Assembly Your WorkBee Thrust Bearing Kit - V1.0-V2.0

Written By: Robert
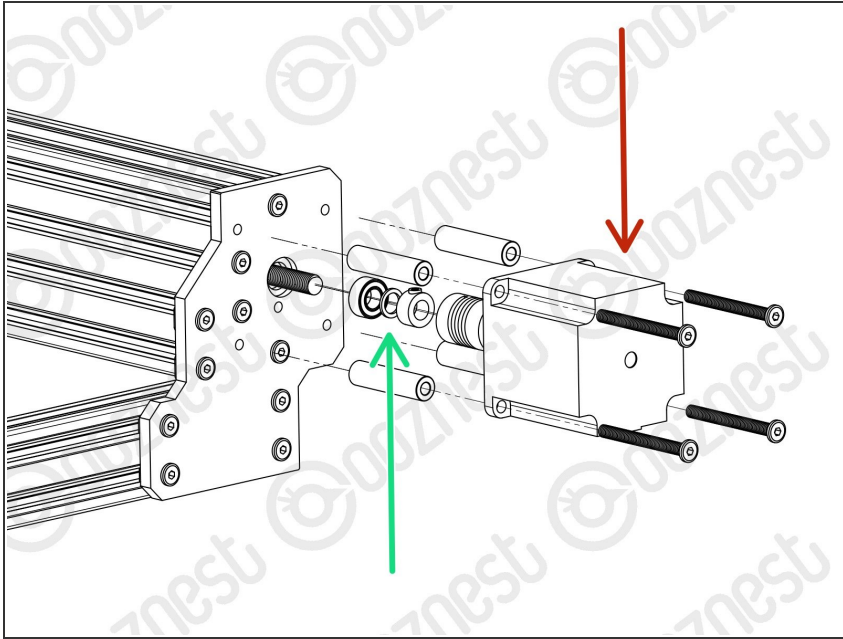
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Step 1 — Warning

ⓘ This upgrade kit may require a significant amount of disassembly and reassembly.

ⓘ If you have any concerns about this, please Contact Us.

Step 2 — Remove Stepper Motors

- Loosen the Flexible-Coupler from the Stepper-Motor and Lead-Screw on the X, Y-Left & Y-Right Axis.

- Disconnect and remove the Stepper-Motors, M5-Low-Profile-50mms and 4 x Aluminium-Spacer-40mms.
  - ⓘ You will need to put these back later. So put them in a safe place.

- Remove the Lead-Screws Clamping-Collars, Bearing-Shim & Flanged-Radial-Bearings.
  - Aside from the Lead-Screws, we supply new parts to replace these. So they can be discarded, or kept for spares.

Step 3 — Y-Carriages
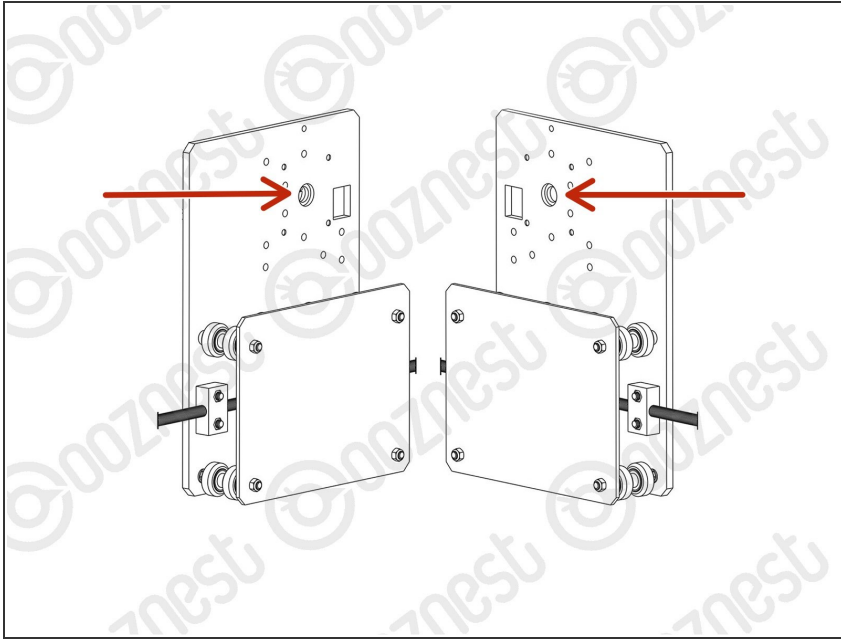
- If the insets on your Y-Carriages are already on the inside, skip this Step.

- Remove the Y-End-Plates and then take the X-Gantry off the machine,
  - Then take the Y-Carriages off and build them as a V1.0 Y-Carriage [2. Y-Plate Assembly](#)
    - ⚠ Do not attach the X-Axis Stepper-Motor.
    - The bearing inset needs to be on the inside.

