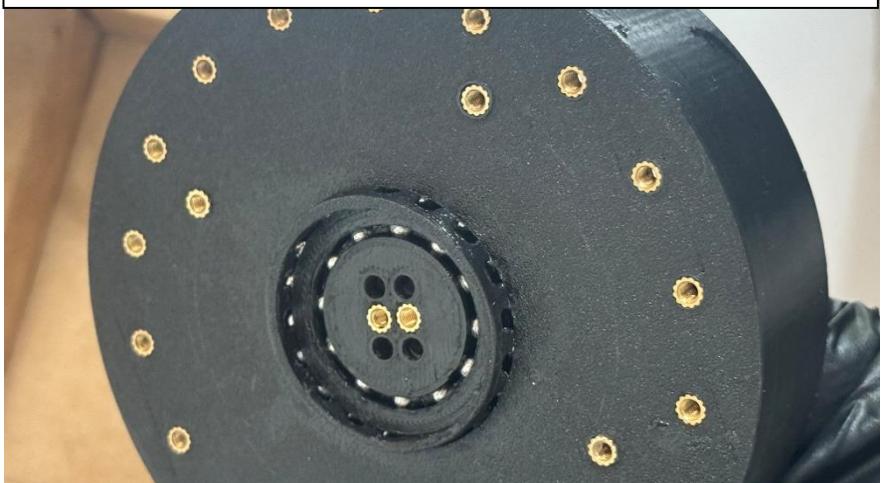
Step 5. Push the output flange/disk against the ball bearings to close the gap until it is even.



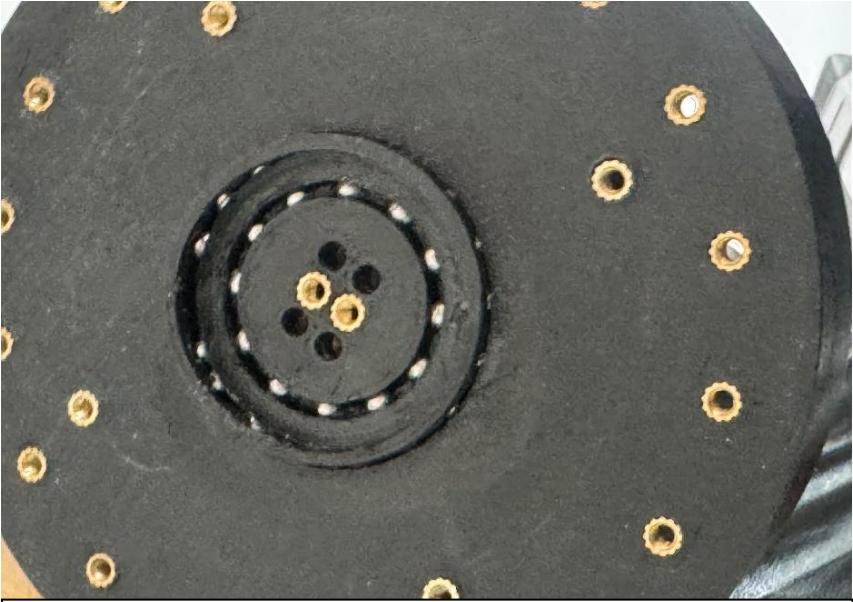
Step 7. Distribute ball bearings once again, once evenly spaced. Grab the bearing cage.



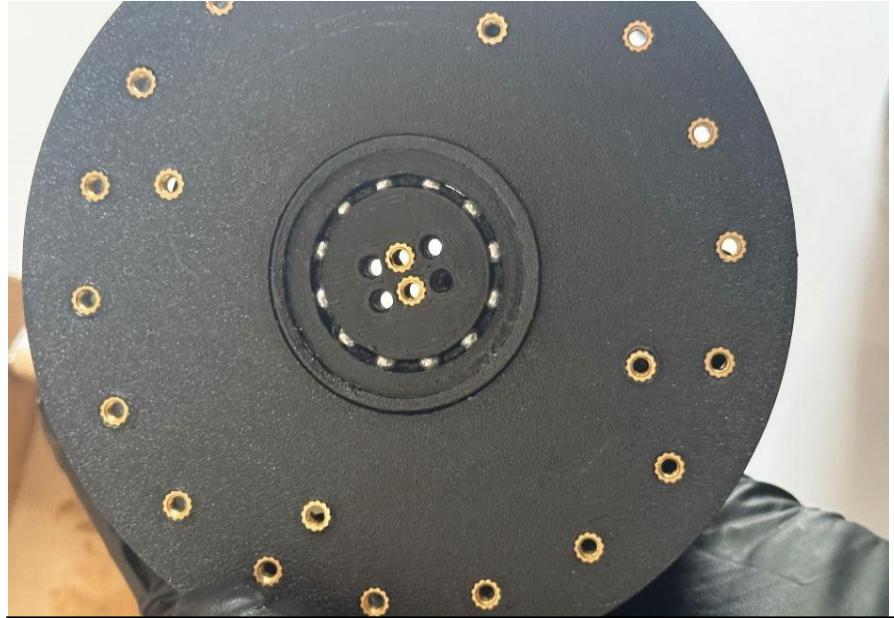
Step 6. Evenly distribute the ball bearings in pairs using either a flat head screwdriver or pair of tweezers.



