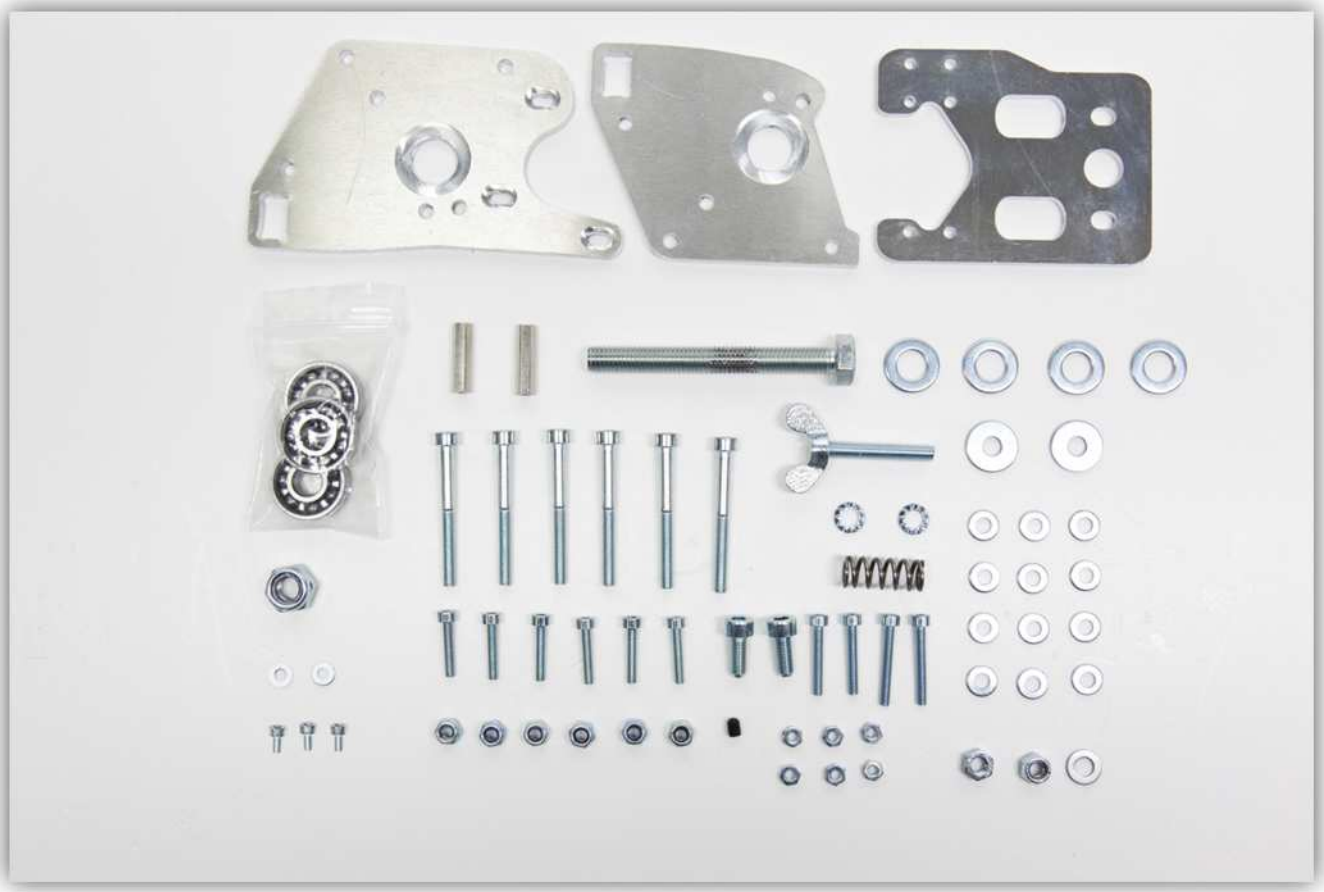
009 – ASSEMBLING THE EXTRUDER

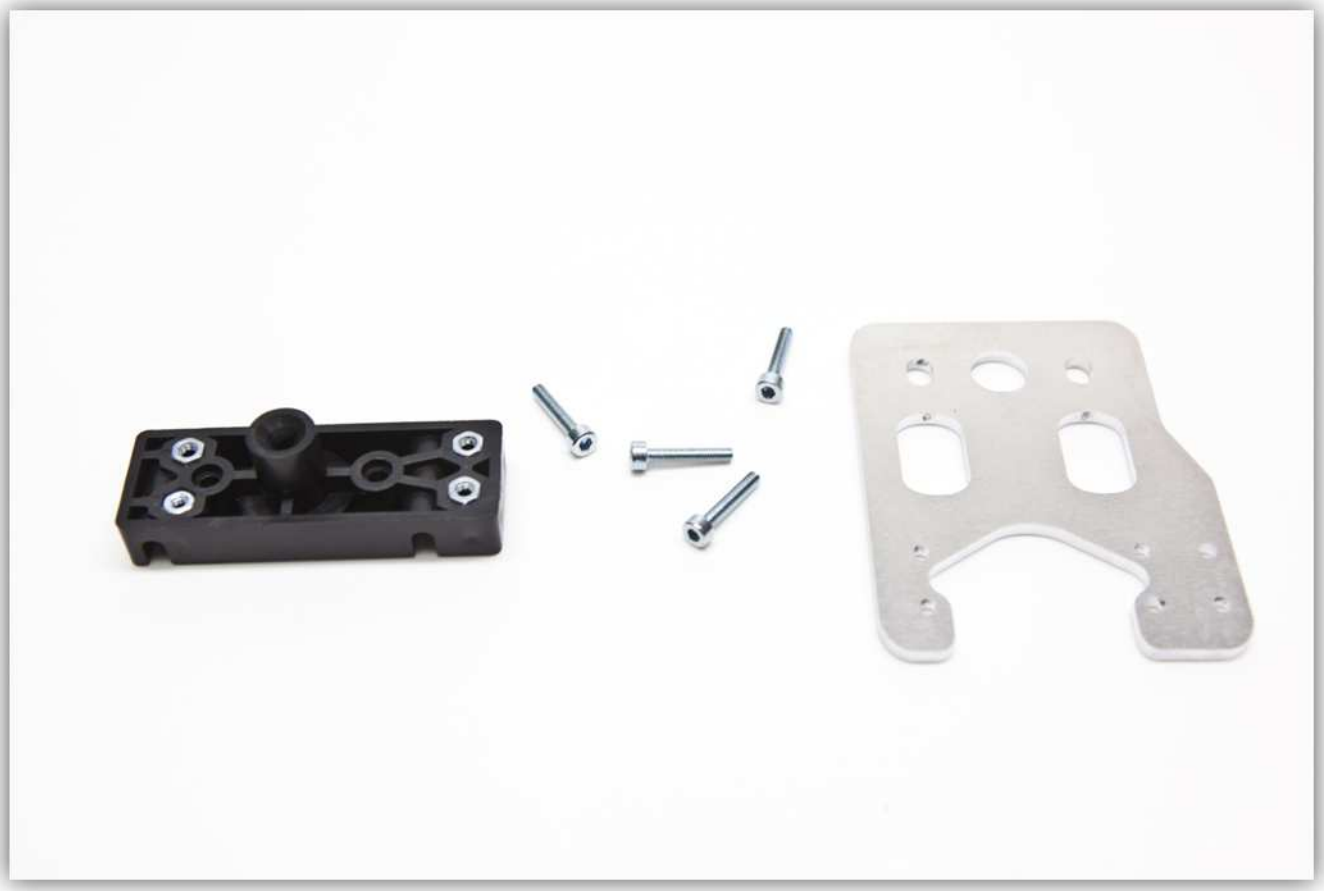
Take the parts out of the bag labelled with 30.