Step 4 — Base
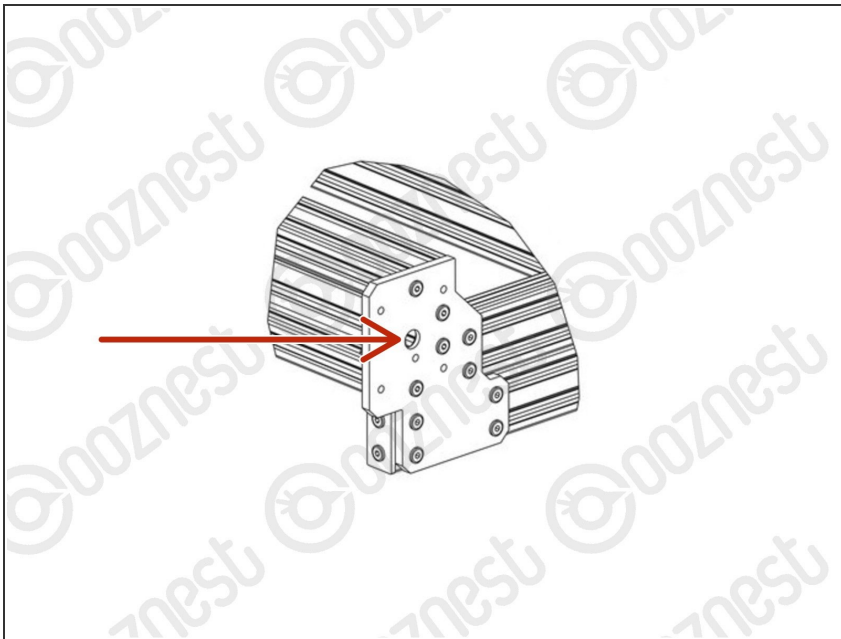
- If you skipped the previous step and the insets on your Y-End-Plates are already on the inside, skip this Step also.

- Slide the X-Gantry back onto the machine.
  - Reattach the Y-End-Plates.
  - The bearing inset needs to be on the inside.
  - ⚠ Do not attach the Y-Axis Stepper-Motors.

Step 5 — X-Axis Limit Switch
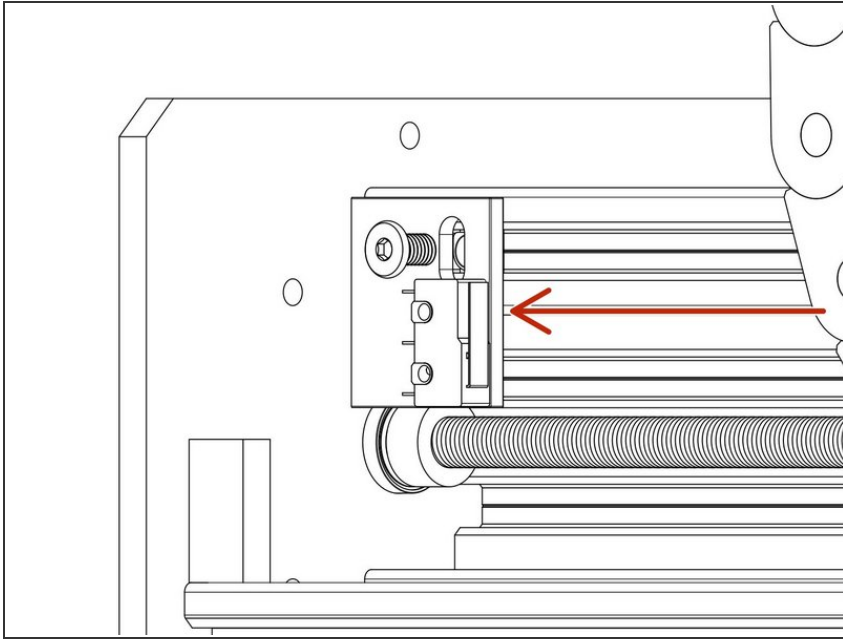
- The X-Limit-Switch-Mount is going to be replaced later in the guides.
  - Take the X-Limit-Switch-Mount off the machine.
  - Remove the Limit-Switch from X-Limit-Switch-Mount.
    - ⓘ Leave the Limit-Switch hanging from the X-Gantry.
- ⓘ Put the 2 x M3-Plastite-Screw-8mm, M5-Low-Profile-8mm and M5-Drop-In-Tee-Nut in a safe place.

Step 6 — Radial Bearings
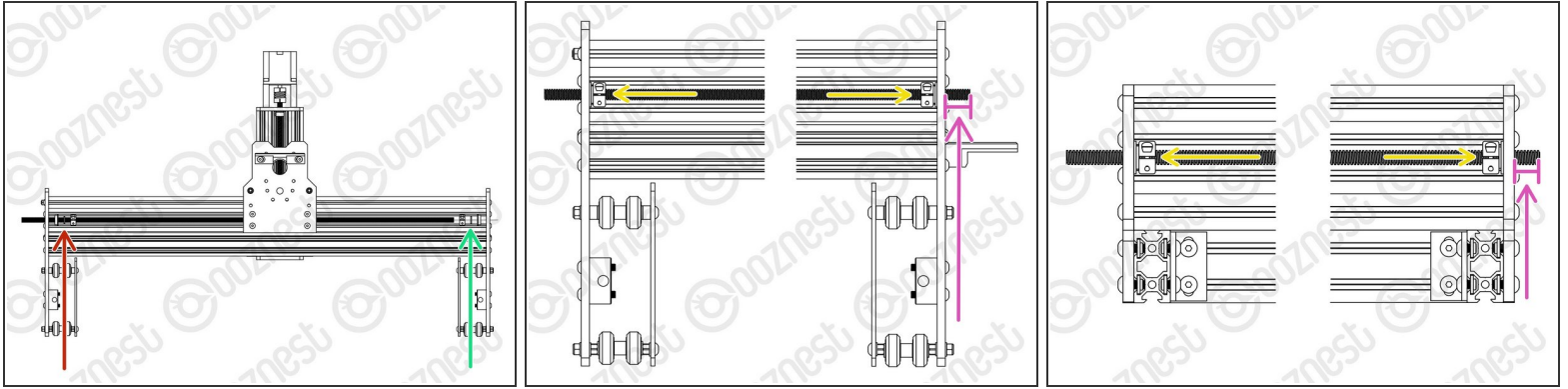
- Starting with the X-Axis. Thread back through the Lead-Screw so the end of it is on the inside of the extrusion channel.

