

# Rat Rig

## 01. V-Core 3.0 to 3.1 Upgrade Guide

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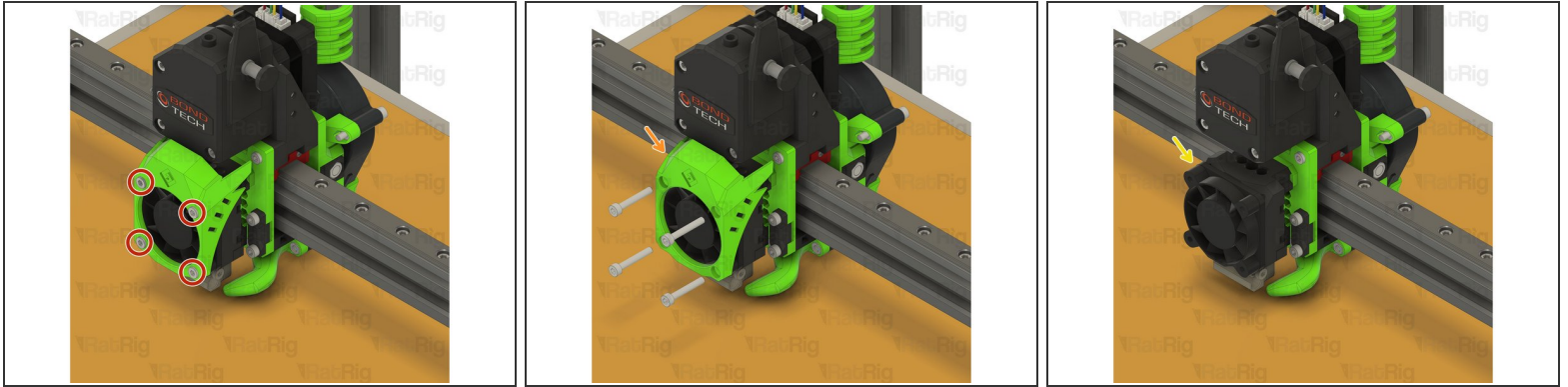


## INTRODUCTION

This guide covers the disassembly of a V-Core 3.0 machine to prepare it for the 3.1 upgrade.

As a large number of components will be re-used for 3.1, it is recommended to sort them during disassembly so that they are easily found during the 3.1 build process.

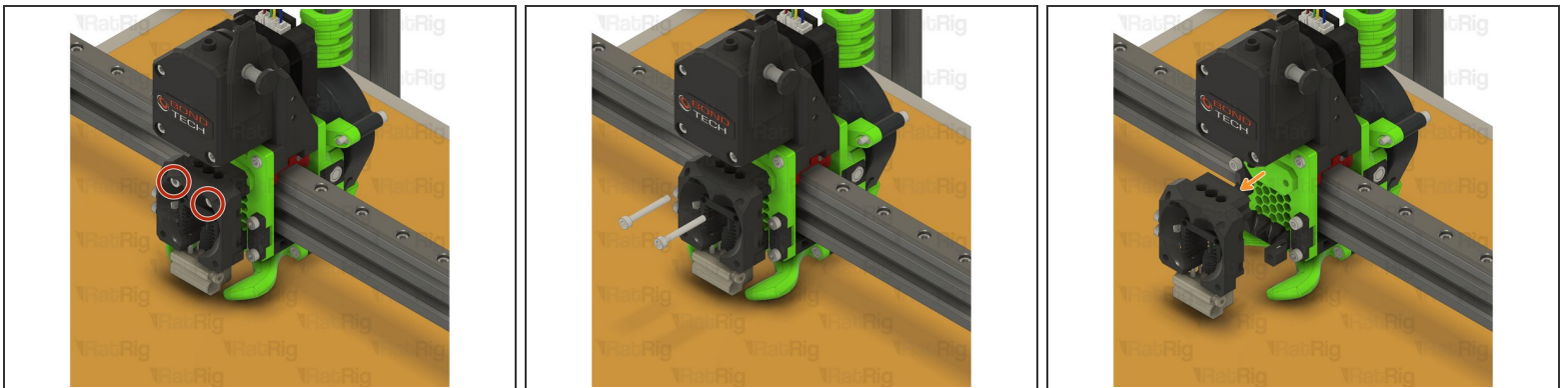
## Step 1 — Disassemble EVA2 - Part 1



**i** Your EVA2 assembly may differ from the one shown. The EVA2 sections of this guide should be used as general advice for disassembly.

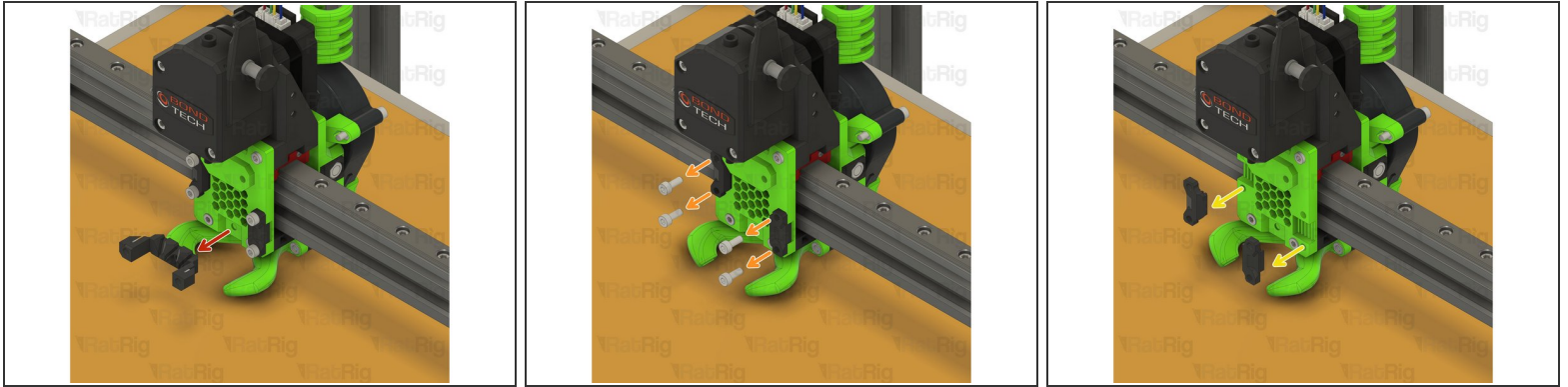
- Remove the four M3x20 screws
- Remove the EVA2 shroud
- Remove the 40x10mm hot end fan

## Step 2 — Disassemble EVA2 - Part 2



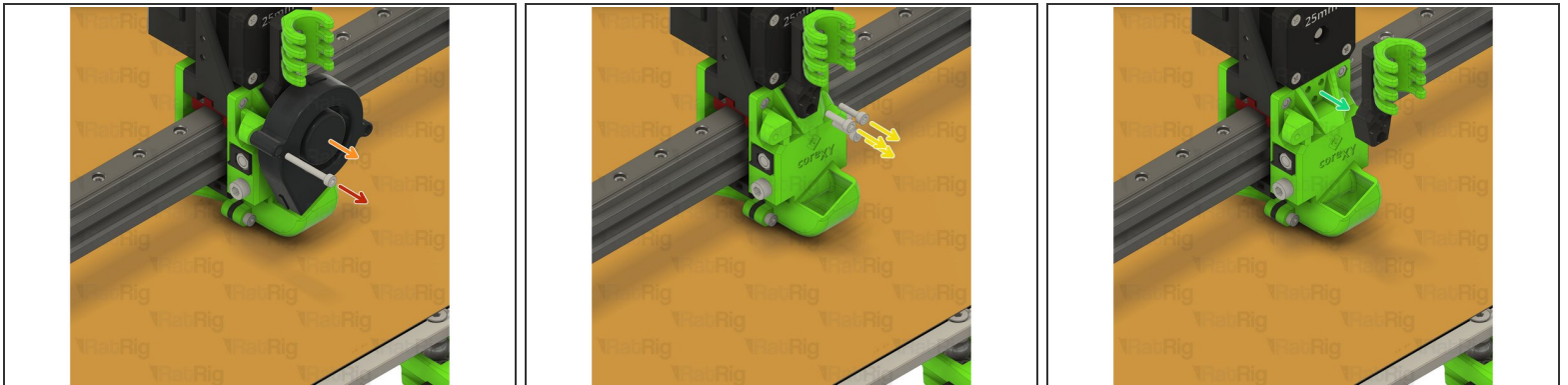
- Remove the two marked M3x25 screws
- Remove the hot end assembly