Now take the pieces as shown in the picture below out of the bag containing the plastic parts (LARGE GEAR, SMALL GEAR, EXTRUDER BASE, EXTRUDER SPRING MOUNT, FILAMENT GUIDER, EXTRUDER BEARING CLAMP A, EXTRUDER BEARING CLAMP B). **Attention: there is one SMALL GEAR with a small threaded hole on the side this is the one you need, there are also 3 SMALL GEARS in a separate bag without the small threaded hole on the side, these are spare parts. Do not use one of these 3).**

Take 4 M3 nuts and push them into the EXTRUDER BASE as shown below.

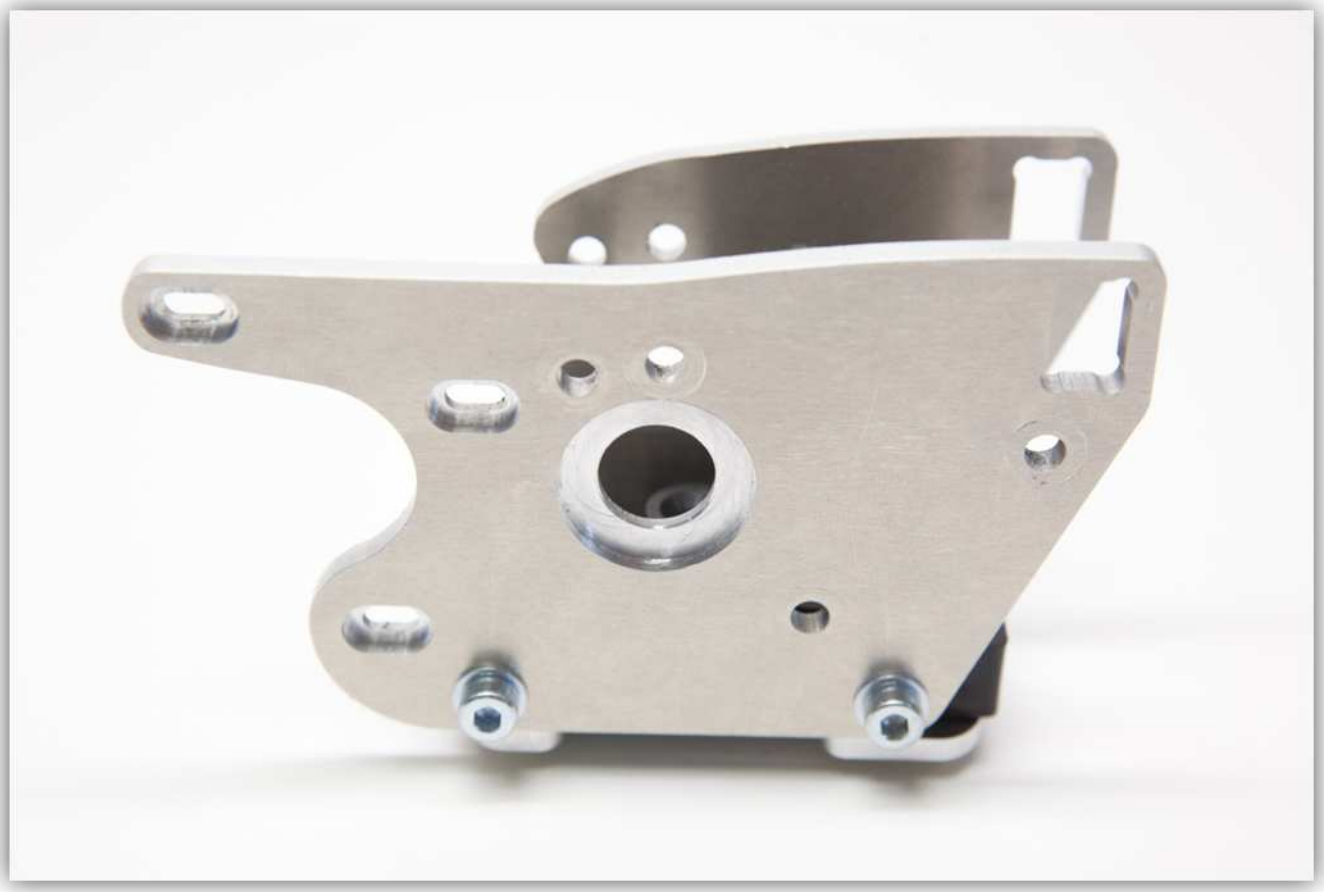
Take the EXTRUDER MOUNT PLATE and 4 M3x16 bolts.