  - Then slide onto the Lead-Screw a Clamping-Collar - ->- - Rubber-Bushing - ->- - Radial-Bearing.

  - Repeat for the opposite end of the Lead-Screw in reverse order.

- Adjust the Lead-Screw so there is 13mm protruding from the Stepper-Motor side of the X-Axis.

  - Seat the Radial-Bearings into the insets on the Y-Carriages, slide the Rubber-Bushing against the Radial-Bearings and finally slide the Clamping-Collars so they are against against the Rubber-Bushings.

  - Slightly tighten the Clamping-Collars.

- Repeat all the above points for Y-Left & Y-Right Axis, like Image 3.

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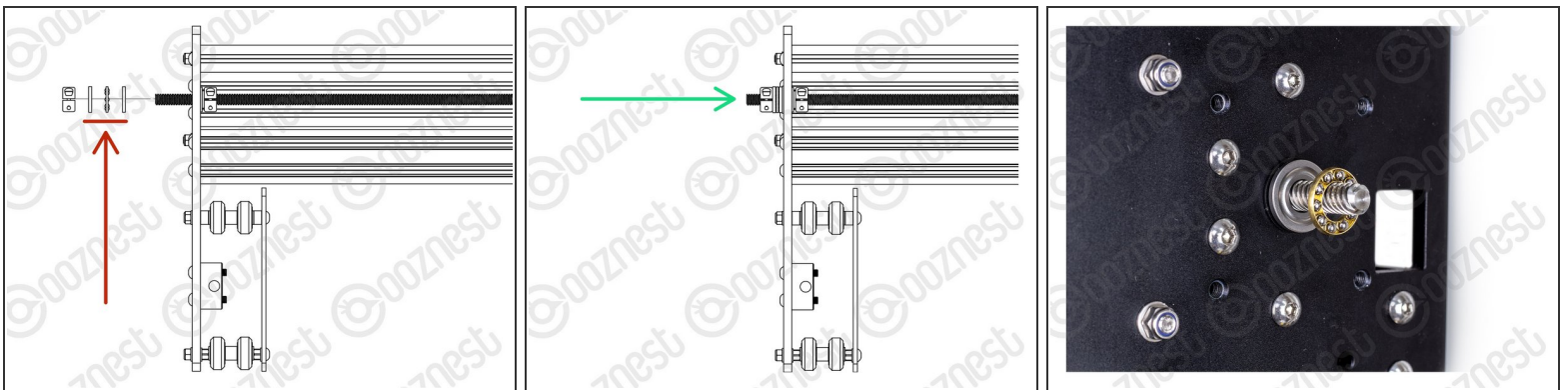## Step 7 — Thrust Bearings - Stepper Motor Side
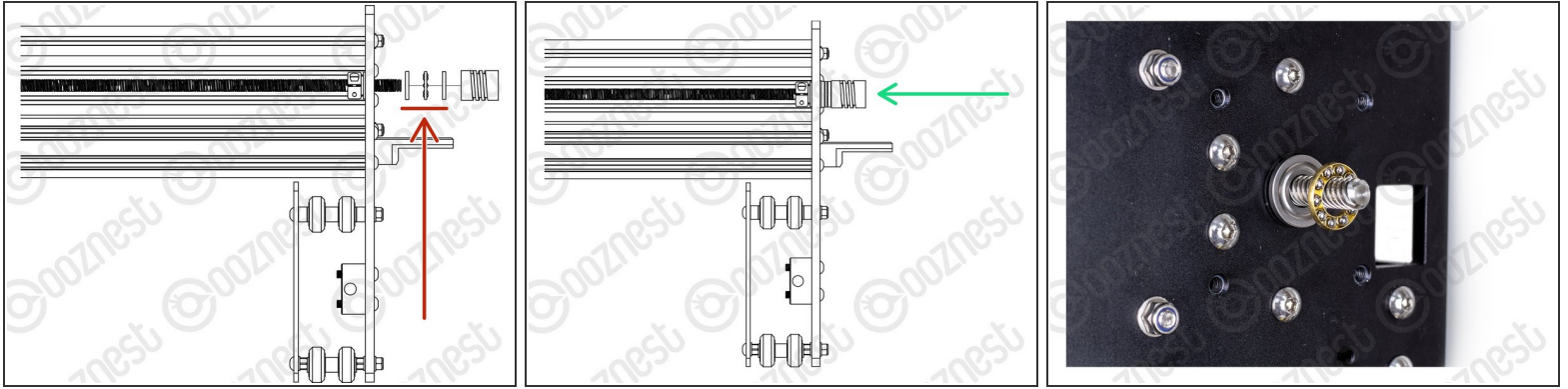
- ⓘ Thrust-Bearings come in 3 parts. Thrust-Bearing-Housing-Washer, Thrust-Bearing-Caged-Roller and Thrust-Bearing-Shaft-Washer

  - ⓘ The Thrust-Bearing-Housing-Washer and Thrust-Bearing-Shaft-Washer look exactly the same. They are not.