### Step 3 — Disassemble EVA2 - Part 3



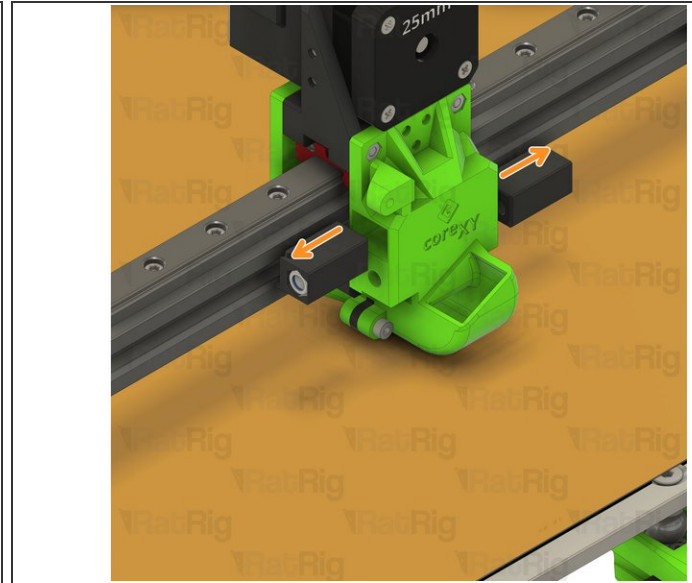
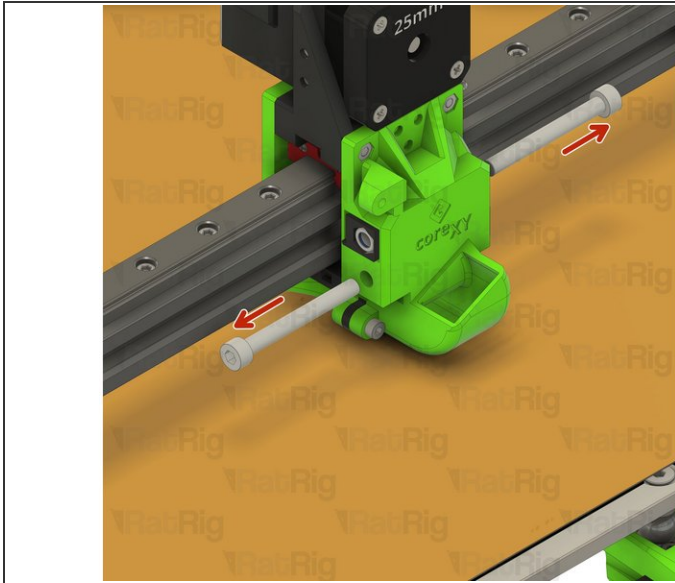
- Remove the lower face support
- Remove the four M3x8 screws
- Remove both belt grabbers and free the CoreXY belts

### Step 4 — Disassemble EVA2 - Part 4



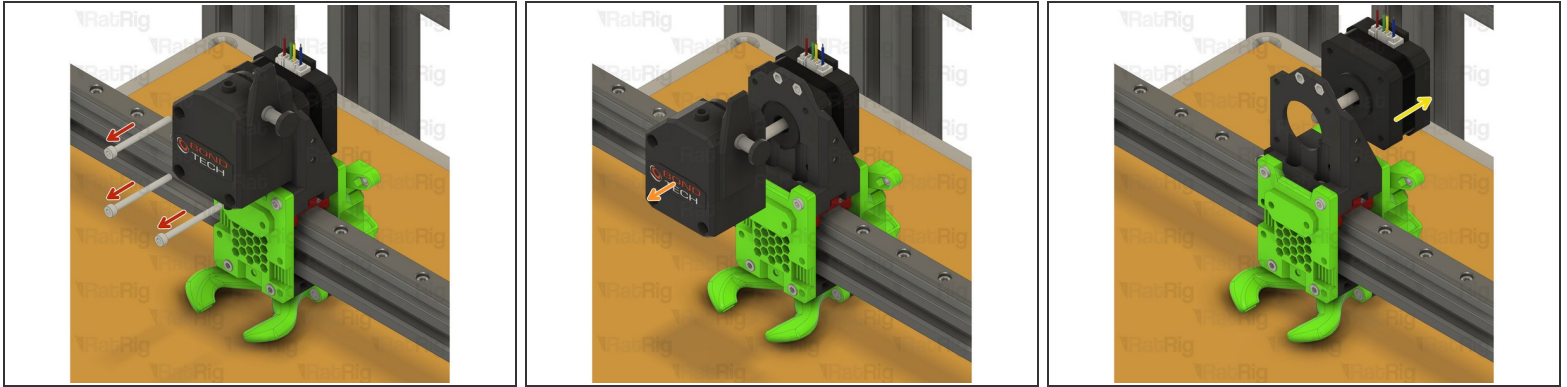
- Remove the M3x25 screw securing the 5015 fan
- Remove the 5015 fan
- Remove the three M3x12 screws securing the cable holder
- Remove the cable holder assembly

## Step 5 — Disassemble EVA2 - Part 5



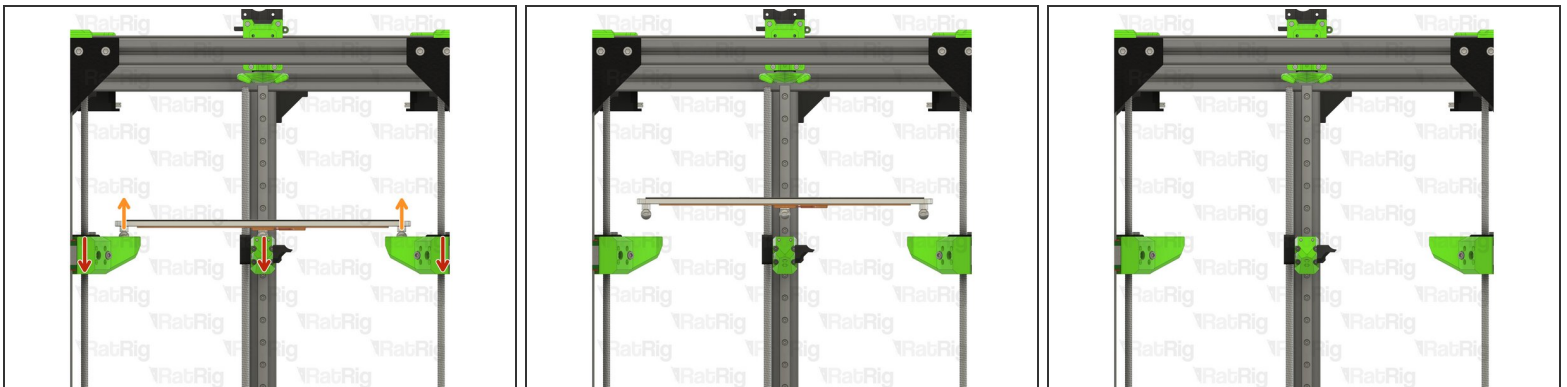
- Remove the two M5x45 screws securing the belt grabbers into the EVA2 back
- Pull the belt to remove the belt grabbers
- Remove the belt from the belt grabbers
- Slowly pull one end of the first belt to remove it from the CoreXY drive mechanism
- Repeat to free the second belt