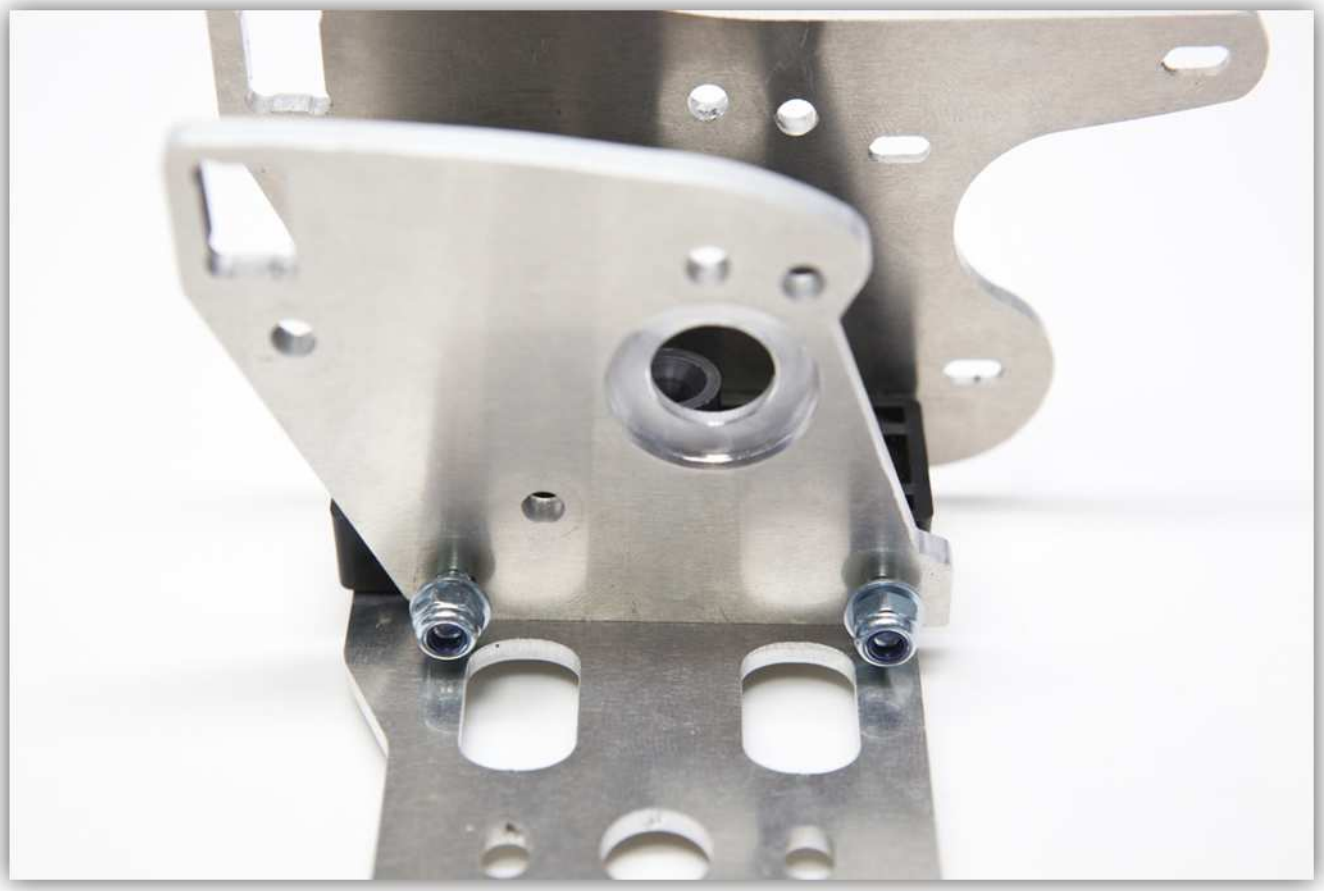
Bolt the EXTRUDER MOUNT PLATE to the EXTRUDER BASE. **Watch the orientation of the pieces closely. Do not fully tighten these bolts.**

Take 2 M4 bolts and 2 M4 washers.

Bolt the FRONT AND BACK EXTRUDER PLATE to the EXTRUDER BASE. **Watch the orientation of the parts closely.**

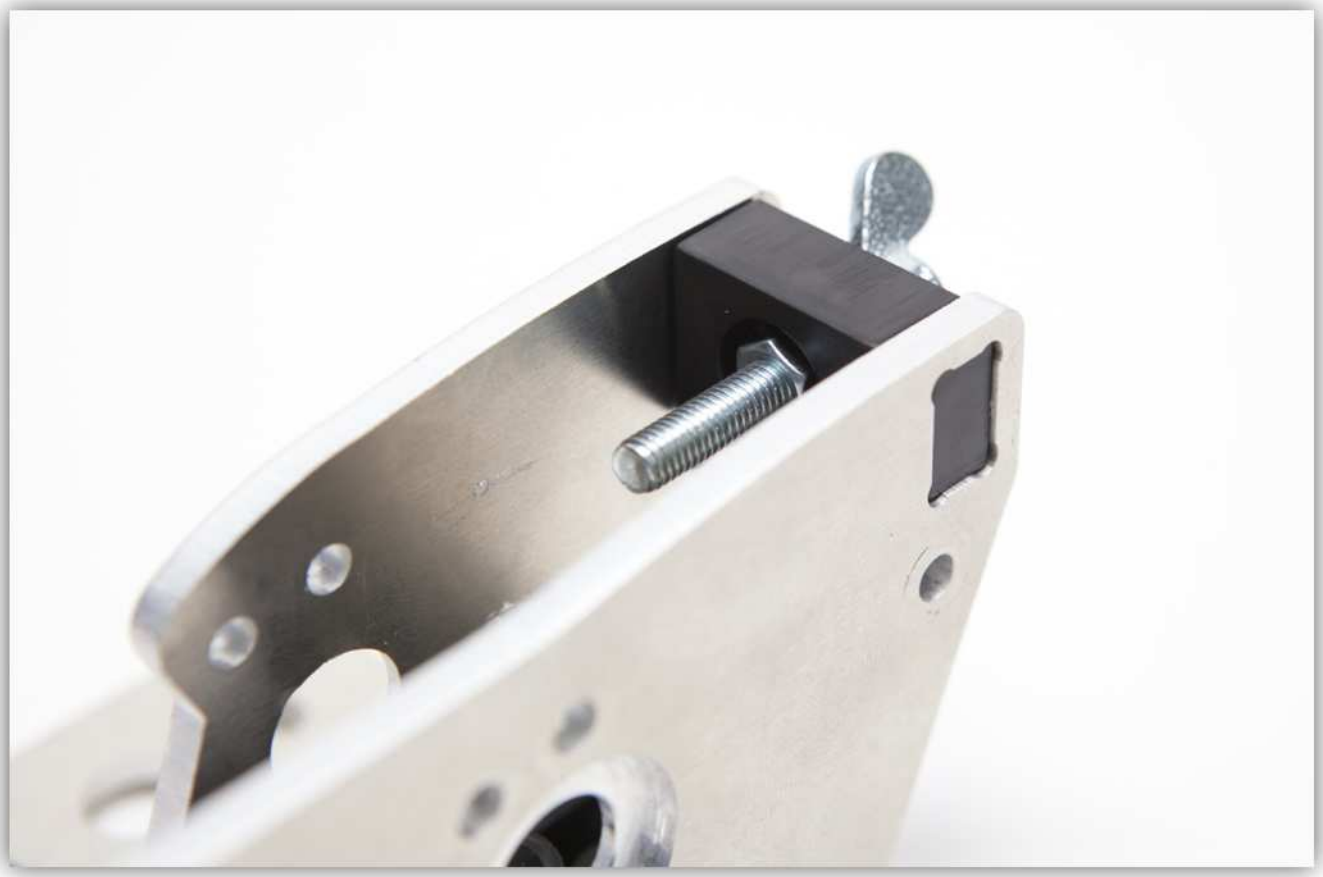


Use 2 M4 locking nuts and 2 M4 washers. **Do not tighten the nuts.**



Use the M5 butterfly bolt and an M5 nut as shown in the picture below together with the EXTRUDER SPRING MOUNT.

