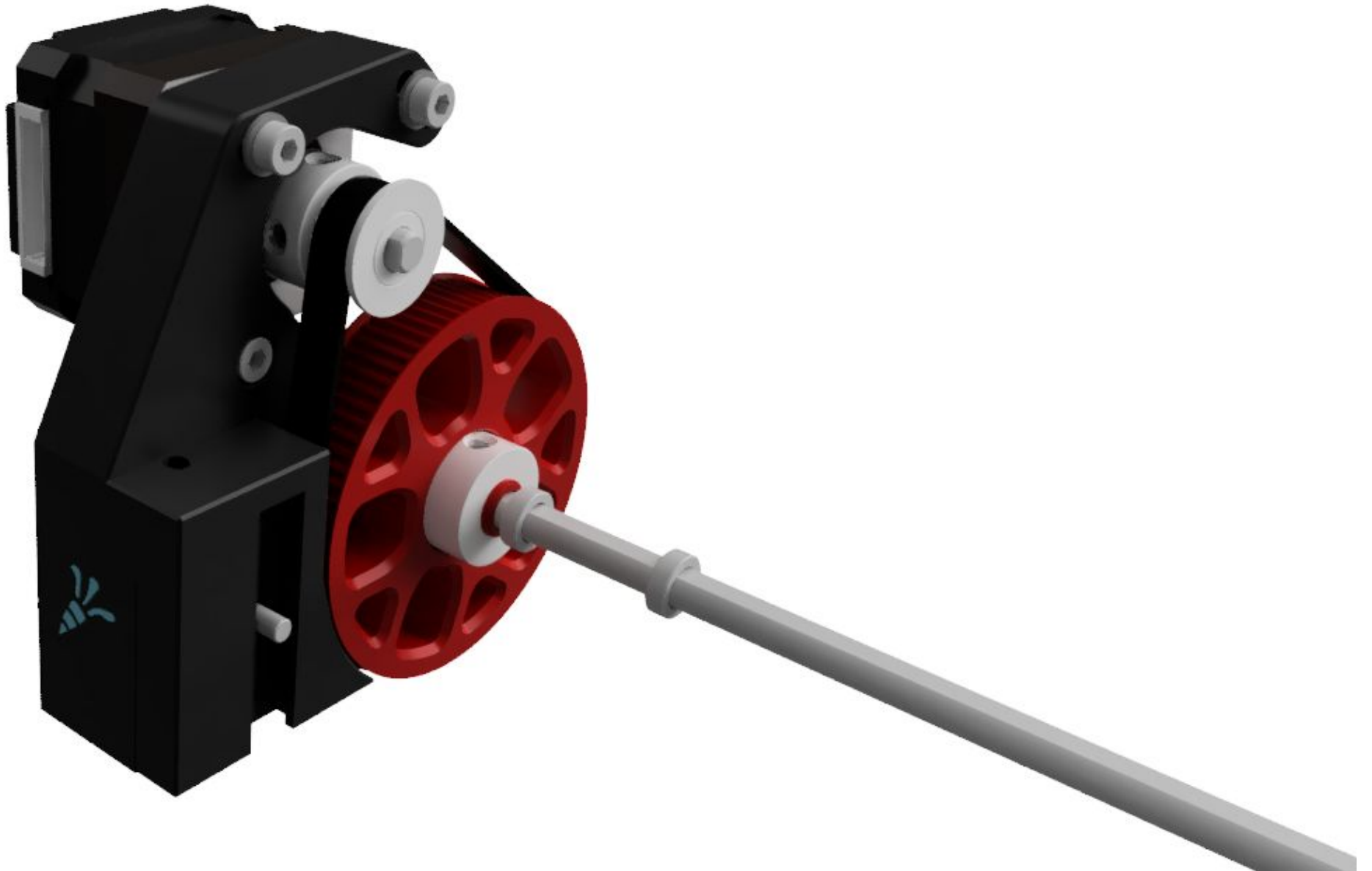


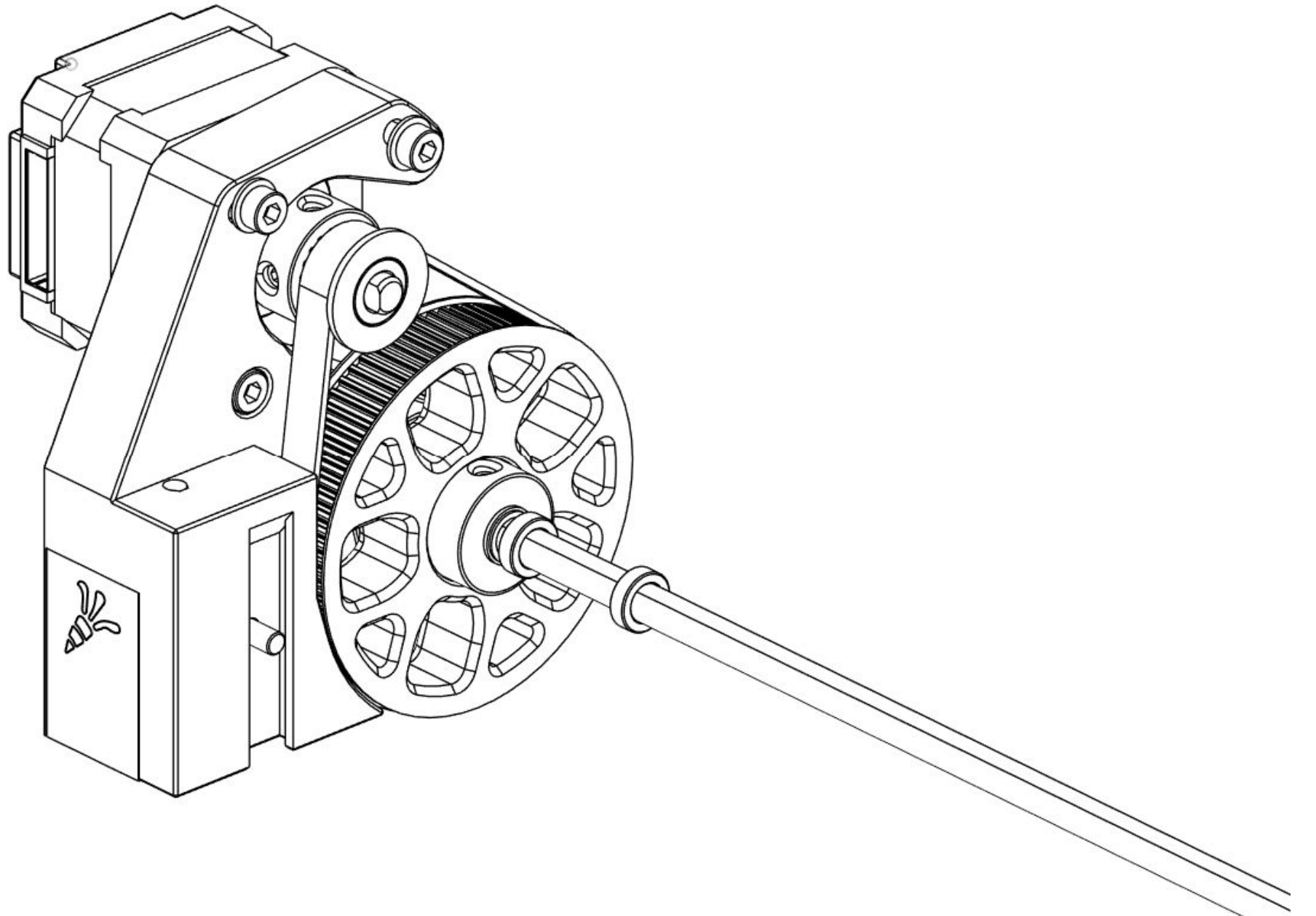
*MOTOR MOUNT (GEARED)

OVERVIEW



*MOTOR MOUNT (GEARED)

OVERVIEW



*MOTOR MOUNT (GEARED)