## Step 6 — Disassemble EVA2 - Part 6



- Remove the three M3x35 screws from the Bondtech BMG extruder
- Remove the Bondtech BMG extruder
- Remove the extruder NEMA17 stepper motor
- ❗ Leave the remainder of the EVA2 assembly for now. It will be further disassembled in **Step 32**

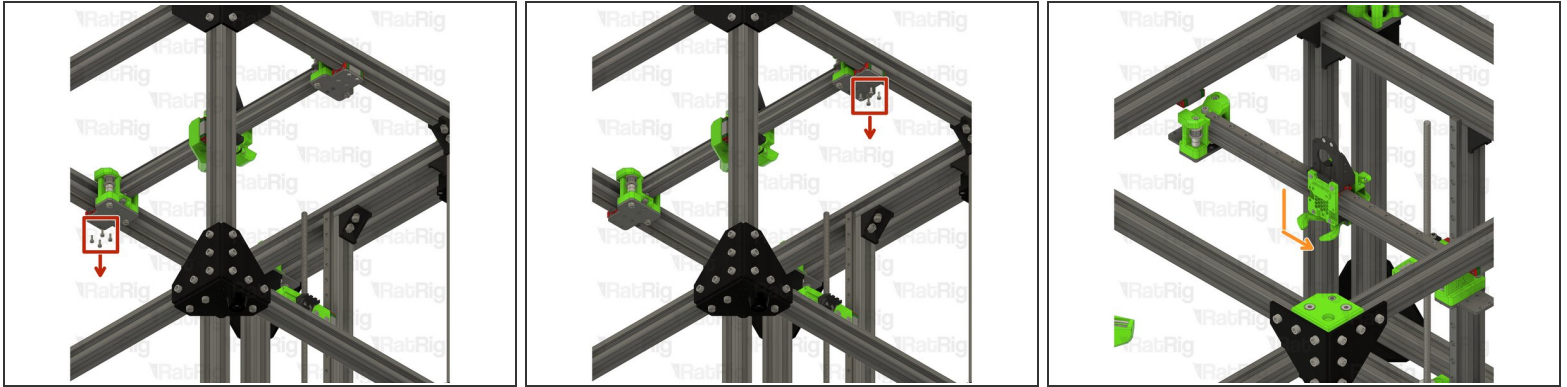
## Step 7 — Remove the bed assembly



- Lower the z-axis by turning each lead screw counter-clockwise
- Lift the bed assembly upwards to raise it off of the arms
- ❗ Disconnect the heated bed wiring and set it aside for the V-Core 3.1 assembly



## Step 8 — Remove the x-axis assembly



- Whilst supporting the x-axis assembly, remove the eight marked M3x8 screws
- Remove the x-axis assembly from the V-Core 3 and set it aside until **Step 30**

## Step 9 — Remove the front bed arms



- Remove the two marked M5x35 screws from the front left arm
- Remove the four M3x20 screws from the front left arm
- Repeat the above 2 steps to remove the front right arm
- ⓘ Set the both front bed arms aside until **Step 27**

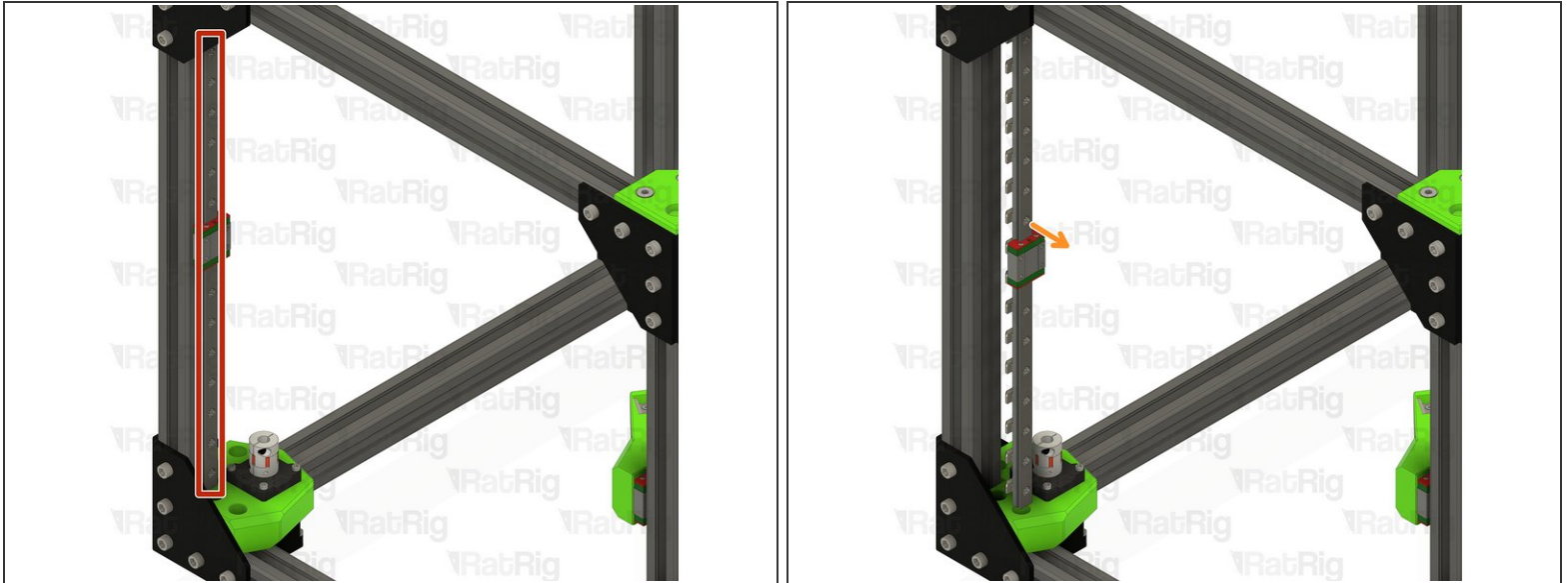
## Step 10 — Remove the front lead screws



- Loosen the upper M3 screw on the lead screw coupler
- Gently pull the lead screw upwards and out of the coupler
- Remove the anti-backlash nut block from the lead screw
- Repeat the above 3 steps for the lead screw at the front right side

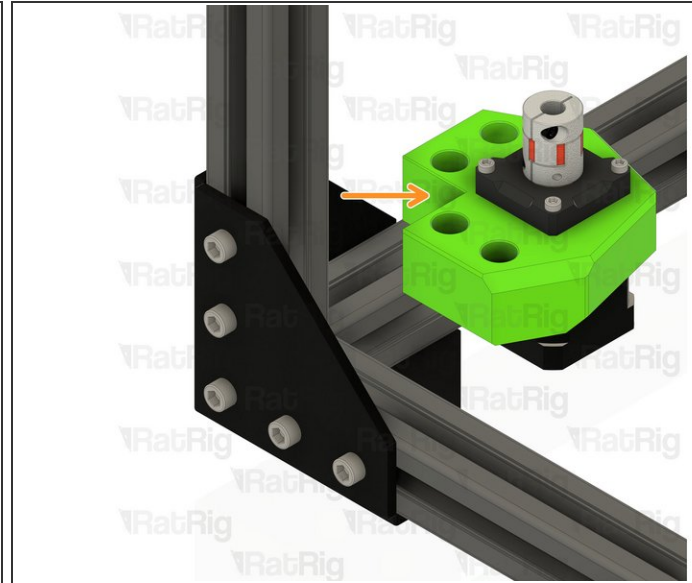
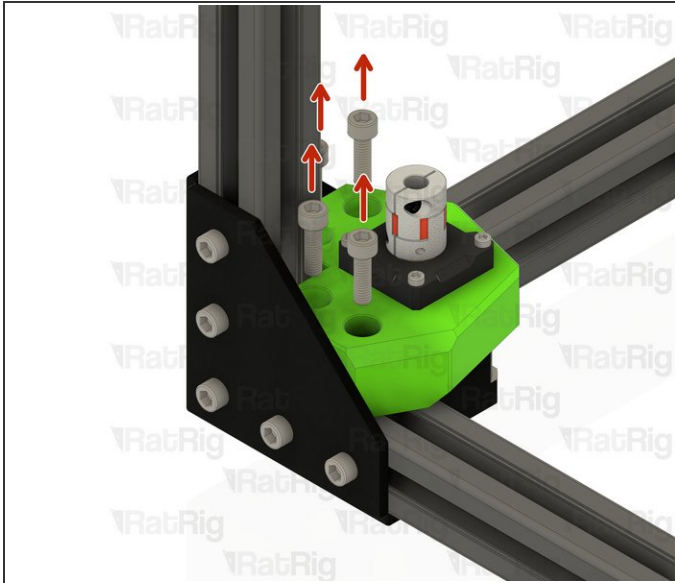


