

Rat Rig

07. Bed Arm Assemblies

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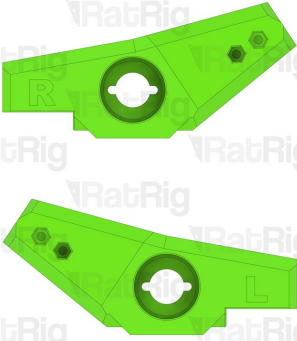
INTRODUCTION

Please note: The lead screw measurements provided in this guide are based upon building a 300x300 V-Core 3.

If you are building a machine of a different size, please refer to the following list for the correct lead screw length for your machine:

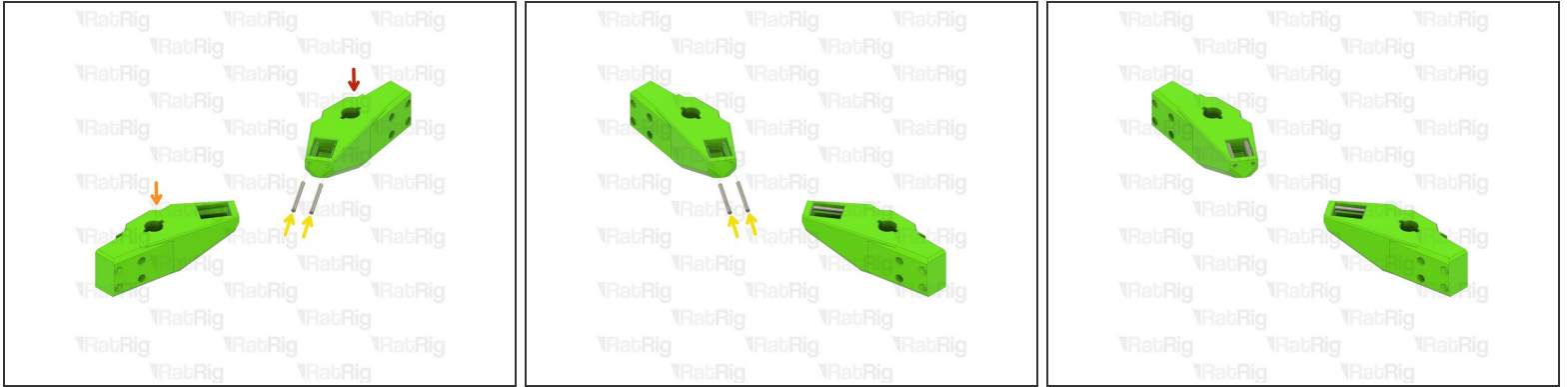
- **200x200:** 3x 280mm lead screws
- **300x300:** 3x 380mm lead screws
- **400x400:** 3x 480mm lead screws
- **500x500:** 3x 580mm lead screws

Step 1 — Prepare the front bed arm parts



- 1x bed_arm_right_3.1 Printed Part
- 1x bed_arm_left_3.1 Printed Part
- 4x M3x12 Countersink Screw
- 4x 3x35mm Dowel Pin
- 2x Neodymium Magnet
- 4x M3 Nylon Locking Hex Nut

Step 2 — Assemble the front bed arms - Part 1



- bed_arm_left_3.1 Printed Part

- bed_arm_right_3.1 Printed Part

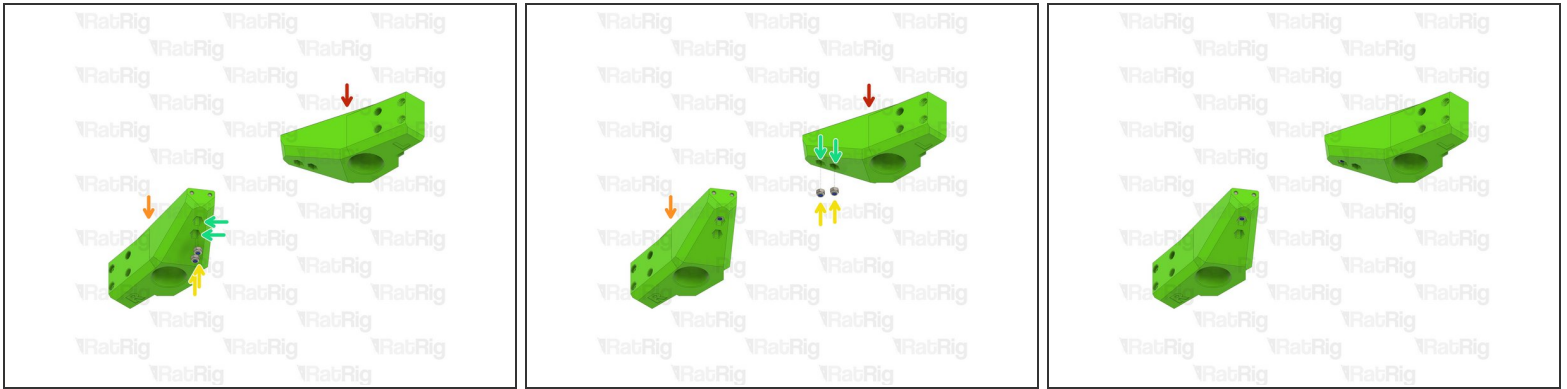
- 3x35mm Dowel Pin

① Insert two dowel pins into each arm as shown

① **Please note:** The dowel pins are quite a tight fit. It is recommended to use a pair of pliers to install them by twisting each pin in the same manner you would install a screw

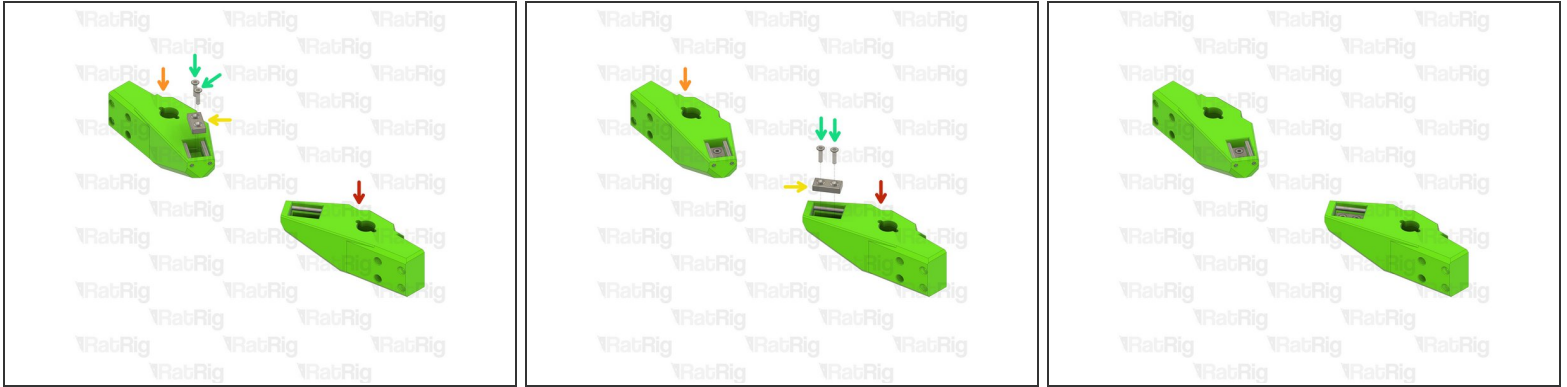
⚠ **Do not** use excessive force to install the pins as this can cause damage to the printed part