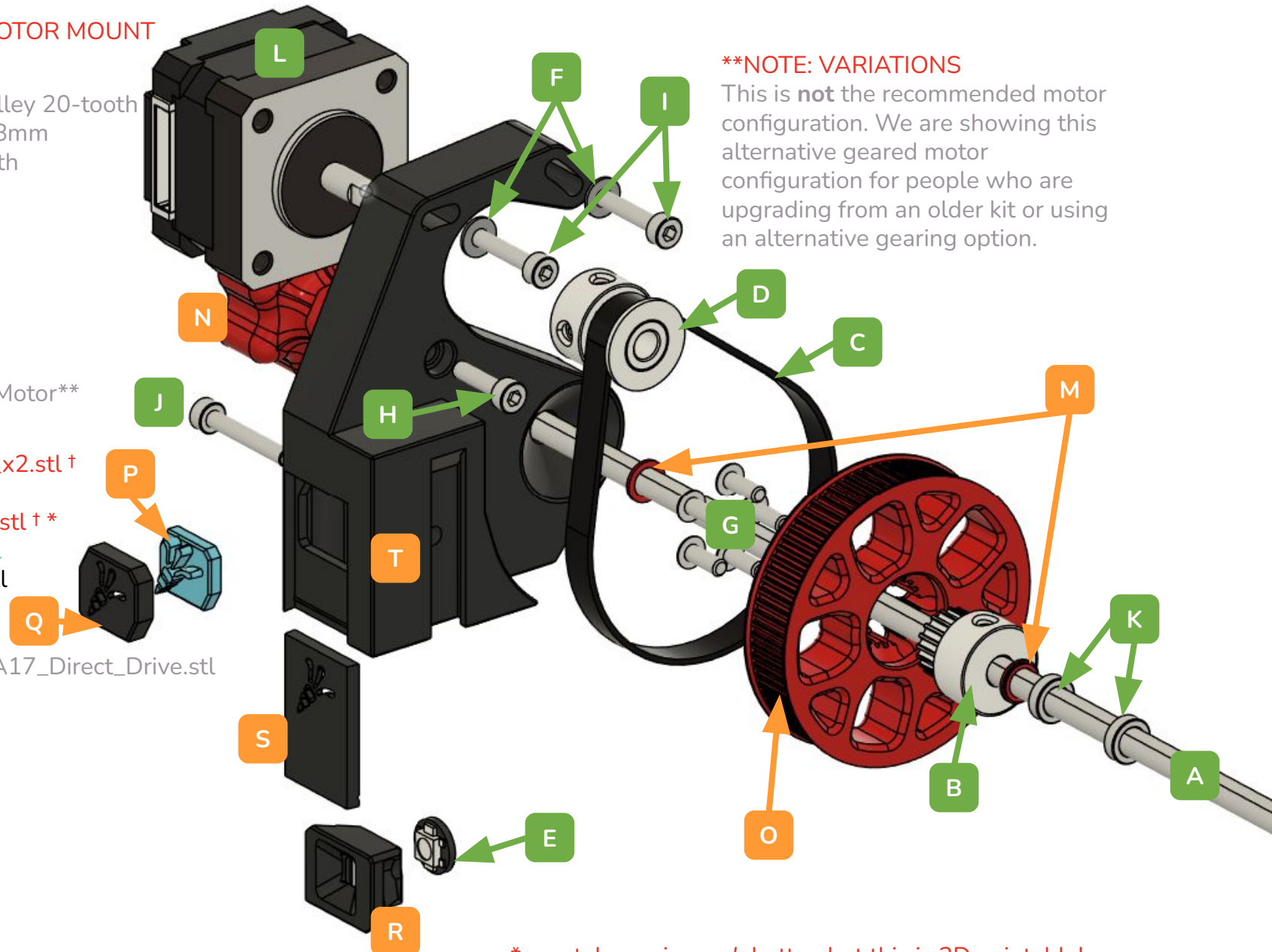
EXPLODED VIEW

GEARBOX SUB-BOM FOR MOTOR MOUNT

A	1x 5mm D-Cut Shaft
B	1x Deflanged GT2 Pulley 20-tooth
C	1x GT2 Belt Loop, 188mm
D	1x GT2 Pulley 20-tooth
E	1x LED PCB
F	2x M3 Washers
G	5x M3x8mm BHCS
H	1x M3x12mm SHCS
I	2x M3x16mm SHCS
J	1x M3x20mm SHCS
K	2x MR85ZZ Bearing
L	1x NEMA14 Stepper Motor**
M	1x [a]_Bearing_Spacer_x2.stl †
N	1x [a]_Knob.stl †
O	1x [a]_M4_80T_Wheel.stl † *
P	1x [c]_Logo_Diffuser.stl
Q	1x [o]_Diffuser_Mask.stl
R	1x LED_Carrier.stl
S	1x Logo_Mask.stl
T	1x Motor_Mount_NEMA17_Direct_Drive.stl

**NOTE: VARIATIONS

This is **not** the recommended motor configuration. We are showing this alternative geared motor configuration for people who are upgrading from an older kit or using an alternative gearing option.



*a metal gear is *much* better, but this is 3D-printable!

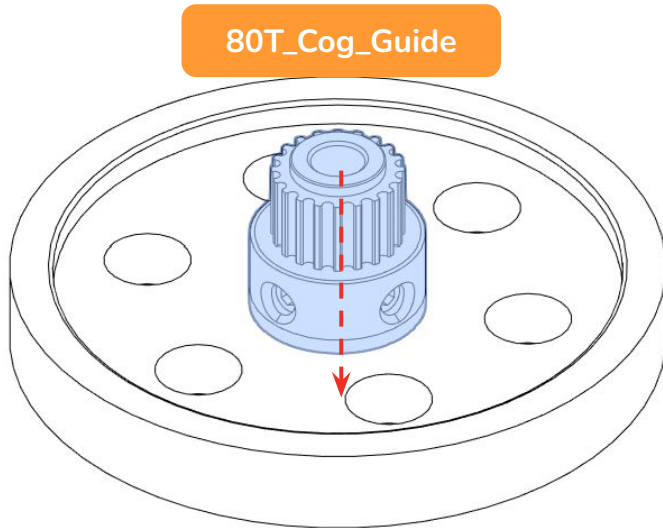
*MOTOR MOUNT (GEARED)

80T GEAR ASSEMBLY

REMOVE FLANGE

Use pliers to gently remove the top flange of the GT2 pulley. Most kits either provide the pulley pre-deflanged, or even better, a whole metal gear!

Place the GT2 pulley into the **80T_Cog_Guide**.

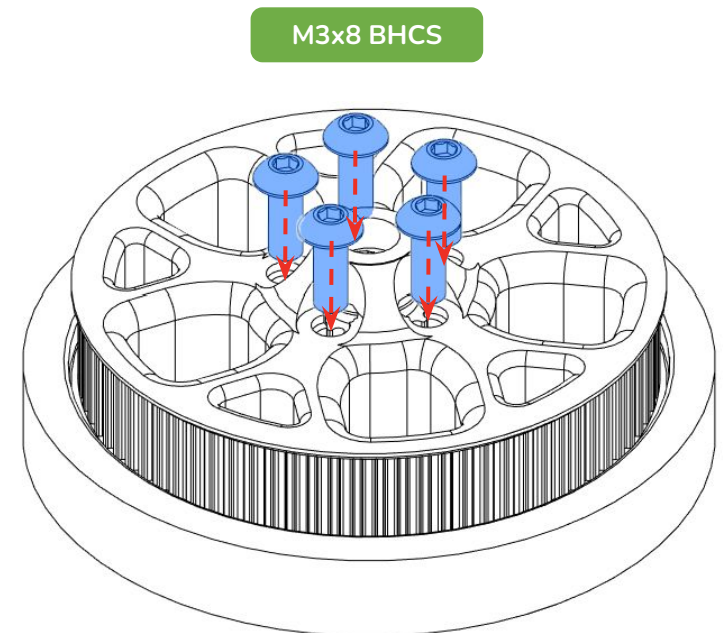
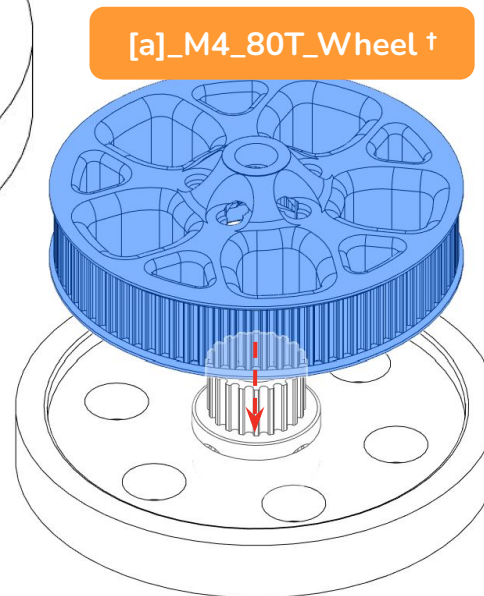
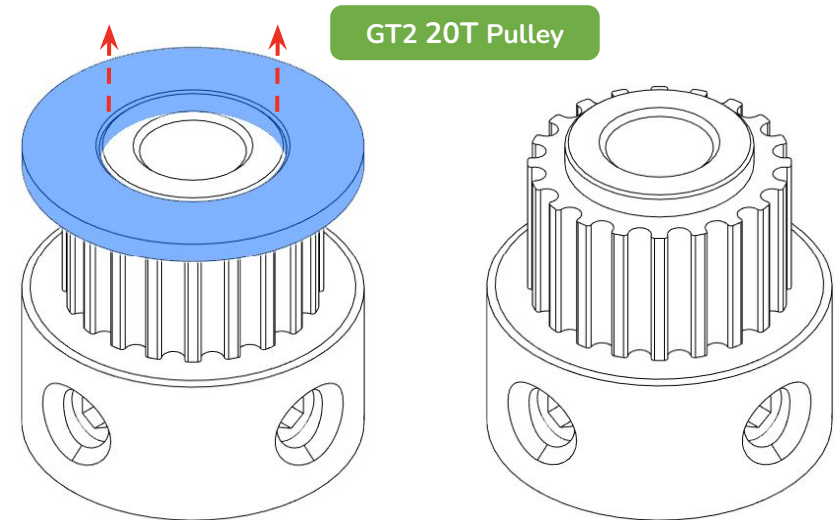


FINISH MOUNTING

Insert the **M4_80T_Wheel** onto the GT2 pulley and press it flat to the guide.

Add 5 M3x8 BHCS to secure the wheel in place. Gently tighten the screws in a star pattern (skipping every other screw) until the hub is snug. Don't overtighten, you'll strip the plastic, or worse, the pulley!

Set the **M4_80T_Wheel** aside for now.



*MOTOR MOUNT (GEARED)

