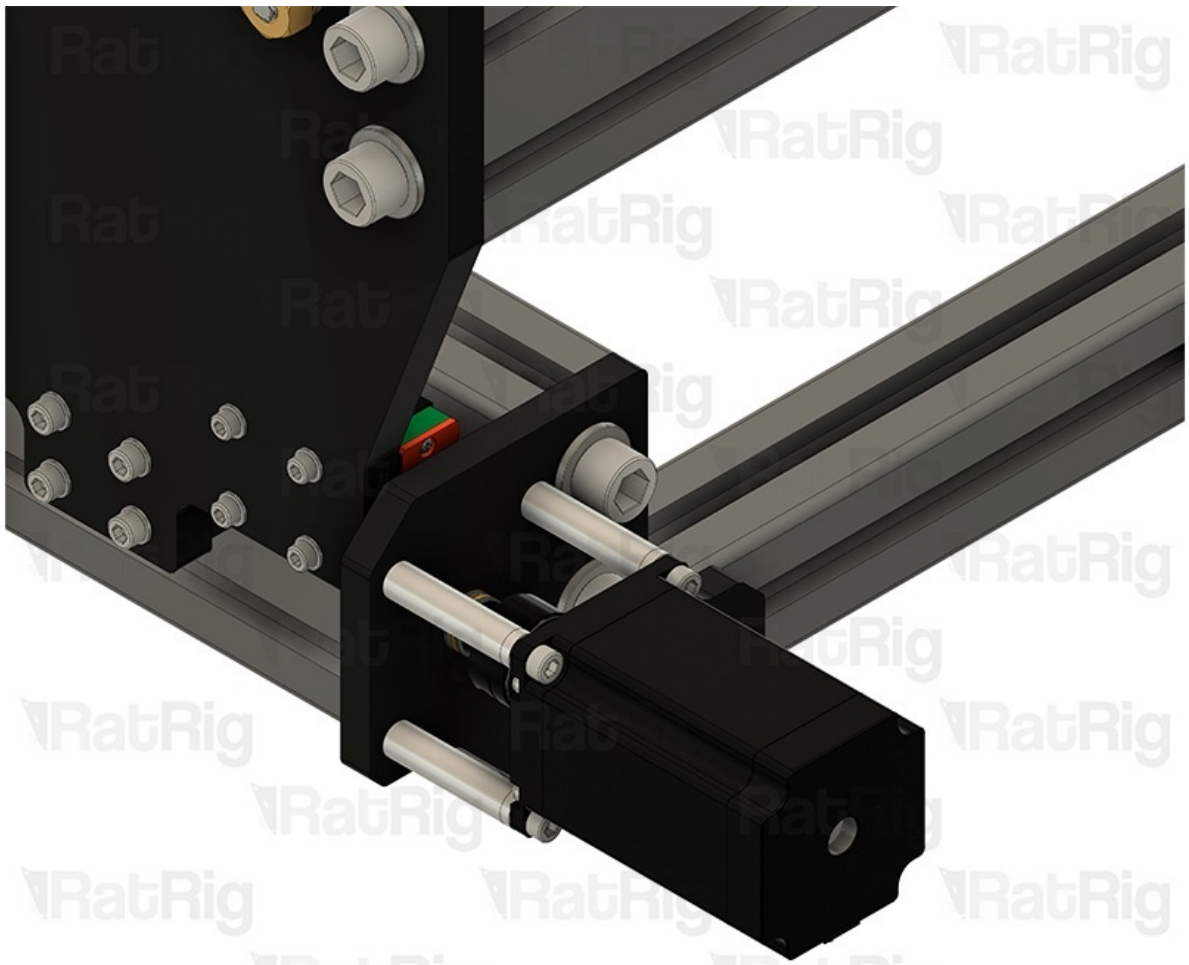
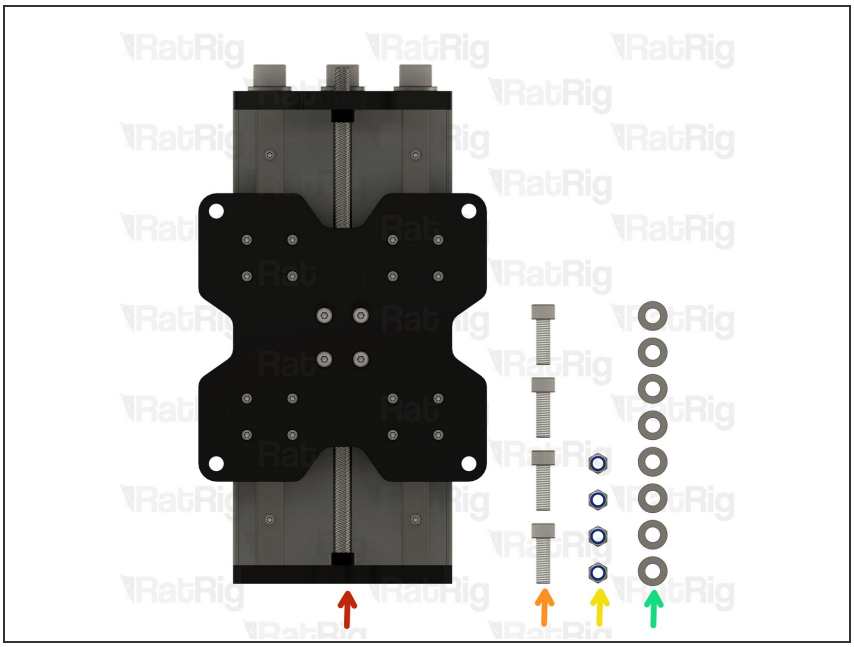
Rat Rig