Step 8. Rest the bearing cage on the gap, align the gaps on the bearing cage to the ball bearings. If alignment is slightly off, you can adjust them with a pair of tweezers or flat head through the gaps.



Step 9. Once fully aligned press the bearing cage down evenly. (do not force this as it can break easily.)



Step 10. Press the cage all the way down until fully seated.

Cycloidal Disk Assembly

2 x Cycloidal Disks (I)

2 x Eccentric Shaft(D)

24 x 4mm stainless steel Ball Bearings

2 x (D-I) 12 Ball Bearing Cage



Step 1. Grab all listed parts from the above.



Step 2. Place the eccentric shaft (D) in the central hole of the cycloidal disk, align the eccentric shaft so it is tangent to the inner diameter of the central hole



Step 3. Place 12 4mm ball bearings in the gap. After the ball bearings are in, push the shaft against the balls to make the gap even.



Step 4. Space the ball bearings evenly. Then Grab the cage(D-I) and place it in the gap.



Step 5. Flip the disk over being careful not to drop the cage. Align the Ball bearings with the gaps in the cage and push down on the disk to set the cage in place.



Step 6. Flip the disk over once again, and push the cage through until flush. Add grease into the bearing races and rotate the disk around the shaft to distribute the grease. (repeat from step 1 until both disks are assembled)

Cycloidal Disk Alignment

What you will need:

2 x Cycloidal Disks assembled.

1 x Eccentric Spacer (D-Spacer)

2 x 25mm M3 Hex head bolts

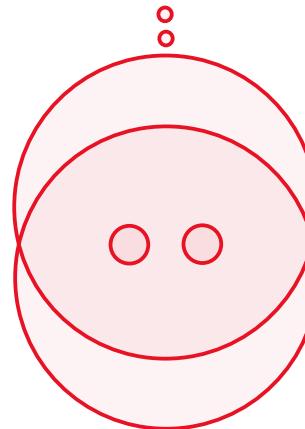
A 2.5mm Allen Key



Step 1. Gather Parts listed above.



Step 2. Locate both Alignment Indicators on Surface of cycloidal disks.



Step 3. Align the bolt holes as shown above, making sure they also align with the alignment indicators.

The alignment indicators must be aligned 180 degrees out of phase. If they are not aligned properly the drive will not work.



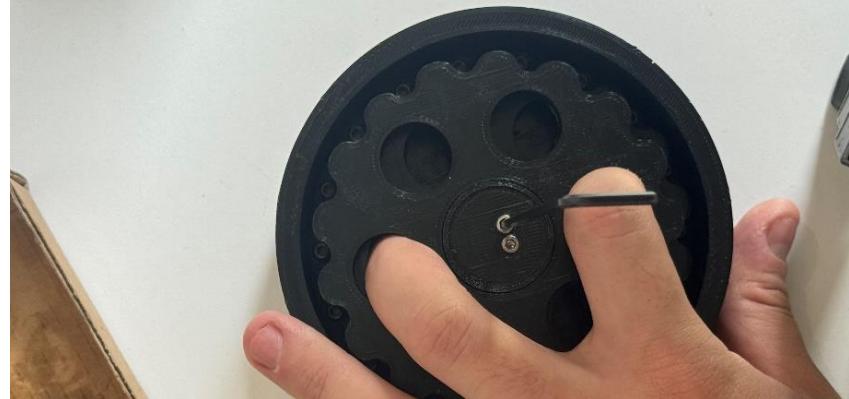
Step 4. Place two fingers through the output pin holes to ensure alignment is not lost.



Step 5. Push the eccentric spacer onto the two bolts.



Step 6. With your free hand ready the already assembled Housing and bottom output flange.



Step 8. Tighten the two hex head bolts using an allen key, you can ensure the two cycloidal disks are aligned by putting your fingers through the output bearing holes.

(Be careful as once these bolts are tight, The input shaft will start spinning and could lead to injury.)



Step 7. Ensuring there is a gap between the two disks carefully align the two bolts with the two central holes on the input shaft coupled to the output flange.

Lid and output Assembly

You will Need

1 x J-1 (Lid)

1 x F (Top output flange)

12 x 4mm Ball Bearings

1 x J-2 (Bearing Cage)

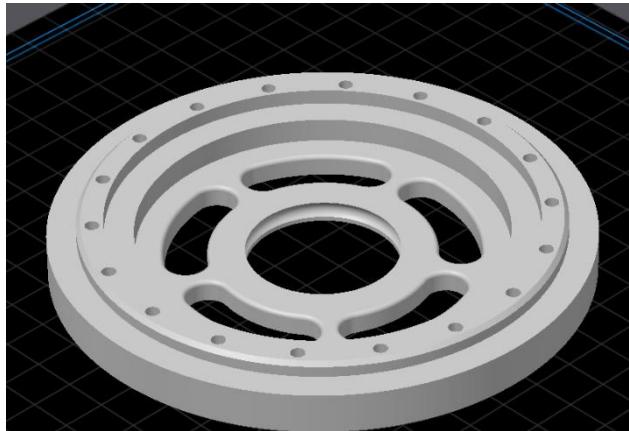


Figure 16 J-1 (lid)