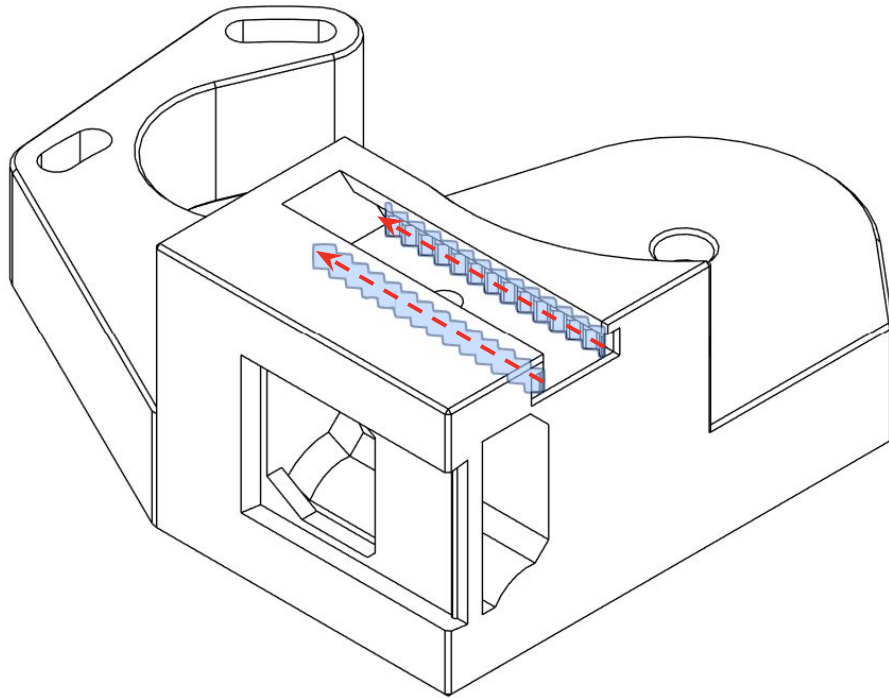
GEARED MOTOR MOUNT PREPARATION

GEARED MOTOR MOUNT SUPPORTS

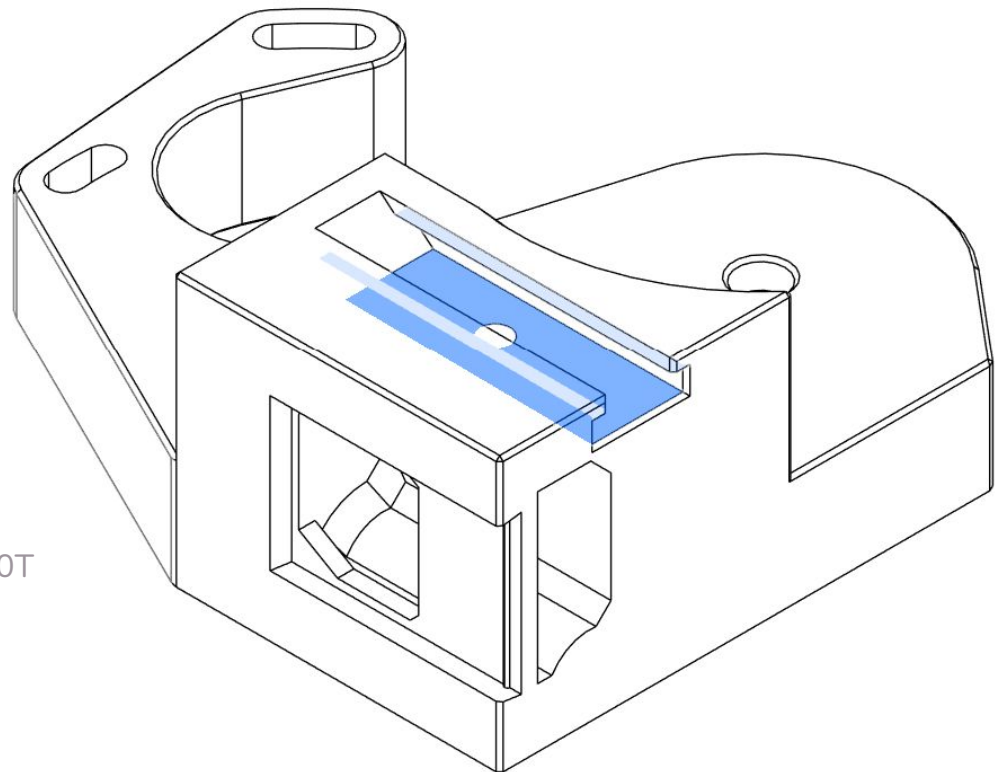
This step is only necessary for the alternative Geared Motor Mounts.

Take a small flathead screwdriver or Allen wrench, and remove the print-in-place supports out of the dovetail of the **Motor_Mount**.

You may need to use a file or hobby knife to clean up any remaining residue from the print-in-place supports on the roof and floor, so that the dovetail is smooth. Or just YOLO it in the next step.



Shown: an alternative NEMA14 Motor Mount for a Metal 80T gear.



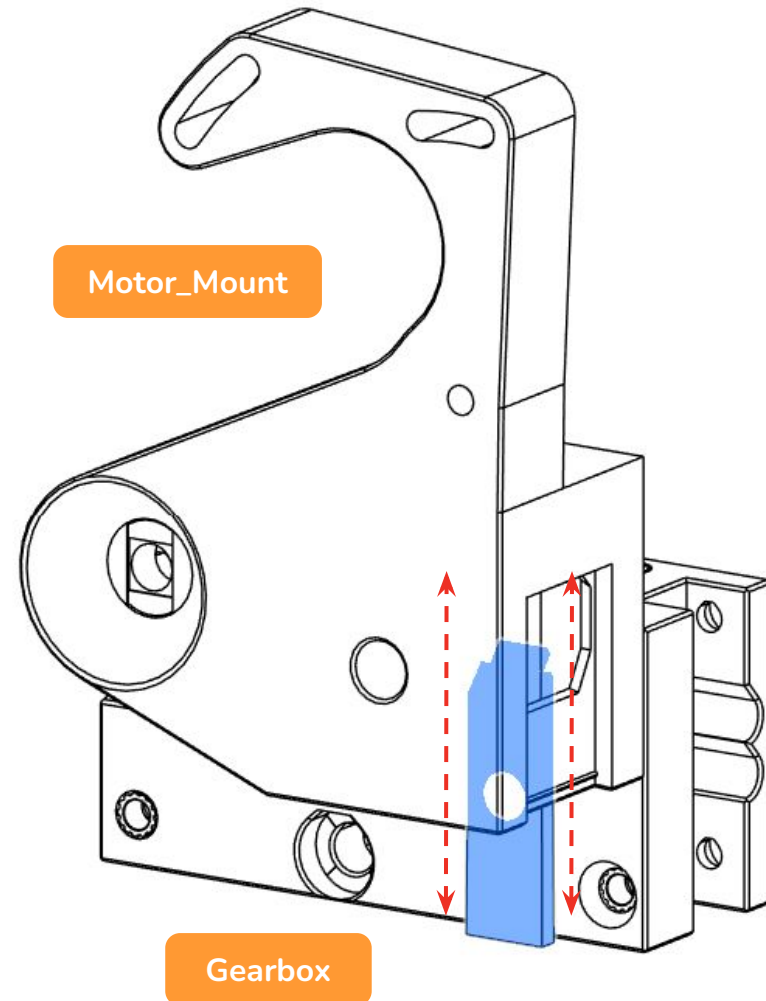
2.1 MOTOR MOUNT MESHING

Take your choice of **Motor_Mount** and carefully mate the dovetail on the **Gearbox** to the slot in the **Motor_Mount**. If it is a tight fit, take sandpaper, a file, or a hobby knife to the parts that are rubbing so that it meshes and unmeshes without too much force. We want this dovetail to mesh with little effort so that later assembly steps are easy.

If the fit between these parts is too tight to put together or pull apart, it's a good sign that you either need to reprint the parts, or possibly tune your printer more, especially the Extrusion Multiplier. The parts are designed to fit together and come apart with your hands alone, and without straining. It is normal for the first 3-4 times fitting together to be "sticky," but simply meshing and remeshing the dovetail several times should smooth things out. It is also normal for the area around the dovetail to wear!

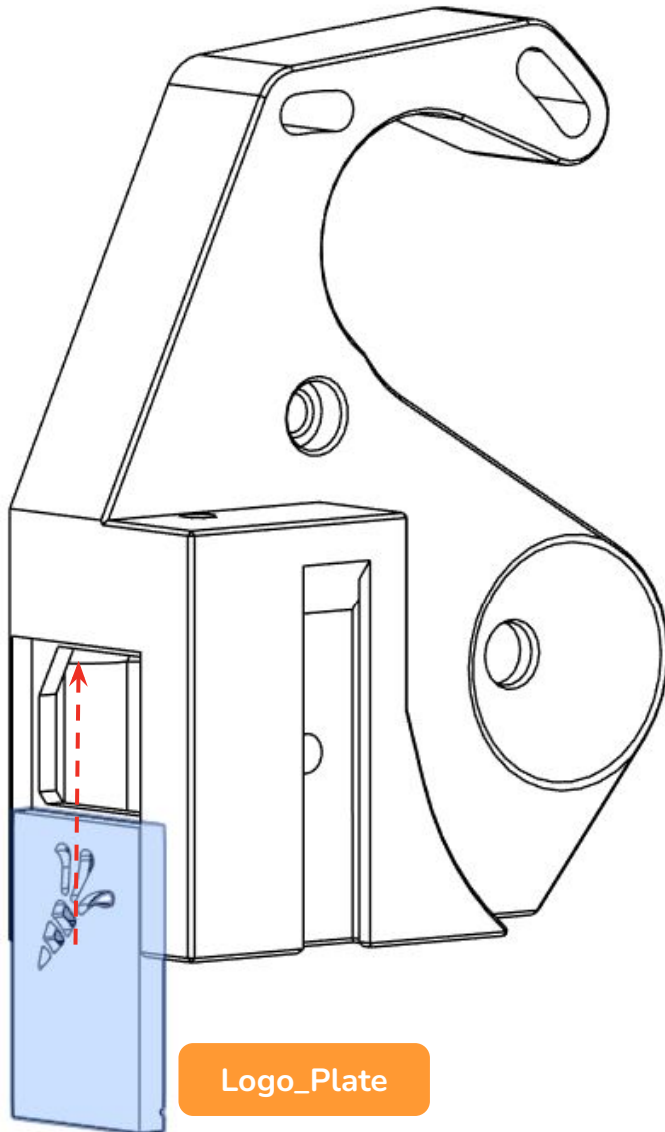
Unmesh and set aside the **Motor_Mount** for now.

Shown: an alternative NEMA17 Motor Mount for a Metal 60T gear.