Step 3 — Assemble the front bed arms - Part 2



- Left Bed Arm Assembly
- Right Bed Arm Assembly
- M3 Nylon Locking Hex Nut
- Insert an M3 nut into each marked position

Step 4 — Assemble the front bed arms - Part 3



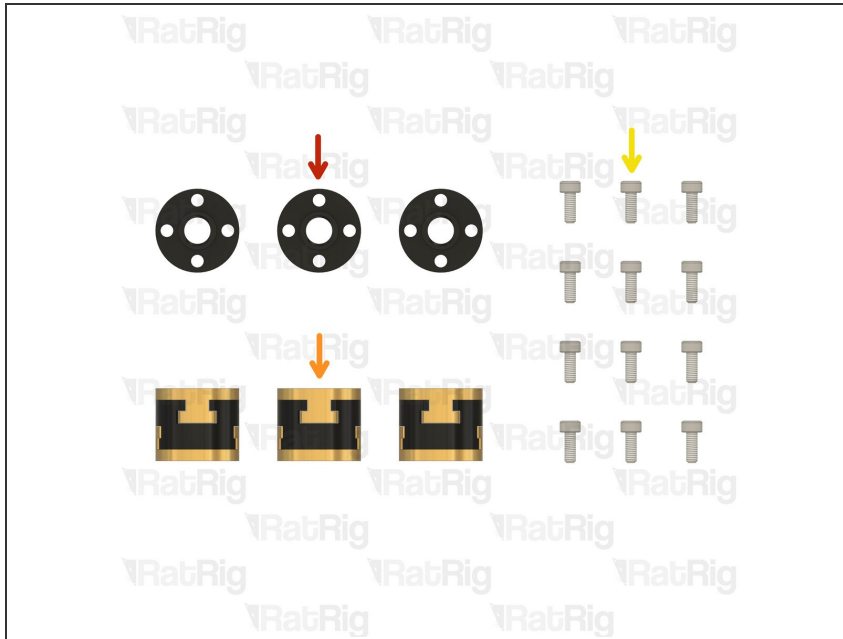
- Left Bed Arm Assembly
- Right Bed Arm Assembly
- Neodymium Magnet
- M3x12 Countersink Screw

i Install two M3x12 countersink screws into each magnet and then install them into the arms as shown

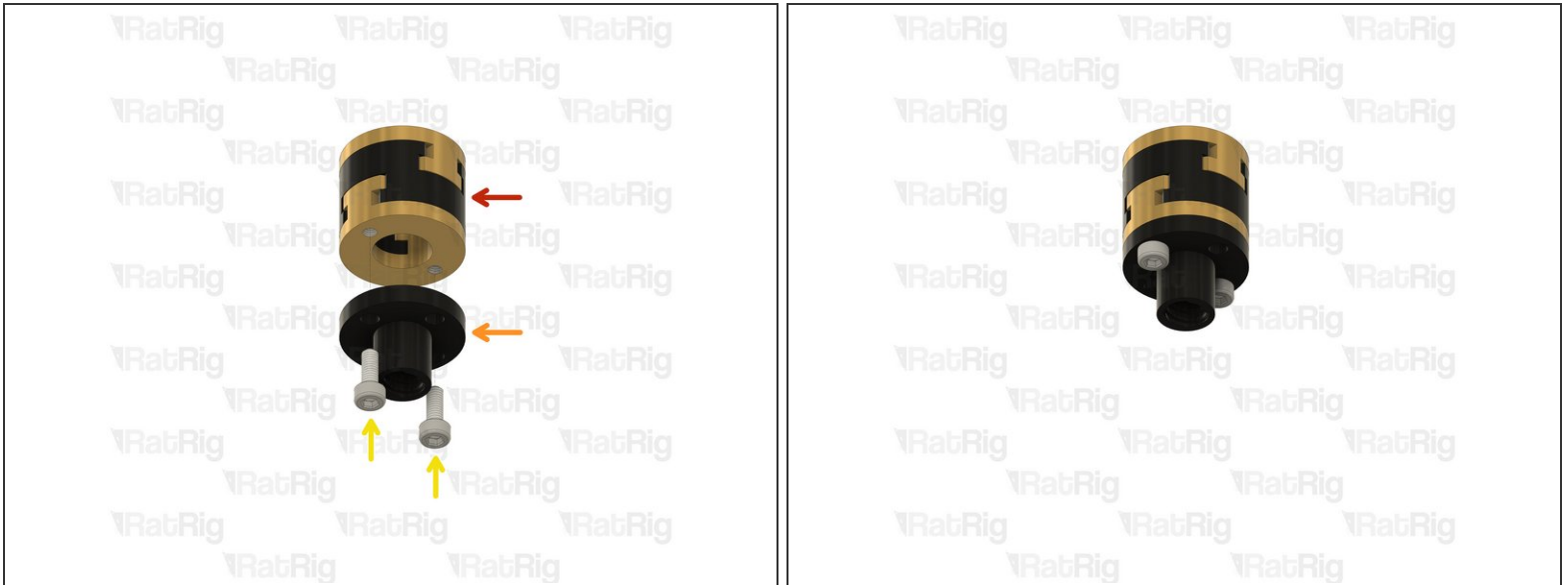
! Take care not to over tighten the M3x12 screws as you can crack the magnets and/or damage the printed parts

i Set these assemblies aside until **Step 7**

Step 5 — Prepare the lead screw decoupler parts



- 3x TR8x4 POM Lead screw Nut
- 3x Rat Rig Bi-Material Lead Screw Decoupler
- 12x M3x8 Cap Head Screw

Step 6 — Assemble the lead screw decouplers (x3)

- Rat Rig Bi-Material Lead Screw Decoupler
- TR8x4 POM Lead screw Nut
- M3x8 Cap Head Screw