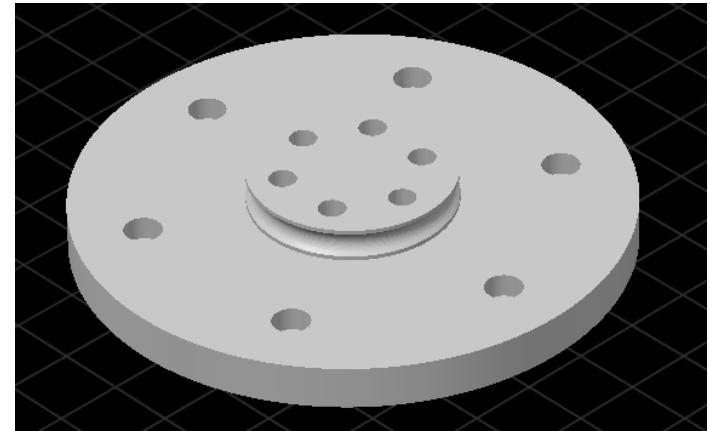


Figure 15 F (Top Output Flange)

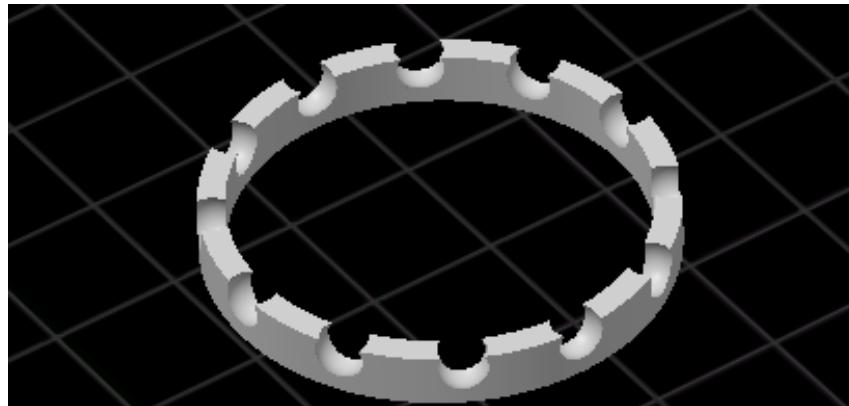


Figure 17 J-2 Bearing Cage

Currently there is no assembly guidance for this Part. However the principle of assembling this is the same as the previous assemblies featuring Ball Bearings. This Will be Updated in the future.

Complete Assembly

You will need:

18 x Roller Bearings assembled

6 x Output Bearings Assembled

1x Lid Assembled

1 x Motor Mount

1 x Nema 17 42-40

1x Motor coupler

18 x M3 40mm Hex Head bolts – Roller Bearings

4 x M3 x 25mm Hex Head bolts – Input Coupler

6 x M3 x 30mm Hex Head bolts – Output Assembly

4 x M3 x6mm Hex Head Bolts – Motor Mount -> Stepper motor

4 x M3 x 8mm Hex Head bolts – Motor mount -> Outer casing



Step 1. Insert the Output Bearings Into the output bearing holes in the Cycloidal disks



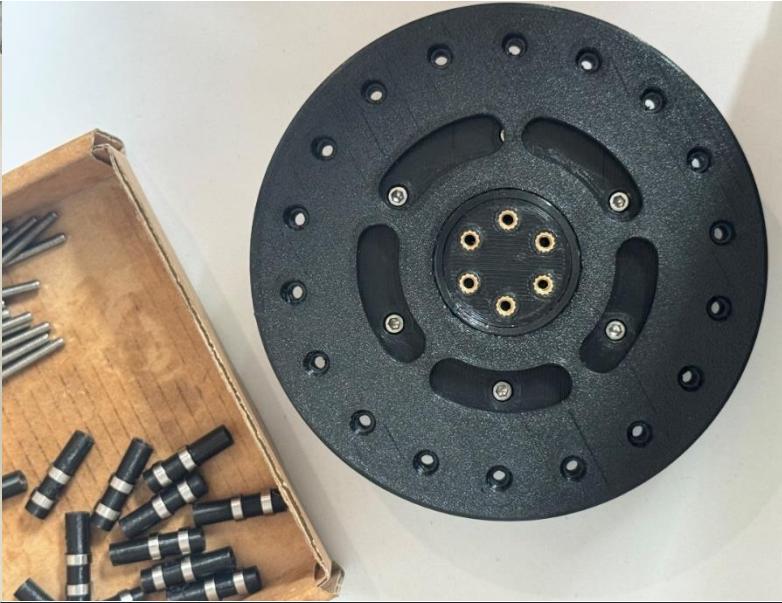
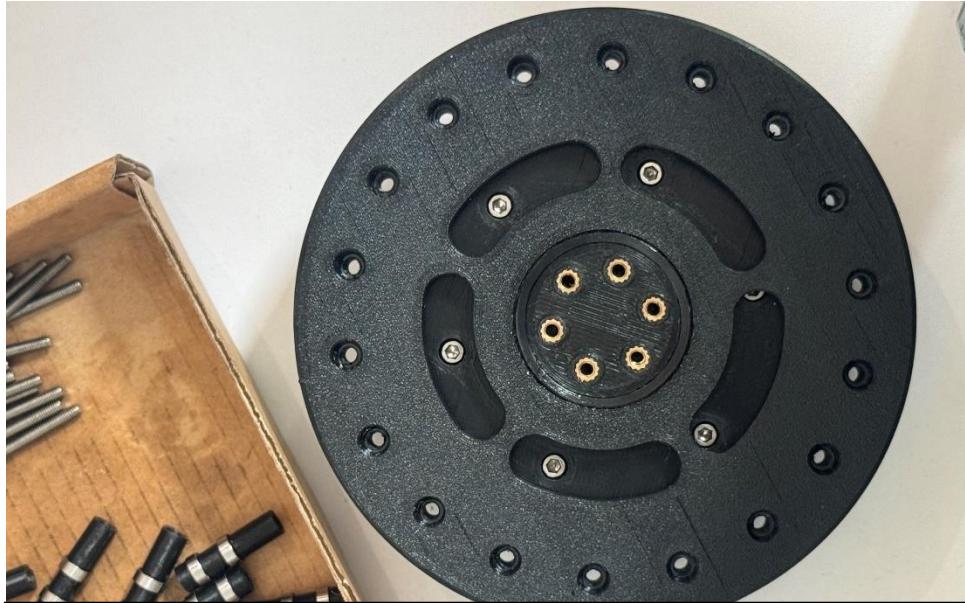
Ensure they sit flush against the bottom output flange.