04. Z-Axis and Steppers Installation

Written By: Miguel Cruz

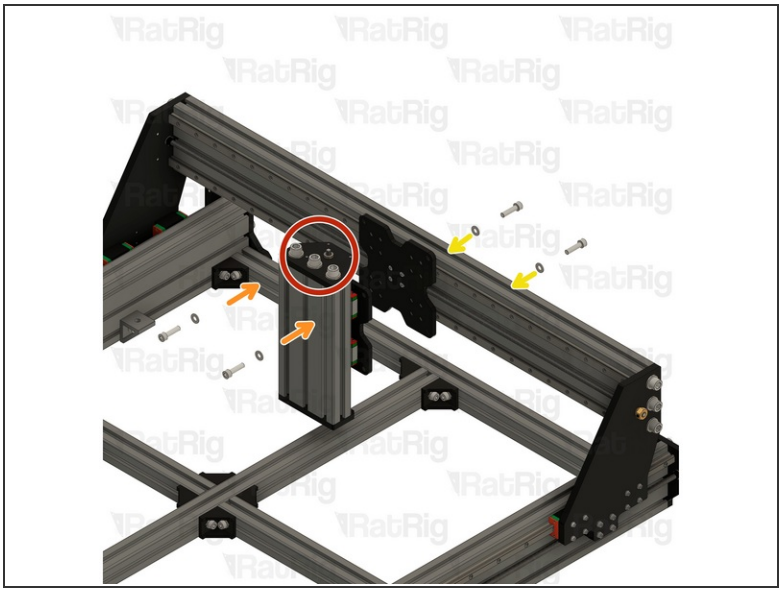


Step 1 — Prepare to install the Z- Axis



- Z- Axis Assembly
- 4x M8x30 Cap Head Screw
- 4x M8 Nylon Locking Hex Nut
- 8x M8 Washer

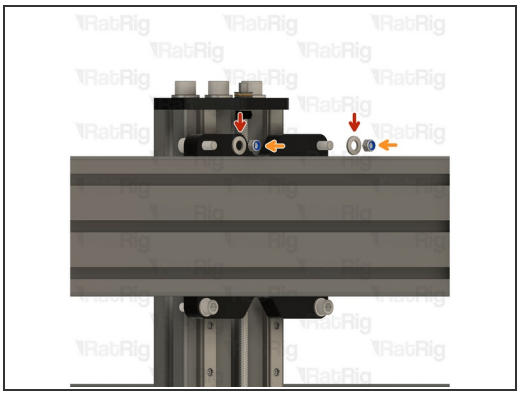
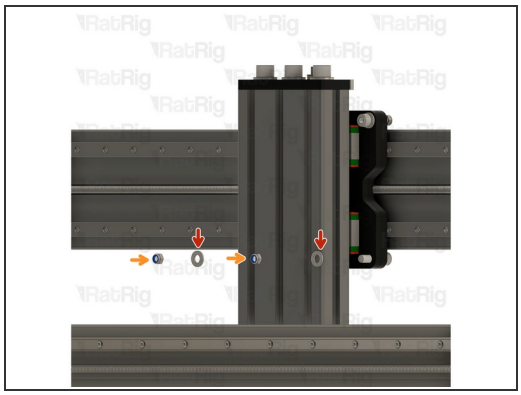
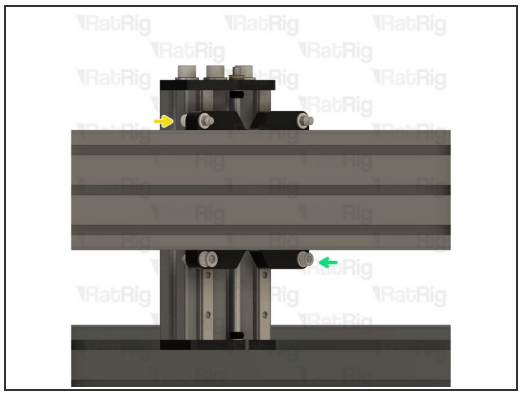
Step 2 — Install the Z - Axis - Part 1



- Make sure the top Z plate is at the top

- Once all four holes are aligned, install an M8 washer on to each M8x30 screw and insert them through the XZ plates, screwing them into the ball screw block
  - The top fasteners must be inserted from the front
  - The bottom fasteners must be inserted from the back