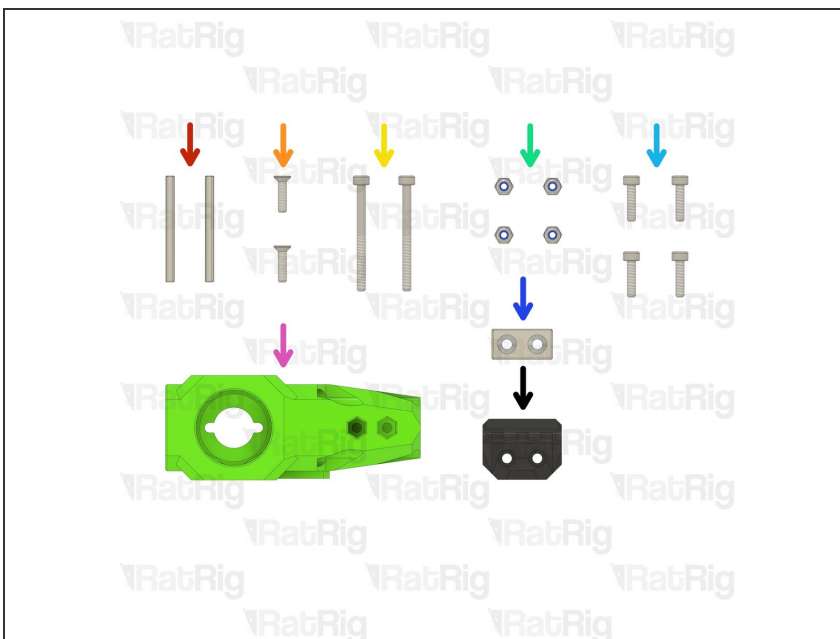
i Assemble all three lead screw decouplers as shown. Set one aside until **Step 13**, keep the other two for the next step

Step 7 — Install the lead screw decoupler into the front bed arms



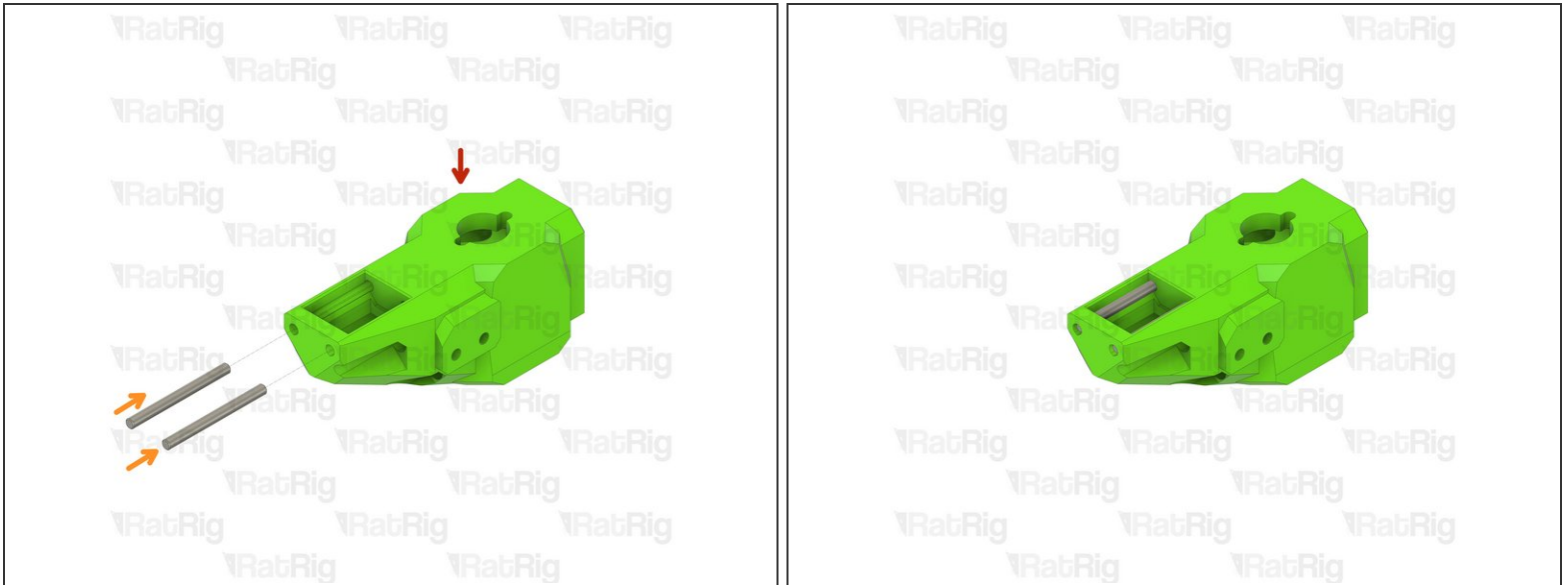
- Left bed arm assembly
- Lead screw decoupler assembly
- M3x8 Cap Head Screw
- ❗ Install a lead screw decoupler assembly into each arm as shown
- ⚠ Take care not to over tighten the M3x8 screws as you damage the printed parts
- Right bed arm assembly

Step 8 — Prepare the rear bed arm parts



- 2x 3x35mm Dowel Pin
- 2x M3x12 Countersink Screw
- 2x M3x35 Cap Head Screw
- 4x M3 Nylon Locking Hex Nut
- 4x M3x12 Cap Head Screw
- 1x Neodymium Magnet
- 1x bed_arm_rear_3.1 Printed Part
- 1x bed_cable_relief_3.1 Printed Part

Step 9 — Assemble the rear bed arm - Part 1



- bed_arm_rear_3.1 Printed Part

- 3x35mm Dowel Pin

① Insert two dowel pins into the arm as shown

① **Please note:** The dowel pins are quite a tight fit. It is recommended to use a pair of pliers to install them by twisting each pin in the same manner you would install a screw

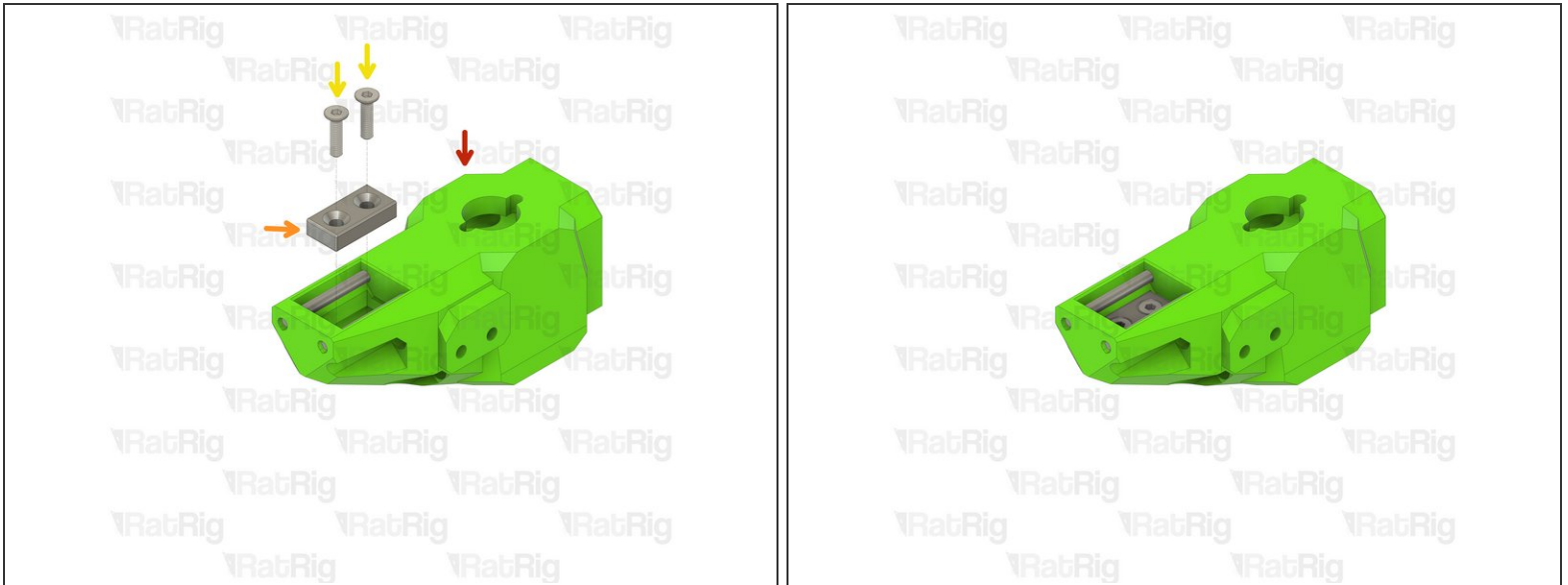
⚠ **Do not** use excessive force to install the pins as this can cause damage to the printed part