Step 2. Get the assembled top lid with top output flange attached.

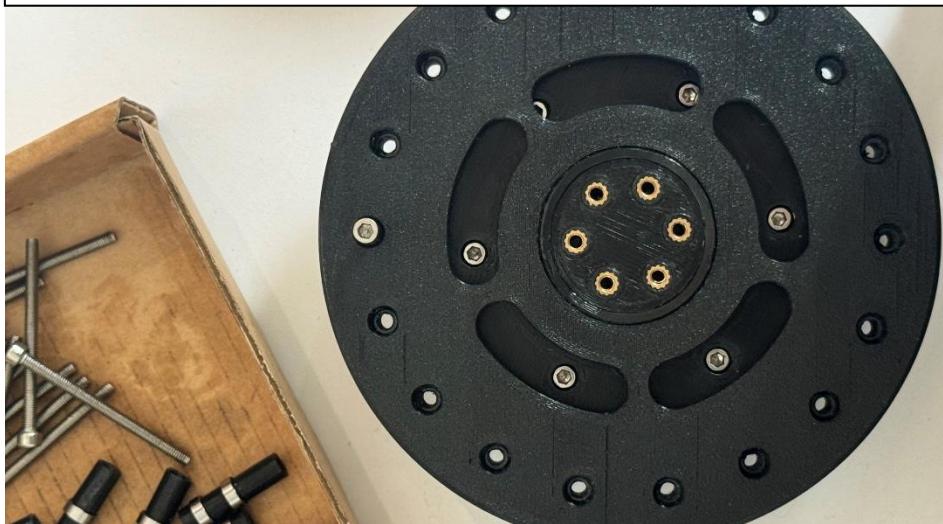


Step 3. Flip the Lid over to the top side.

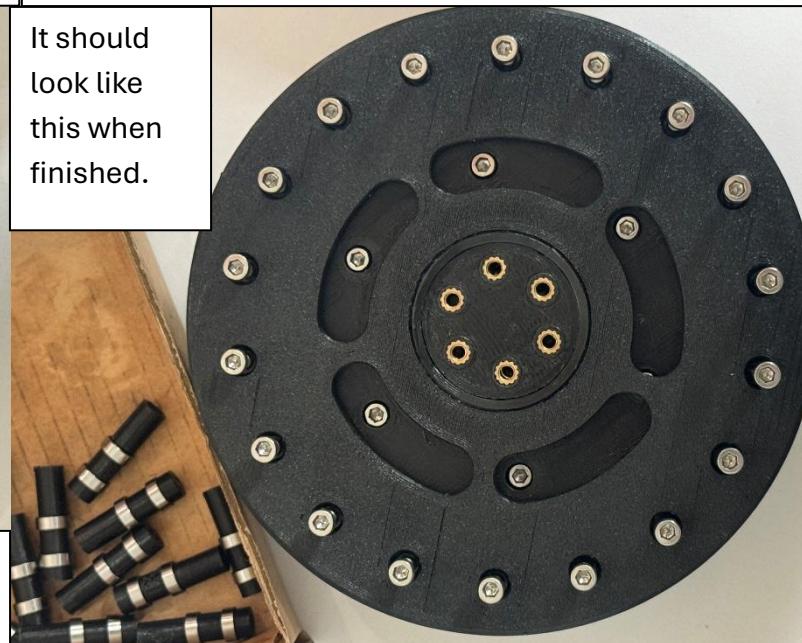


Step 4. Insert 6 M3 x 30mm Hex Head bolts through the holes in the cutouts. Make sure they are fully inserted.