*MOTOR MOUNT (GEARED)

Motor_Mount_NEMA14_Printed_80T

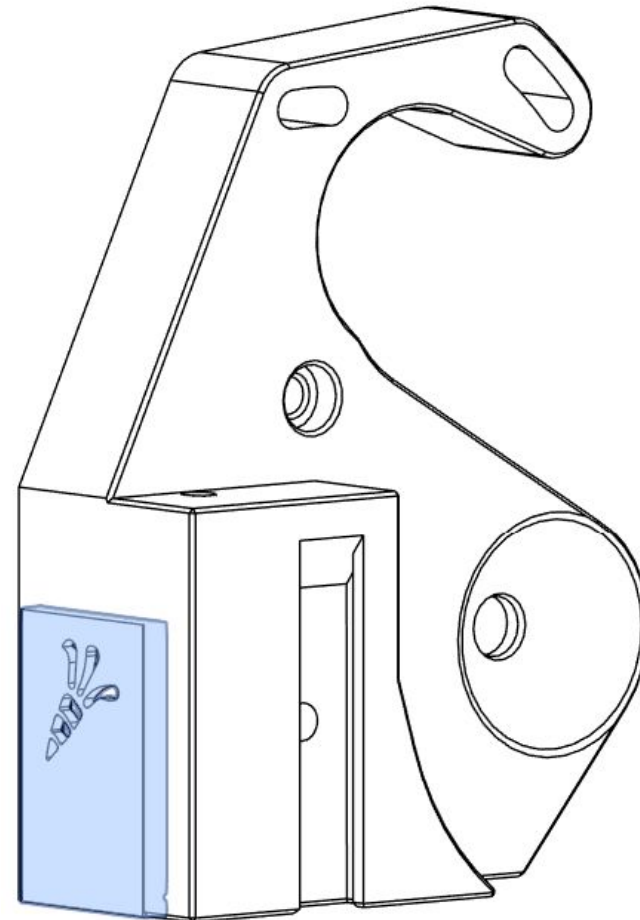


LOGO PLATE

2.2 INSTALLING THE LOGO PLATE

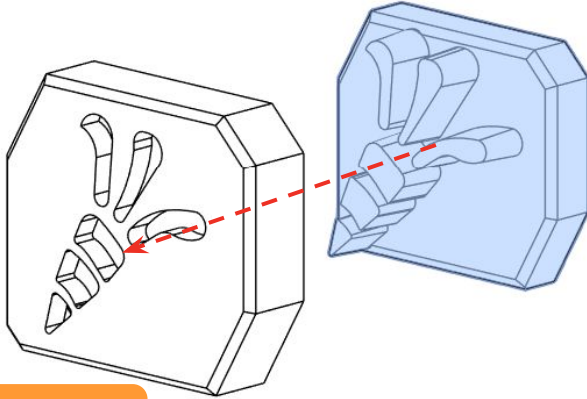
The **Logo_Plate** interlocks with the **LED_Diffuser** and **Diffuser_Mask**, so it must be installed first.

Align the **Logo_Plate** with the slot in the bottom of the **Motor_Mount**, and slide it upwards until it clips into place.

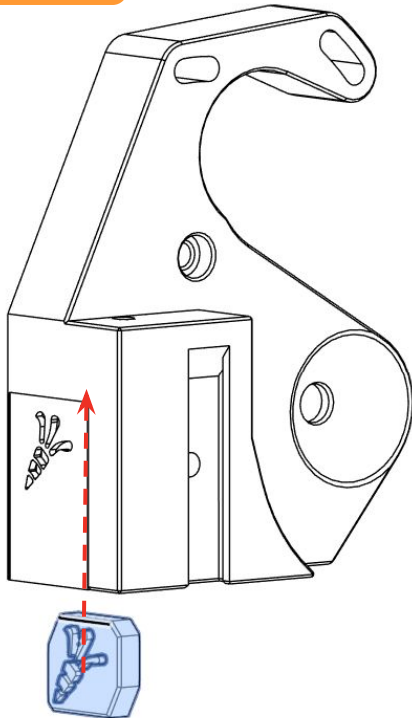


*MOTOR MOUNT (GEARED)

LED_Diffuser



Diffuser_Mask

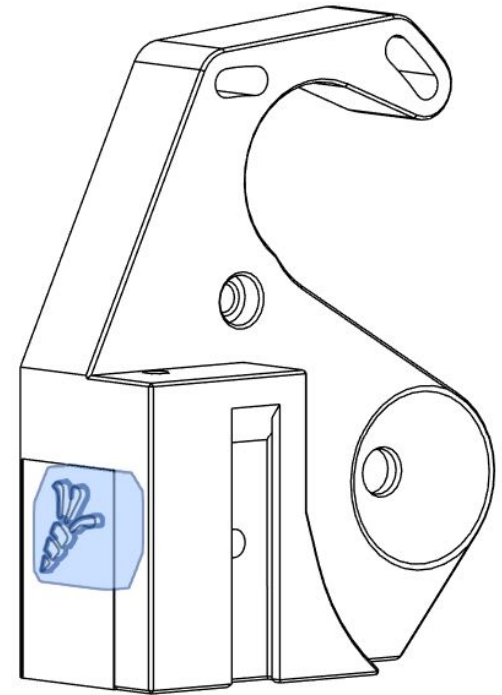
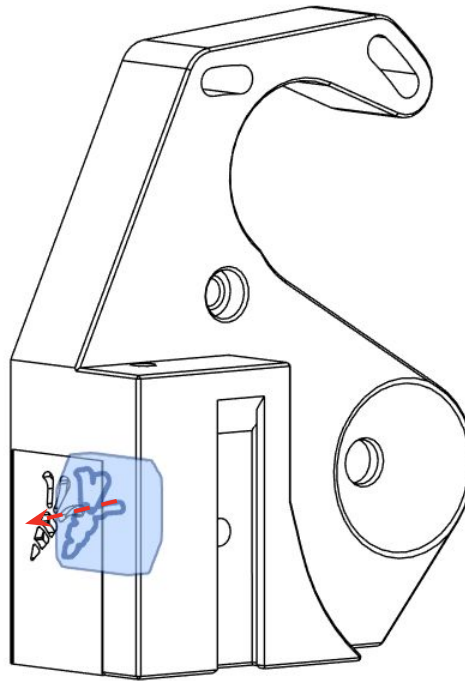


LED DIFFUSER

2.2 INSTALLING THE LED DIFFUSER

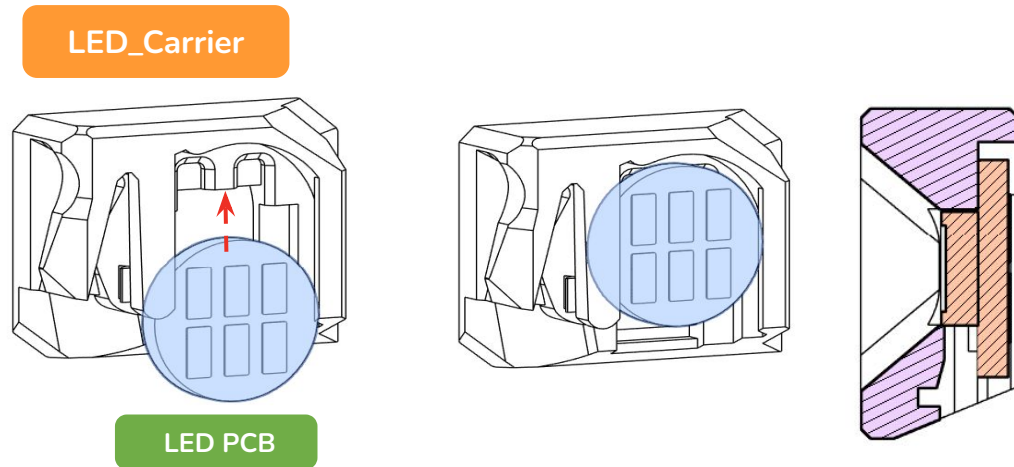
Insert the LED_Diffuser into the Diffuser_Mask, so that the carrot logo pokes through the Diffuser_Mask.

Insert the combined part into the Motor_Mount from the bottom. Once the combined part is as far up as it can go, use an Allen key or screwdriver to push it into the Logo_Plate.



*MOTOR MOUNT (GEARED)

LED CARRIER

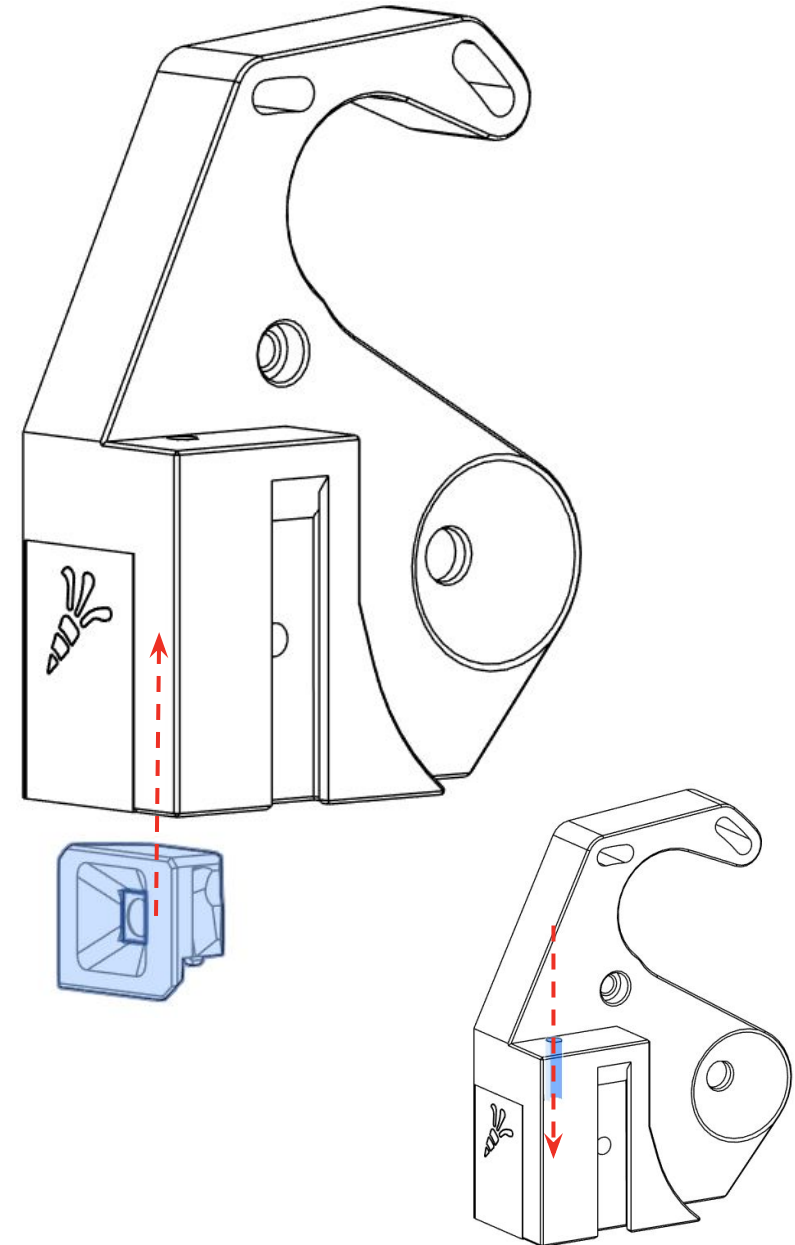


2.2 INSTALLING THE LED CARRIER

Insert the LED PCB into the **LED_Carrier**, so that the edges of the PCB clip into the **LED_Carrier**. Check the front of the **LED_Carrier** to make sure the LED is aligned with the window. The wires are omitted from the images for clarity.