## Step 11 — Remove the front linear rails



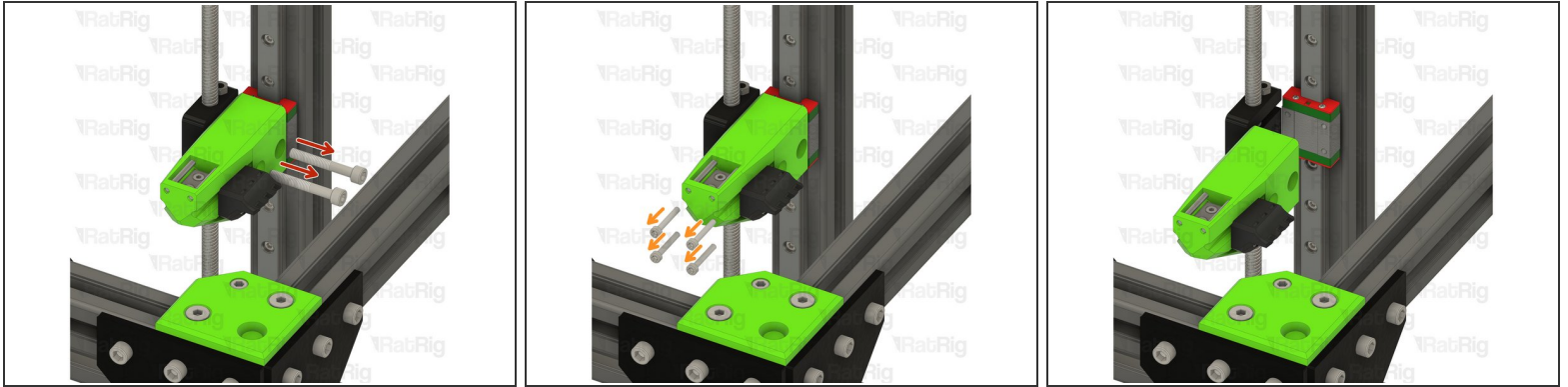
- Loosen all of the M3 screws securing the linear rail to the V-Core 3.0 frame
  - Remove the linear rail, taking care not to let the carriage leave either end of the rail
  - Repeat the above two steps for the linear rail on the front right
- i** Set the linear rail assemblies aside, they will be re-installed during the V-Core 3.1 assembly guide

## Step 12 — Remove the front motor mounts



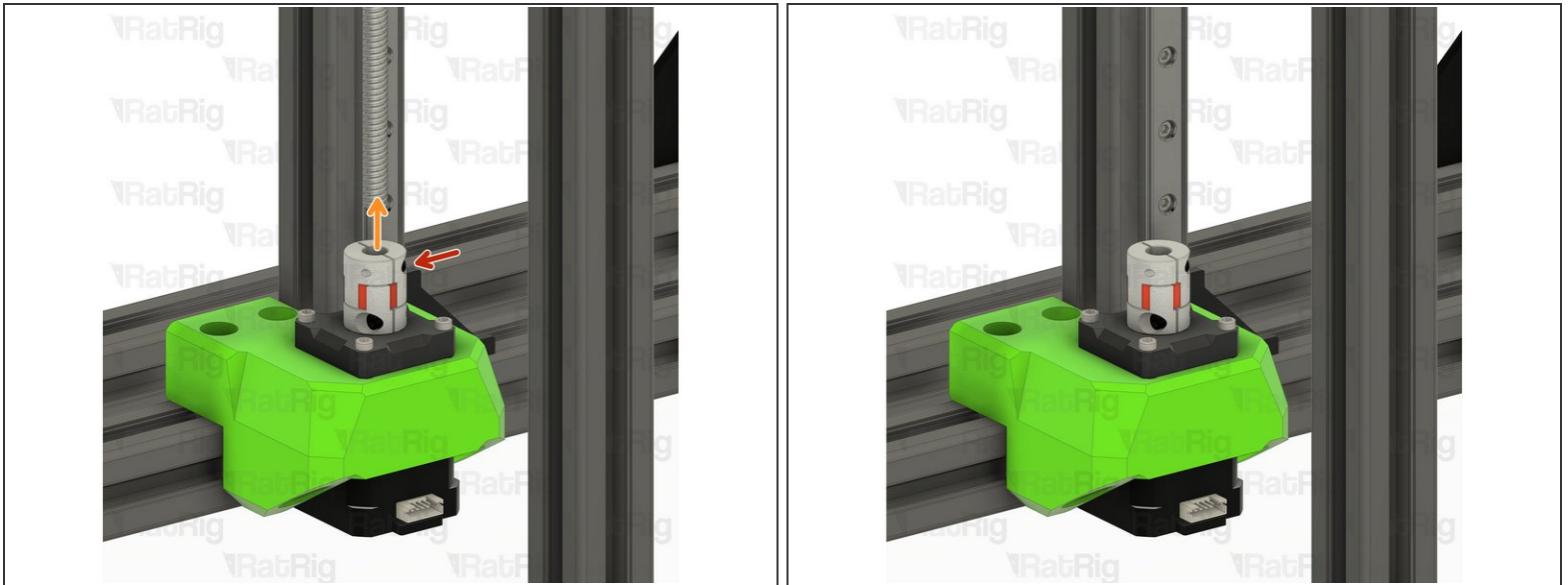
- Remove the four marked M6x20 screws
  - Remove the front left z-axis motor mount
  - Retrieve the four 3030 drop-in t-nuts from the 3030 extrusion
  - Repeat the above three steps for the motor mount on the front right side
- i** Set both assemblies aside until **Step 25**

## Step 13 — Remove the rear bed arm



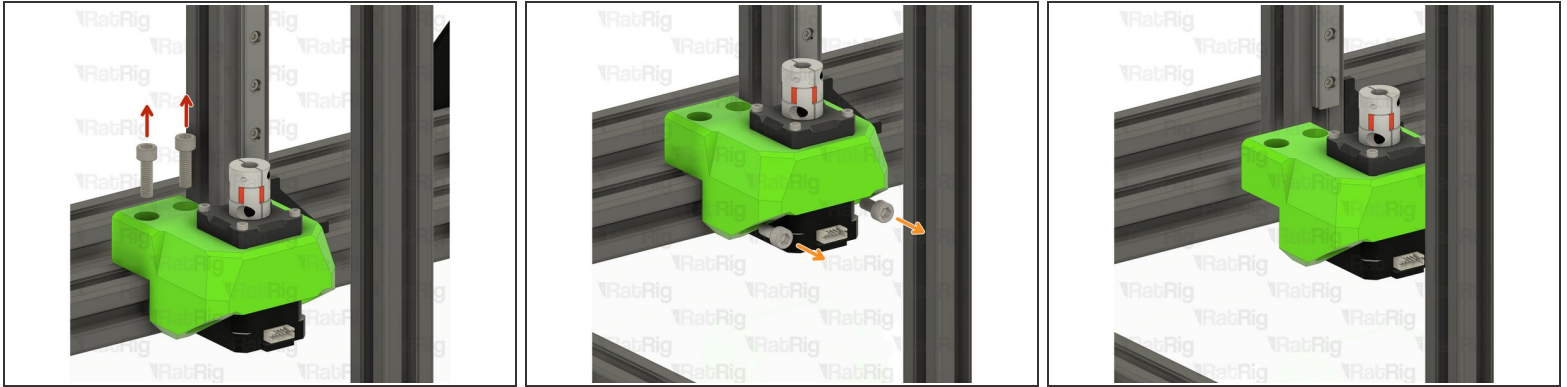
- Remove the two marked M5x35 screws from the rear bed arm
- Remove the four M3x20 screws from the rear bed arm
- ⓘ Set the rear bed arm aside until **Step 28**