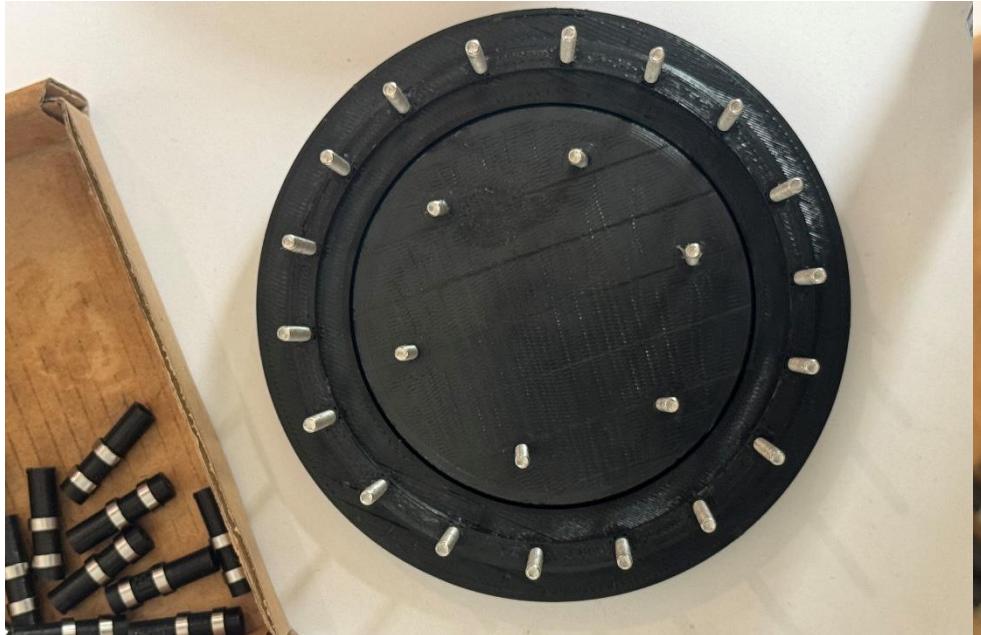
To access all of the holes you will have to rotate the output. To do this ensure the bolts are fully seated.



It should look like this when finished.

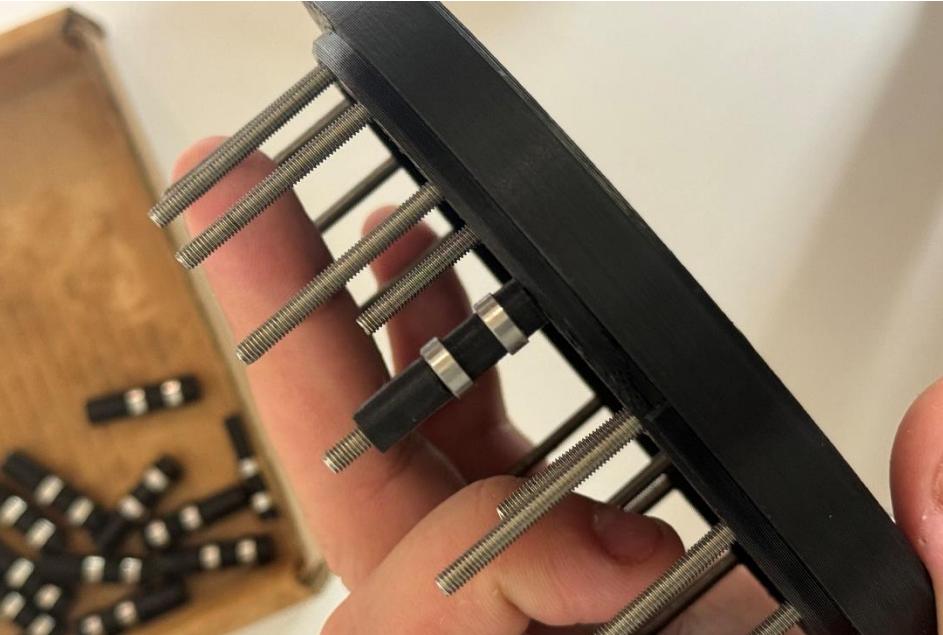
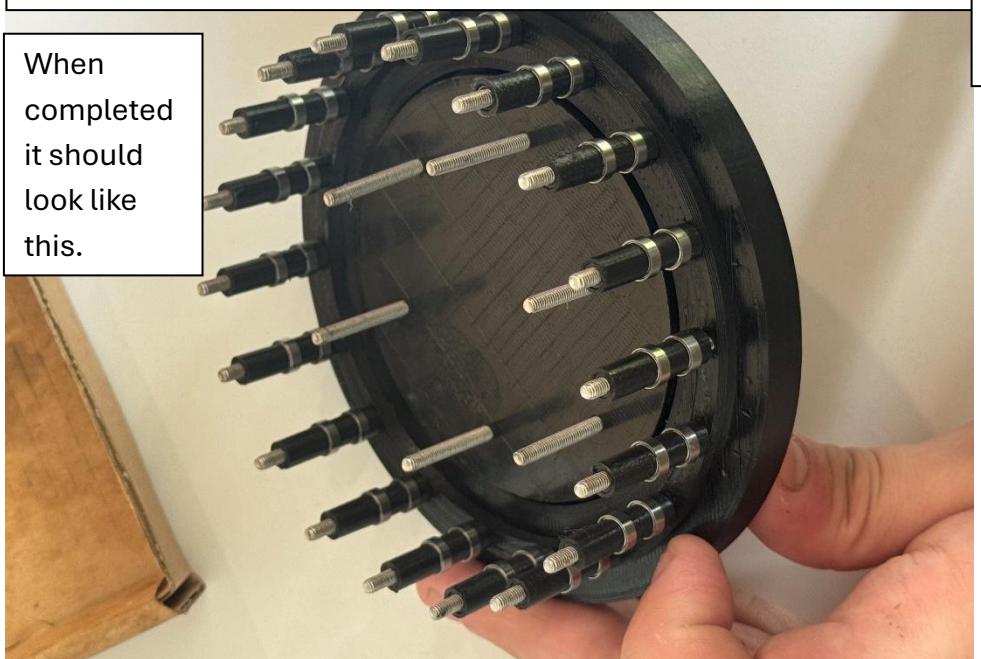


Step 5. Begin Inserting 18 M3 x 40mm Hex Head bolts through the holes around the outer diameter.

