Makertech
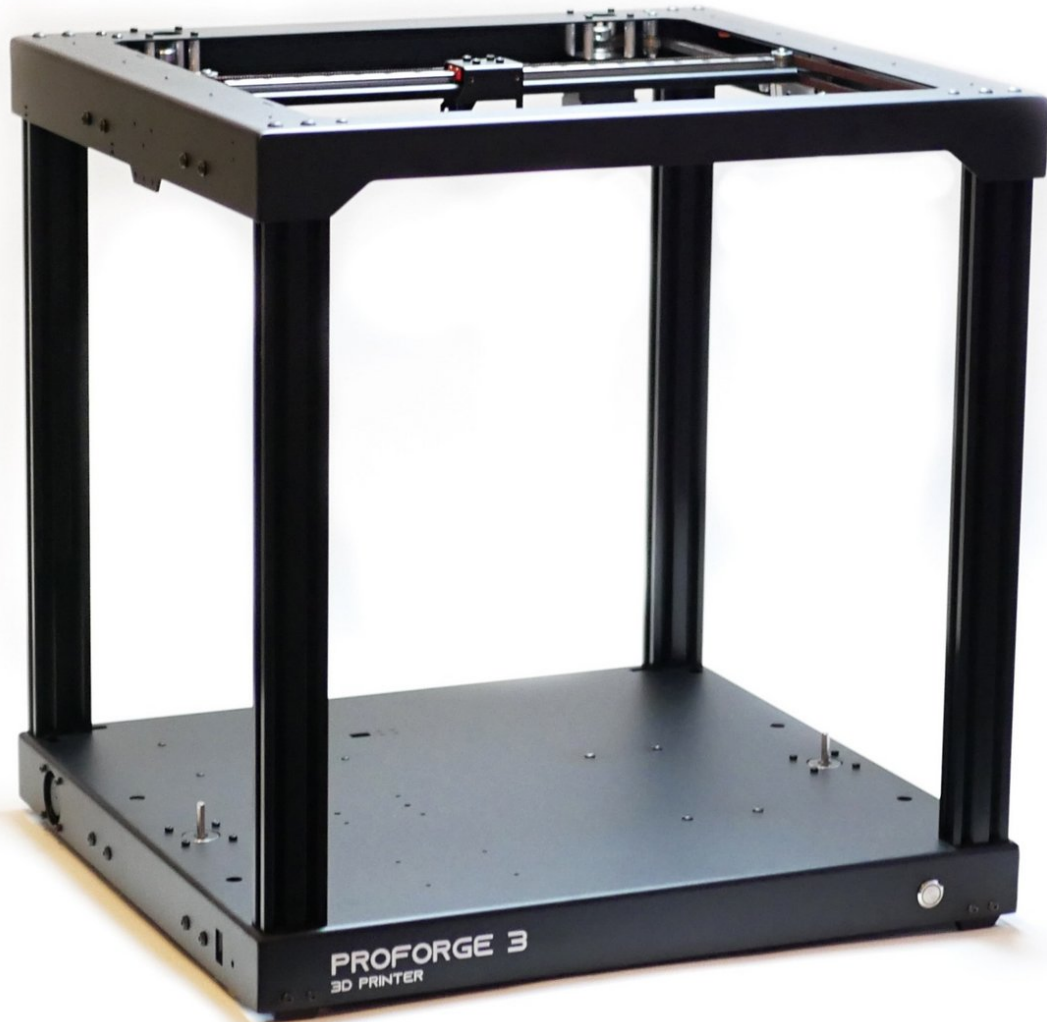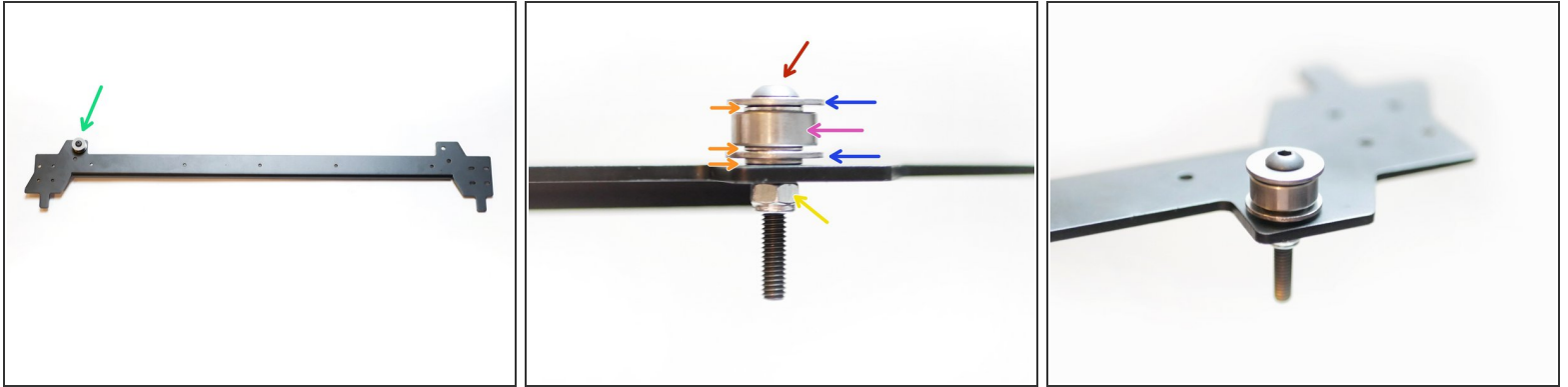
Stage 03: Gantry

Written By: Makertech 3D

Step 1 — Endstop Idler Assembly
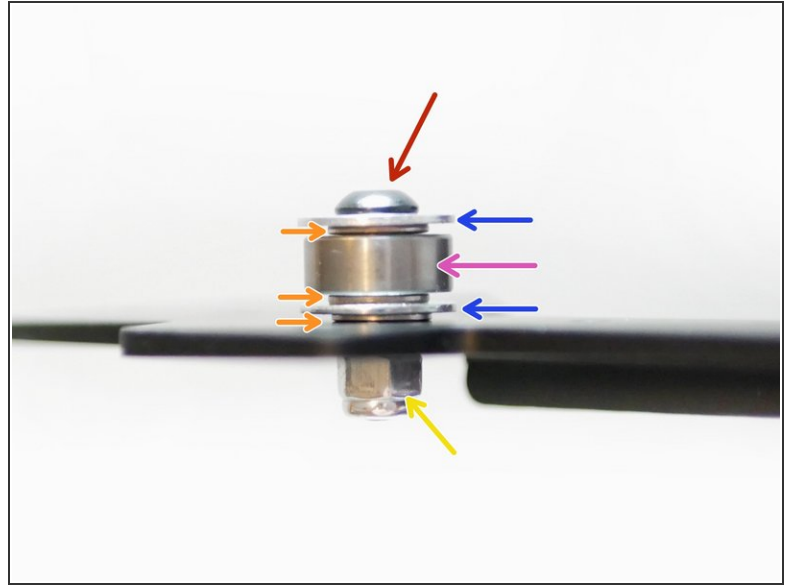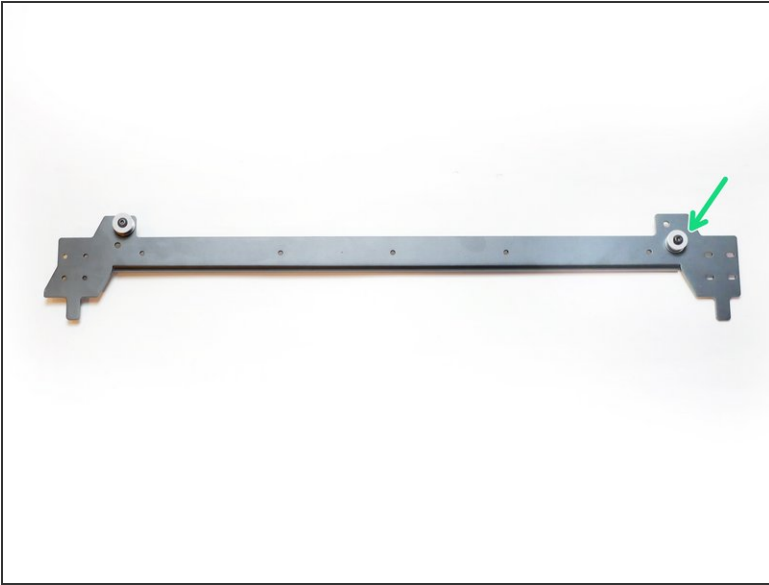

- 🟢 Build the Idler assembly onto the gantry panel as shown.
  - 🔴 M4 x 30mm
  - 🔵 M4 Penny Washer
  - 🟠 M4 Washer
  - 🟣 624zz Bearing
  - 🟡 M4 Nyloc Nut

- ⓘ The longer bolt is used here, as it also acts as an end stop trigger for the x-axis.