Step 10 — Assemble the rear bed arm - Part 2



- Rear bed arm assembly
- M3 Nylon Locking Hex Nut
- Insert an M3 nut into each marked position

Step 11 — Assemble the rear bed arm - Part 3



- Rear bed arm assembly
 - Neodymium Magnet
 - M3x12 Countersink Screw
- i** Install two M3x12 countersink screws into the magnet and then install it into the arm as shown
- ⚠** Take care not to over tighten the M3x12 screws as you can crack the magnet and/or damage the printed part

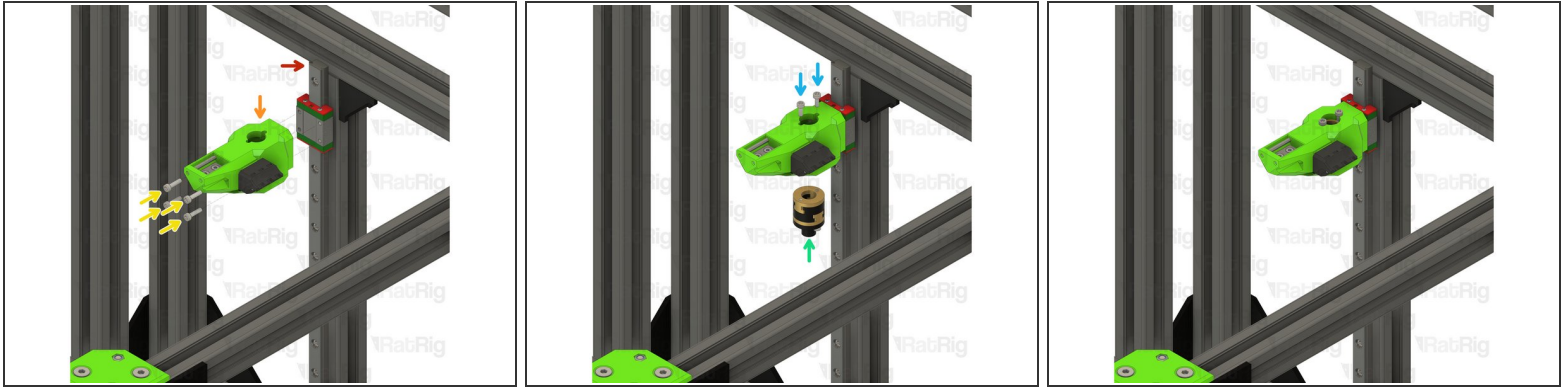
Step 12 — Assemble the rear bed arm - Part 4



- Rear bed arm assembly
- M3 Nylon Locking Hex Nut
- bed_cable_relief_3.1 Printed Part
- M3x35 Cap Head Screw
- ① Install the M3x35 screws through the bed_cable_relief_3.1 printed part, rear bed arm, and fasten them into the M3 nylon locking nuts

⚠ Take care not to over tighten the M3x35 screws as you can damage the printed parts

Step 13 — Install the rear bed arm - Part 1



- V-Core 3.1 Frame Assembly

- Rear bed arm assembly

- M3x12 Cap Head Screw

① Install the M3x12 screws into the arm as shown, then fasten the arm to the rear linear rail carriage

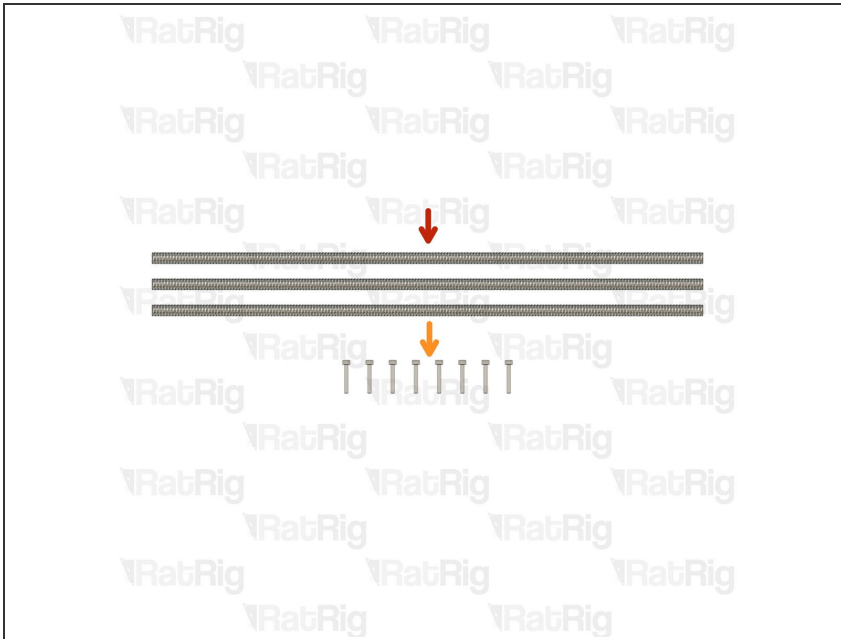
- Lead screw decoupler assembly from **Step 6**