  - ⓘ The Thrust-Bearing-Shaft-Washer has a smaller internal diameter thus it will be tighter on the Lead-Screw.

- ⓘ We recommend adding a generous amount of bearing Lubricant to the grooved face of both washers.

- ● Starting with the X-Axis, on the Stepper-Motor side slide on a Thrust-Bearing-Housing-Washer - ->- - Thrust-Bearing-Caged-Roller - ->- - Thrust-Bearing-Shaft-Washer

  - ● The Thrust-Bearing-Caged-Roller seats in the grooves on the Thrust-Bearing washers. Look at Image 3 for the correction orientation of the Thrust-Bearing-Caged-Roller.

- ● Finally slide on a Flexible-Coupler. While pushing the Flexible-Coupler against the Thrust-Bearing assembly, tighten Flexible-Coupler

  - ⓘ On the Flexible-Coupler tighten the clamping bolt first and then the grub screw.

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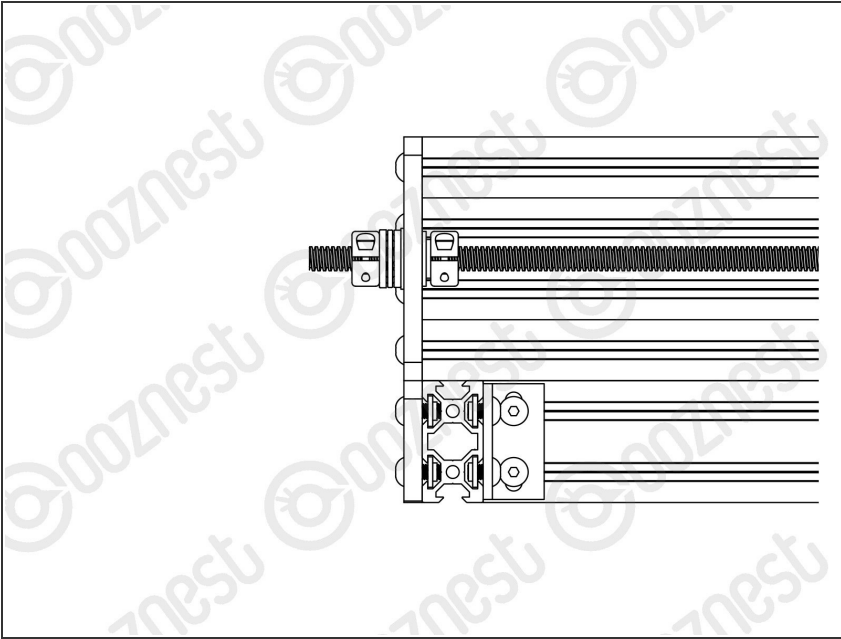
Step 8 — Repeat
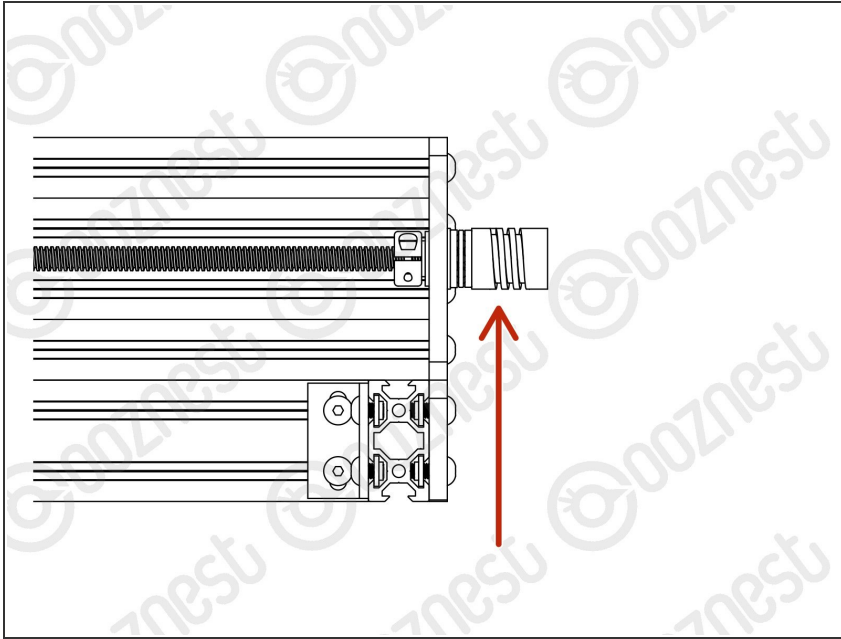
- Repeat Step 6 for Stepper-Motor side on the Y-Left & Y-Right Axis

Step 9 — Thrust Bearings - Opposite Side

- Starting with the X-Axis, on the opposite side to the Stepper-Motor slide on to the Lead-Screw a Thrust-Bearing-Housing-Washer - ->- - Thrust-Bearing-Caged-Roller - ->- - Thrust-Bearing-Shaft-Washer
  - The Thrust-Bearing-Caged-Roller seats in the grooves on the Thrust-Bearing washers. Look at Image 3 for the correction orientation of the Thrust-Bearing-Caged-Roller.
- Finally slide on a Clamping Collar. While pushing the Clamping-Collar against the Thrust-Bearing assembly, tighten the Clamping-Collar.