Insert the combined part into the **Motor_Mount** from the bottom. Use an Allen key or screwdriver to push the combined part up as far as it can go.

If you need to recover the LED for any reason, insert an Allen key into the hole in the roof of the **Motor_Mount** to push the **LED_Carrier** back out of the bottom.



*MOTOR MOUNT (GEARED)

MOTOR PREPARATION

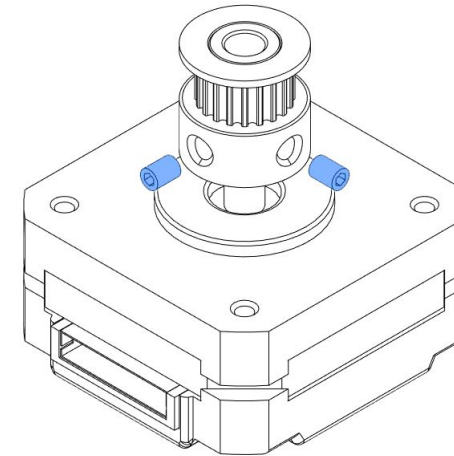
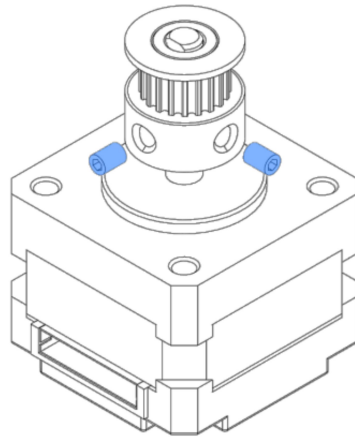
MOTOR VARIATIONS

While the NEMA 17 motor is what is called for in the BOM, we also support NEMA 14 motors for those who are sourcing their own parts or upgrading from a previous version. NEMA 17 motors tend to have more torque but need to run at lower speeds compared to NEMA 14 motors, so NEMA 17 motors are preferred.

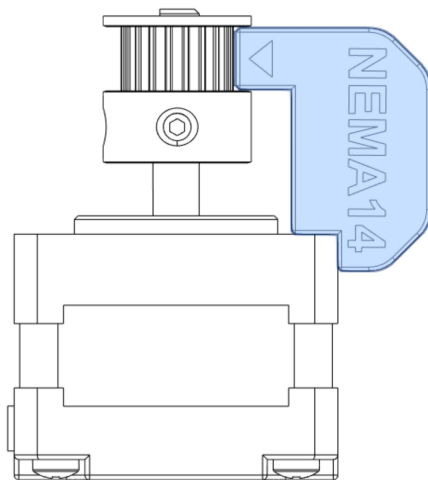
SET SCREWS

Insert both M3 set screws and use thread locker on them.

Use the appropriate pulley tool to install the pulley at the correct height on the motor shaft.



Pulley_Tool_NEMA14 †

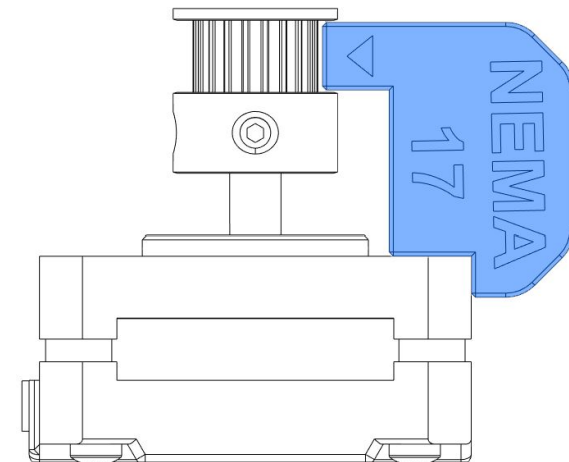


PULLEY HEIGHT

Use the [Pulley_Tool_NEMA17 †](#) to set the correct height of the GT2 20T gear.

If you are using a NEMA 17 motor for the gear axis, assembly is the same but you'll need to use [Pulley_Tool_NEMA14 †](#) and print a different Motor Arm to mount it.

Pulley_Tool_NEMA17 †

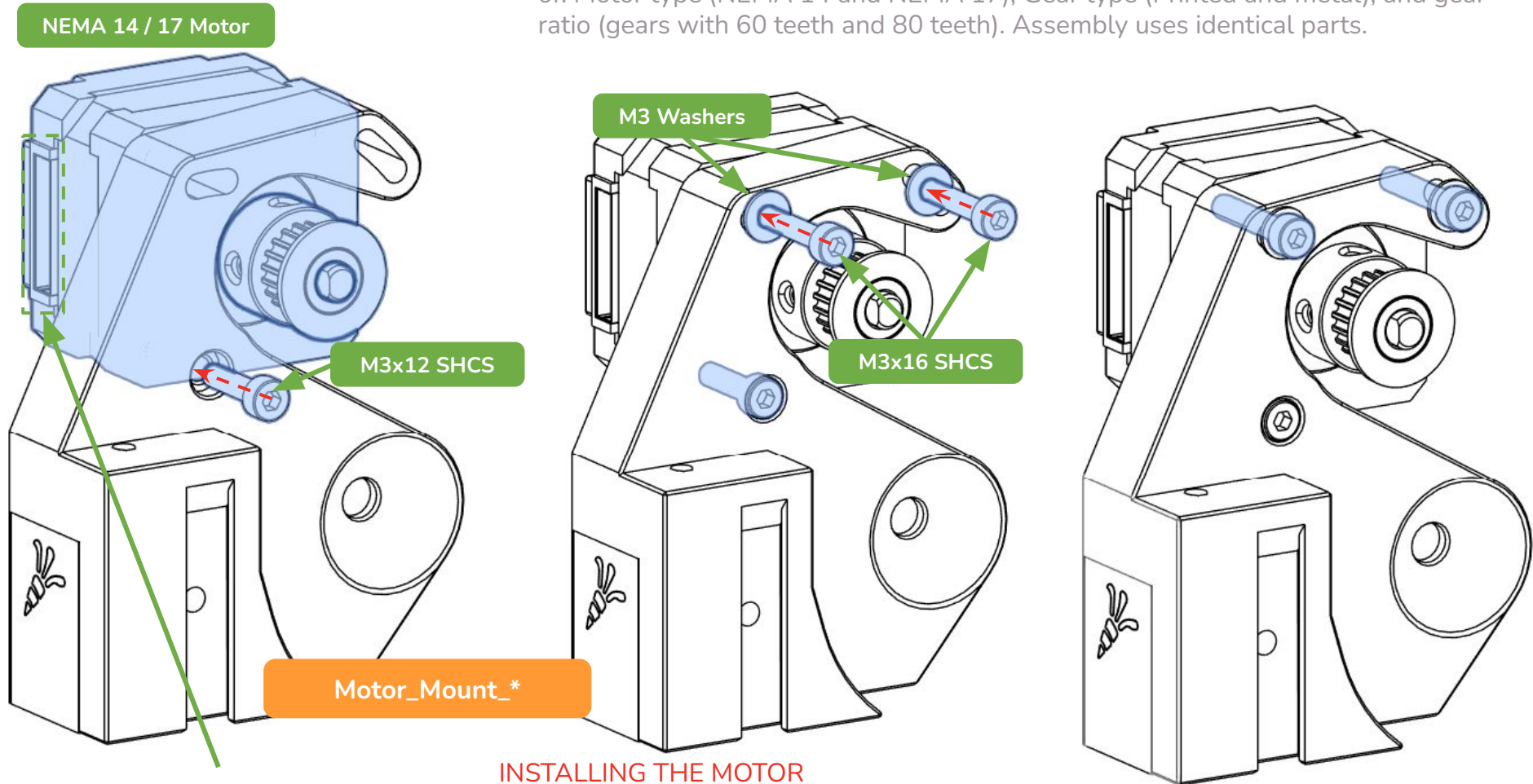


*MOTOR MOUNT (GEARED)

MOTOR MOUNT

ALTERNATIVE MOTOR MOUNTS

If you look in the User Mods on Github, there is a version for every combination of: Motor type (NEMA 14 and NEMA 17), Gear type (Printed and metal), and gear ratio (gears with 60 teeth and 80 teeth). Assembly uses identical parts.