- ⚠ Note the orientation of the aluminium gantry beam, double-check the Idler is installed in the correct position and on the correct side.
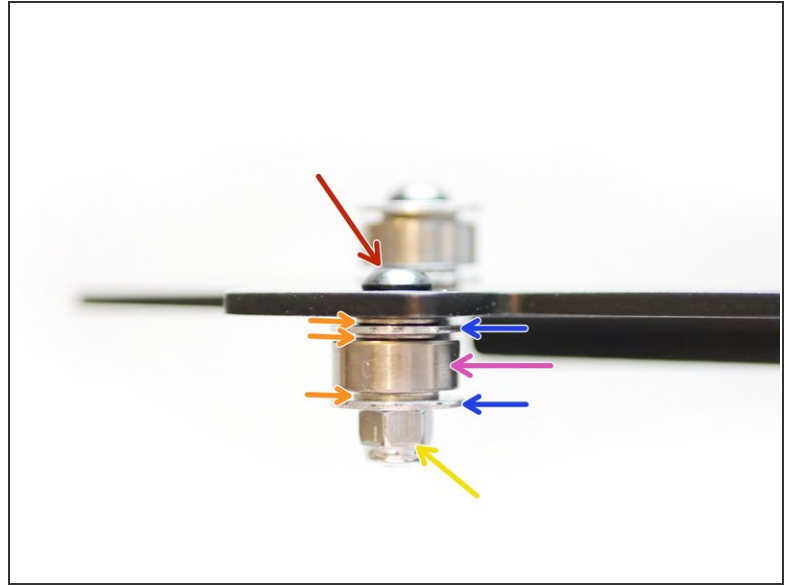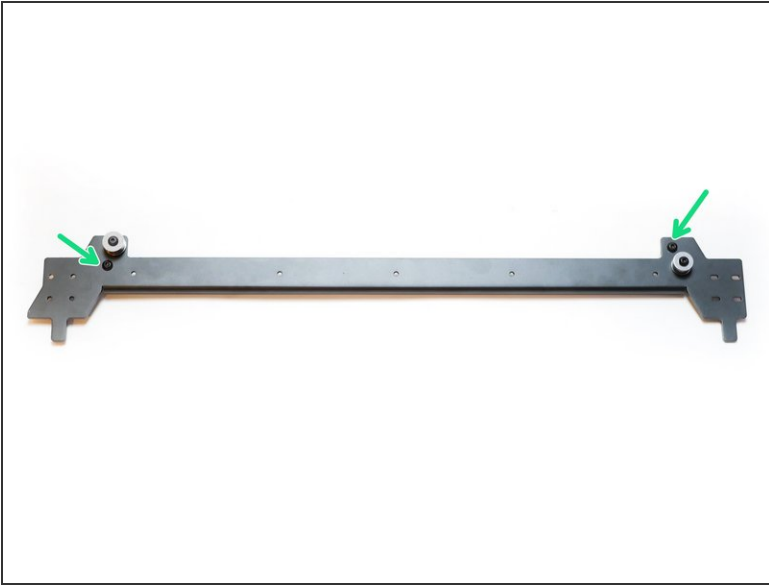
Step 2 — Remaining Top Side Idler

- On the other side of the gantry beam build the remaining top side Idler assembly.
  - M4 x 18mm Button
  - M4 Penny Washer
  - M4 Washer
  - 624zz Bearing
  - M4 Nyloc

⚠ Note the orientation of the aluminium gantry beam, double-check the Idler is installed in the correct position and on the correct side.
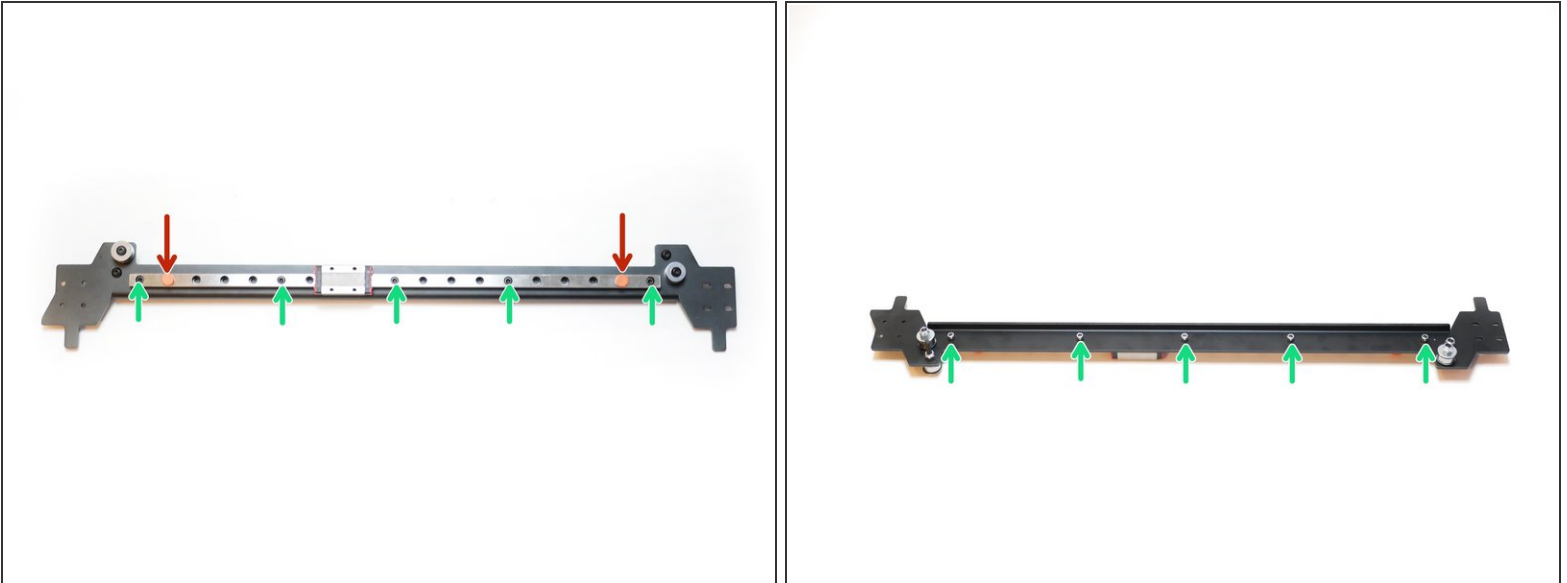
Step 3 — Bottom Side Idlers

- Install the **two** bottom side idler assemblies as shown.
  - M4 x 18mm Button
  - M4 Penny Washer
 - M4 Washer
  - 624zz Bearing
  - M4 Nyloc Nut

⚠️ Note the orientation of the aluminium gantry beam, double-check the Idler is installed in the correct position and on the correct side.

Step 4 — X - Rail

- Remove the final rail from its packaging and move the red carriage stoppers inwards one hole space.

- Secure the rail to the gantry as shown with five M3 x 10mm cap head bolts and M3 nyloc nuts.