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Step 10 — Repeat

- Repeat Step 8 for Y-Left & Y-Right Axis

Step 11 — Stepper Motors
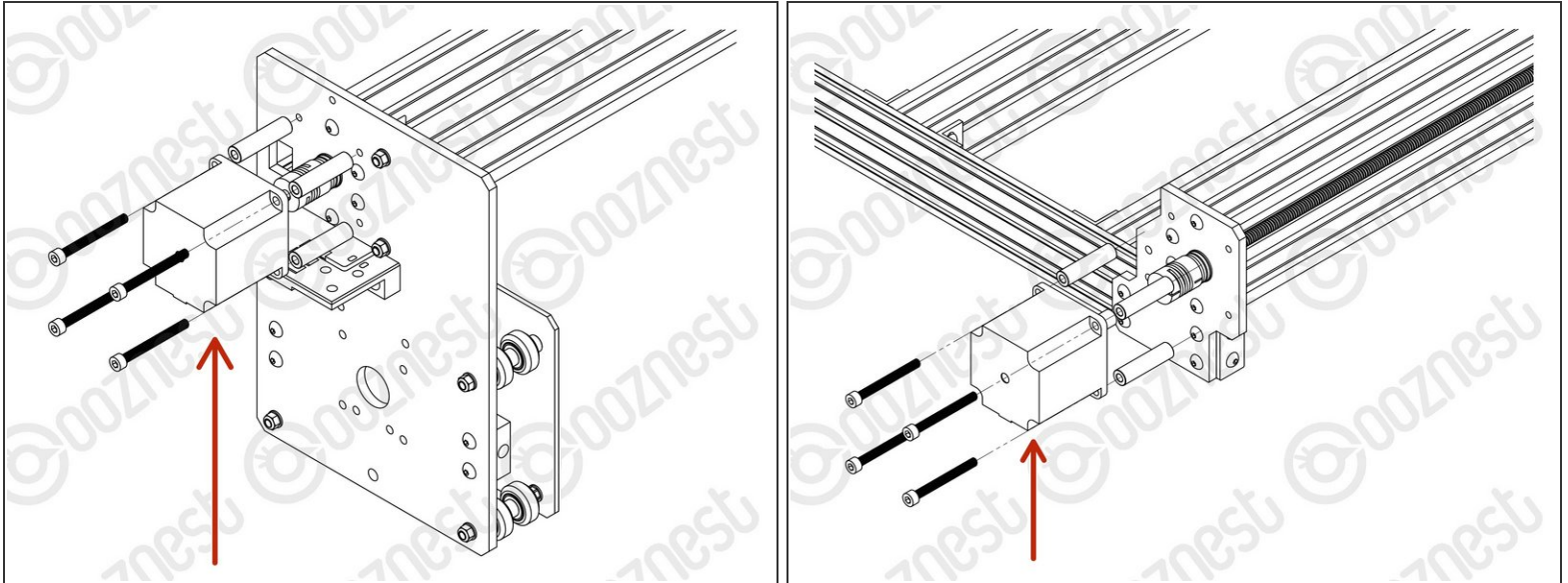
- Reattach and reconnect all Stepper-Motors using the previously removed M5-Low-Profile-50mms and 4 x Aluminium-Spacer-40mms

- ⚠ On the Stepper-Motor side make sure the Flexible-Coupler grub screw is on the flat portion of the Stepper-Motor shaft.

  - Once in position, tighten the clamping bolt first, then the grub screw.

  - ⓘ The Lead-Screw side was tightened earlier in this guide.

Step 12 — X-Axis Limit Switch
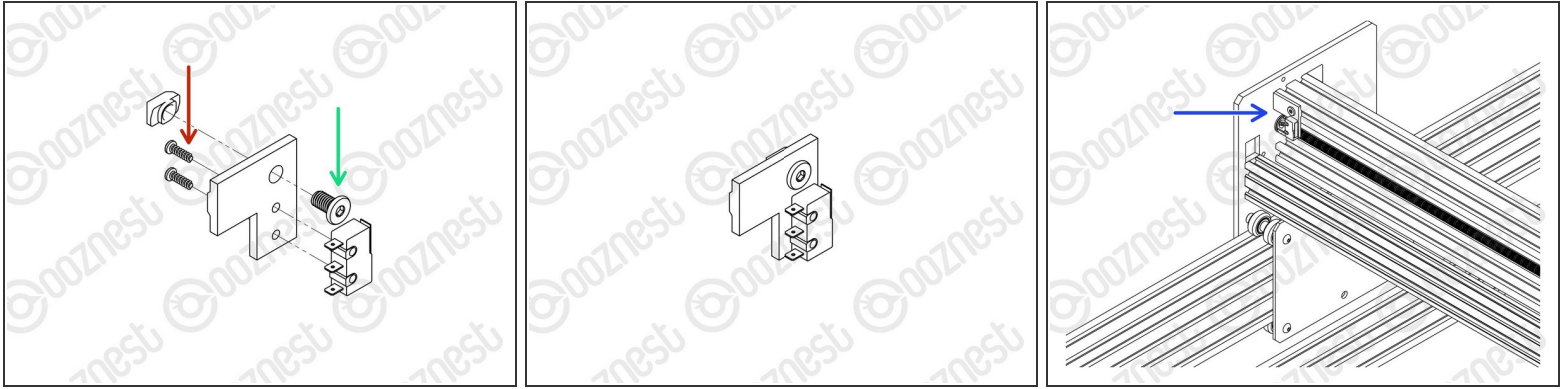
- Attach the X-Axis Limit-Switch to the X-Limit-Switch-Mount using the previously removed 2 x M3-Plastite-Screw-8mm.