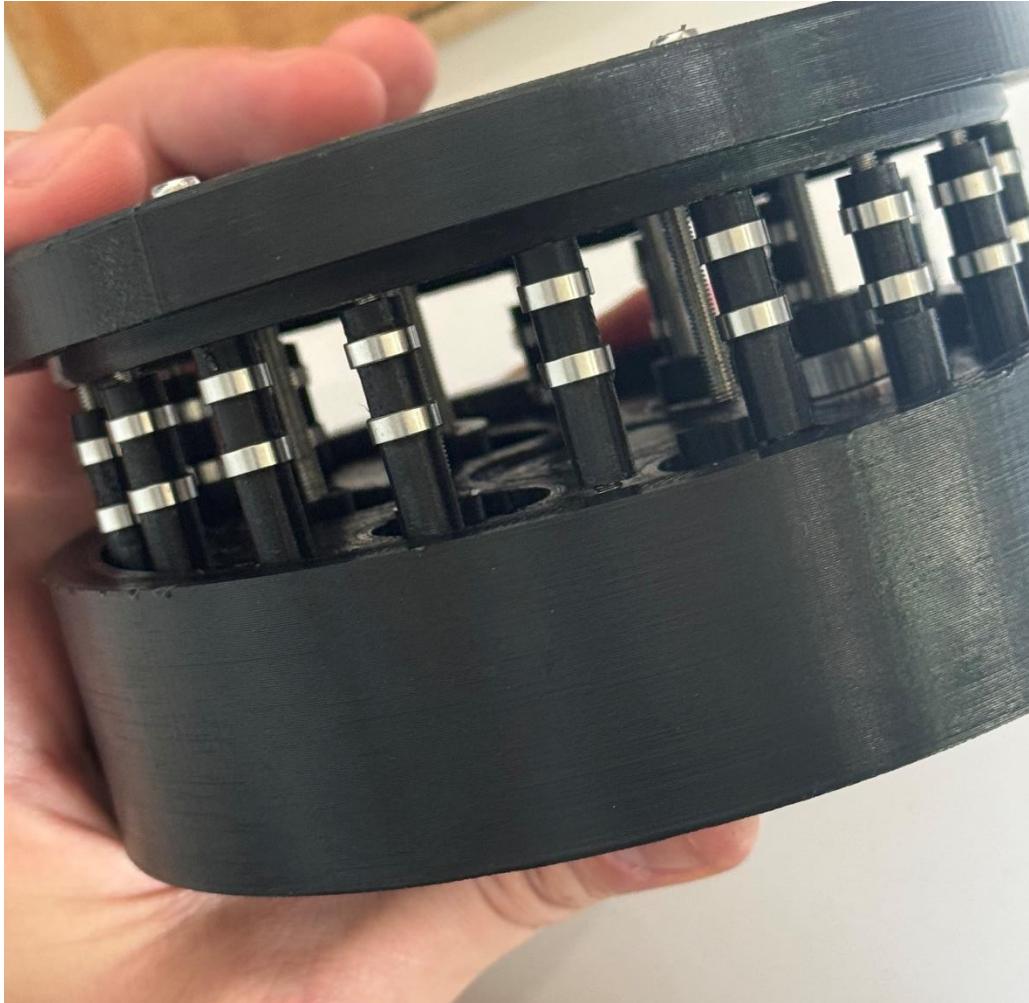


Step 6. Flip the Lid over and prepare your 18 assembled roller bearings.

When completed it should look like this.



Make note of the orientation shown. This is the correct orientation, If mounted incorrectly the cycloidal disks will not mesh properly with the roller bearings