Step 3 — Install the Z - Axis - Part 2

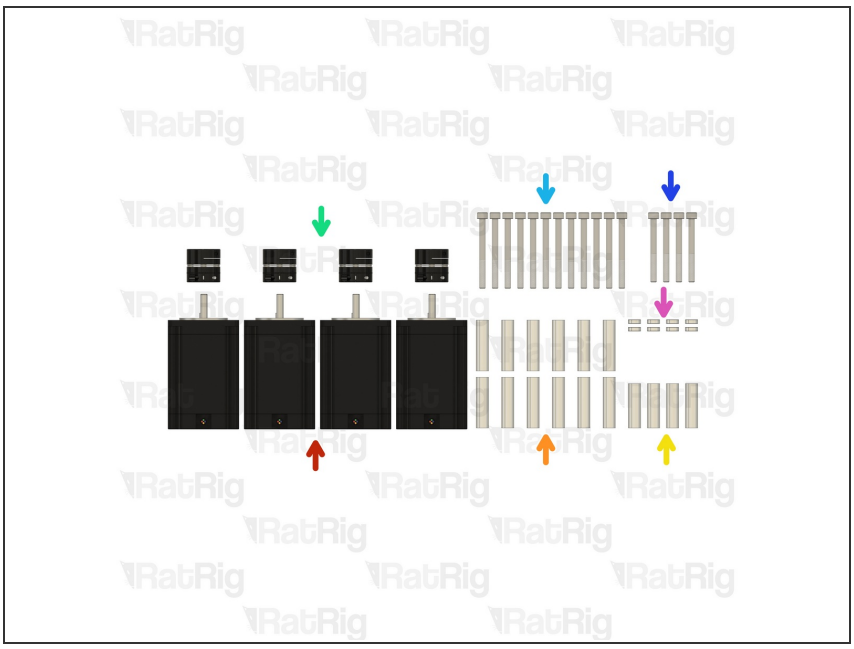




- Insert an M8 Washer on to each screw
- Thread a Nylon Locking Hex Nut into each Screw and tighten everything

Double check the orientation of the screws before proceeding:

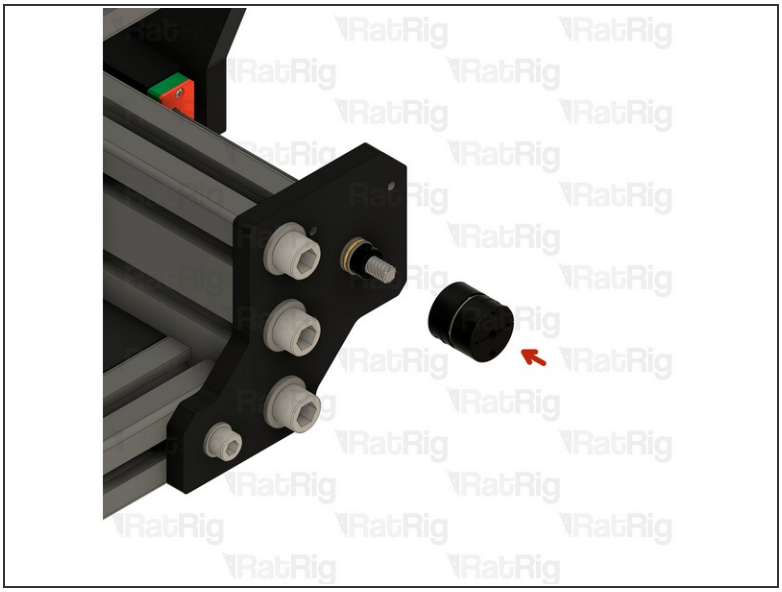
- The top screws must be inserted from the front
- The bottom screws must be inserted from the back