- M3x8 Cap Head Screw

① Install a lead screw decoupler assembly into the rear arm as shown

⚠ Take care not to over tighten the M3 screws as you damage the printed part

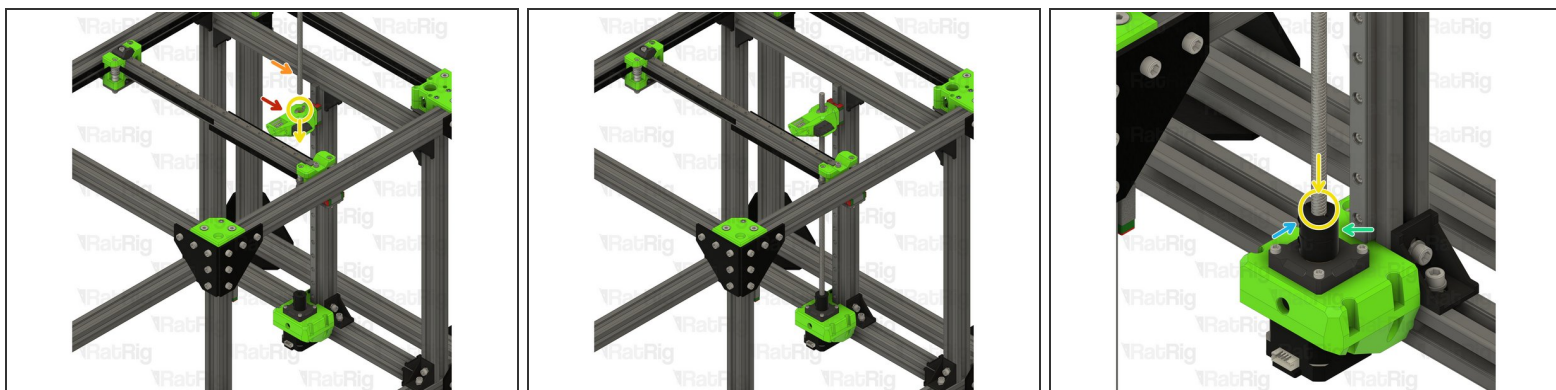
Step 14 — Prepare the Z-axis lead screws



● 3x 380mm TR8x4 Lead Screws

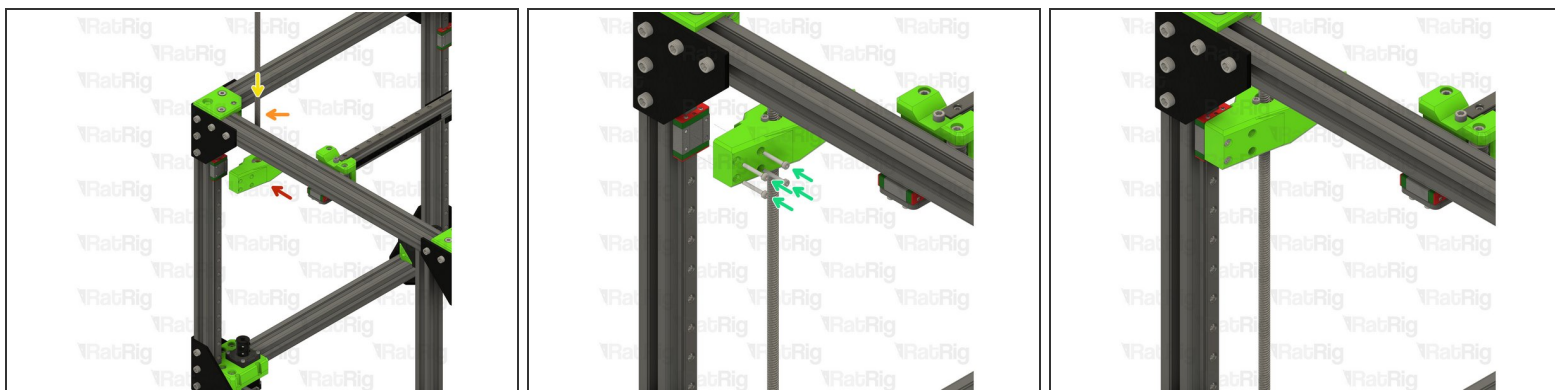
● 8x M3x20 Cap Head Screw

Step 15 — Install the rear lead screw



- Rear bed arm assembly
- 380mm TR8x4 Lead Screw
- Install the lead screw through the rear bed arm and decoupler
- ⚠ **Do not force** the lead screw through the POM nut on the decoupler as this can cause damage.
It should thread through smoothly
- Rigid Lead Screw Coupler
- ⓘ Continue threading the lead screw through the arm until it reaches the rigid lead screw coupler on the rear Z-axis motor mount
- Insert the lead screw fully into the rigid coupler
- Fasten the marked M3 screw to secure the lead screw to the NEMA17 motor

Step 16 — Install the front left bed arm & lead screw - Part 1

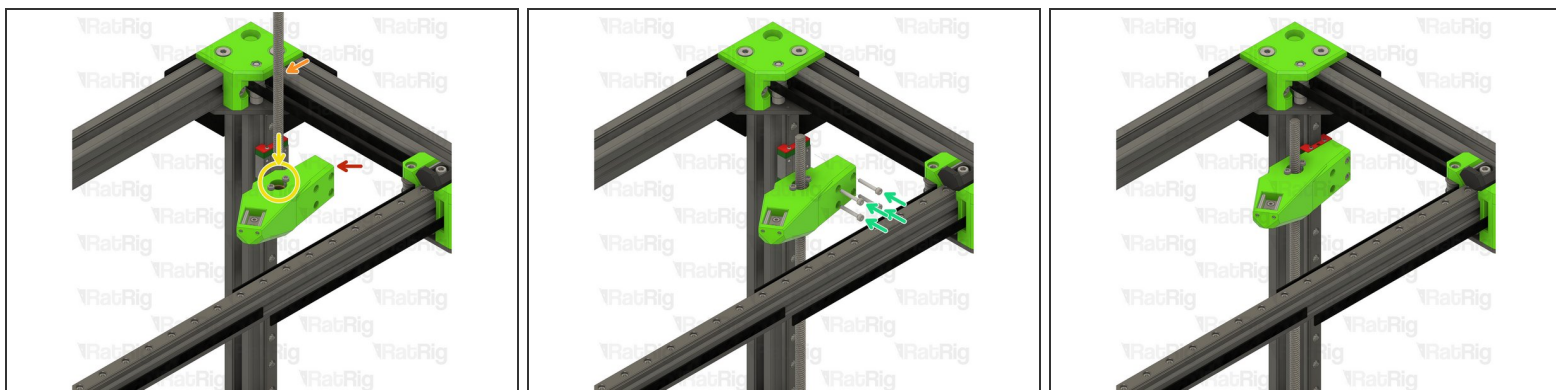


- Front right bed arm assembly
- 380mm TR8x4 lead screw
- Install the lead screw through the front bed arm and decoupler
- ⚠ **Do not force** the lead screw through the POM nut on the decoupler as this can cause damage.
It should thread through smoothly
- ⓘ Continue threading the lead screw through the arm until it reaches the rigid lead screw coupler on the front right Z-axis motor mount
- M3x20 Cap Head Screw
- ⓘ Install each screw through the bed arm assembly as shown, then fasten the arm to the linear rail carriage