  - The M3-Plastite-Screw-8mm's go through the X-Limit-Switch-Mount first, then self thread into the Limit-Switch.

  - ⓘ A Pozi #1 Screwdriver should be used.

  - ⓘ The best technique is to thread into the Limit-Switch a small amount, then back out. Then back in further, back out, so on so fourth until the Limit-Switch is secure.

  - ⚠ Do not over tighten as you can shatter the switch. Make sure the Limit-Switch is orientated correctly.

- Insert the previously removed M5-Low-Profile-8mm through the hole on the X-Limit-Switch-Mount and slightly thread on the M5-Drop-In-Tee-Nut.

- Attach the X-Limit-Switch-Mount to the back of the X-Gantry C-Beam. It should be at the left side if looking from the back. The X-Limit Switch-Mount should be up against the Y-Carriage.

Step 13 — Lead Screw Tensioning - Part 1
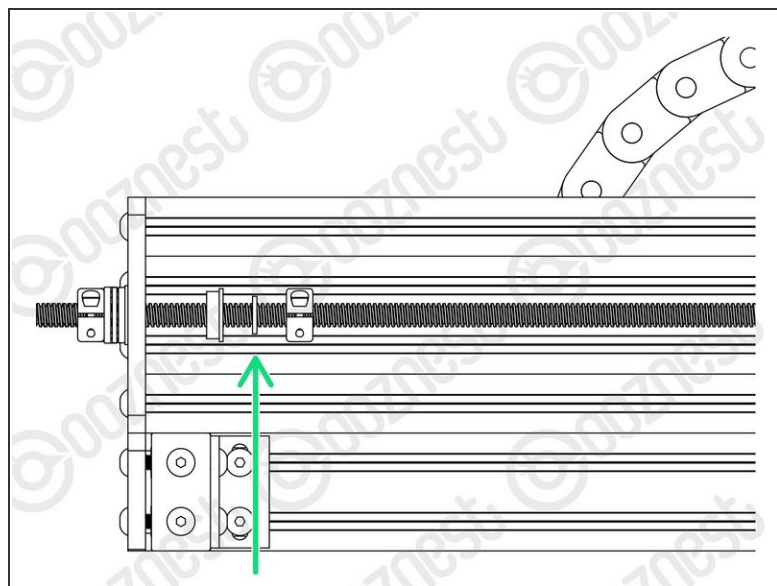
- Home the machine and use the jog buttons to move the machine roughly into the middle of the working area.

- Loosen all the Nut-Blocks on the X & Y-Carriages.

- Loosen the Clamping-Collars that are on the inside of the extrusion channel on the X & Y Axes.
    - Move all Radial-Bearings, Rubber-Bushings & Clamping-Collars away from the plates.

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## Step 14 — Lead Screw Tensioning - Part 2
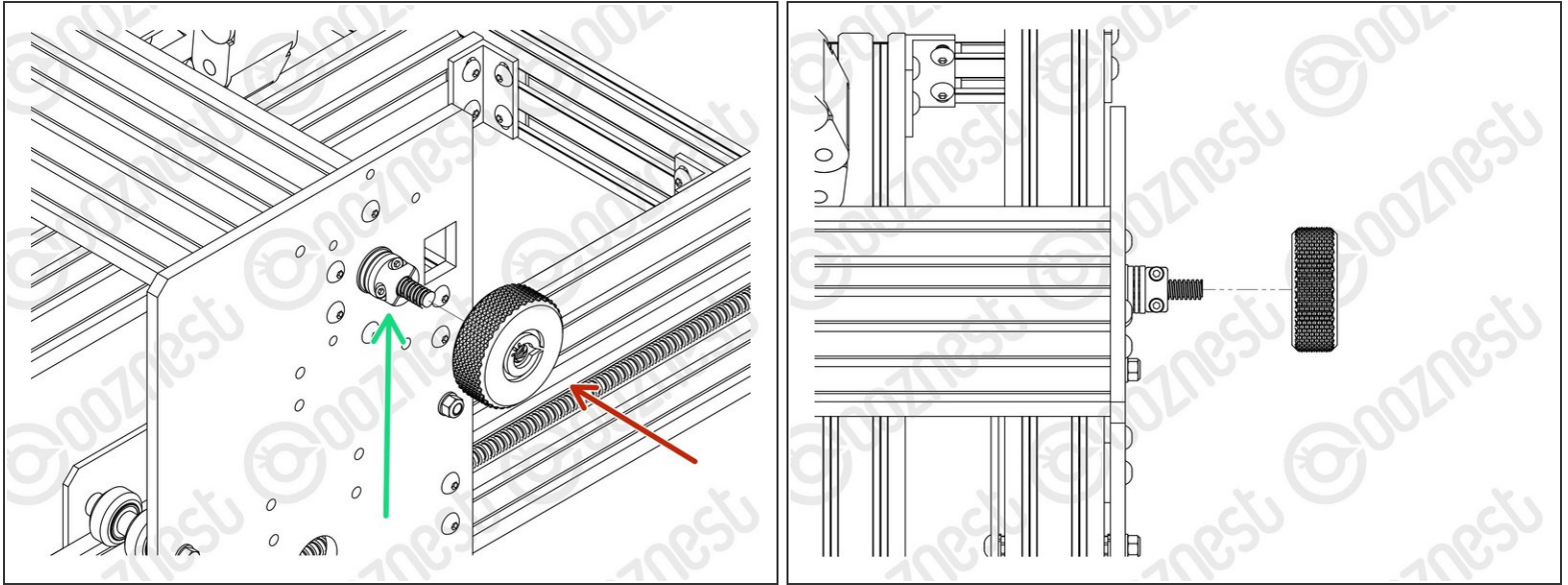
- ● Starting with the X-Axis, thread on the Tensioning-Knob until it is up against the Clamping-Collar.
  - ● Then loosen the same Clamping-Collar.
  - ● Turn the Tensioning-Knob clockwise, you will feel the Lead-Screw tension build.
  - ● Keep turning until the Stepper-Motor clicks over.
  - ● Keep turning, just before the point that the Stepper-Motor clicks over is the correct amount of tension for the Lead-Screw.
  - ● While at this point of tension, tighten the Clamping-Collar that is next to the Tensioning-Knob.
  - ● Remove the Tensioning-Knob.
- ● Repeat all the above for both Lead-Screws on the Y-Axis.