- If the aluminium gantry is slightly warped, do not worry; the rail, when secured to it, is designed to give it its structural strength.

Step 5 — Gantry to Top Panel
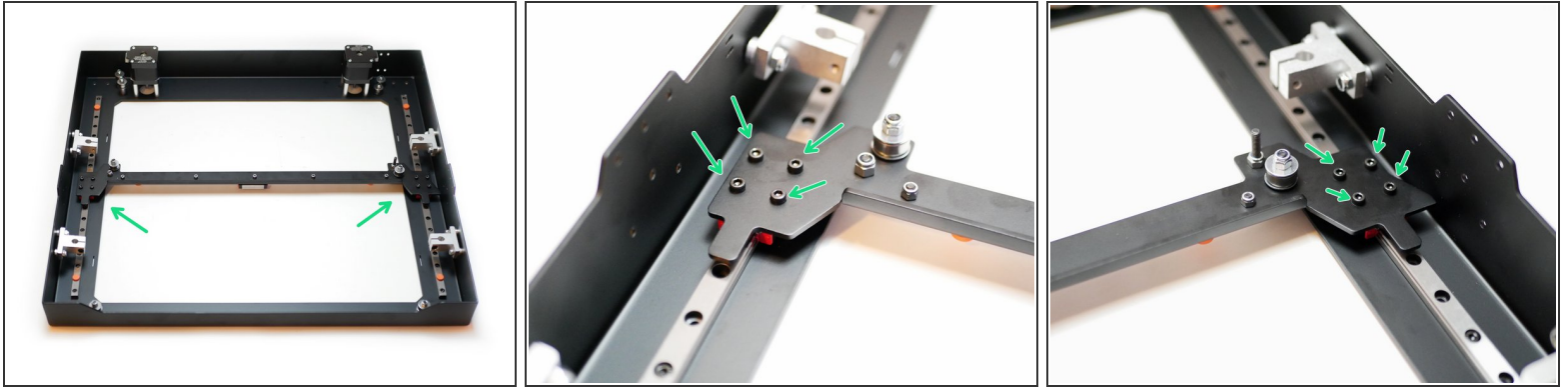
⚠️ If you are building the 3.5 upgrade, skip this step.

- Secure the gantry to the top panel as shown. Note the orientation of the gantry assembly.
  - ℹ️ The gantry fixes onto the carriages of the y-axis rails.

  - M3 x 6mm Cap

- 📌 Secure each bolt lightly to begin with, tighten firmly when all bolts are in place.

Step 6 — 2040 Extrusions to Base

- Secure the four 2040 aluminium extrusions to the base.
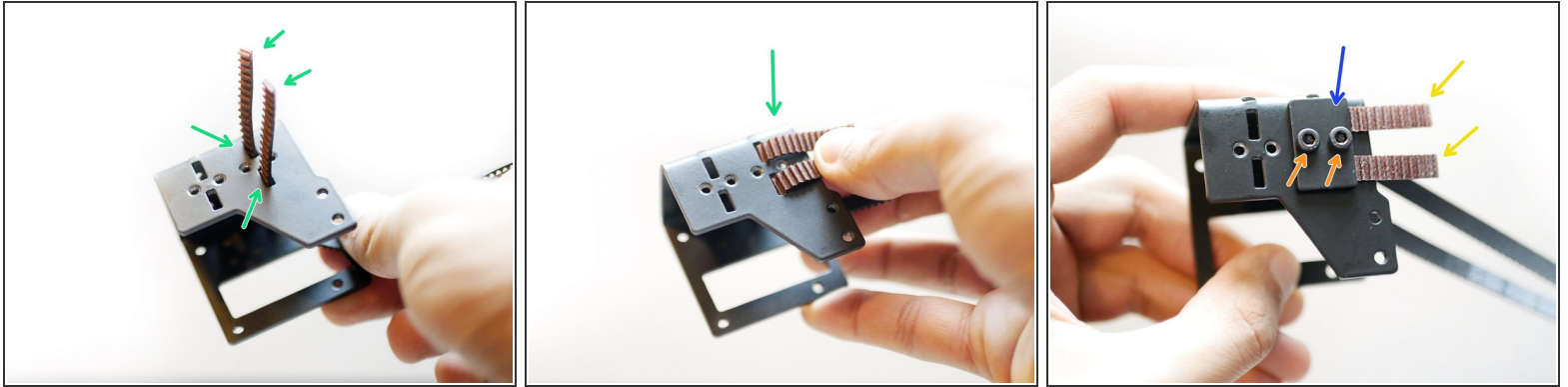 - M5 x 6mm Button

Step 7 — Base To Top Panel
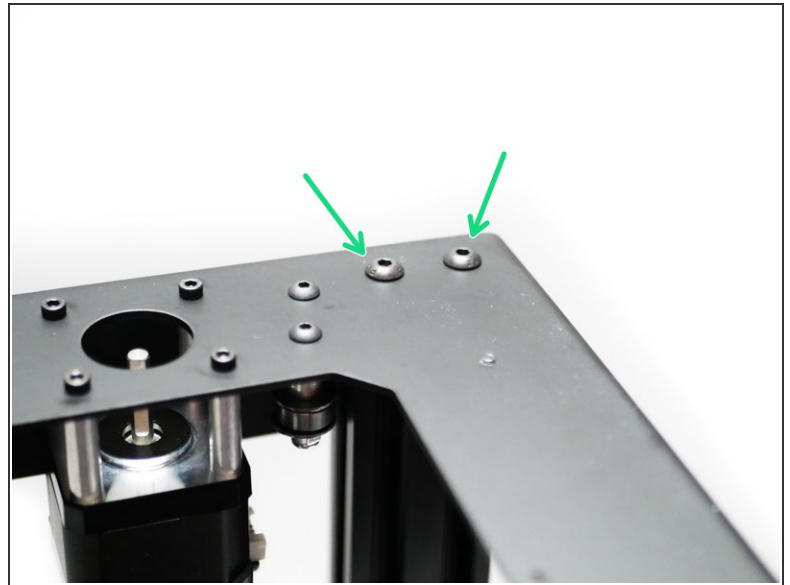
⚠ If you are building v3.5 continue this stage from [here](#).

- Secure the top panel assembly onto the 2040 extrusions.
  - M5 x 6mm Button

Step 8 — Belts

ⓘ Take the 4M roll of GT2 belt and cut it in **half**.

● Feed one side of each of the two lengths into the back of the tool carriage as shown.

● Secure in place with one of the belt clamps.

  ● M3 x 6mm Cap

  ● Leave approximately a CM of extra length. Make sure that the belts are clamped down straight and horizontal.