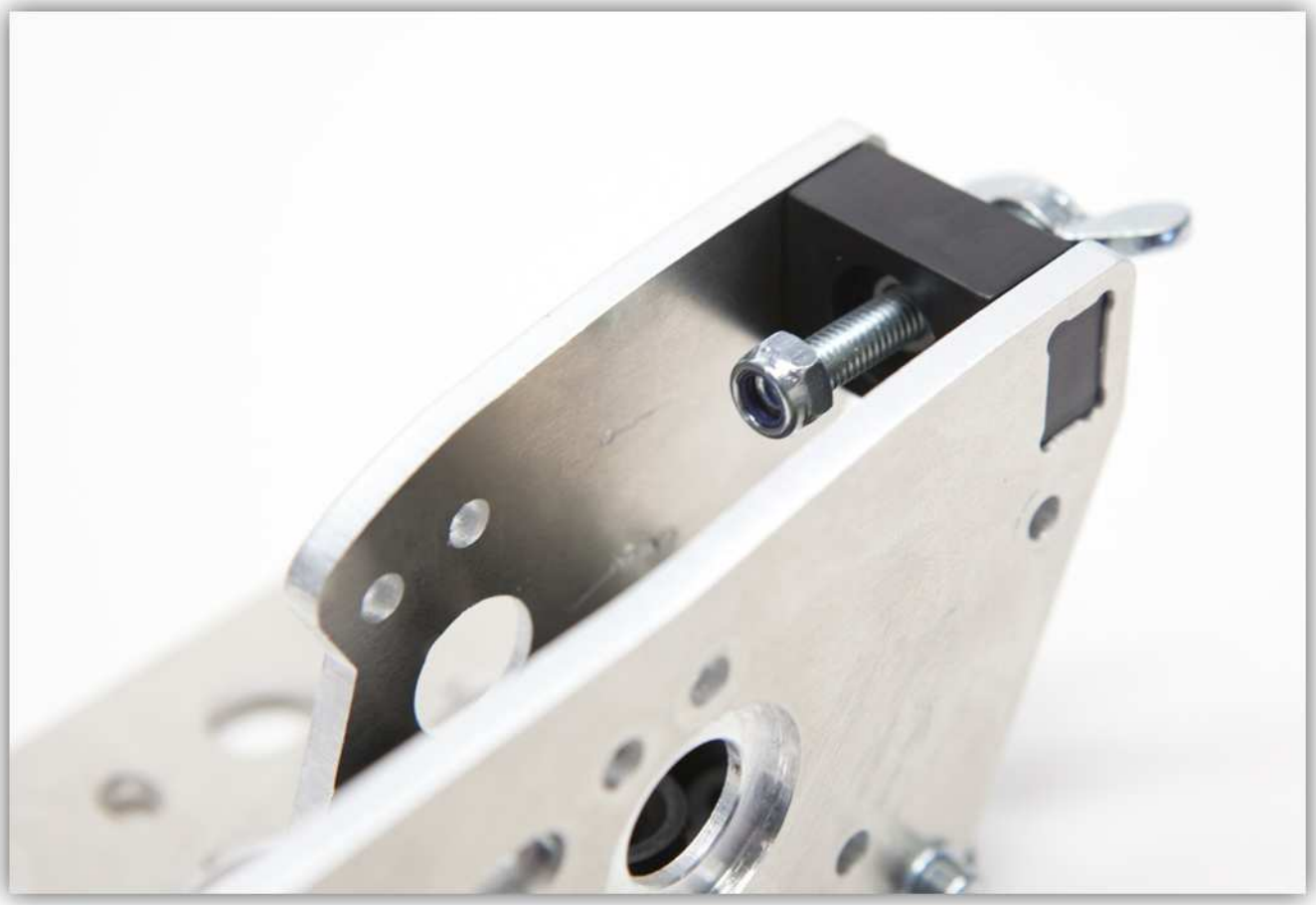
Slide this assembly into the FRONT AND BACK EXTRUDER PLATE.