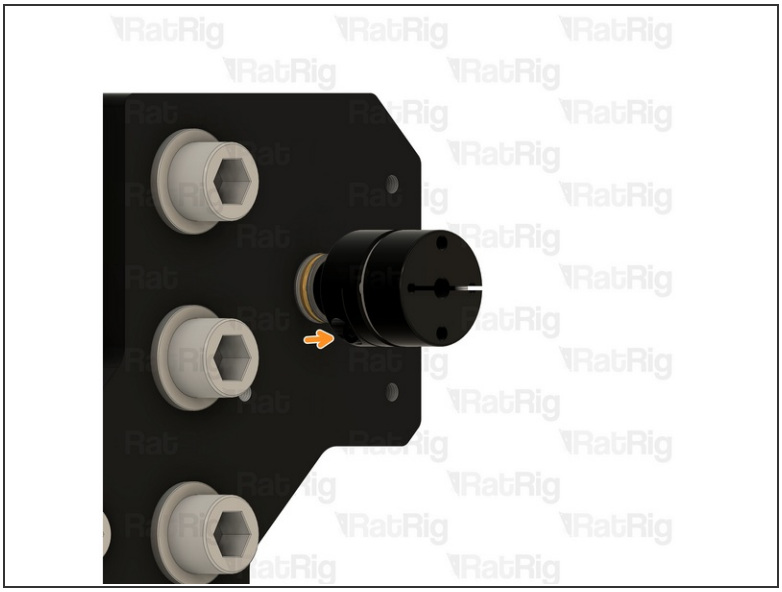
Step 4 — Prepare the Stepper Motors



- 4x Nema 23 Stepper Motor High Torque
- 12x 40mm Aluminium Spacer
- 4x 35mm Aluminium Spacer
- 4x Coupler - Disk Type
- 12x M5x55 Cap Head Screw
- 4x M5x50 Cap Head Screw
- 4x 3mm Aluminium Spacer

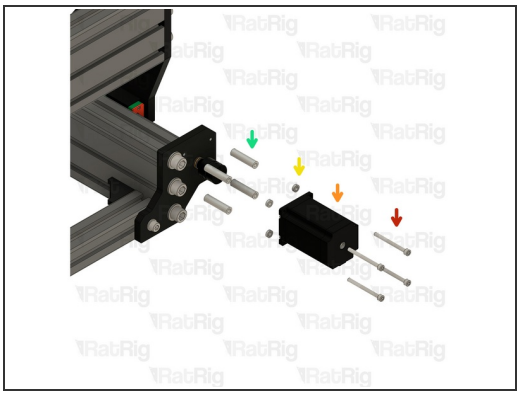
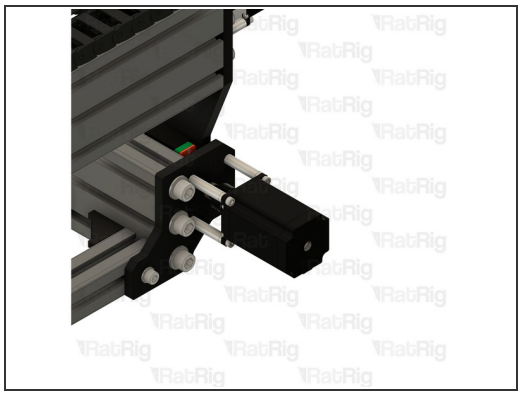
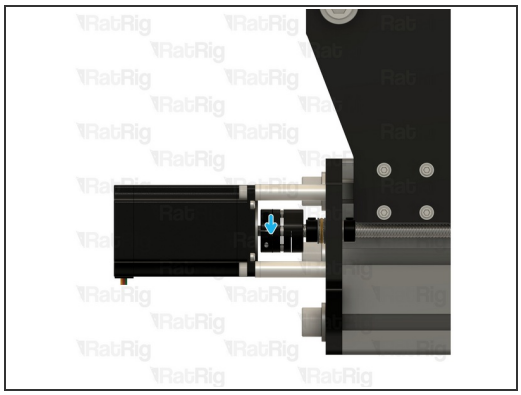
Step 5 — Install the Y Stepper Motor- Part 1





- Coupler - Disk Type
  - Insert the coupler on to the end of the Y-Axis Lead Screw
- Tighten the Screw on the Coupler

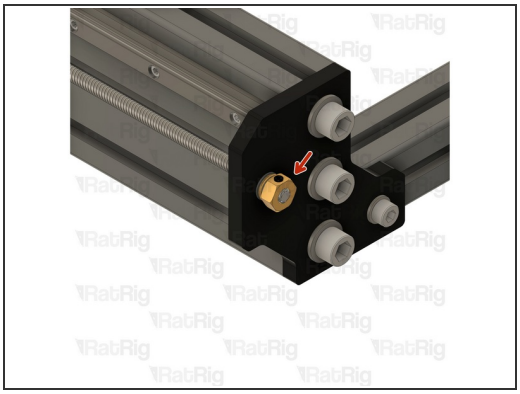
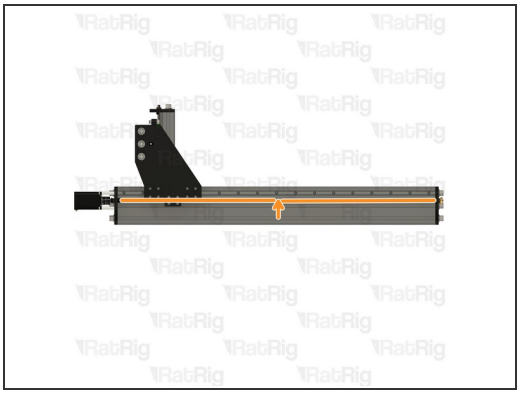
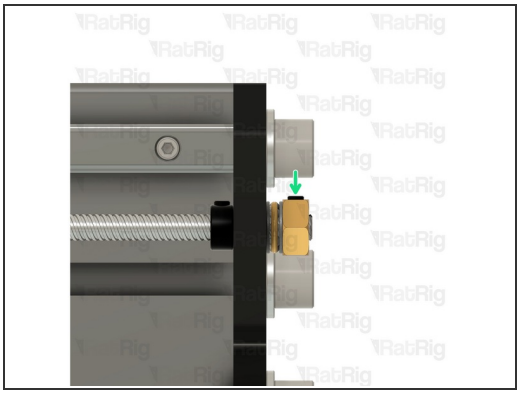
Step 6 — Install the Y Stepper Motor - Part 2