Step 9 — Belt Continued
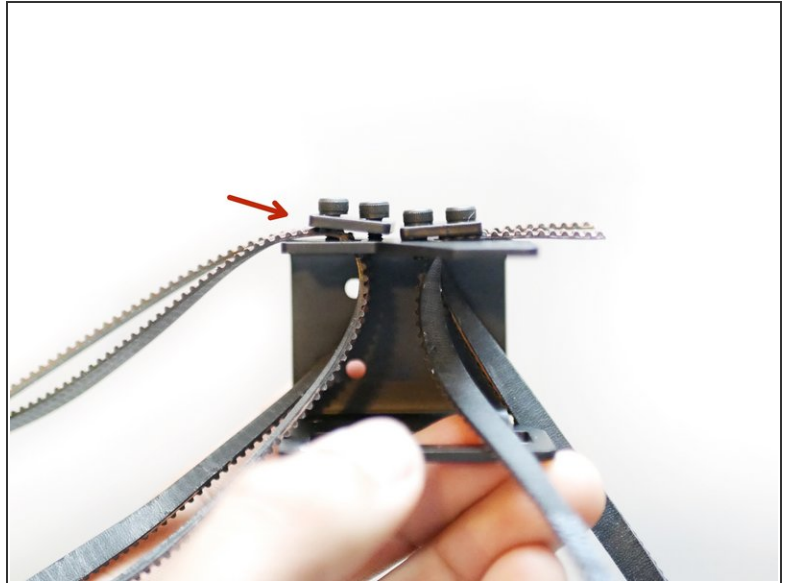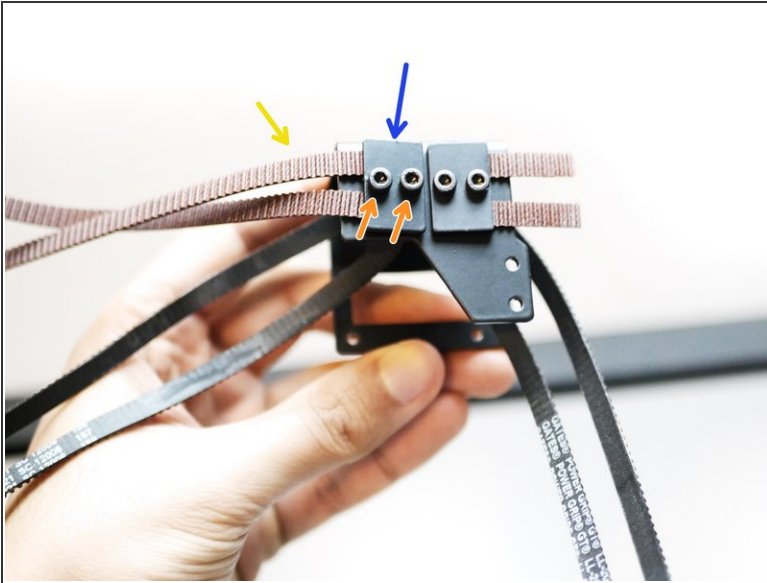
ⓘ Loop the lengths of belt around, making sure to keep them from getting twisted. The inside of the loop should be the toothed side of the belt. Feed the other end into the corresponding slot on the other side of the tool carriage.

● Use the remaining belt clamp to hold the belt in place.

 ● M3 x 6mm Cap

● Do not tighten this clamp down fully, but just enough to hold the belt in place. You should still be able to pull and push the belt through the slot.

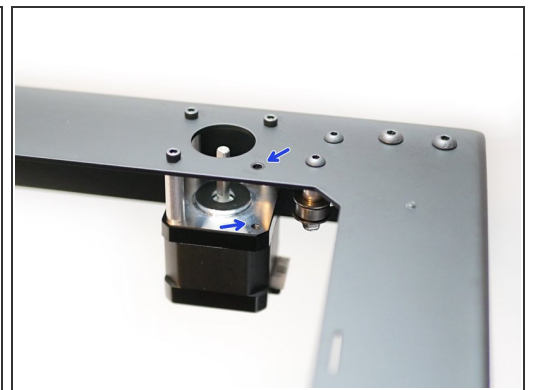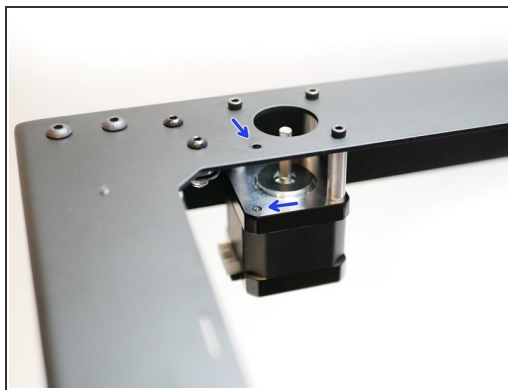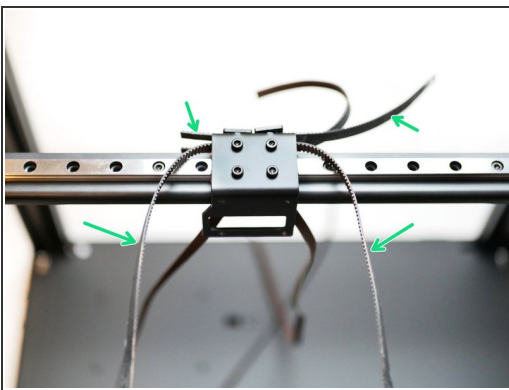● Leave about a few inches free.

Step 10 — Tool Carriage to Gantry
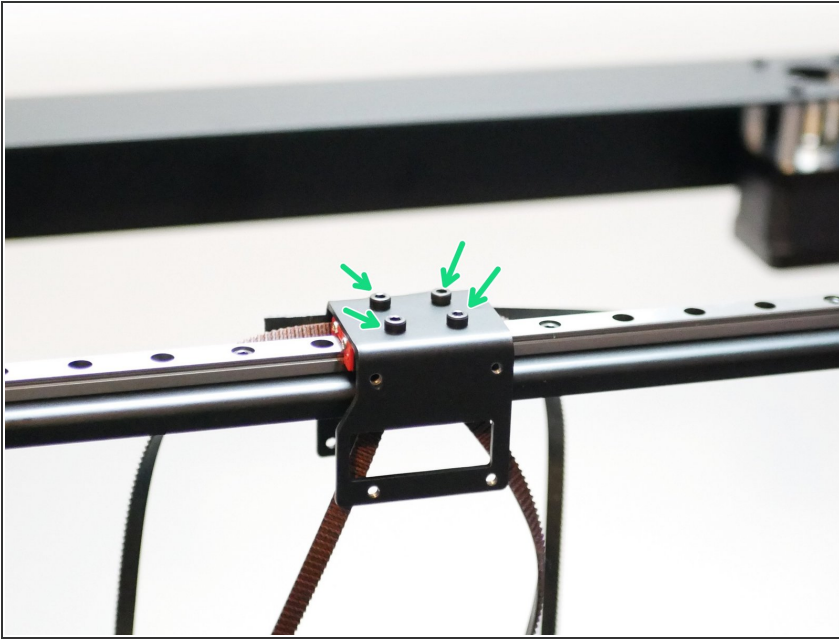
ⓘ Mount the tool carriage to the gantry as shown. Note the belt claps are facing the rear of the printer, towards the motors.
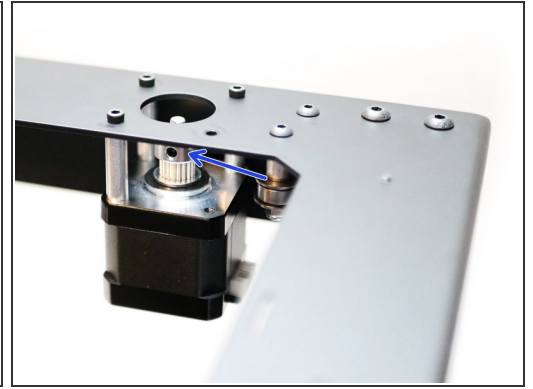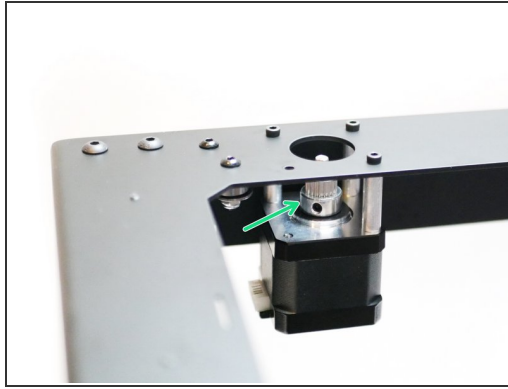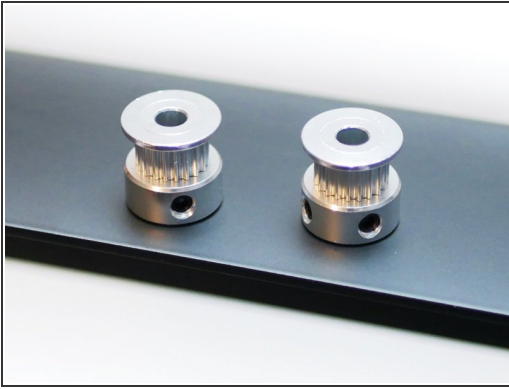
- M3 x 6mm Cap

Step 11 — Preparation for Installing the Belt

- Take the upper belt loop and swing it over the front of the gantry.