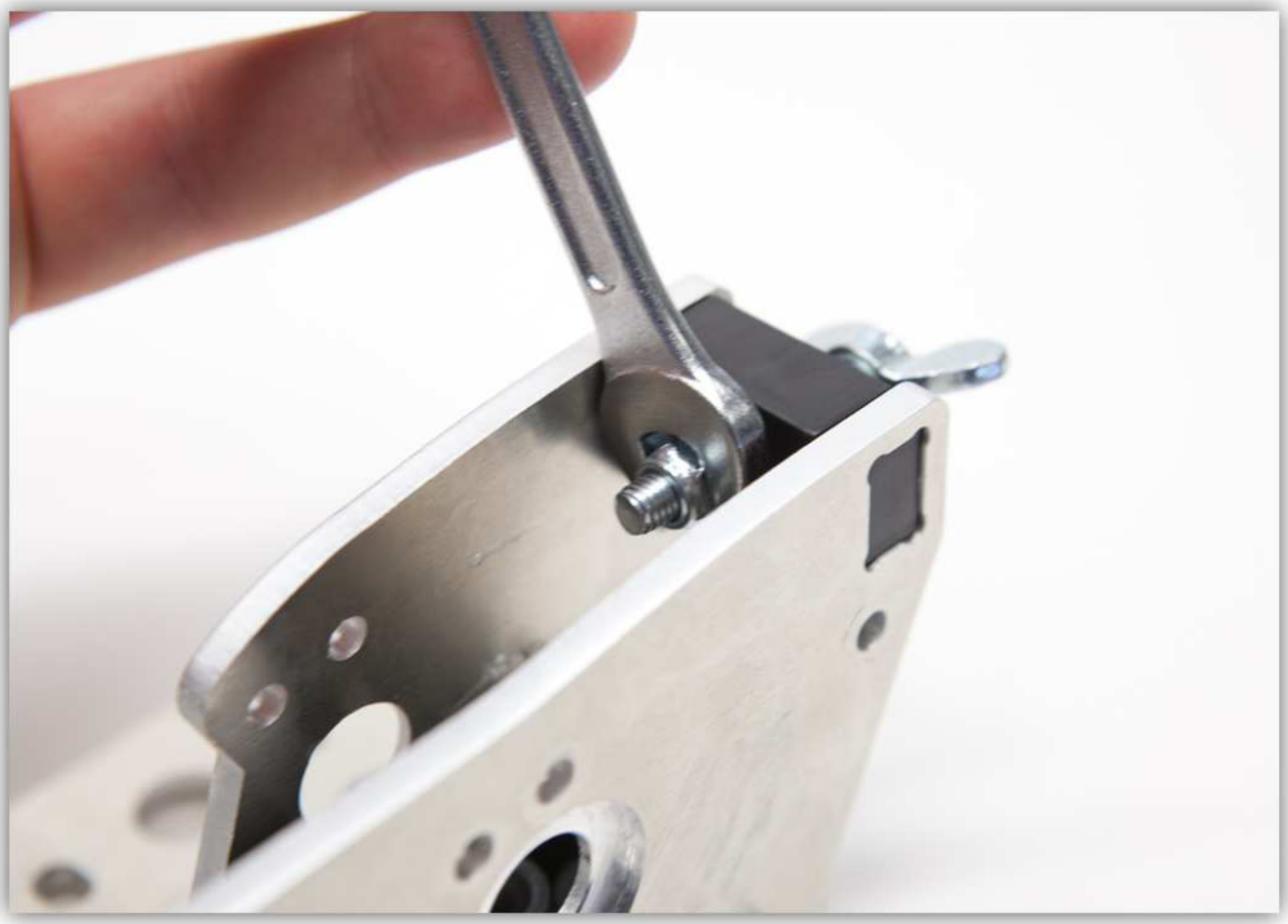
Tighten the bolts that hold the FRONT AND BACK EXTRUDER PLATE together.

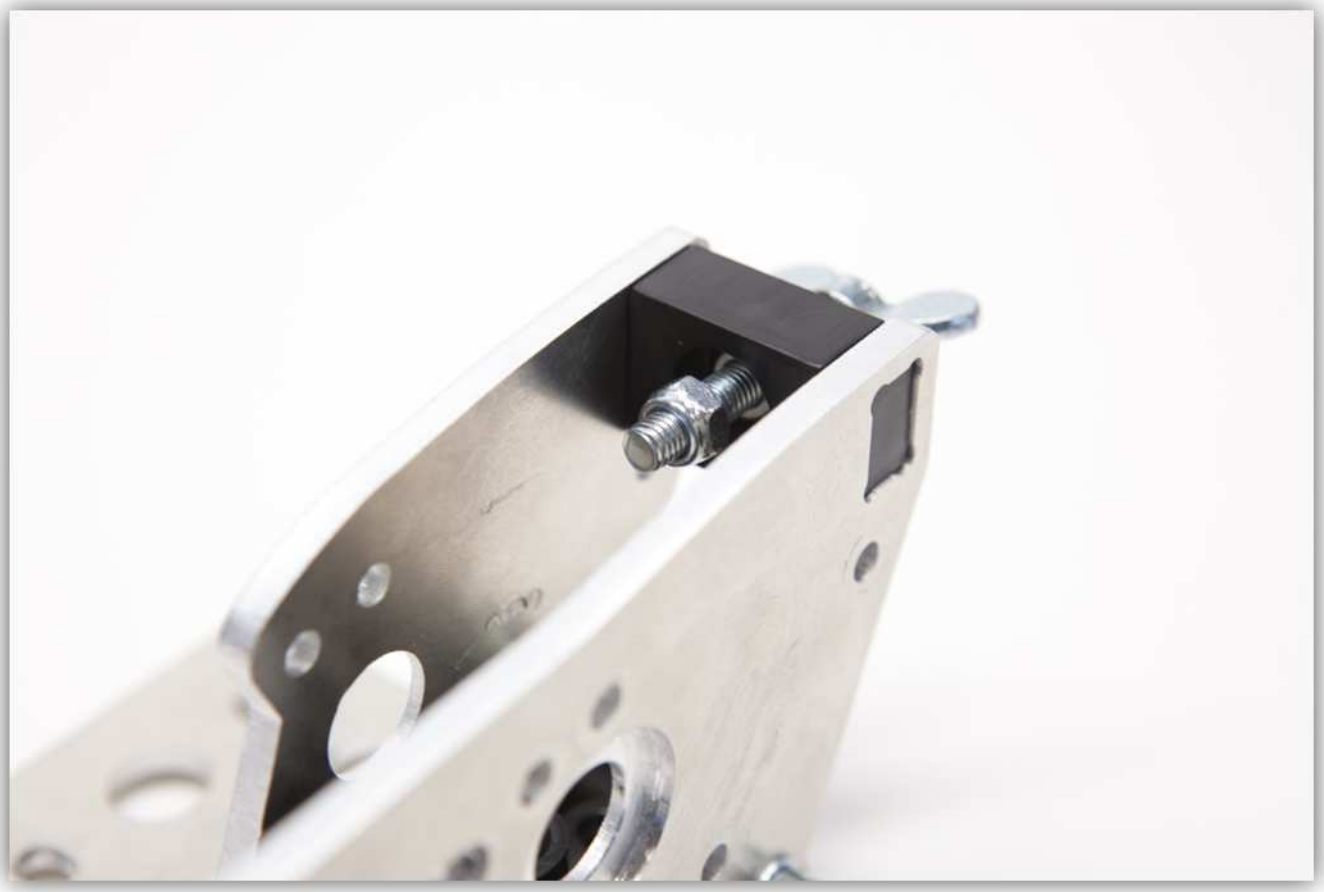
Tighten the bolts that hold the EXTRUDER MOUNT PLATE to THE EXTRUDER BASE.

Use an M5 locking nut and screw it on the end of the butterfly bolt.



Screw this bolt further down so there is about 3 to 5 mm (0.12" to 0.2") of thread from the butterfly bolt visible.