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Step 15 — Lead Screw Tensioning - Part 3
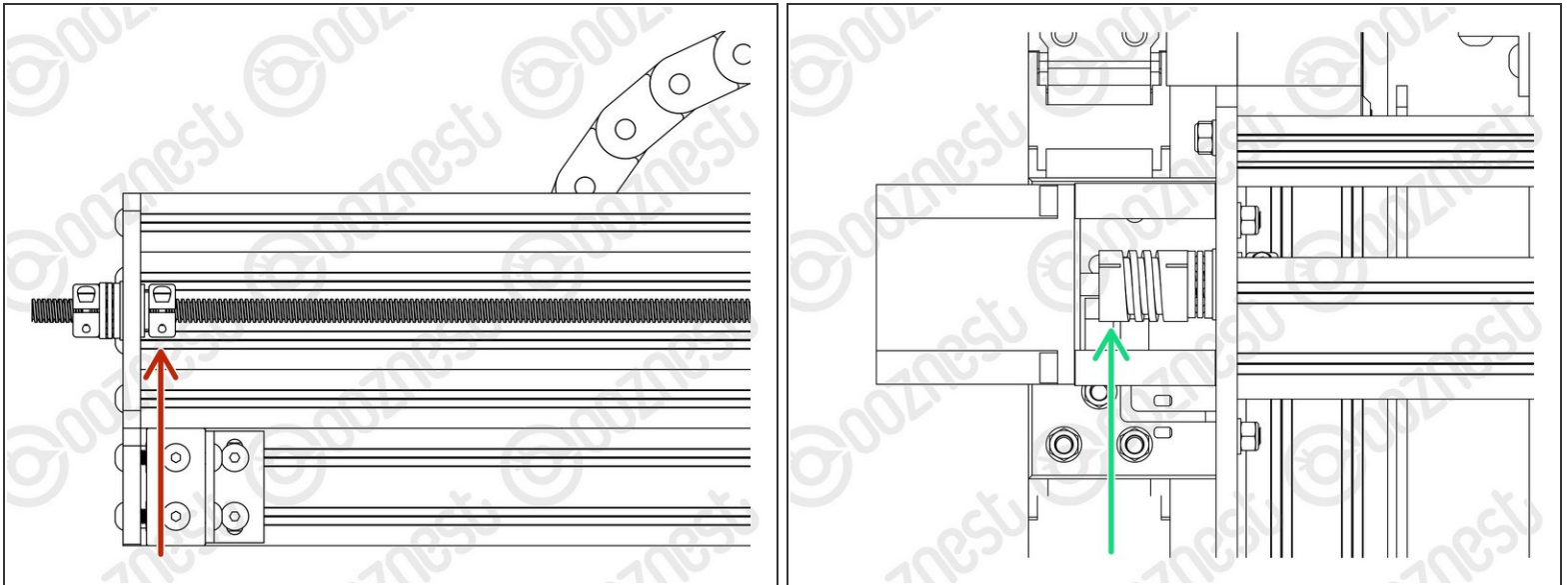
- Once all 3 Lead-Screws are tensioned, put back the Radial-Bearings, Rubber-Bushings, and Clamping-Collars that are on the inside of the extrusion channel on the X & Y Axes.
  - The Clamping-Collars only need to be pushed lightly up against the Rubber-Bushings & Radial-Bearings.

- We need to release any tension inside the Flexible-Couplers.
  - On the Stepper-Motor side of the X & Y-Axis Flexible-Couplers completely loosen the grub screws and clamping bolts.
  - Then completely tighten the same grub screws and clamping bolts.
  - ⚠ Make sure you do this to the Stepper-Motor side of the Flexible-Coupler.
    - ⚠ If you loosen the Lead-Screw side you will loose all tension in the Lead-Screws and you will need to redo it.