- Remove these two bolts and spacers on the motors as shown.
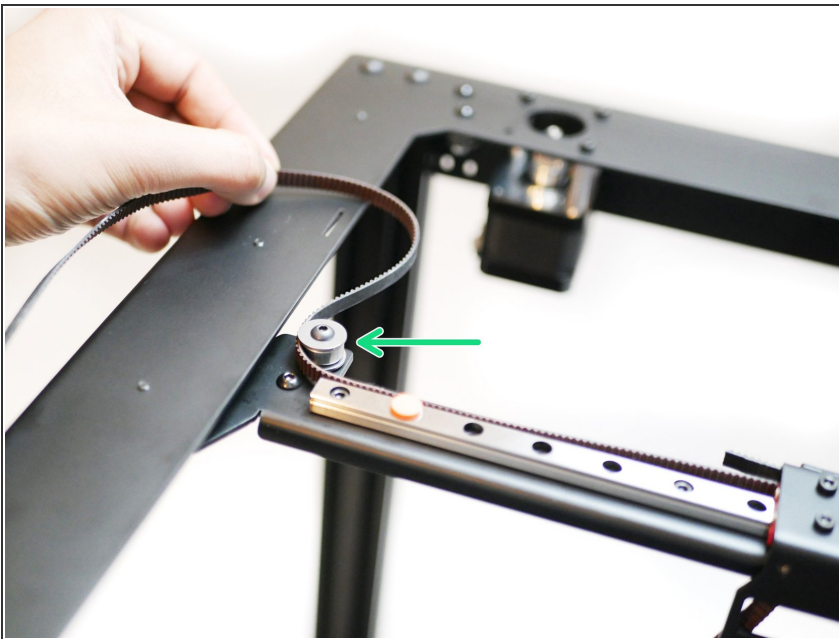
Step 12 — Pulleys

ⓘ Drop a pulley onto each of the motor shafts.

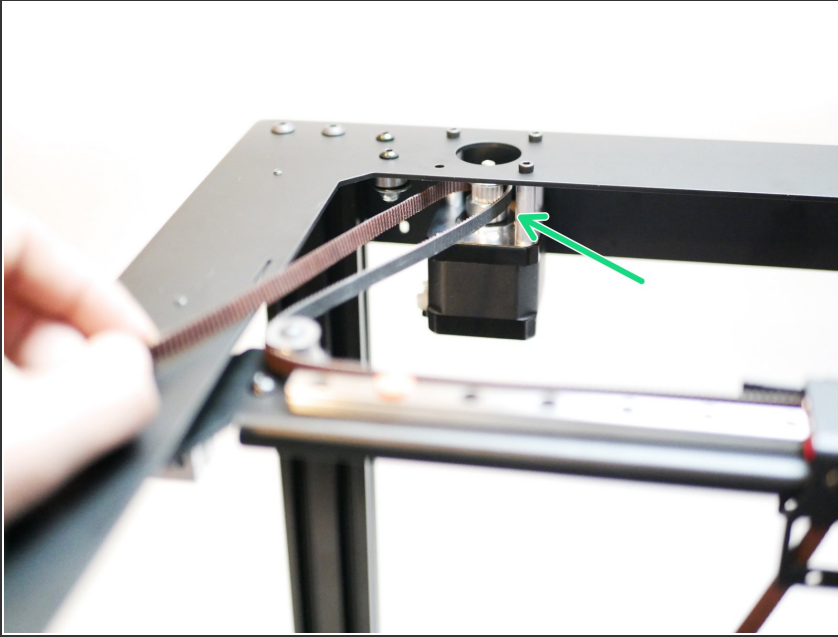ⓘ Note, the pulley's orientation for each motor.

- Left motor pulley

- Right motor pulley
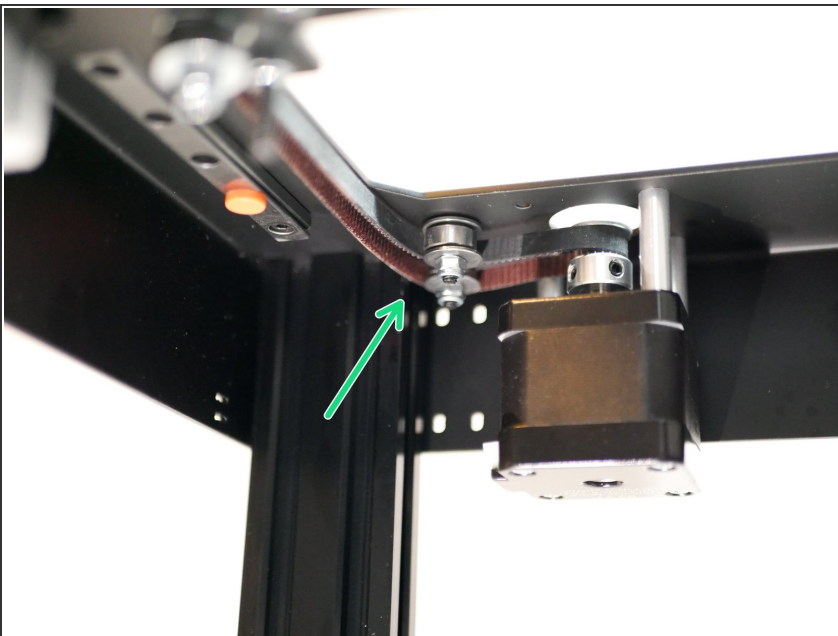
Step 13 — Upper Belt

- Take the upper belt and begin by wrapping the smooth side around the left idler on the gantry.
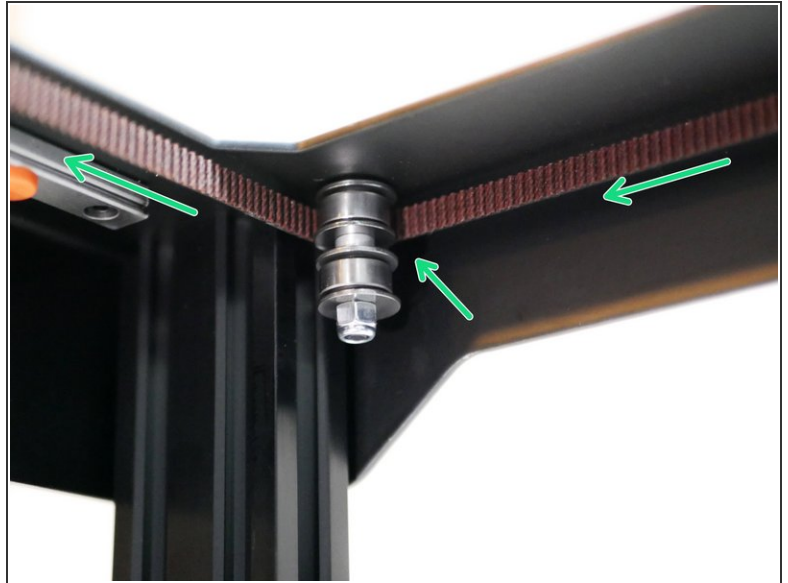
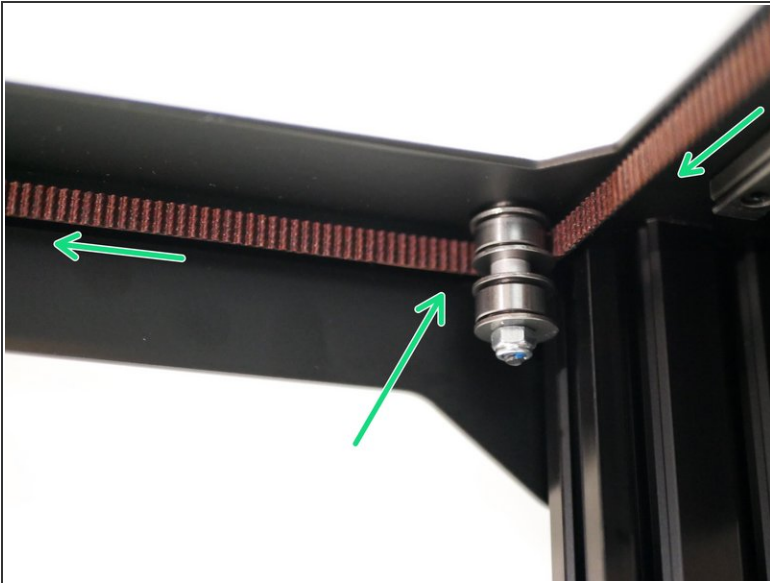## Step 14 — Upper Belt