Step 17 — Install the front left bed arm & lead screw - Part 2

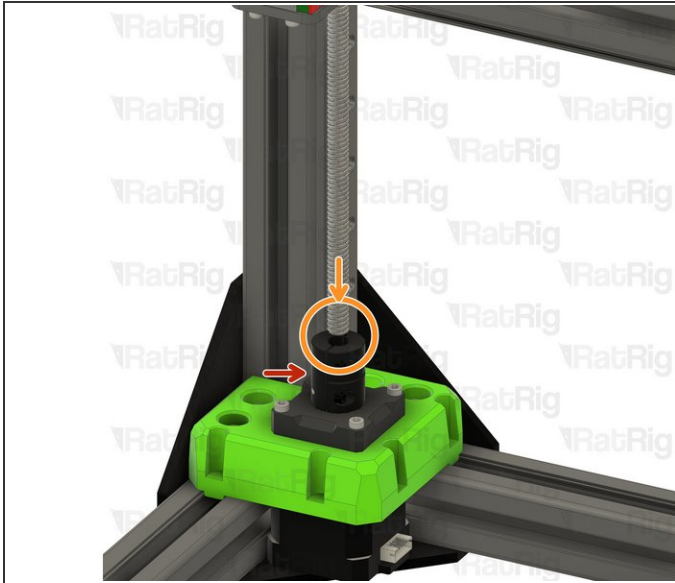
- Rigid Lead Screw Coupler
- Insert the lead screw fully into the rigid coupler
- Fasten the marked M3 screw to secure the lead screw to the NEMA17 motor

Step 18 — Install the front right bed arm & lead screw - Part 1



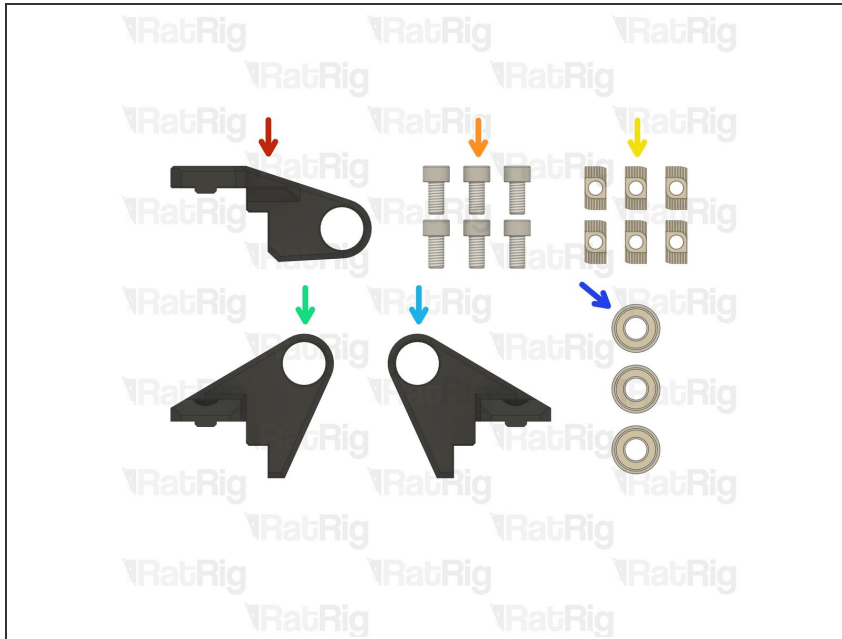
- Front left bed arm assembly
- 380mm TR8x4 lead screw
- Install the lead screw through the front bed arm and decoupler
- ⚠ **Do not force** the lead screw through the POM nut on the decoupler as this can cause damage. It should thread through smoothly
- ⓘ Continue threading the lead screw through the arm until it reaches the rigid lead screw coupler on the front left Z-axis motor mount
- M3x20 Cap Head Screw
- ⓘ Install each screw through the bed arm assembly as shown, then fasten the arm to the linear rail carriage

Step 19 — Install the front right bed arm & lead screw - Part 2



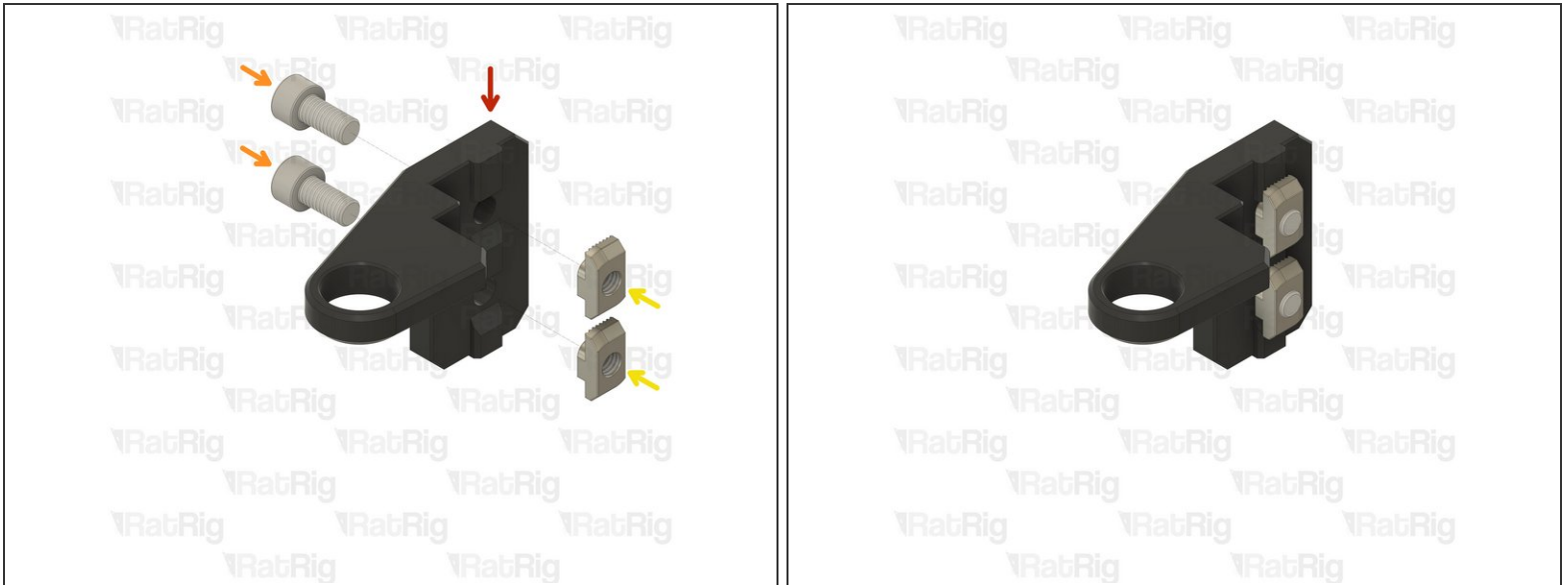
- Rigid Lead Screw Coupler
- Insert the lead screw fully into the rigid coupler
- Fasten the marked M3 screw to secure the lead screw to the NEMA17 motor

Step 20 — Prepare the lead screw constraint parts



- 1x lead_screw_constraint_rear_3.1 Printed Part
- 6x M6x12 Cap Head Screw
- 6x 3030 Drop-in T-Nut - M6
- 1x lead_screw_constraint_front_left_3.1 Printed Part
- 1x lead_screw_constraint_front_right_3.1 Printed Part
- 3x F688ZZ Ball Bearing