- 4x M5x55 Cap Head Screw
- Nema 23 Stepper Motor High Torque
- 4x 40mm Aluminium Spacer
- 4x 3mm Aluminium Spacer
- Using a 2.5mm hex key, tighten the marked screw to secure the disc coupler to the NEMA23 shaft

  ⓘ Rotate the lead screw by hand until the marked screw is accessible. It's required that both Y-Axis lead screw are rotated simultaneously since they are atatched to the X-gantry.

Step 7 — Install the Y Stepper Motor - Part 3

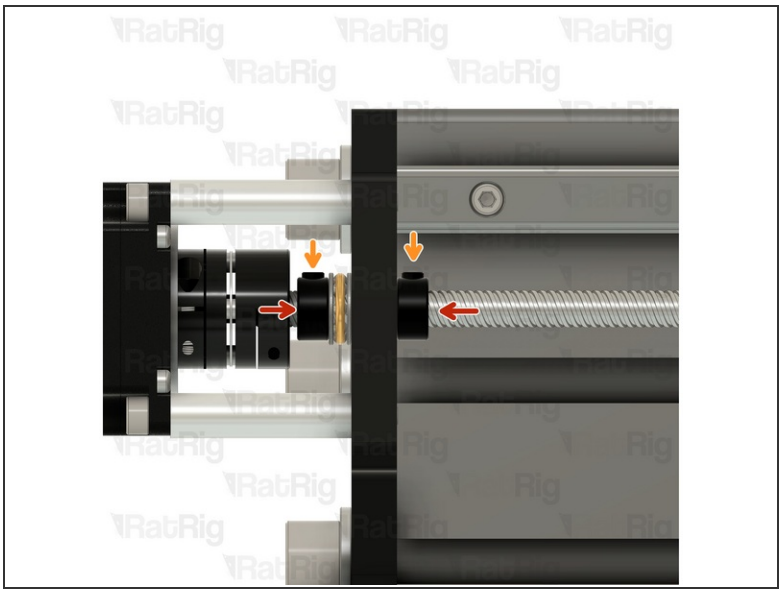




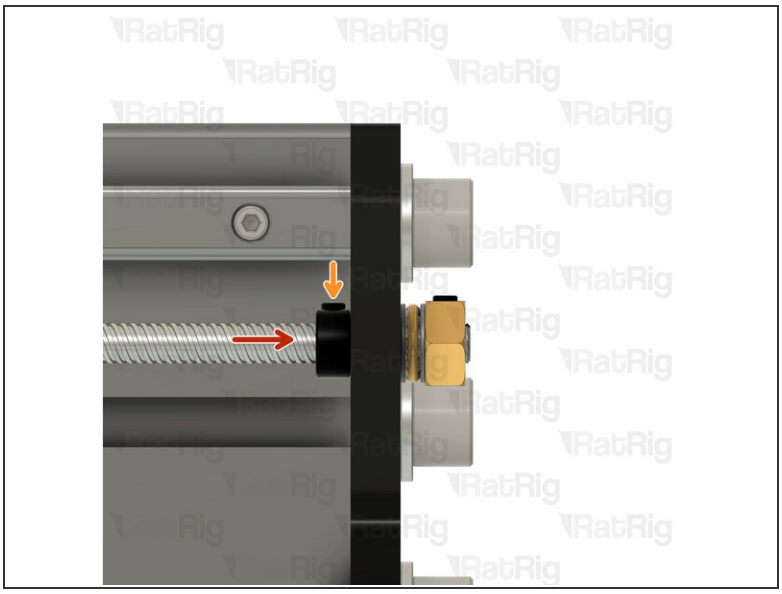
- Tighten the Tensioning Nut until the lead screw is straight
- If you are building a bigger StrongHold ONE then sag on the Lead Screw should be more noticeable, requiring a bit more tension to keep it straight

⚠ Don't overtighten the tensioning nut as it will lead to binding and malfunction of the axis

- Tighten the screw on the tensioner nut once the lead screw is properly adjusted