- Next, wrap it around the left motor's pulley as shown.
  - The belt's teeth should grip the pulley.
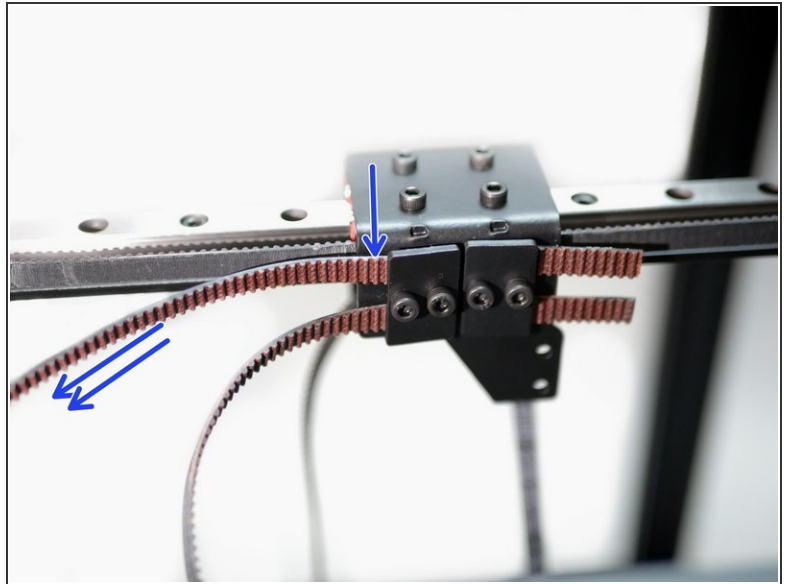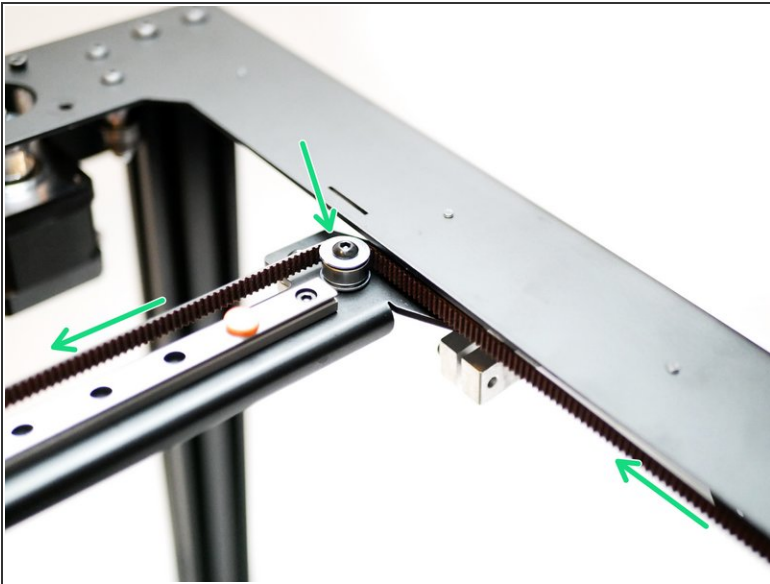
Step 15 — Upper Belt

- Next, wrap the belt around the rear left idlers as shown.
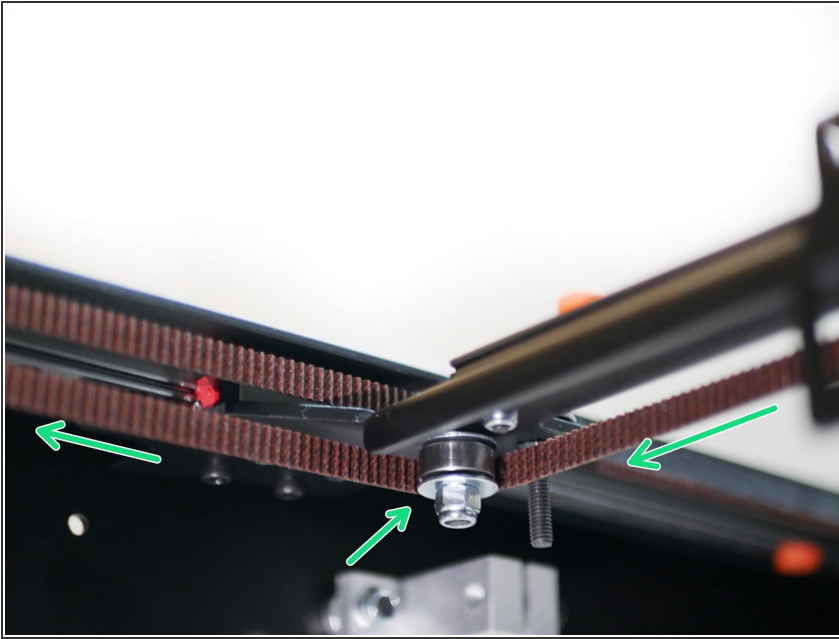
Step 16 — Upper Belt

- Whilst keeping some tension on the belt to prevent it from falling off the idlers, pull it forward and wrap it around the front idlers like shown.
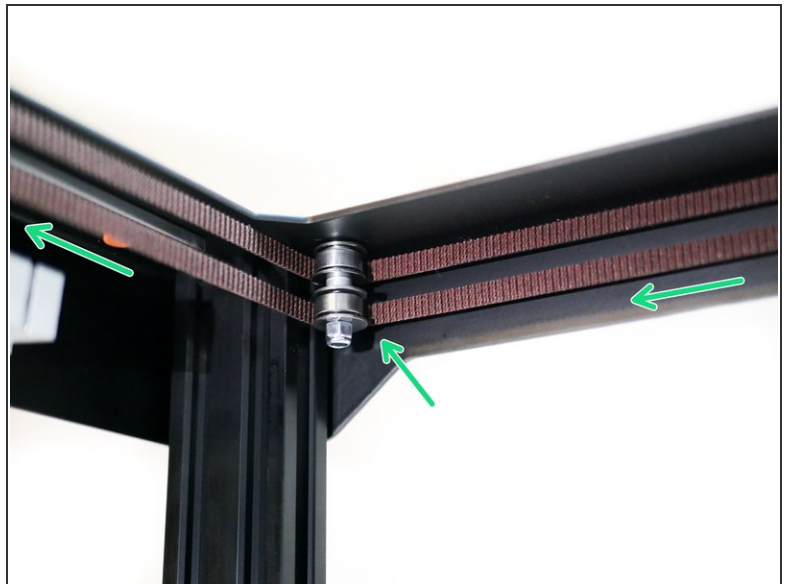
Step 17 — Upper Belt

- Finally, wrap it around the final idler on the gantry.