## Step 14 — Remove the rear lead screw



- Loosen the upper M3 screw on the lead screw coupler
- Gently pull the lead screw upwards and out of the coupler
- Remove the anti-backlash nut block from the lead screw
- ⓘ Set the lead screw aside, along with the other two, for use during the V-Core 3.1 assembly

## Step 15 — Remove the rear motor mount



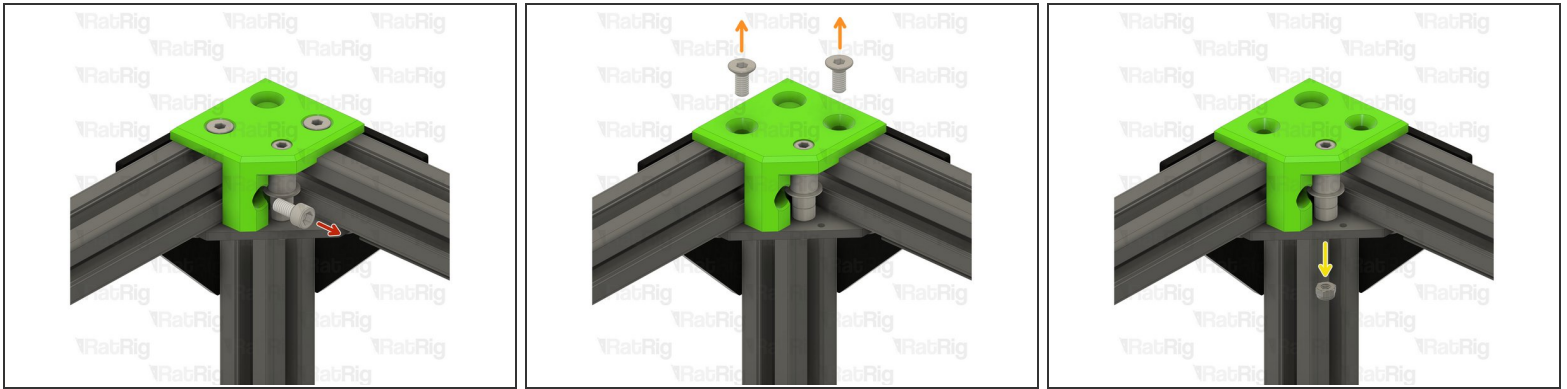
- Remove the two marked M6x20 screws
  - Remove the two marked M6x12 screws
  - Retrieve the four 3030 drop-in t-nuts from the 3030 extrusion
- i** Set this assembly aside until **Step 25**

## Step 16 — Remove the rear linear rail



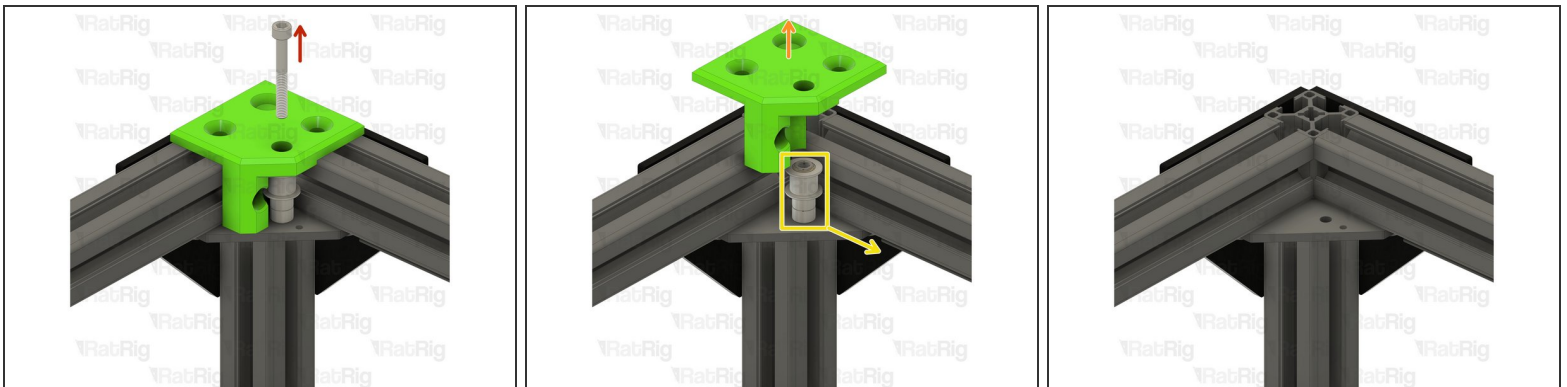
- Loosen all of the M3 screws securing the linear rail to the V-Core 3.0 frame
  - Remove the linear rail, taking care not to let the carriage leave either end of the rail
- i** Set the linear rail assembly aside, it will be re-installed during the V-Core 3.1 assembly guide

## Step 17 — Remove the left CoreXY idler - Part 1



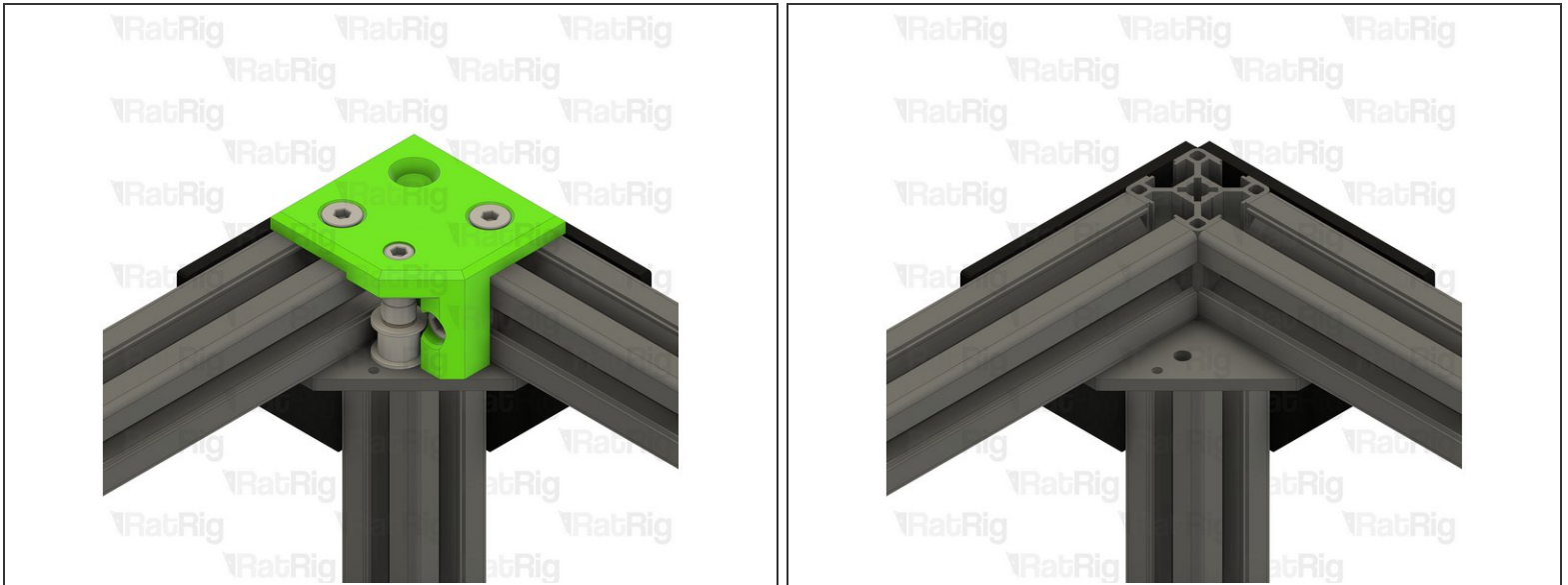
- Remove the marked M6x12 screw
- Remove the two marked M6x14 countersink screws
- Remove the M5 nylon locking nut from the underside of the idler bracker