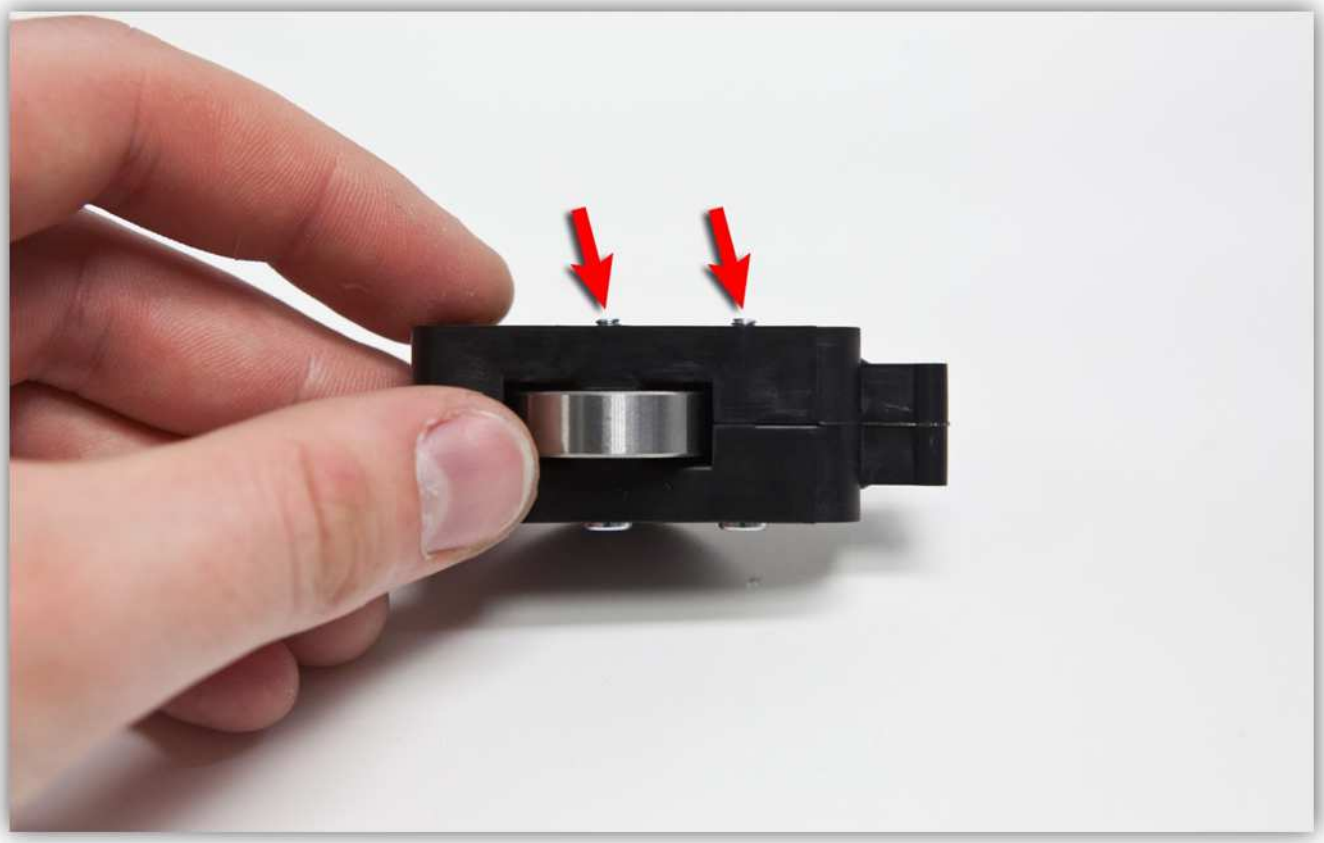


Push 2 M3 nuts into the EXTRUDER BEARING CLAMP A piece.

Take a 608 bearing out of the bag with 3 bearings and put it between the EXTRUDER BEARING CLAMP A and the EXTRUDER BEARING CLAMP B.

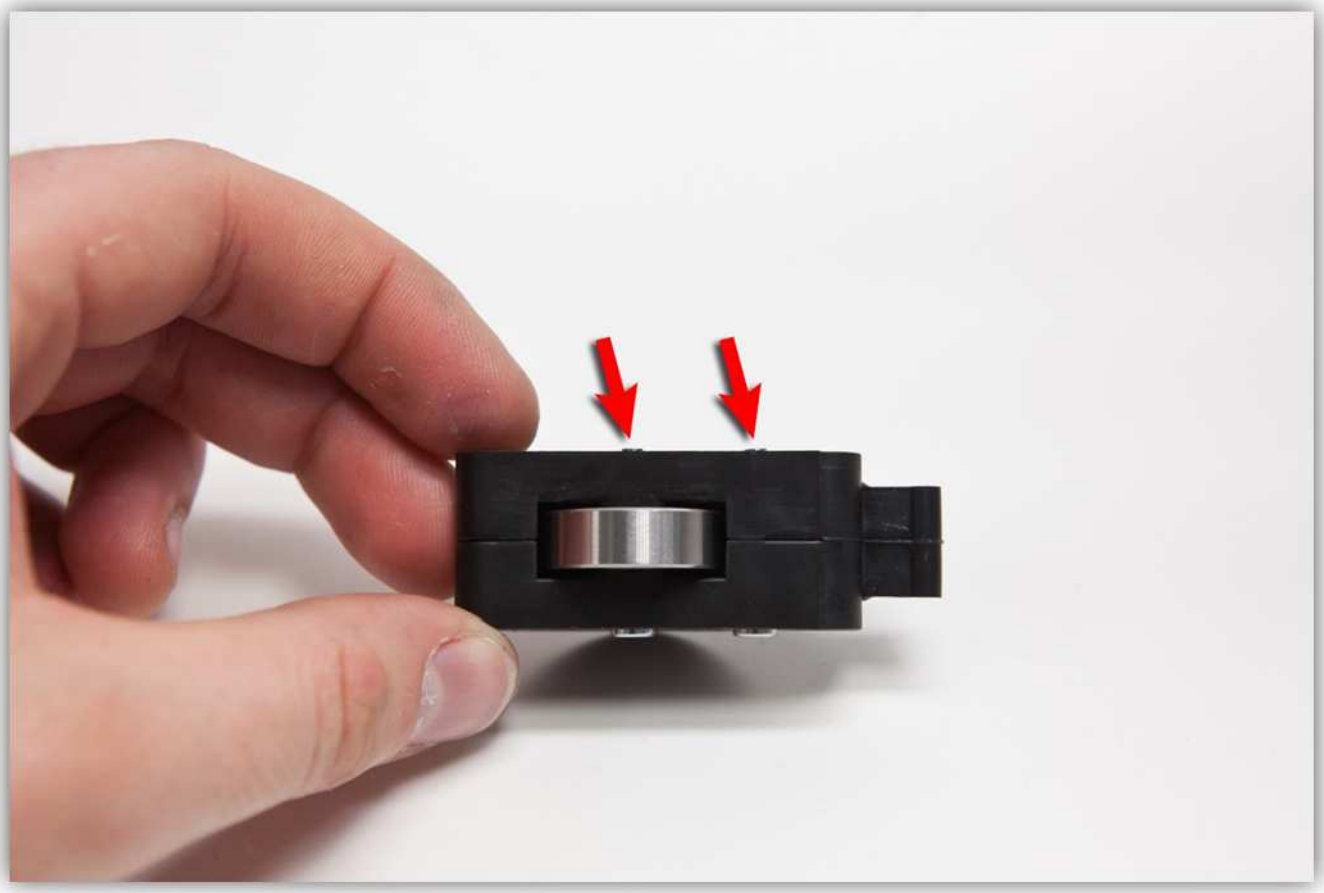
Take the 2 M3x20 bolts and bolt the two halves together.