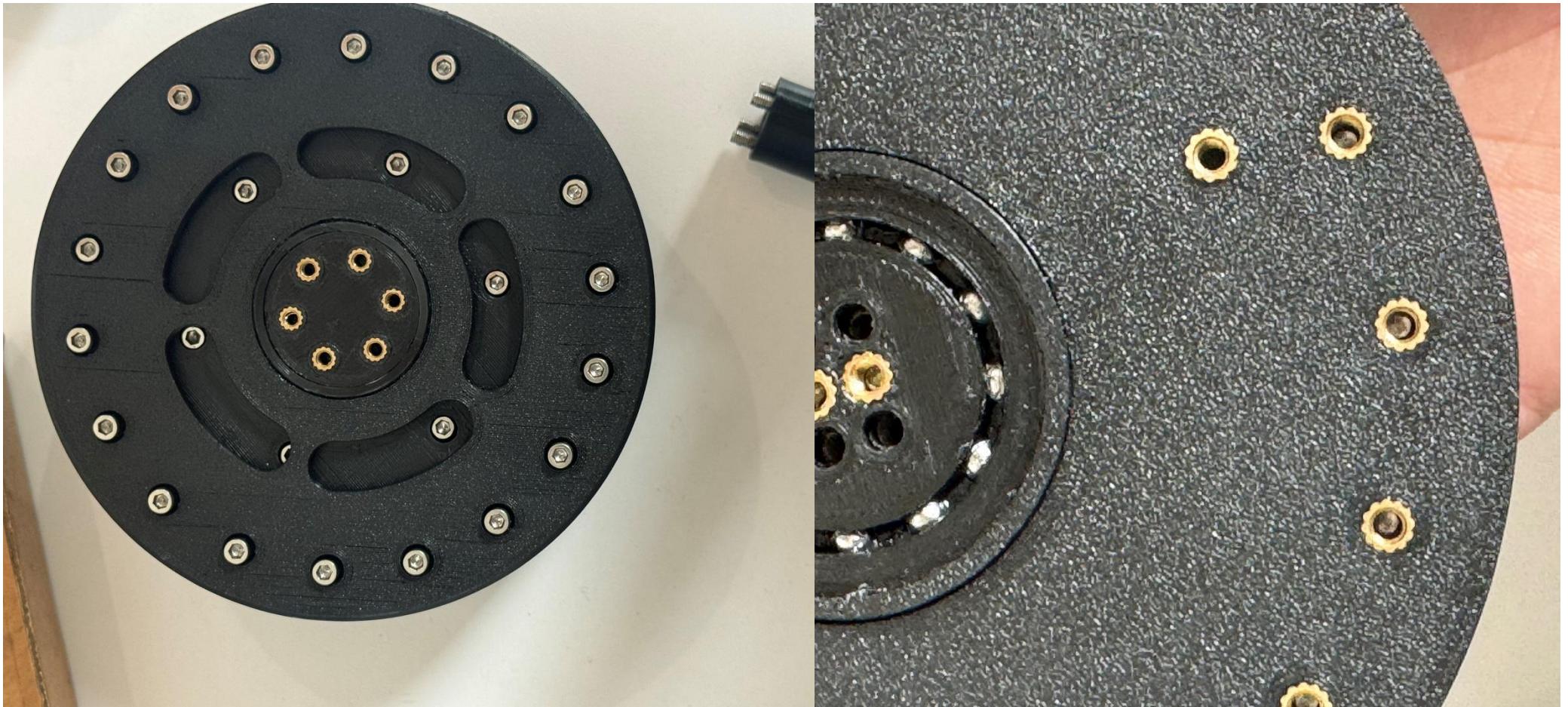
Step 7. (The hard part) This step requires patience, it is easier if you hold the outer housing on its side.

To assemble this fully everything needs to be aligned properly. Start by aligning the output disk bolts with the output bearing, you can rotate the output to help with this.

The roller bearings should align themselves against and between the lobes of the cycloidal disk.

If an output bearing lifts like shown, you can use a flat head screw driver to ensure they are flush again. Once the output bolts are inserted into the output bearings you can re align the assembly, So that the top lid is facing you.

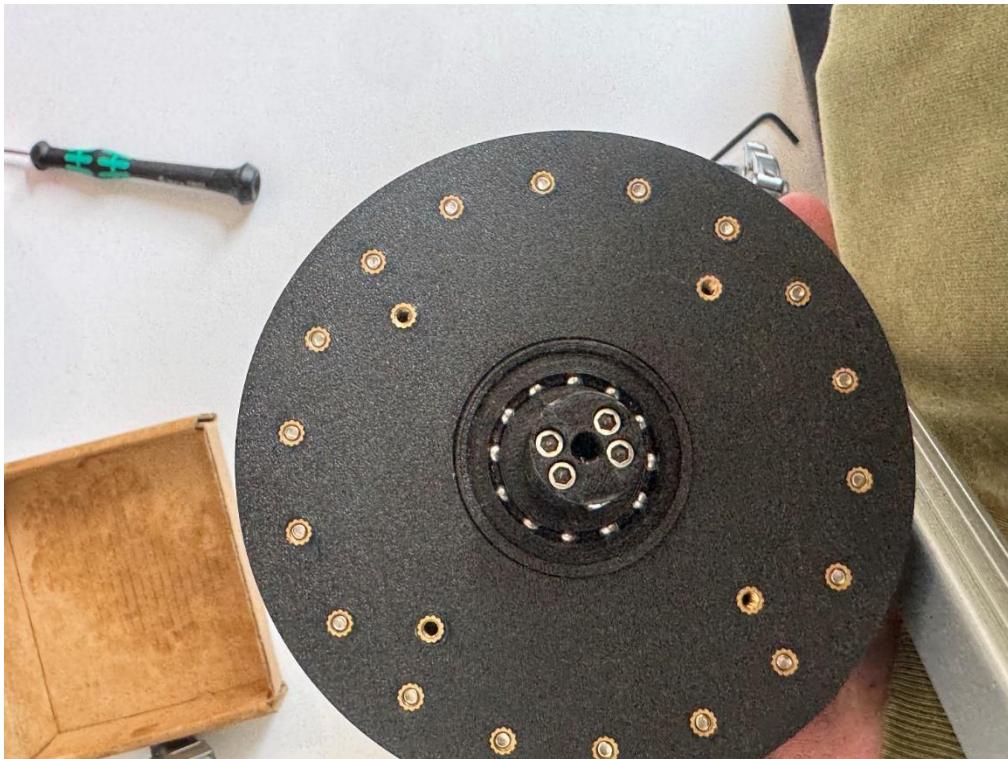
Whilst using both hands, one hand on the top lid and one hand on the outer housing, rotate and push the two pieces together.