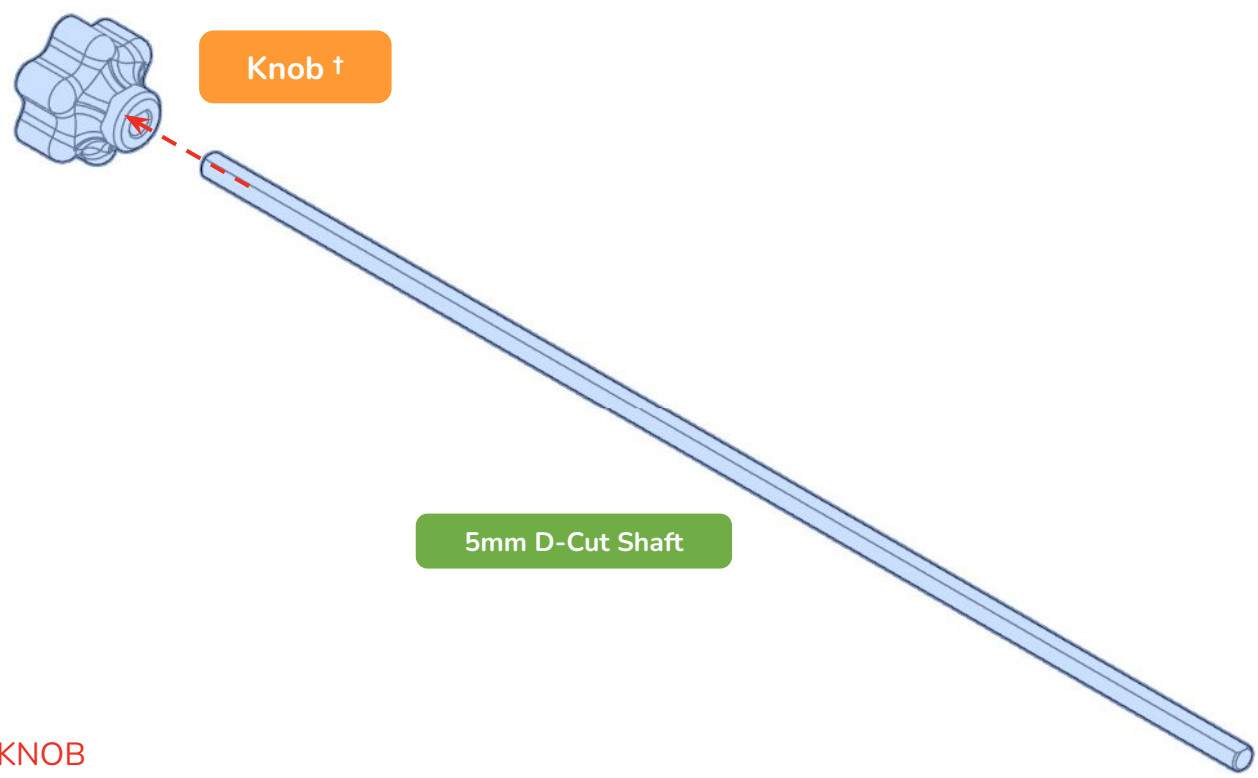
MOTOR WIRES

Make sure the wires of the motor come out on this side.

INSTALLING THE MOTOR

Align the motor to the **Motor_Mount** with the wires or connector facing left. Start by adding the M3x12mm bolt. Leave the bolt loose enough to use as a hinge.

Next add the M3x16 bolts, adding an M3 washer to each. Leave these loose enough to allow the motor to rotate easily.



2.3 INSTALLING THE KNOB

Insert the 5mm D-cut shaft into the Knob. You may want to use a hammer on the Knob to ensure a snug fit. You don't want the Knob to come off later!

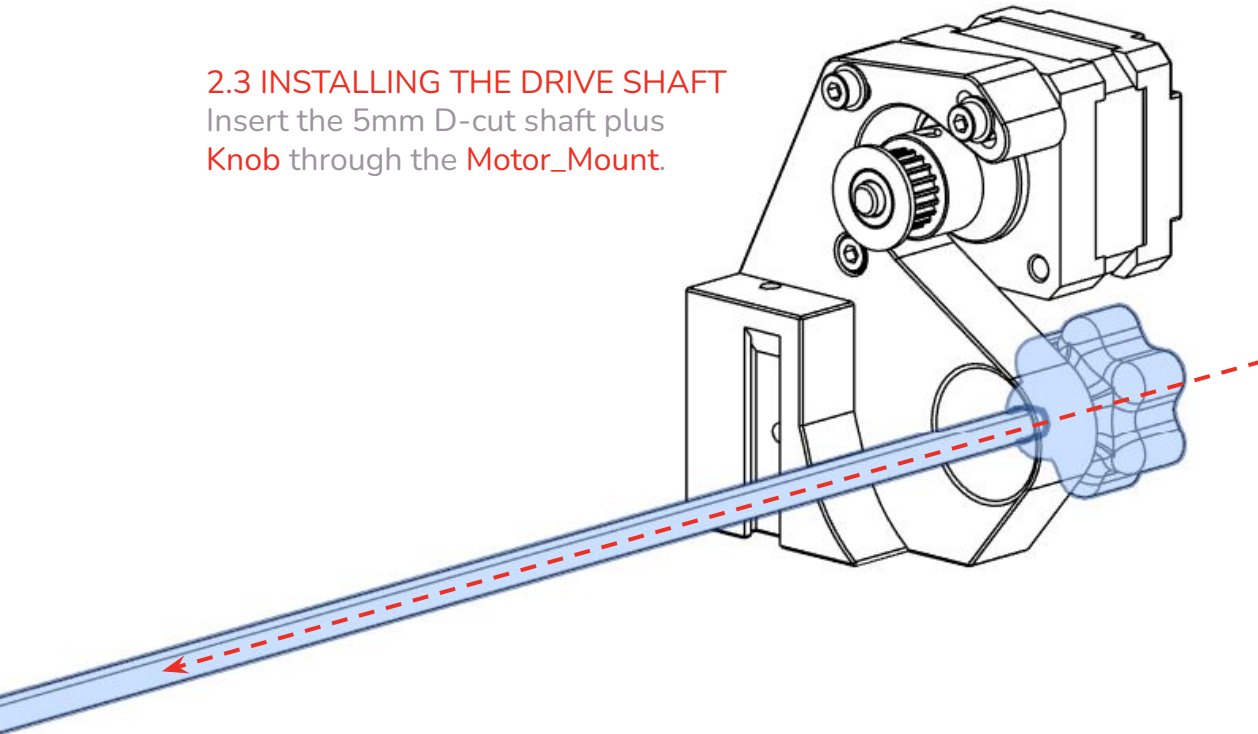
Channels	N	4	5	6	7	8	9	10	11	12	13	14	15
D-Cut Rod Length (mm)	72 + 23N	164	187	210	233	256	279	302	325	348	371	394	417

*MOTOR MOUNT (GEARED)

DRIVE SHAFT ASSEMBLY

2.3 INSTALLING THE DRIVE SHAFT

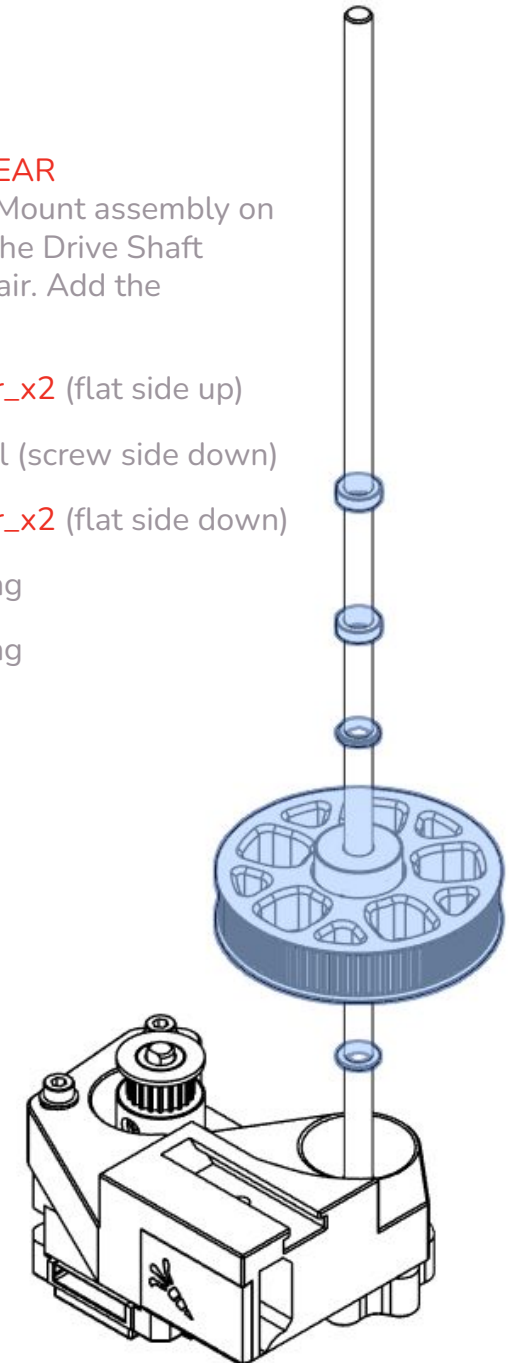
Insert the 5mm D-cut shaft plus Knob through the Motor_Mount.



ADDING THE GEAR

Turn the Motor_Mount assembly on its' side so that the Drive Shaft points up in the air. Add the following parts:

- Bearing_Spacer_x2 (flat side up)
- M4_80T_Wheel (screw side down)
- Bearing_Spacer_x2 (flat side down)
- MR85ZZ Bearing
- MR85ZZ Bearing



If your D-Cut Shaft is rough or at-spec (4.98-5.00mm), it will be difficult to insert and move the bearings. It is important that we be able to move the shaft along its axis during assembly, so if this is a problem for you, this must be addressed.

For many D-cut shafts, degreasing them with your favorite household cleaner can make the difference between a too-tight fit and a snug fit. If that doesn't work, follow up with a light-duty abrasive pad.

If you still find that your D-Cut Shaft is too tight on the bearings, take a high-grit sandpaper (at least 300 grit) and sand the shaft. Use a light oil, wear gloves and take appropriate precautions while sanding. You barely want to take any material away at all.