- Pull the belt tight to hold it in place, but do not tighten the clamp down just yet.
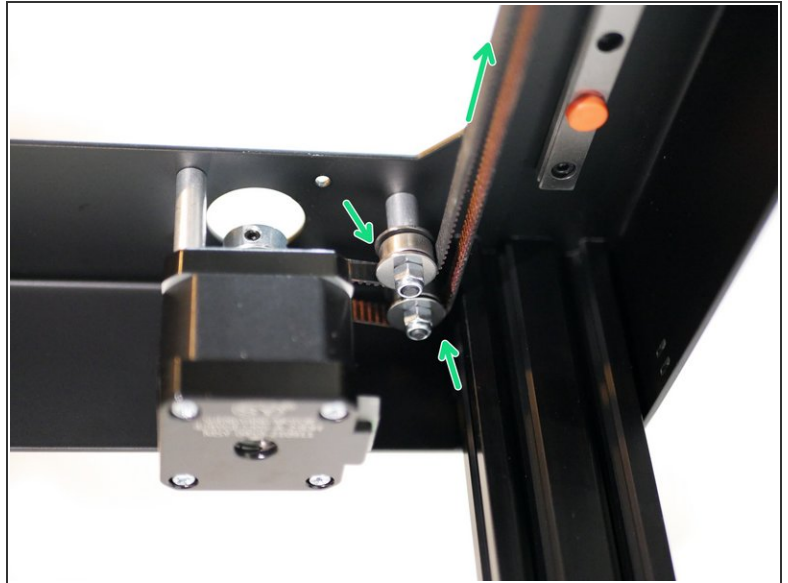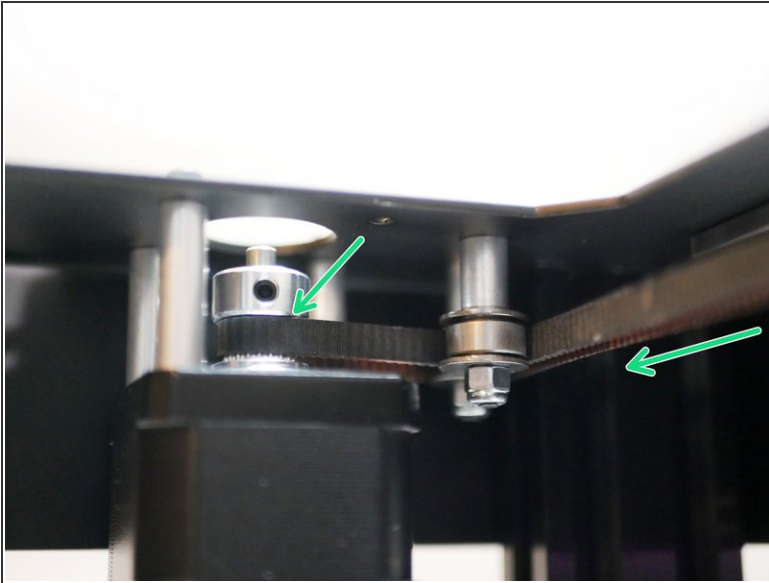
Step 18 — Lower Belt

- Take the left side of the belt and wrap it around the lower left idler on the gantry as shown.
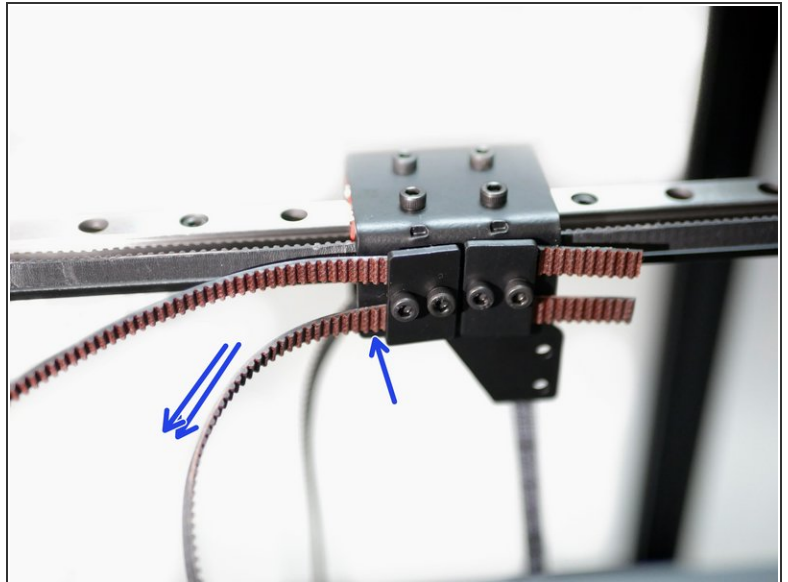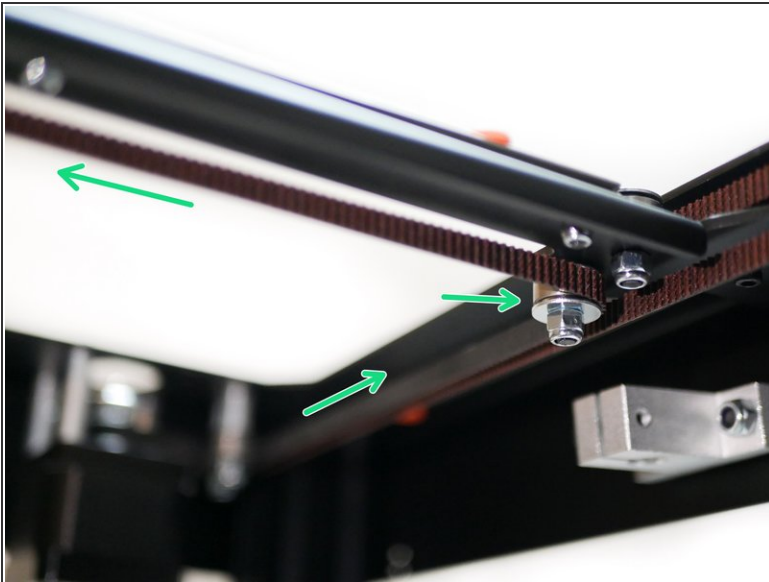
Step 19 — Lower Belt

- Next, wrap the belt around the front idlers.
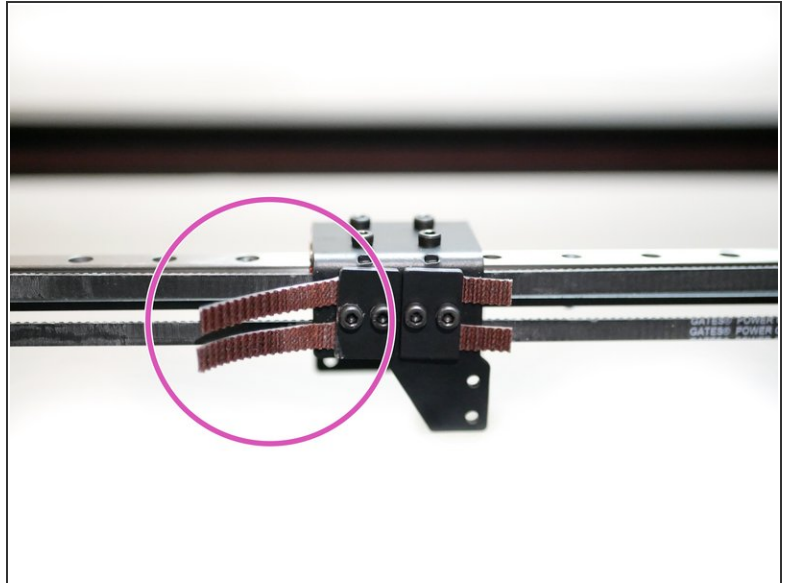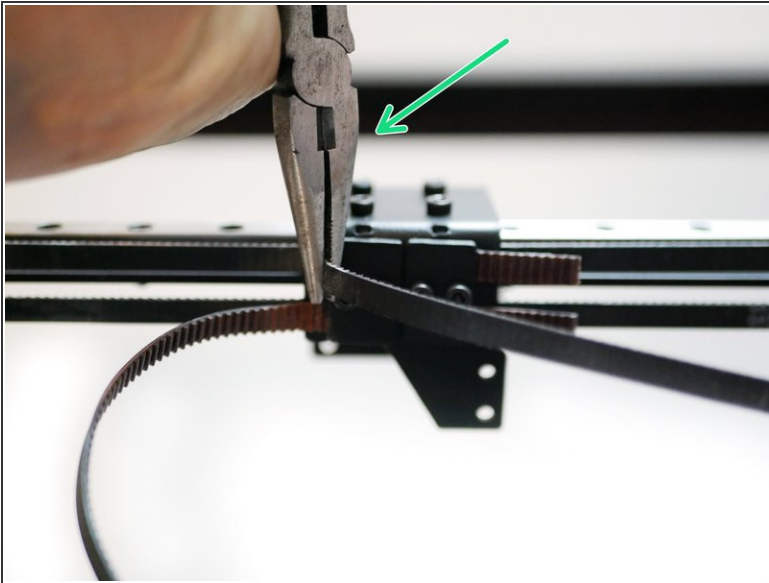
Step 20 — Lower Belt

- As before, wrap the belt around the motor pulley first and then around the two rear right idlers like shown.