## Step 18 — Remove the left CoreXY idler - Part 2



- Remove the marked M5x40 screw
- Lift the xy\_idler printed part off the V-Core 3.0 frame
- Remove all components of the idler stack
- Retrieve the three 3030 drop-in t-nuts from the 3030 extrusion

## Step 19 — Remove the right CoreXY idler



 Repeat **the previous step** to disassemble the front right idler

## Step 20 — Remove the right CoreXY motor assembly - Part 1

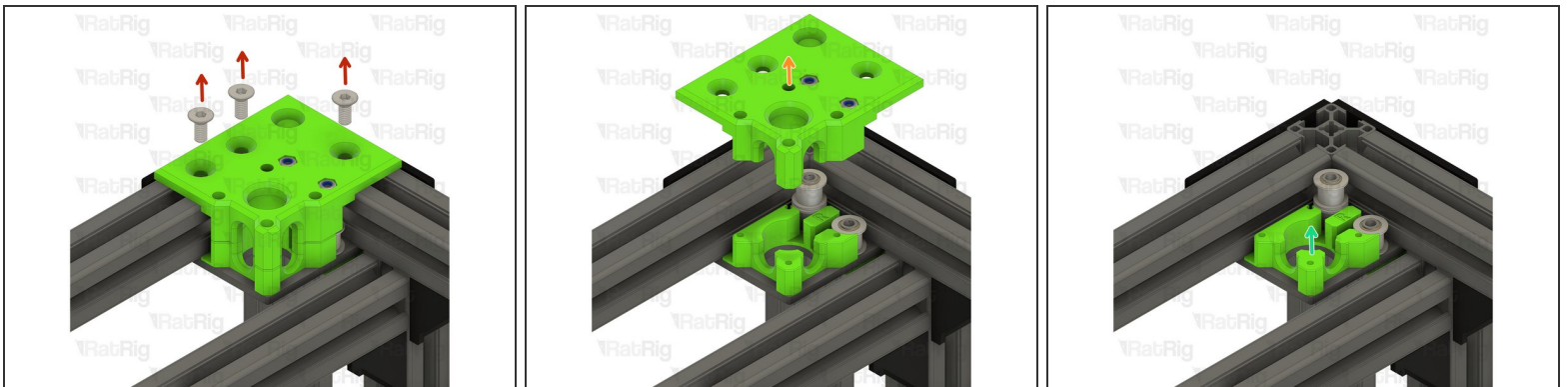


- Support the NEMA17 stepper motor
- Remove the four marked M3x35 screws
- Remove the NEMA17 stepper motor from the mount

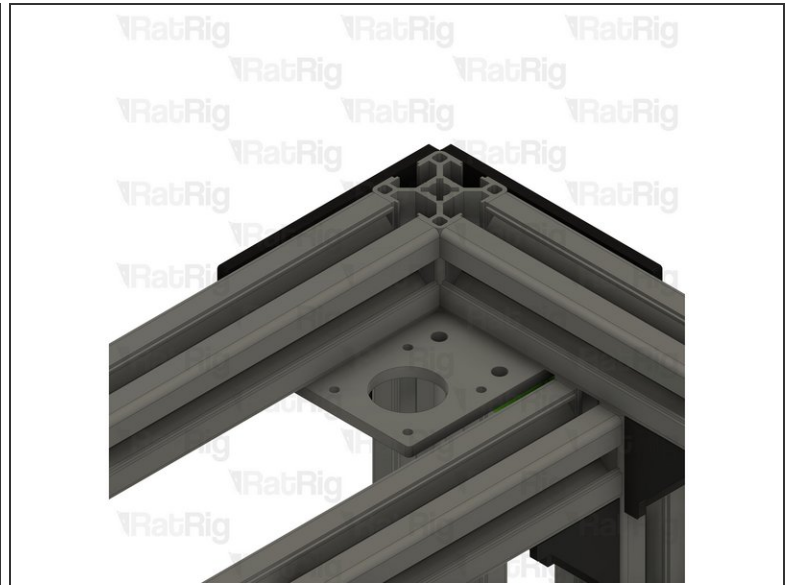


**Step 21 — Remove the right CoreXY motor assembly - Part 2**

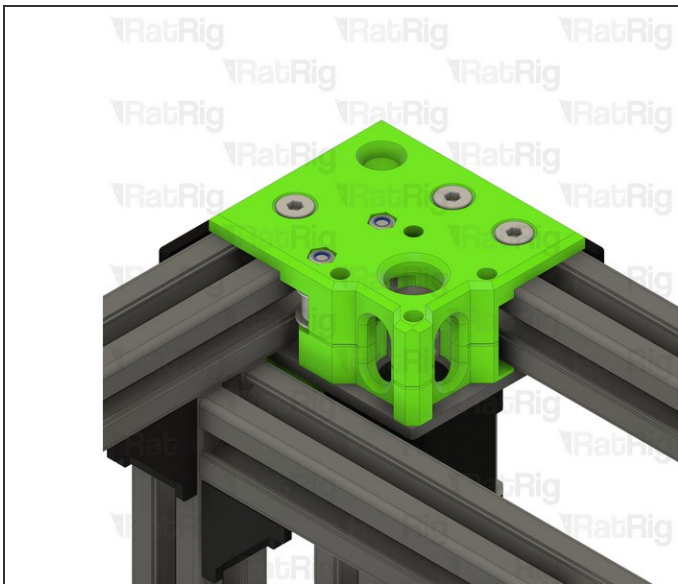
- Remove the two marked M5x35 screws

**Step 22 — Remove the right CoreXY motor assembly - Part 3**

- Remove the three marked M6x14 countersink screws
- Lift off the top of the CoreXY motor mount
- Retrieve the three 3030 drop-in t-nuts from the 3030 extrusion
- Remove the lower part of the CoreXY motor mount

**Step 23 — Remove the right CoreXY motor assembly - Part 4**

- Remove all components of the two idler stacks

**Step 24 — Remove the left CoreXY motor assembly**

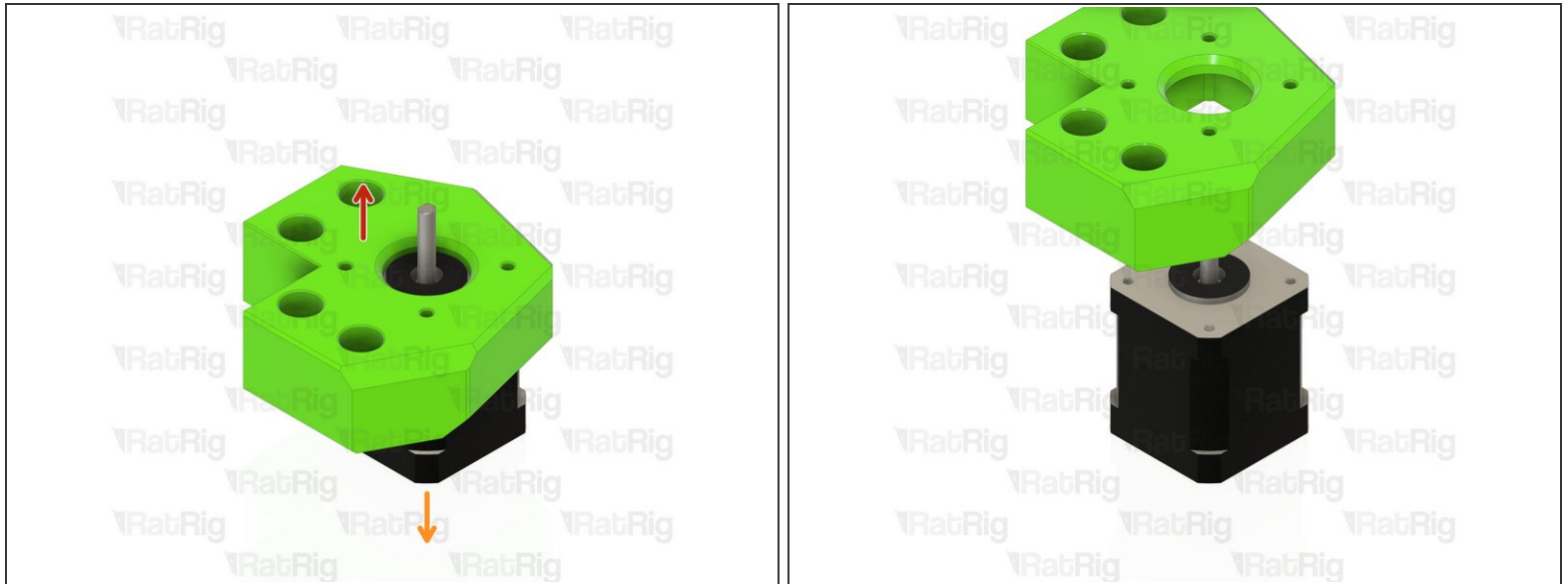
- ① Repeat **Steps 22 and 23** to disassemble the left CoreXY motor assembly