- Tighten all the Nut-Blocks on the X & Y-Carriages. While doing so, squeeze the Nut-Blocks together to remove any backlash.

Step 16 — Y-Axis Alignment
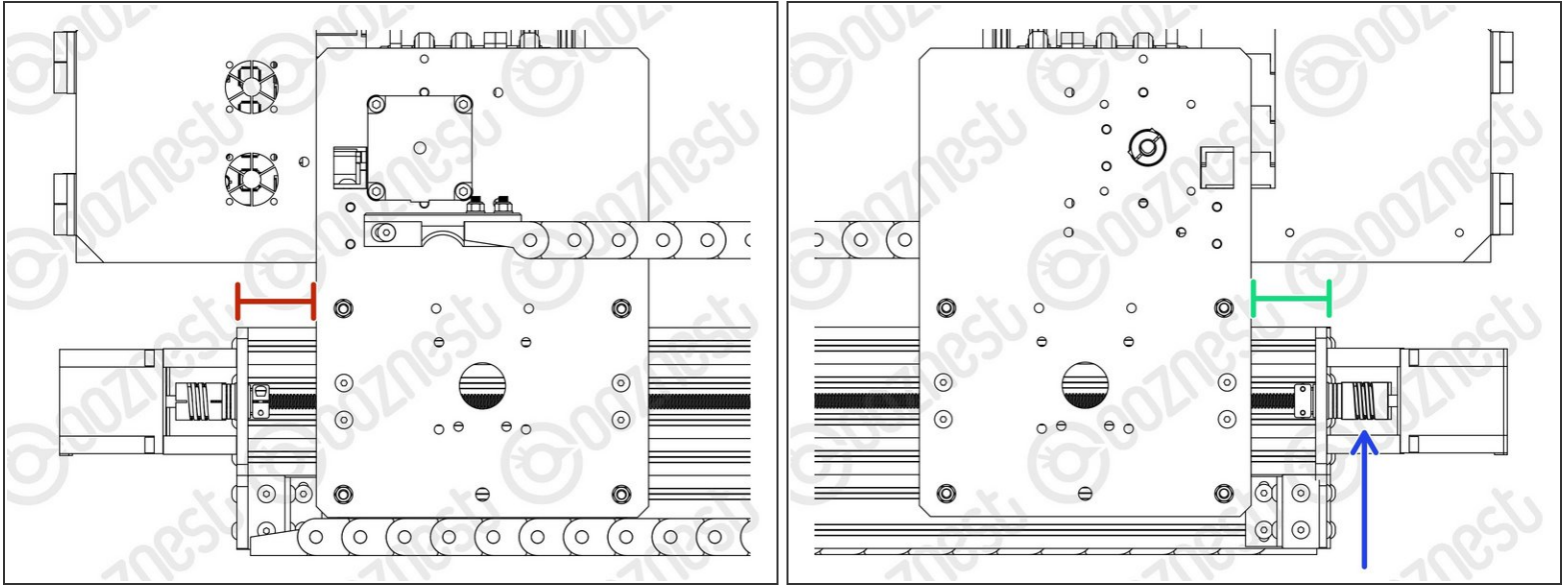
- Home the machine.
  - Then turn the machine off.
  - On the left Y-Axis (The side with the Limit-Switch) measure the distance between the back of the Y-Carriage and Y-End-Plate.
  - On right Y-Axis measure the same distance.
    - Rotate the Flexible-Coupler by hand until it matches the left Y-Axis.

Step 17 — Lead Screw Caps
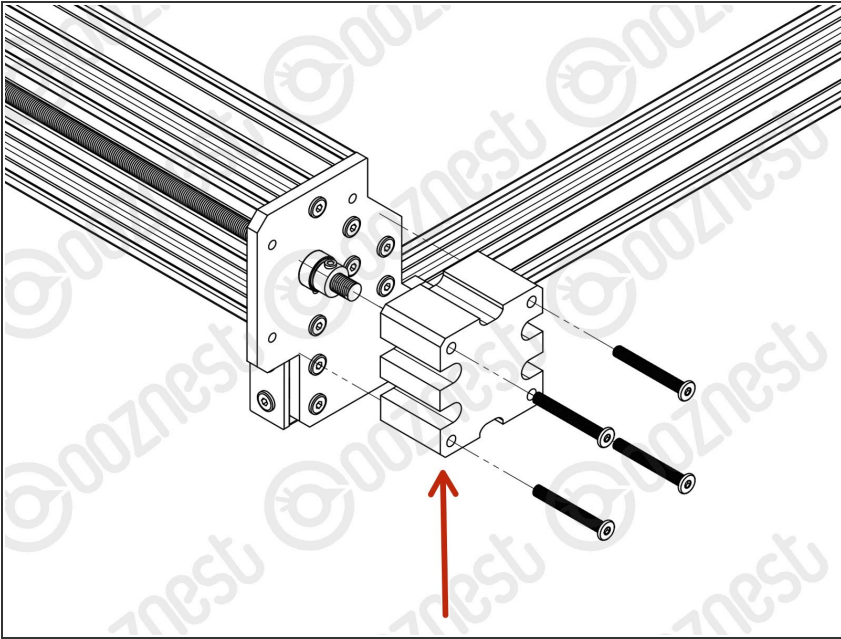
- Put back the Lead-Screw-Caps.

Thanks for following the guide. Any issues, please contact us!