If the bolts stick out a bit you should grind them down.

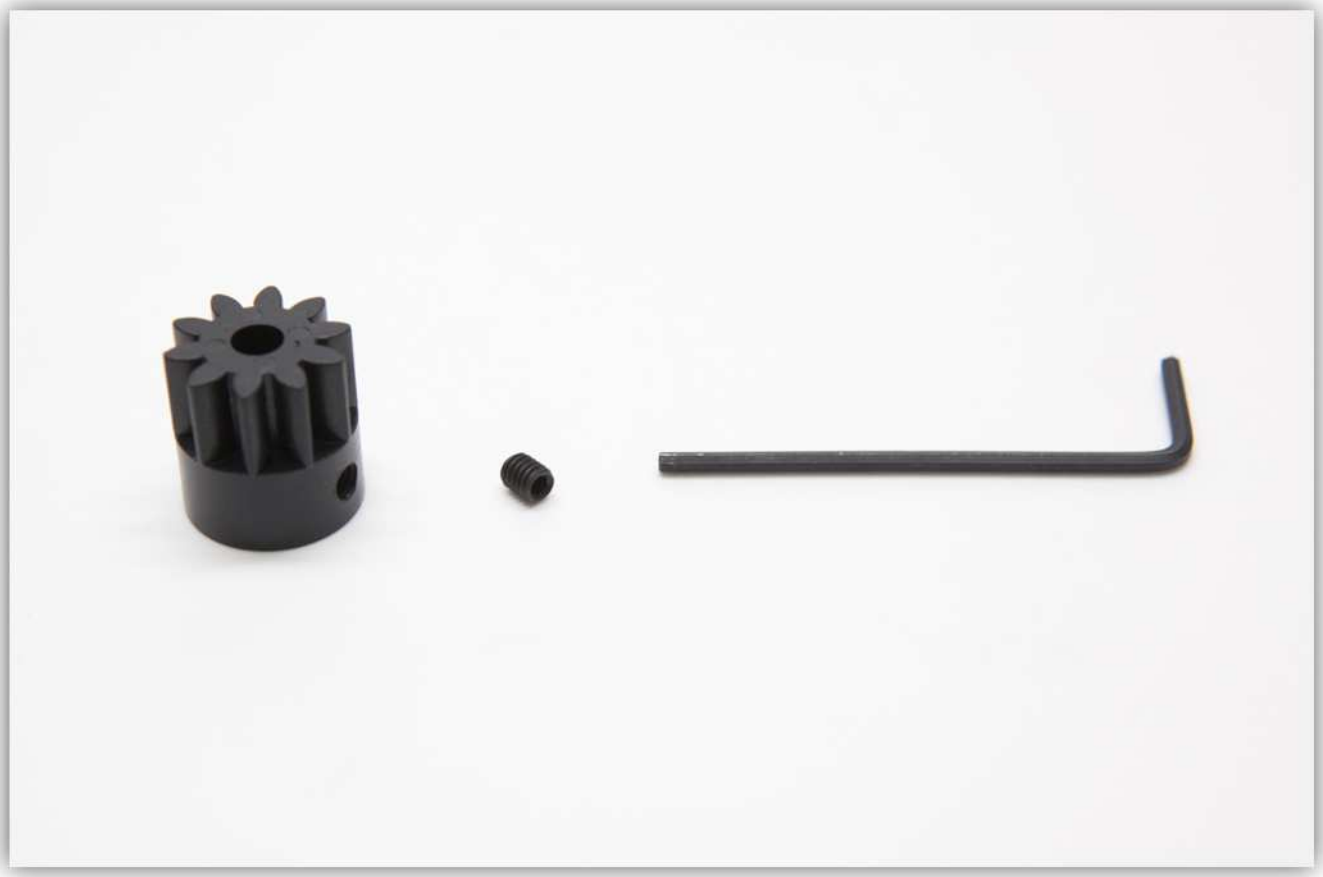


Use a small file and grind the bolts down. Make sure that none of the grindings end up in the 608 BEARING.

If the bolts are almost flush with the plastic they will be ok.