Step 8 — Install the Y Stepper Motor - Part 4

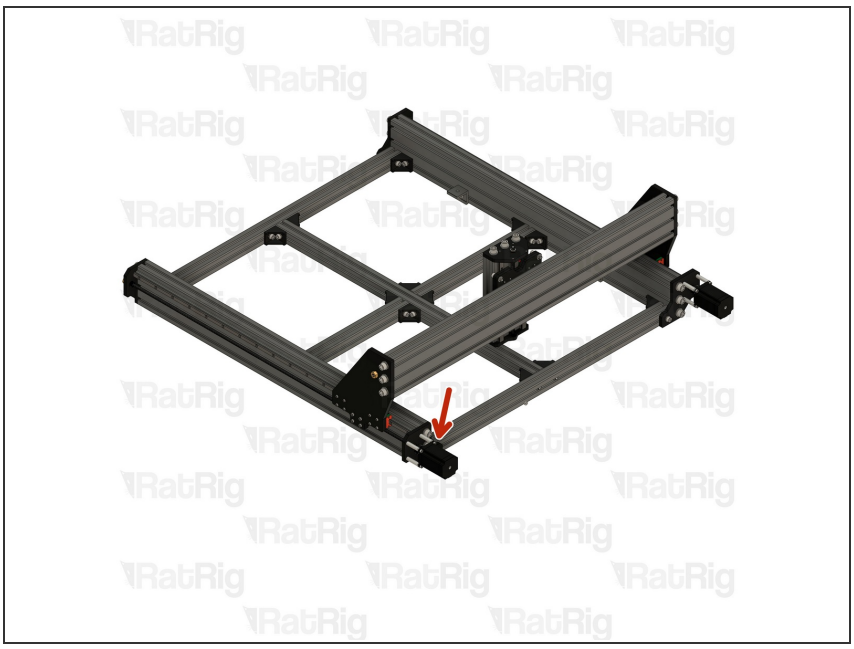




- Push both Lock Collars against the plate
- Tighten the Lock Collar screw

Repeat for the Lock Collar on the other end of the Lead Screw

Step 9 — Install the Y Stepper Motor - Part 5

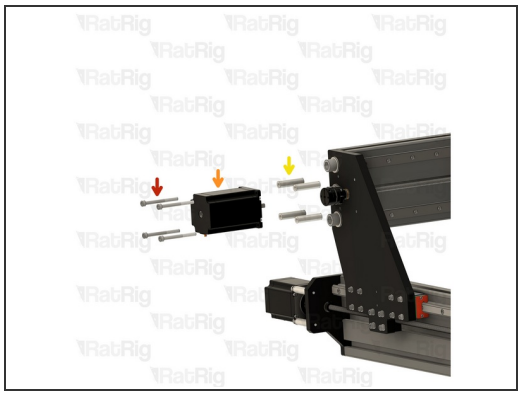


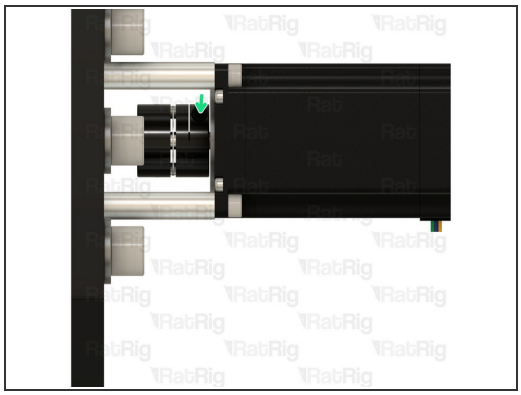
- Repeat **Steps 5 through 8** to install the remaining Y-Axis Stepper Motor

Step 10 — Install the X Stepper Motor - Part 1

- Coupler - Disk Type
  - Insert the coupler on to the end of the X-Axis Lead Screw
- Tighten the Screw on the Coupler