Step 21 — Assemble the rear lead screw constraint



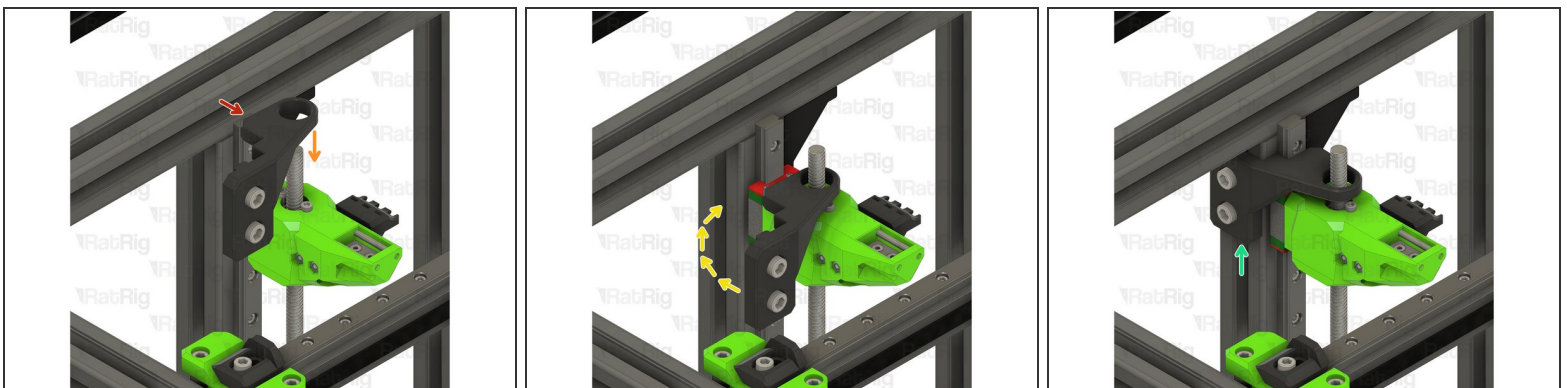
- lead_screw_constraint_rear_3.1 Printed Part
- M6x12 Cap Head Screw
- ① Insert an M6x12 cap head screw into each position on the lead screw constraint as shown
- 3030 Drop-in T-Nut - M6
- ① Loosely thread a 3030 T-Nut onto each of the M6x20 screws. Do not tighten them at this point

Step 22 — Assemble the front lead screw constraints



- lead_screw_constraint_left_3.1 Printed Part
- lead_screw_constraint_right_3.1 Printed Part
- M6x12 Cap Head Screw
 - ① Insert an M6x12 cap head screw into each position on the lead screw constraint as shown
- 3030 Drop-in T-Nut - M6
 - ① Loosely thread a 3030 T-Nut onto each of the M6x20 screws. Do not tighten them at this point

Step 23 — Install the rear lead screw constraint - Part 1



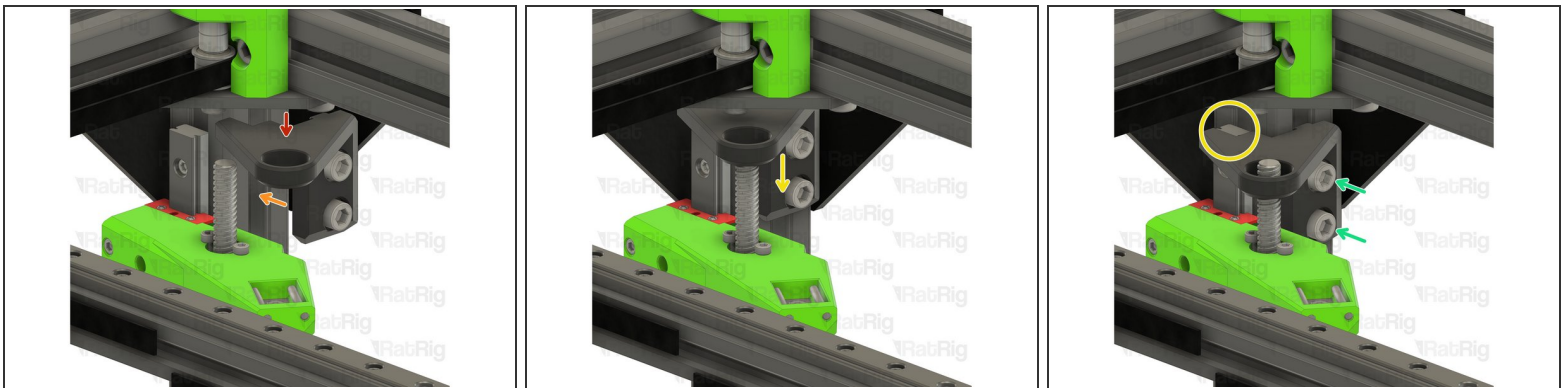
- Rear lead screw constraint assembly from **Step 21**
- Position the constraint assembly so that the rear lead screw passes through the hole
- Rotate the constraint assembly clockwise and fit it to the rear 3030 extrusion as shown
- Push the constraint assembly upwards until it touches the horizontal 3030 extrusion

Step 24 — Install the rear lead screw constraint - Part 2



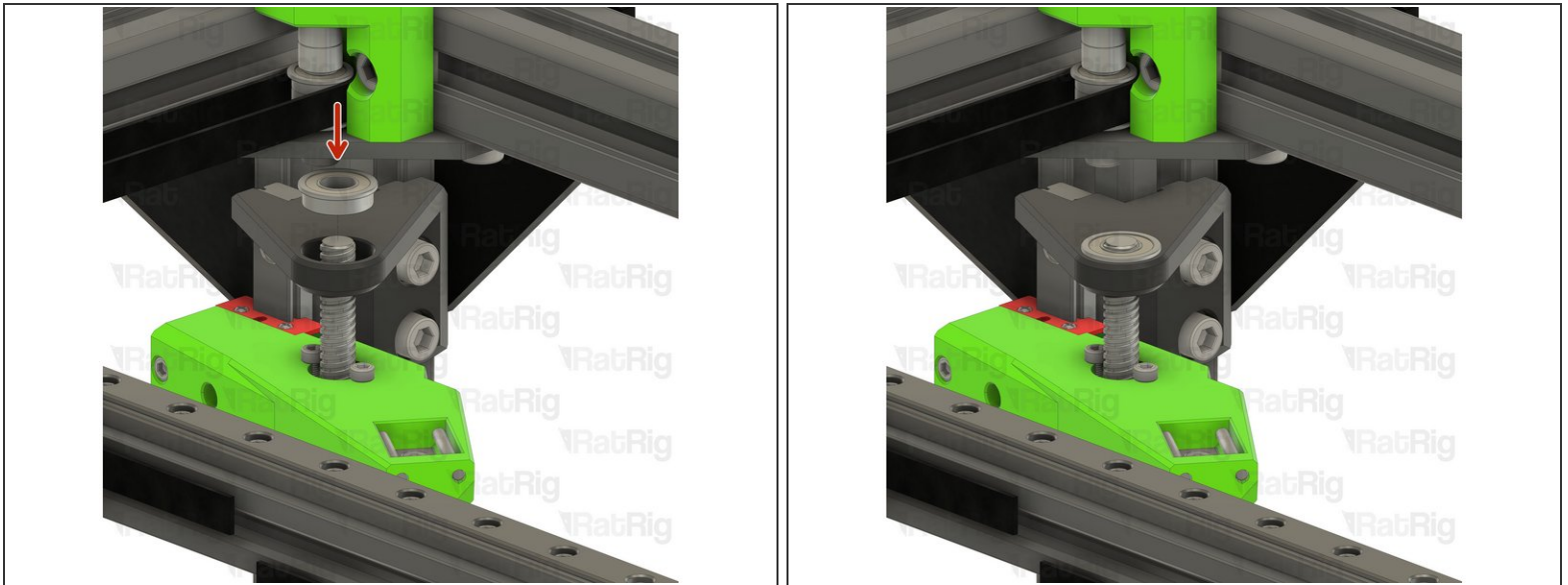
- M6x12 Cap Head Screw
 - ⓘ Fasten both M6x12 screws to secure the constraint assembly to the V-Core 3.1 frame
 - ⚠ Take care not to over tighten the M6 screws as you damage the printed part
- F688ZZ Ball Bearing
 - ⓘ Fit the bearing onto the lead screw and into the constraint assembly as shown