Step 8. Rotate the top lid until you can feel the roller bearing bolts interface with the top of the threaded inserts on the outer housing.

After aligning the bolt holes tighten them so that they catch the thread, but do not tighten all the way.

To aid with this you can flip the assembly over and look at the threaded inserts whilst rotating. When aligned you will be able to see the bolts.



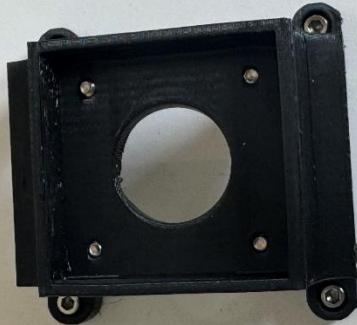
Step 9. Attach the motor coupler to the input shaft using 4 x m3 X 25mm Hex head bolts and an Allen key .



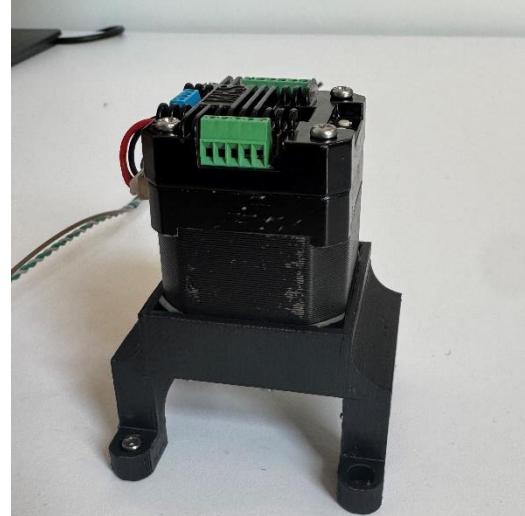
Step 10. Rotate the input shaft, until the 6 output shaft bolts align with the heat set inserts on the bottom output flange.

Although not the best method, you can tighten these bolts whilst rotating. If they thread you will know the output has been aligned properly, if it spins and you cannot feel an increase in resistance it has not been aligned.

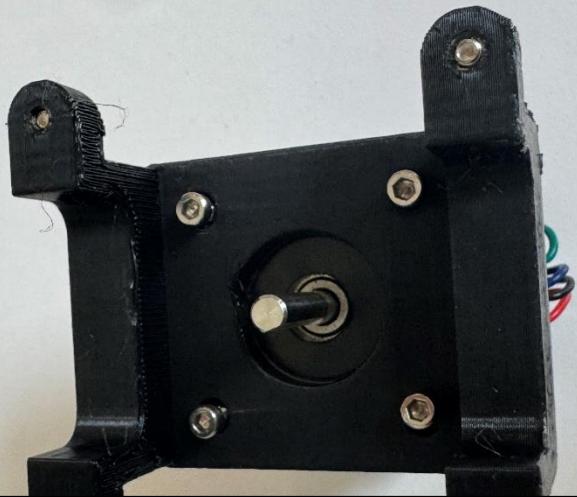
After tightening the Output bolts, Tighten the Roller bearing Bolts until they are flush with the bottom of the housing.



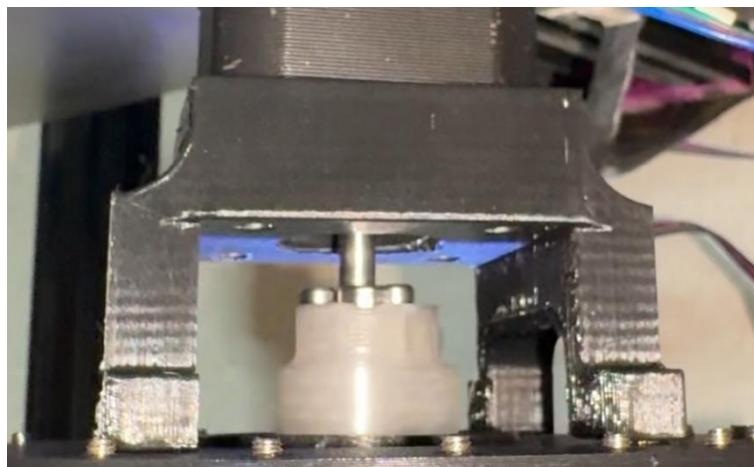
Step 11. Ready the motor Mount, Insert 4 x M3 x 8 hex head bolts into the legs. Insert 4 x m3 X 6 into the holes in the centre from the bottom.



Step 12. Press the stepper motor into the centre.



Step 13. Flip the motor coupler over and tighten the 4 bolts securing the stepper motor.



Step 14. Press the stepper motor into the Shaft coupler, align the bolts with the 4 centre heat set inserts on the outer housing and tighten.

Once fully tightened, tighten the set screw on the shaft coupler.