Step 11 — Install the X Stepper Motor - Part 2

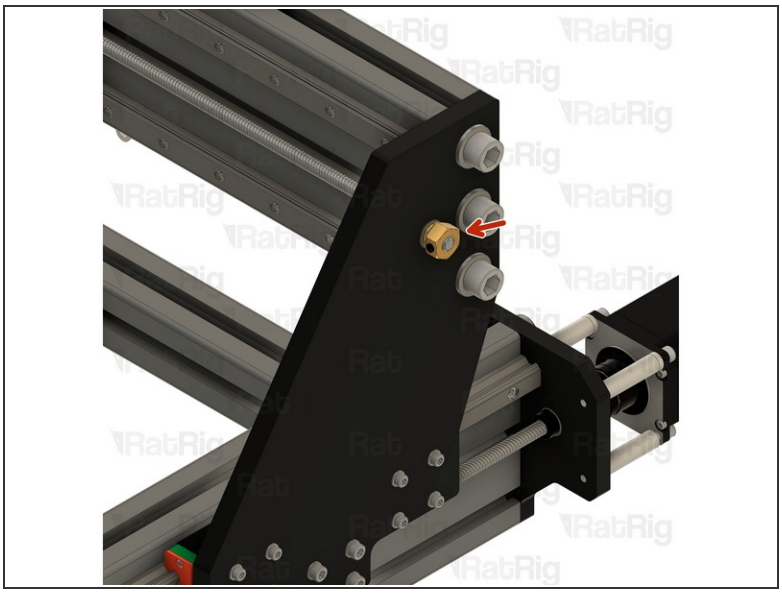


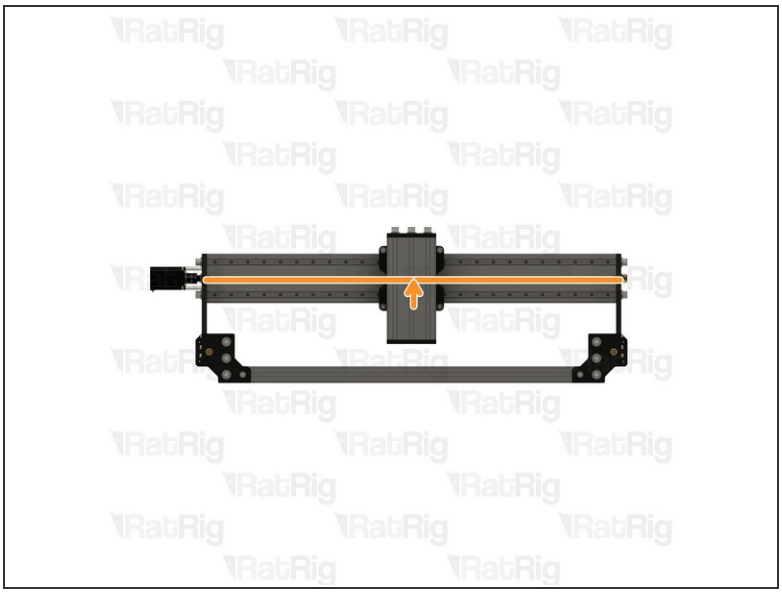


- 4x M5x55 Cap Head Screw
- Nema 23 Stepper Motor High Torque
- 4x 40mm Aluminium Spacer
- Using a 2.5mm hex key, tighten the marked screw to secure the disc coupler to the NEMA23 shaft

  ⓘ Rotate the coupler by hand until the marked screw is accessible

Step 12 — Install the X Stepper Motor - Part 3

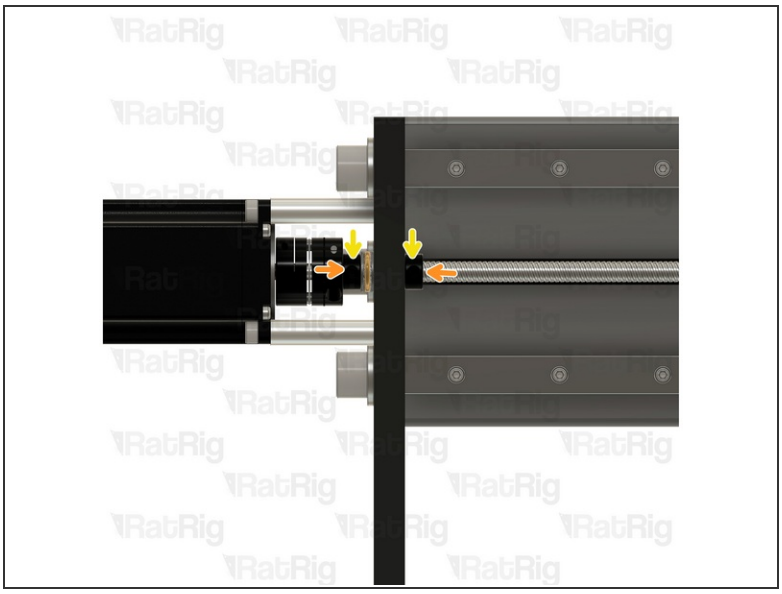




- Tighten the Tensioning Nut until the lead screw is straight
- If you are building a bigger StrongHold ONE CNC then the sag on the Lead Screw should be more noticeable, requiring a bit more tension to keep it straight

⚠ Don't overtighten the tensioning nut as it will lead to binding and malfunction of the axis

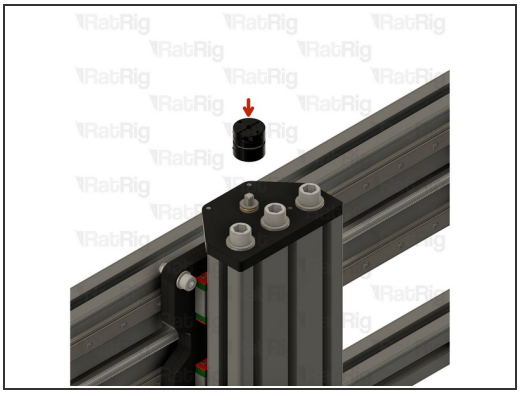
Step 13 — Install the X Stepper Motor - Part 4