## Step 25 — Disassemble the front motor mounts - Part 1



- Loosen the lower M3 screw on the lead screw coupler
- Remove the lead screw coupler
- Remove the four marked M3x18 screws
- Lift the pillow block assembly off and set it aside

## Step 26 — Disassemble the front motor mounts - Part 2



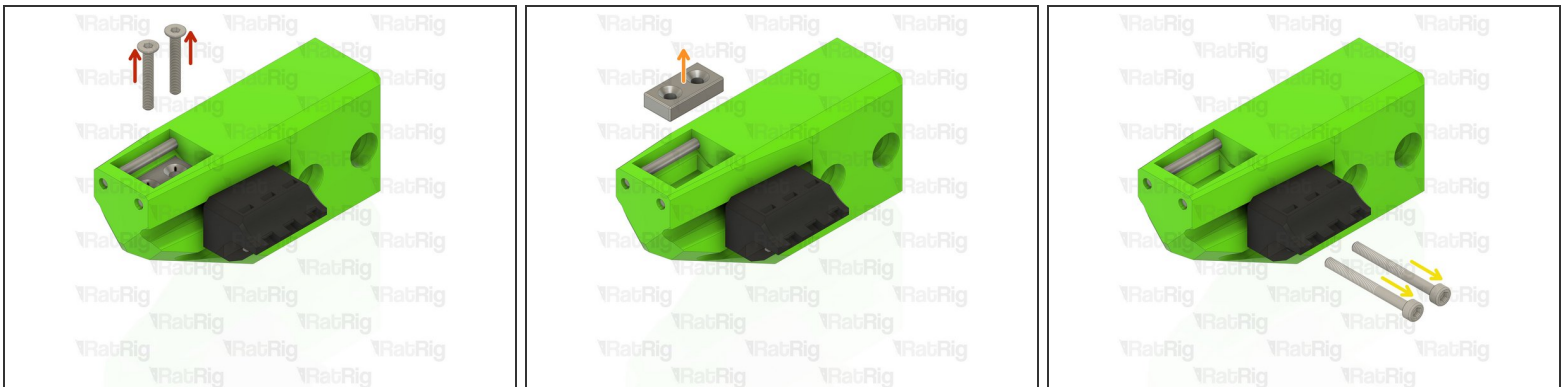
- Remove the printed mount from the NEMA17 stepper motor
- Set the NEMA17 stepper motor aside for the V-Core 3.1 assembly guide
- ① Repeat **Step 25 and the above two steps** for the other two z-axis motor mounts

## Step 27 — Disassemble the front bed arms



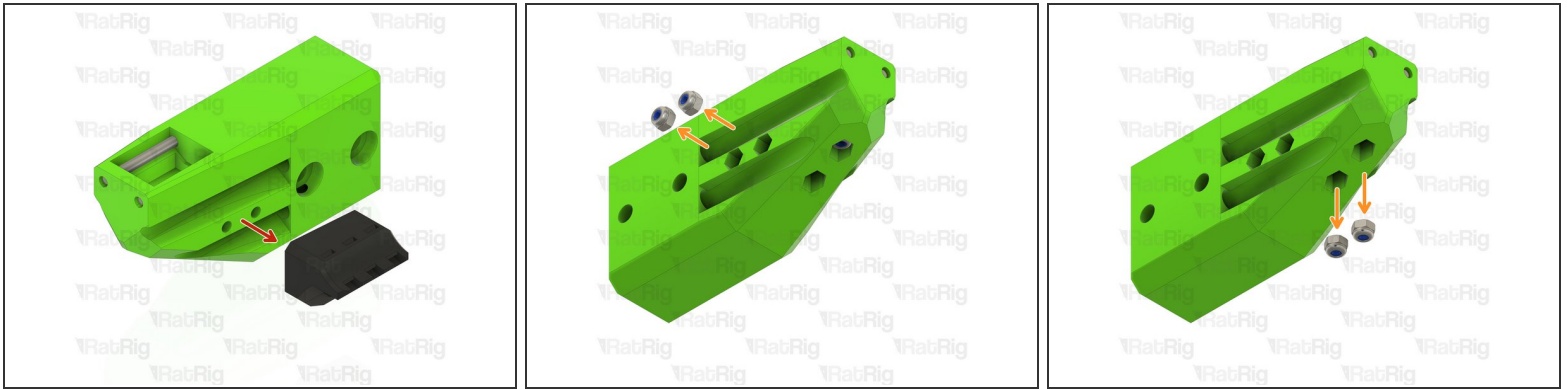
- Remove the two marked M3x20 countersink screws
  - Remove the neodymium magnet
  - Remove the two M3 nylon locking hex nuts
- i** Repeat the above three steps for the front right bed arm

## Step 28 — Disassemble the rear bed arm - Part 1



- Remove the two marked M3x20 countersink screws
- Remove the neodymium magnet
- Remove the two marked M3x30 screws

## Step 29 — Disassemble the rear bed arm - Part 2



- Remove the bed cable tiedown printed part
- Remove the four marked M3 nylon locking hex nuts

## Step 30 — Disassemble the x-axis gantry - Part 1



- Remove the four marked M5 nylon locking hex nuts
- Remove both xy\_joiner\_plates
- Remove the four marked M5x10 screws



## Step 31 — Disassemble the x-axis gantry - Part 2



- Remove the two marked M5x12 screws
- Remove both xy\_joiners from the ends of the 2020 extrusion
- Retrieve the six 2020 square t-nuts from the 2020 extrusion (three at each end)

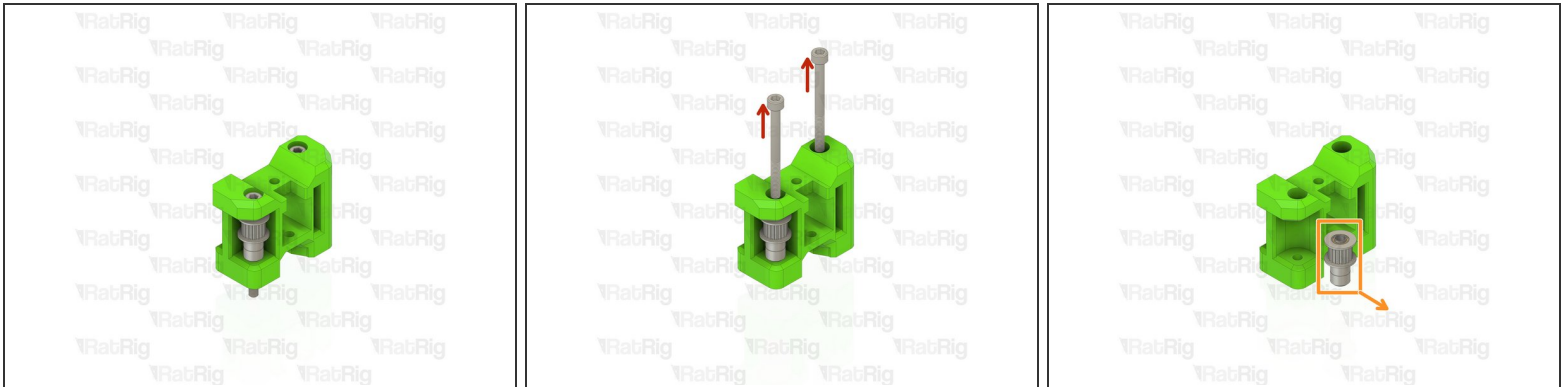
## Step 32 — Disassemble the x-axis gantry - Part 3