*MOTOR MOUNT (GEARED)

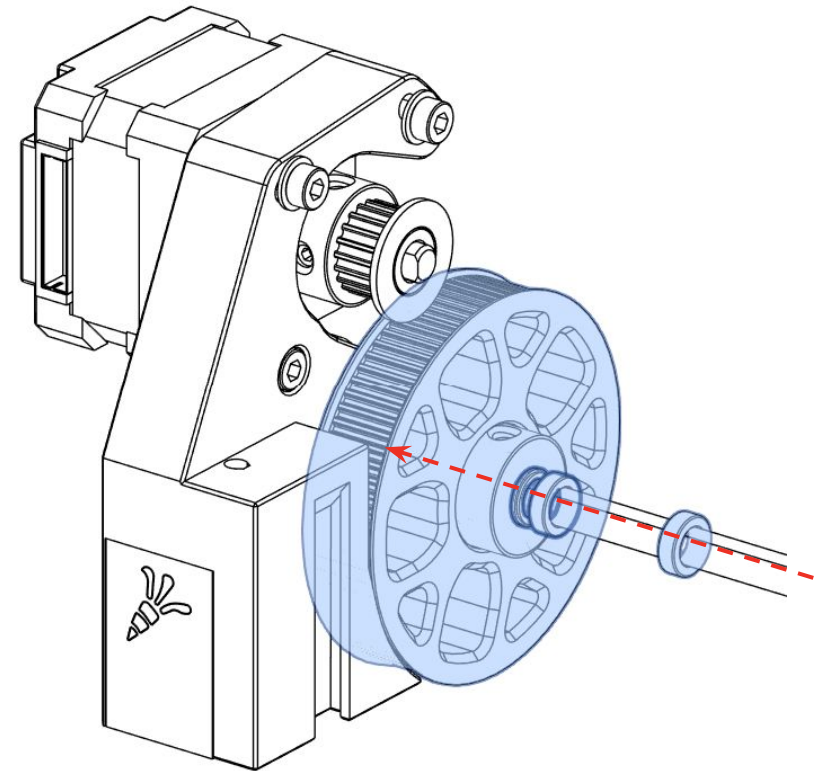
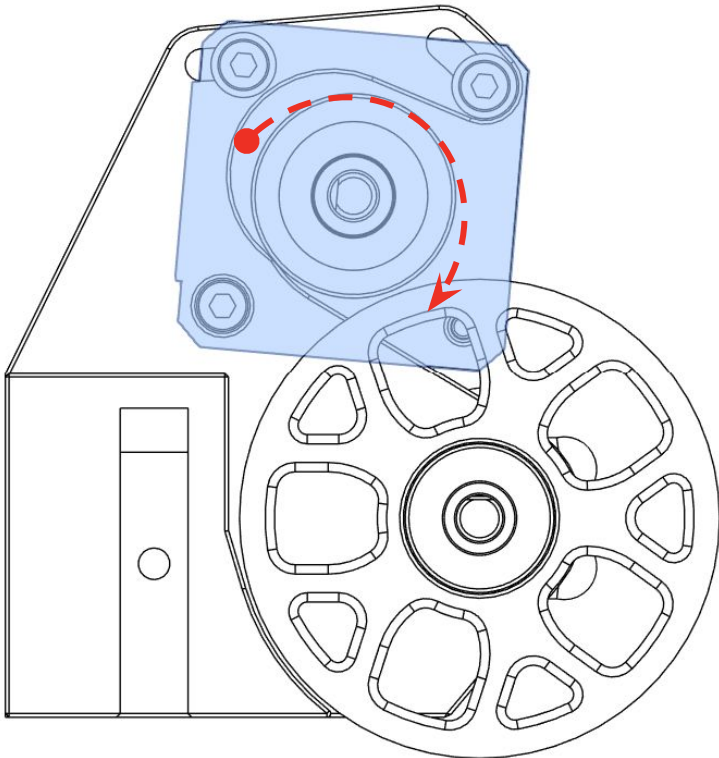
DRIVE SHAFT ASSEMBLY

2.3 SNUG UP THE GEAR

Push the **M4_80T_Wheel** to the end of its' travel, making sure the Knob is snug against the Motor_Mount. Make sure that the **Bearing_Spacer_x2** is against the metal pulley part of the **M4_80T_Wheel**.

Leave some space between the two MR85ZZ bearings.

Metal wheels do not use the **Bearing_Spacer_x2**, they are only for the printed gears.



PREP TO ADD THE BELT LOOP

Twist the motor clockwise so that the GT2 Pulley is as close to the **M4_80T_Wheel** as possible.

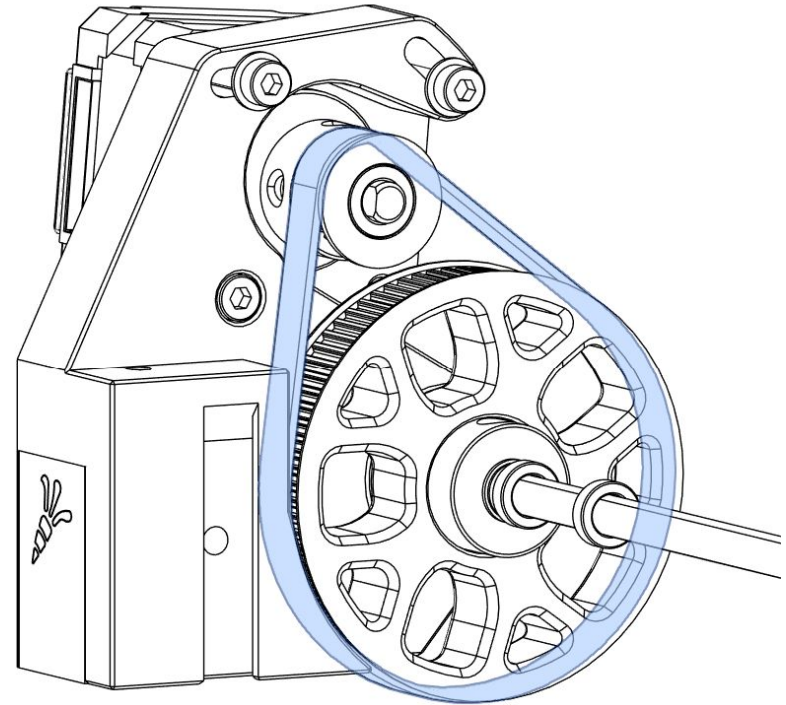
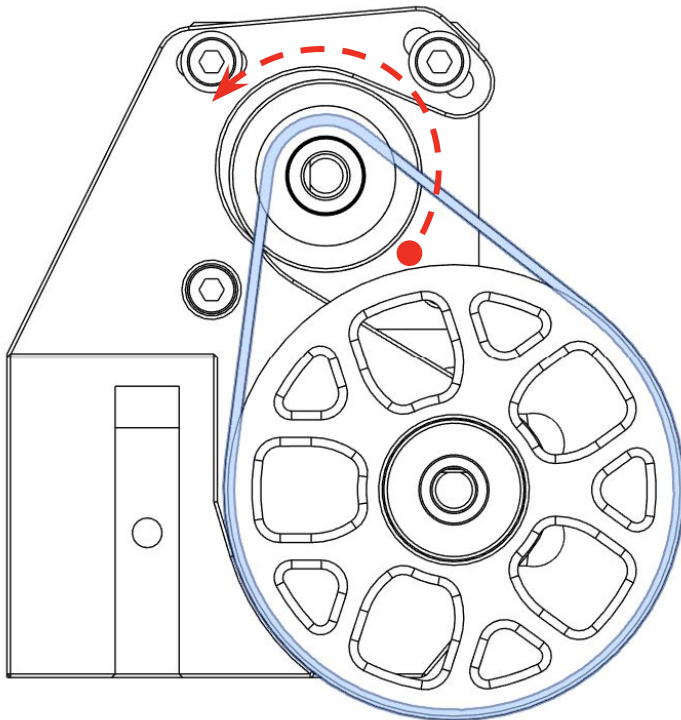
*MOTOR MOUNT (GEARED)

DRIVE SHAFT ASSEMBLY

2.3 ADD THE BELT LOOP

Add the 188mm GT2 belt loop to the **M4_80T_Wheel**. It is usually easiest to start by putting the belt loop on the gear first, then the motor pulley.

With the belt installed, lightly twist the motor counter-clockwise to tension the belt loop. Then snug the screws that mount the motor. Do not tighten them yet - we will adjust the belt tension soon. We just need the motor to stay in place to keep the belt attached for the next steps.

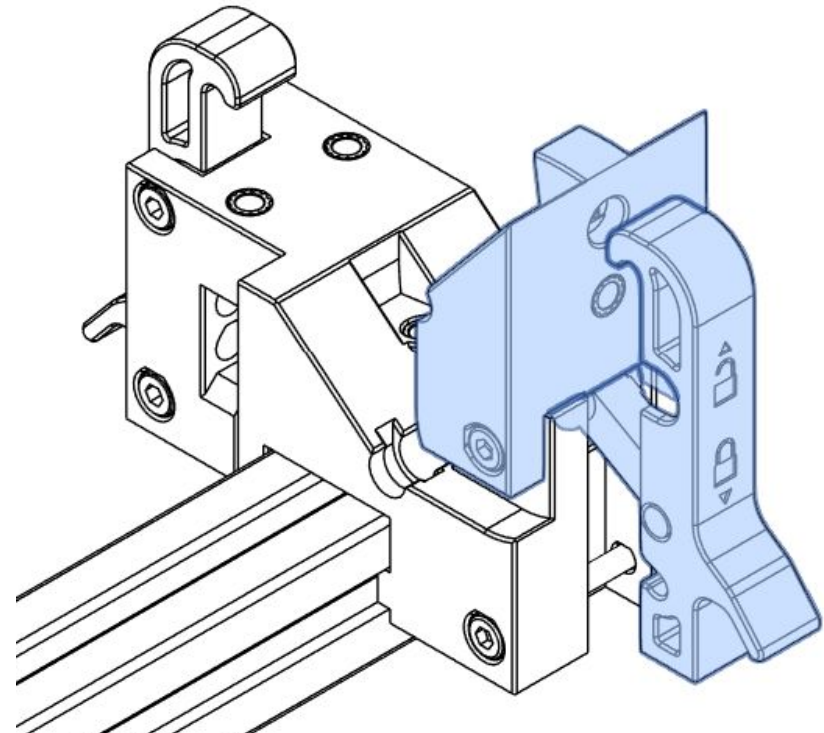
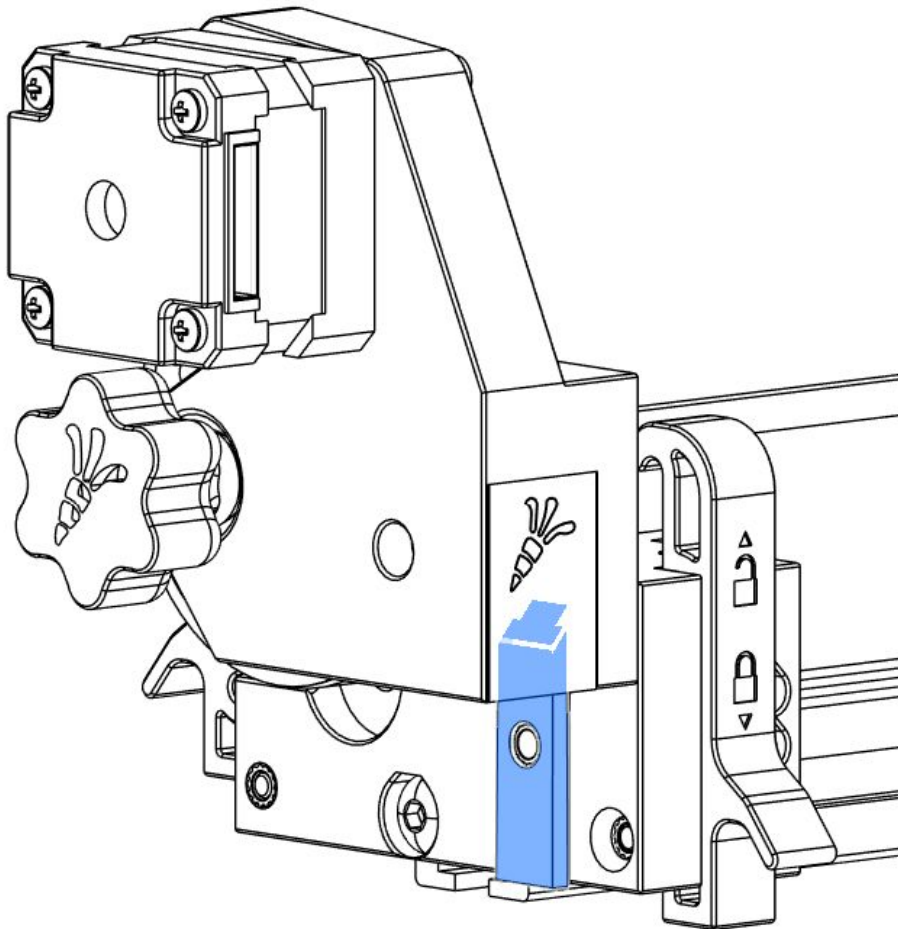