Step 21 — Lower Belt

- Finally, wrap the belt around the lower right idler on the gantry.

- And, as before, pull the belt tight on the tool carriage.

Step 22 — Tensioning the Belts

- Use a pair of needle nozzle pliers (included) to tighten the belts.

- Grip the belts with the pliers and twist against the carriage to tighten.

  - 📌 Before starting, make sure that the clamp is tightened down enough to allow you to pull more belt through, but not allow the belt to slip back.

  - 📌 As a rule of thumb, the belts should be guitar string tight. However be cautious not to over tighten as that could cause the idlers to twist.

- Trim away excess belt leaving approx an inch dangling.

Step 23 — Setting and Securing the Pulleys
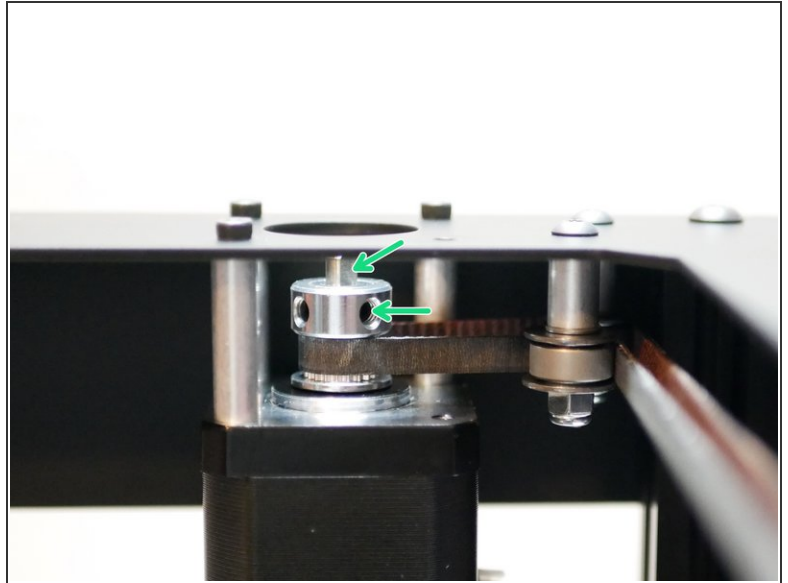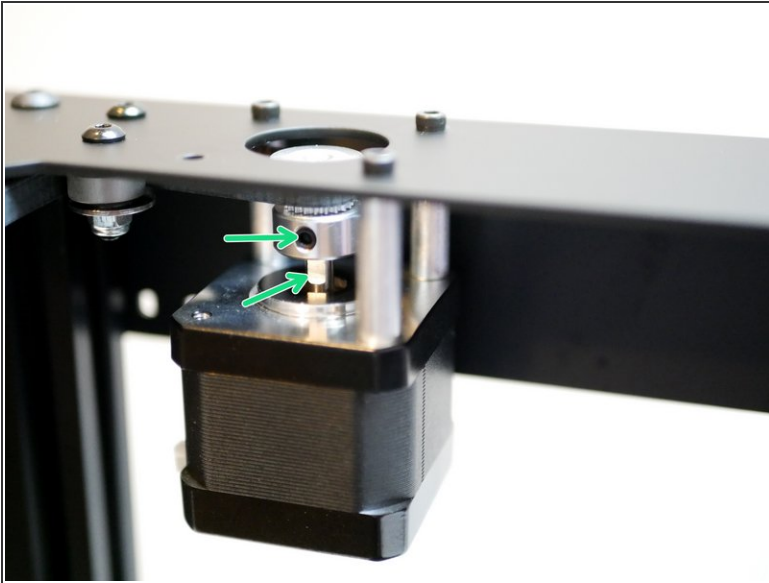
ⓘ Move the tool carriage around by hand to set the pulley's to the correct heights.

● Align the flats of the motor's shaft's to the pulley's grub screws and firmly secure the pulley's in place.

Step 24 — Motor Spacers
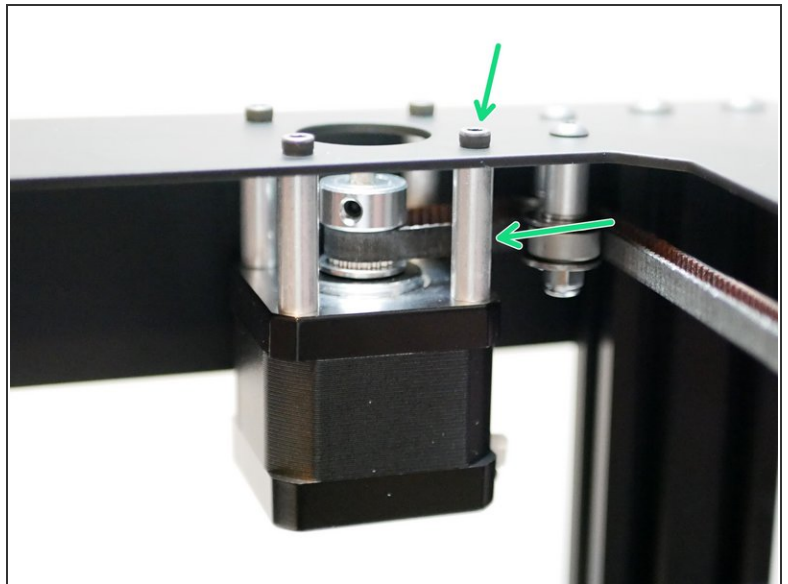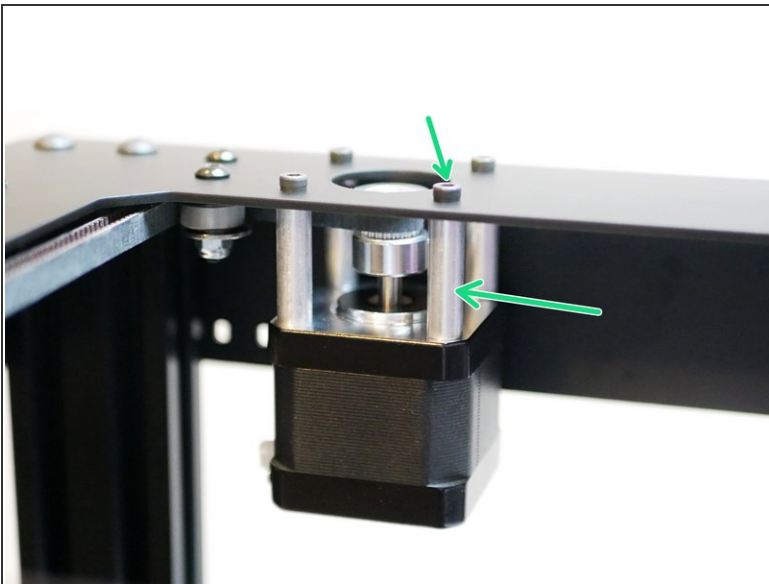
● Refit the motor bolts and spacers.