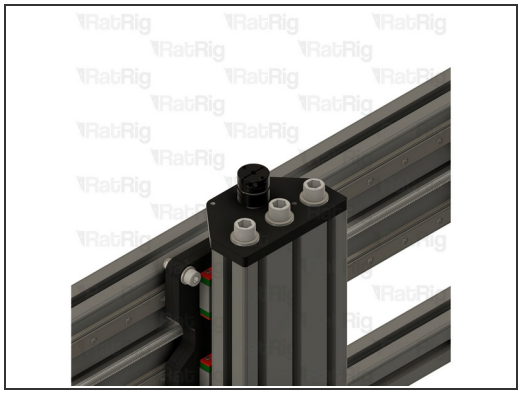


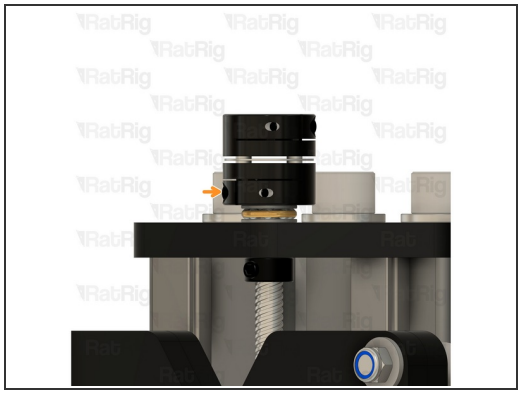
- Tighten the screw on the tensioner nut once the lead screw is properly adjusted
- Push both Lock Collars against the plate
- Tighten the Lock Collar screw

ⓘ Repeat for the Lock Collar on the other end of the Lead Screw

Step 14 — Install the Z Stepper Motor - Part 1





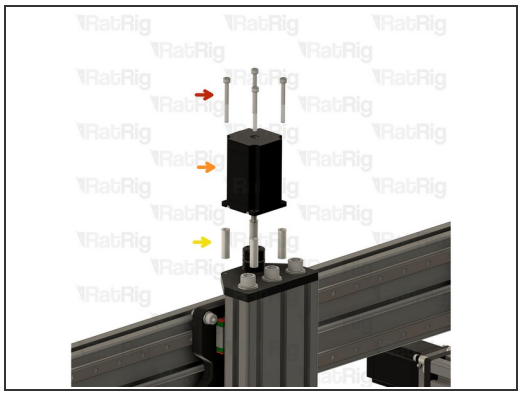
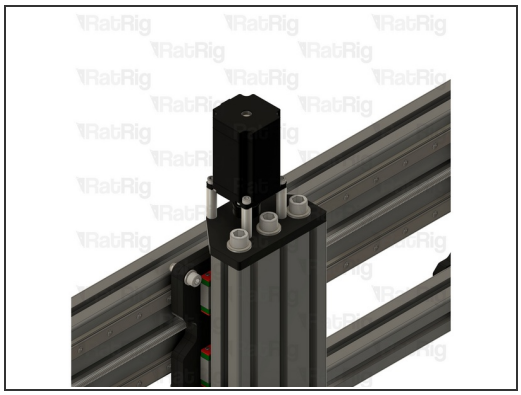
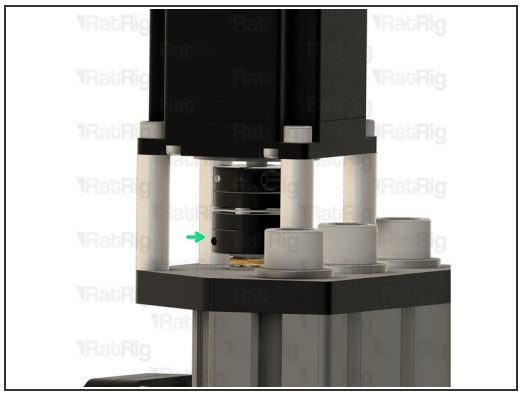


- Coupler - Disk Type

ⓘ Insert the coupler on to the end of the Z-Axis Lead Screw

- Tighten the Screw on the Coupler

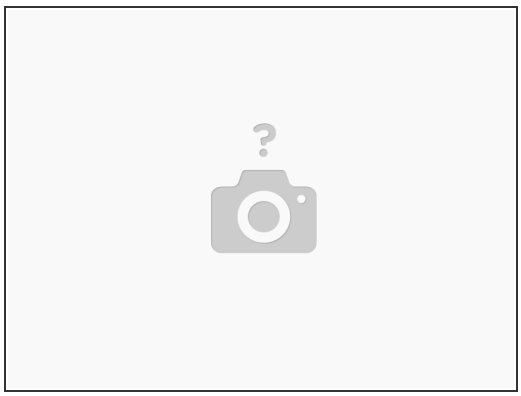
Step 15 — Install the Z Stepper Motor - Part 2

- 4x M5x50 Cap Head Screw
- Nema 23 Stepper Motor High Torque
- 4x 35mm Aluminium Spacer
- Using a 2.5mm hex key, tighten the marked screw to secure the disc coupler to the NEMA23 shaft

  ⓘ Rotate the coupler by hand until the marked screw is accessible

Step 16 — Next guide



- Continue with the next guide: 05. Endstops & Accessories