- Remove the four M3x10 screws securing the remaining EVA2 assembly to the linear rail carriage
- Remove the remaining EVA2 assembly from the 2020 extrusion and linear rail assembly as shown
- ① Set the 2020 extrusion and linear rail assembly aside, as it will be needed during the V-Core 3.1 assembly

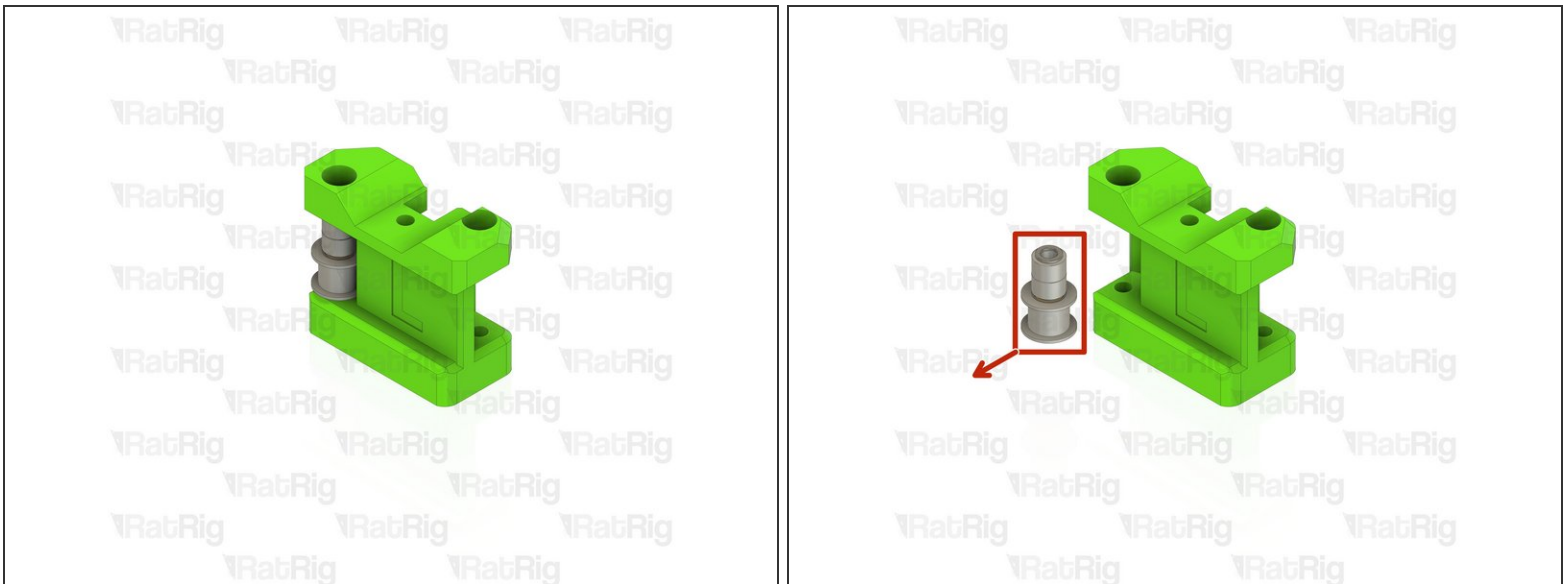


### Step 33 — Disassemble the xy\_joiners - Part 1



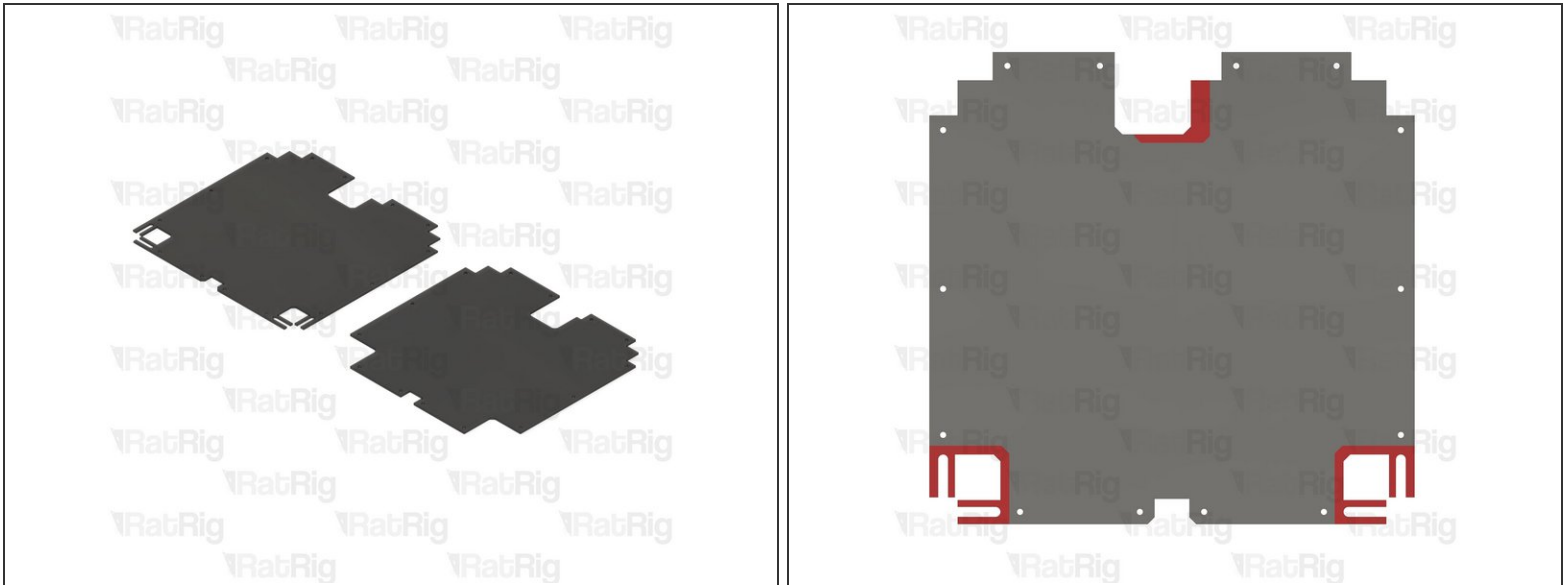
- Remove the two marked M5x55 screws from the xy\_joiner assembly
- Remove all components of the front toothed idler stack
- ① Repeat the above two steps for the opposite xy\_joiner

### Step 34 — Disassemble the xy\_joiners - Part 2



- Remove all components of the rear idler stack on both xy\_joiner assemblies

## Step 35 — Using the 3.0 base panel with the 3.1 upgrade



- ❗ It is possible to reuse the V-Core 3.0 base panel with the V-Core 3.1 upgrade, however additional cuts will be required
- ❗ A 2D printable template, as well as a modified rear motor trim are provided on the [V-Core 3.0 to 3.1 Upgrade Page](#)
- ❗ Refer to the provided image to align the templates for cutting the base panel

## Step 36 — Next guide



- ❗ This completes the required disassembly for the V-Core 3.0. Further instructions for building the V-Core 3.1 are found in the following guide:
  - ❗ [V-Core 3.1 Guide - 02. Z-Axis Assemblies](#)