*MOTOR MOUNT (GEARED)

INSTALLING MOTOR MOUNT

2.1 PREP TO INSTALL THE MOTOR MOUNT

Take the Gearbox assembly and open the **Side_Latch_v2** on the side that shares a hinge with the **Hatch**. Next, flip open the **Hatch**.

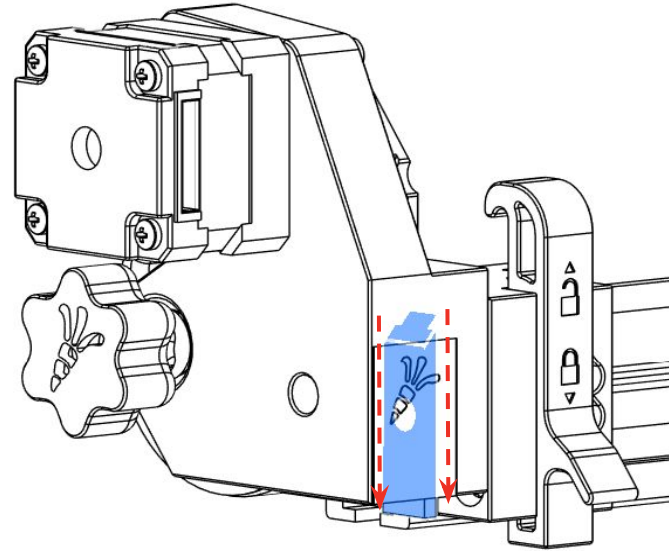
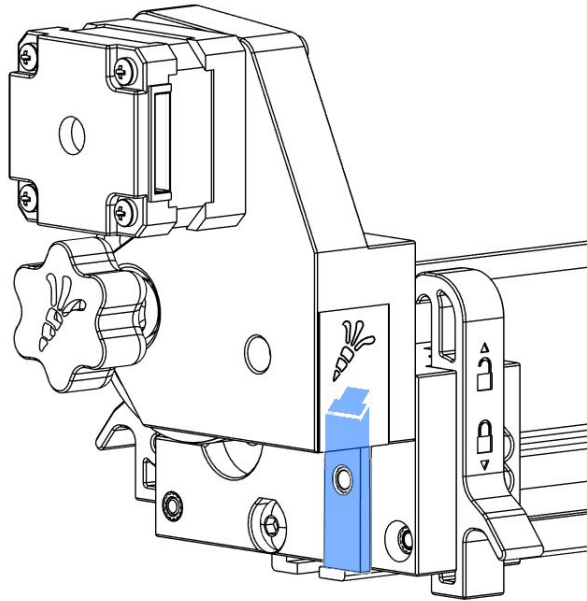


INSTALL THE MOTOR MOUNT

Mate the slot on the **Motor_Mount** to the dovetail on the **Gearbox**. Just get it started, then proceed to the next page.

*MOTOR MOUNT (GEARED)

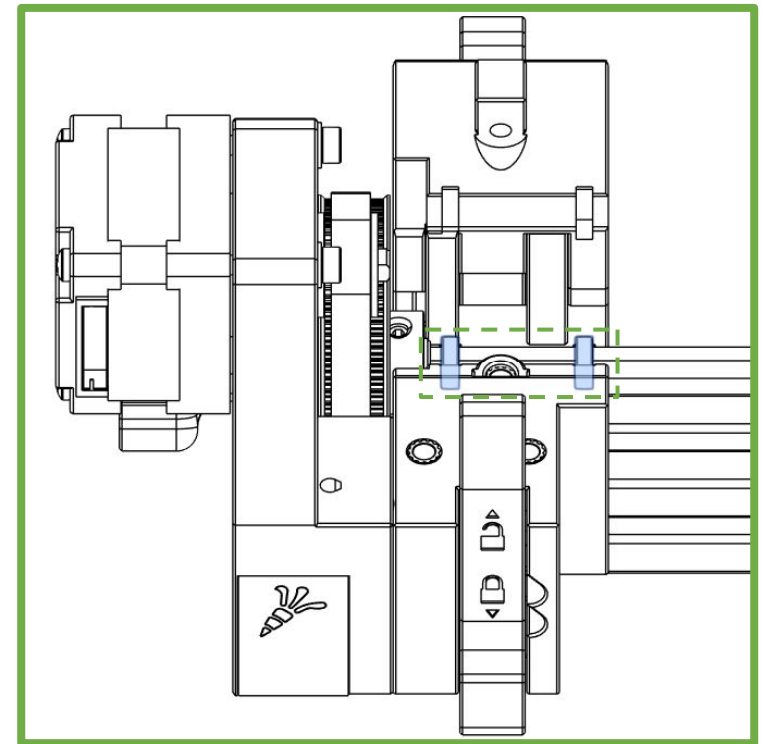
INSTALLING MOTOR MOUNT



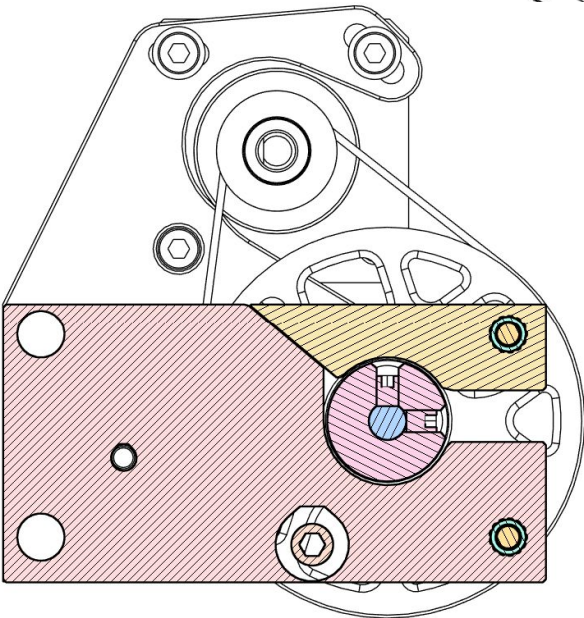
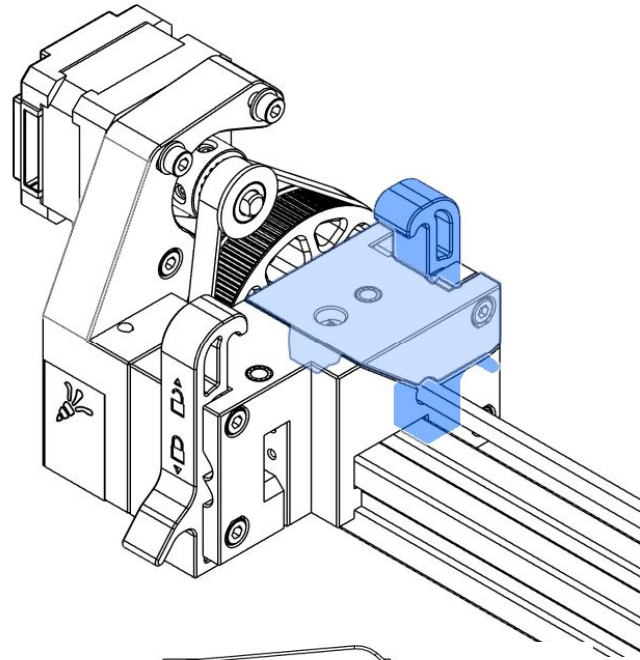
2.1 INSTALLING THE MOTOR MOUNT

Press down on the **Motor_Mount**. It should be a snug fit. As you come to the last ~5mm of travel, double-check to make sure that the MR85ZZ bearings are aligned to their slots.

Keep going until the bottom of the **Motor_Mount** is flush with the bottom of the **Gearbox**.



*MOTOR MOUNT (GEARED)



FINISHING THE MOTOR MOUNT

FINISHING THE MOTOR MOUNT

Close the **Hatch** and **Side_Latch_v2**. Install an M3x8mm bolt to hold the **Hatch** shut. It doesn't need to be tight - it just holds the MR85ZZ bearings in place.

Then, make sure that the grub screws on the pulley part of the **M4_80T_Wheel** are fully tightened, with one to the flat of the Drive Shaft.

Next, tension the 188mm GT2 belt loop by lightly twisting the motor counter-clockwise, and give the screws going into the Motor a final tighten. Triple-check that the Drive Shaft spins freely and smoothly.

If the Drive Shaft isn't running smoothly at any point, undo your most recent assembly step and try again. It is normal for the motor and gear to add some drag.

Finally, install an M3x20mm bolt to hold the **Motor_Mount** to the **Gearbox**.