Step 25 — Install the front right lead screw constraint - Part 1



- Right lead screw constraint assembly from **Step 22**
- Fit the constraint assembly to the frame as shown
- Push the constraint assembly downwards until its top is flush with the top of the linear rail
- Fasten both M6x12 screws to secure the constraint assembly to the V-Core 3.1 frame

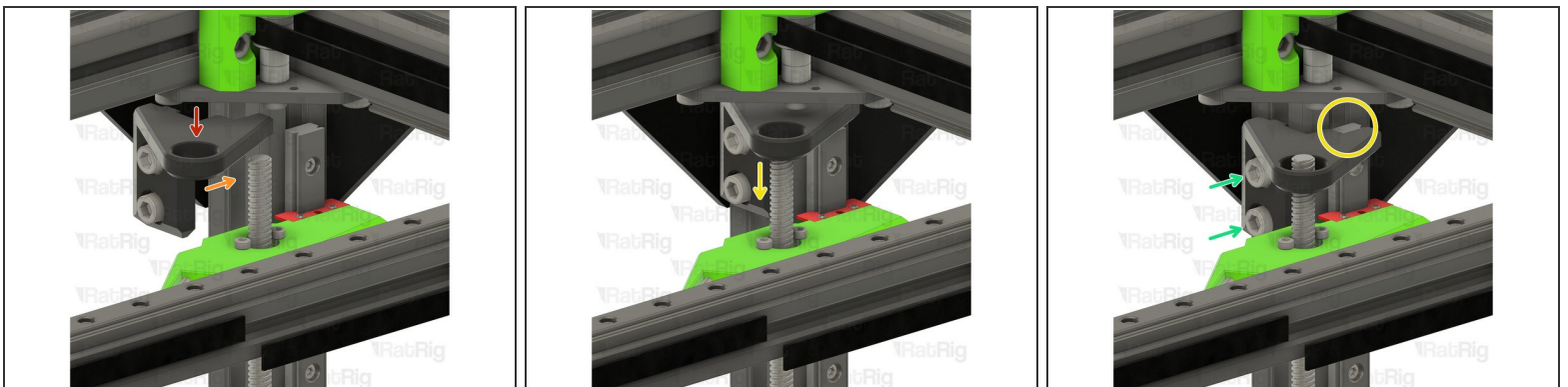
Step 26 — Install the front right lead screw constraint - Part 2



- F688ZZ Ball Bearing

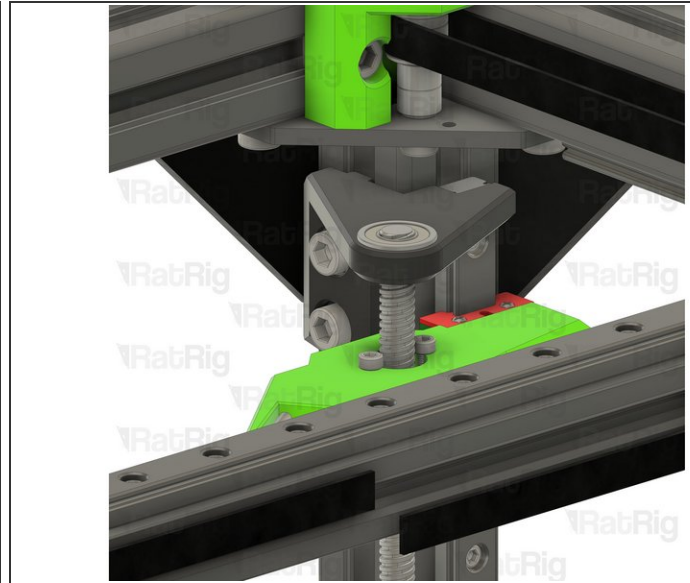
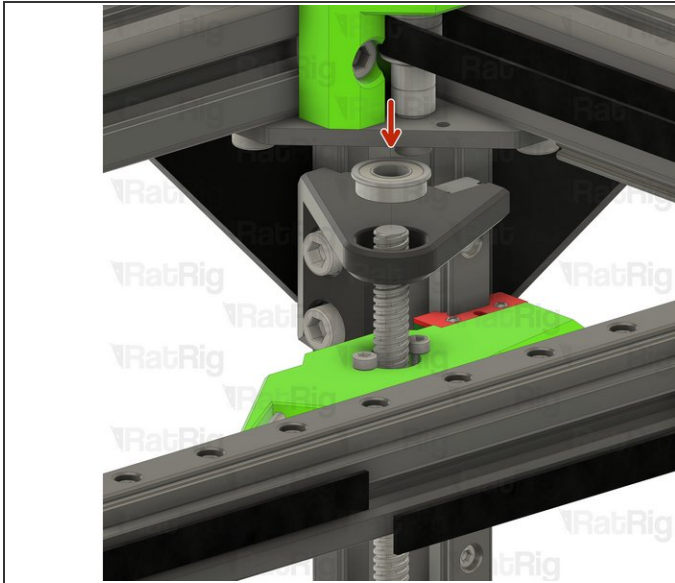
① Fit the bearing onto the lead screw and into the constraint assembly as shown

Step 27 — Install the front left lead screw constraint - Part 1



- Left lead screw constraint assembly from **Step 22**
- Fit the constraint assembly to the frame as shown
- Push the constraint assembly downwards until its top is flush with the top of the linear rail
- Fasten both M6x12 screws to secure the constraint assembly to the V-Core 3.1 frame

Step 28 — Install the front left lead screw constraint - Part 2



- F688ZZ Ball Bearing

❗ Fit the bearing onto the lead screw and into the constraint assembly as shown

Step 29 — Next guide



- Continue with the next guide: [08. Bed & Y-Axis Endstop Assemblies](#)