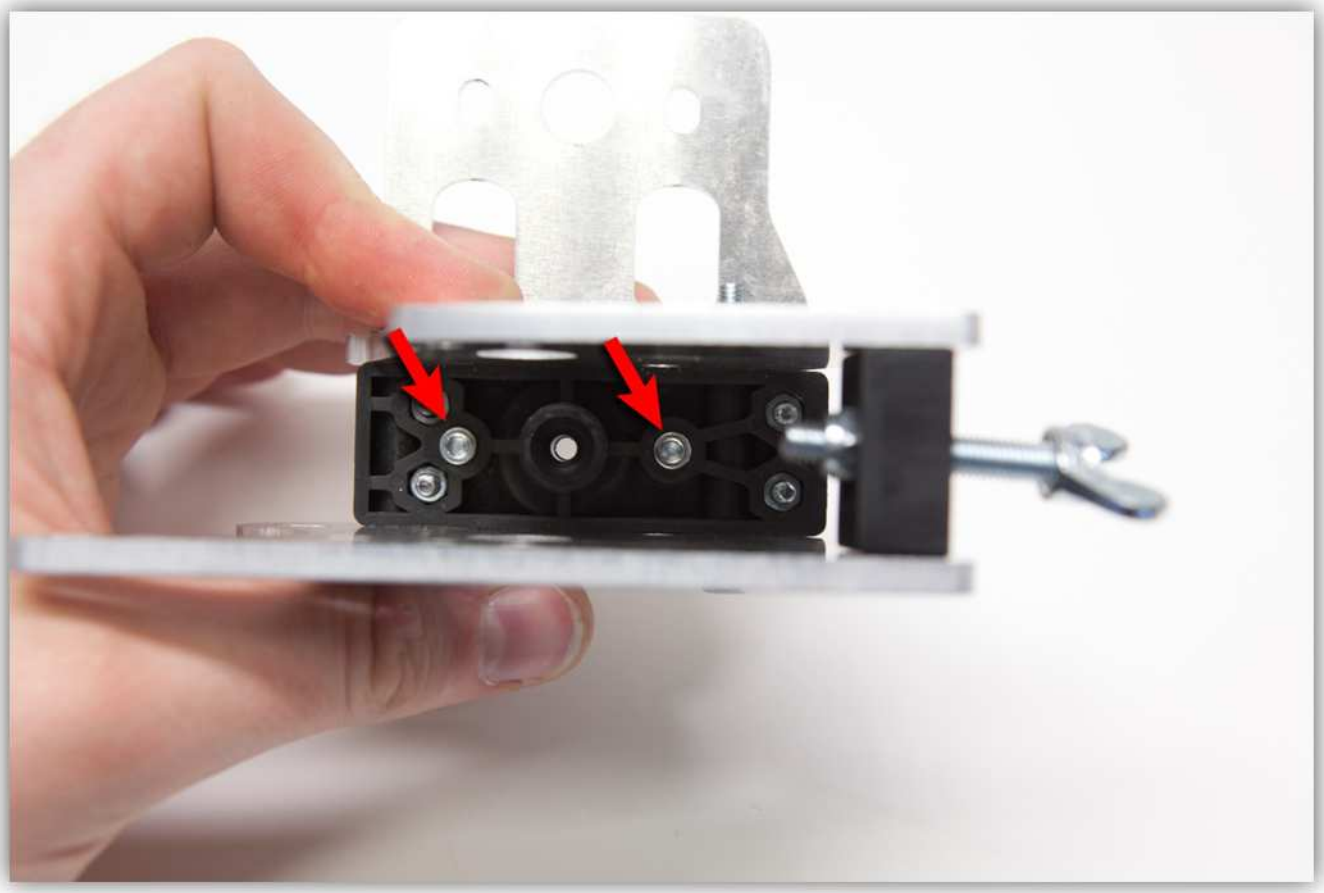
Now screw the small locking bolt (M4 x 5) in the small gear. **Do not screw it in completely.**

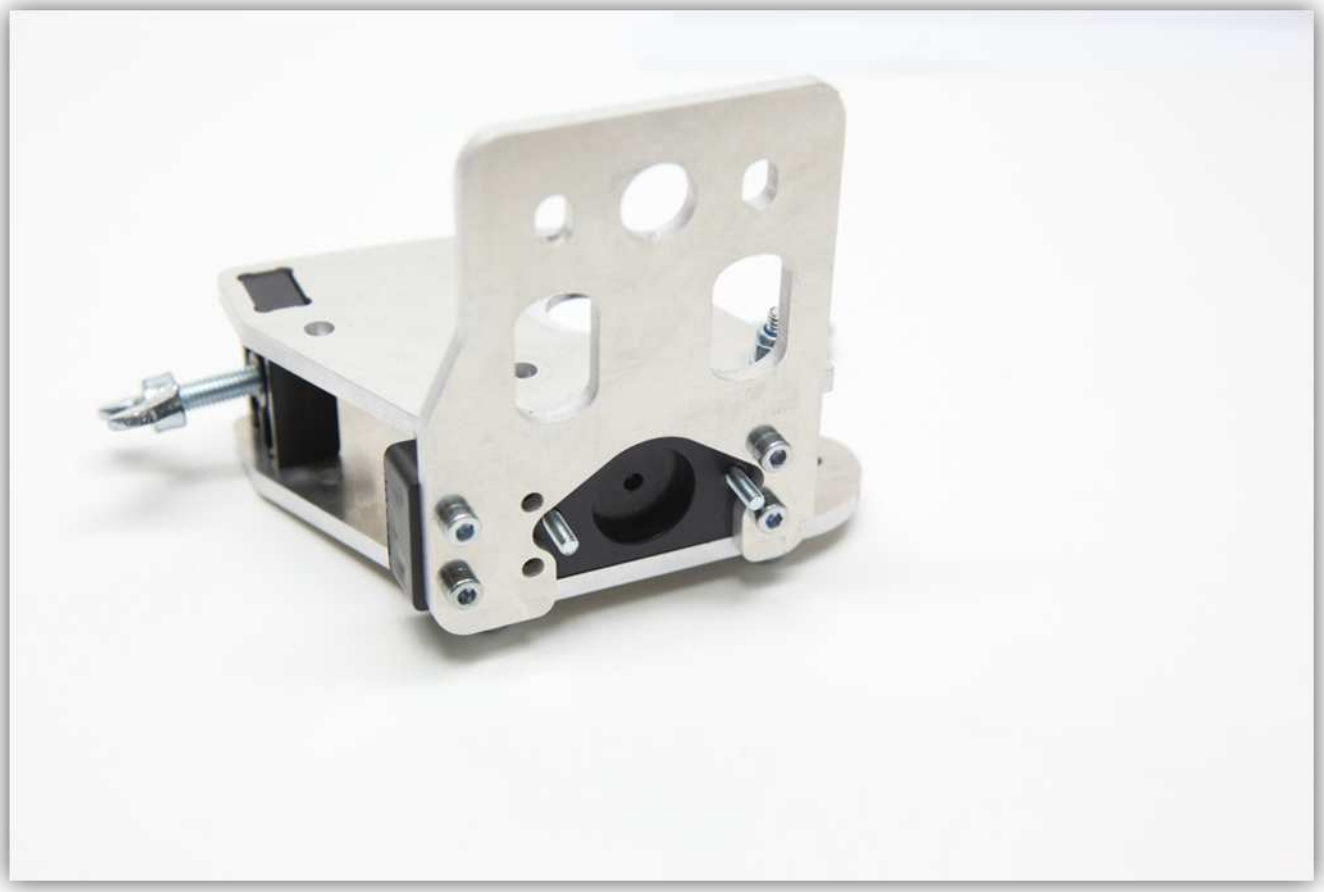


Now take a motor out of the package labelled with 9 and slide the small gear over the shaft. **Slide it down until there is just place for a piece of paper between the motor and the small gear.** Then tighten the small locking bolt.

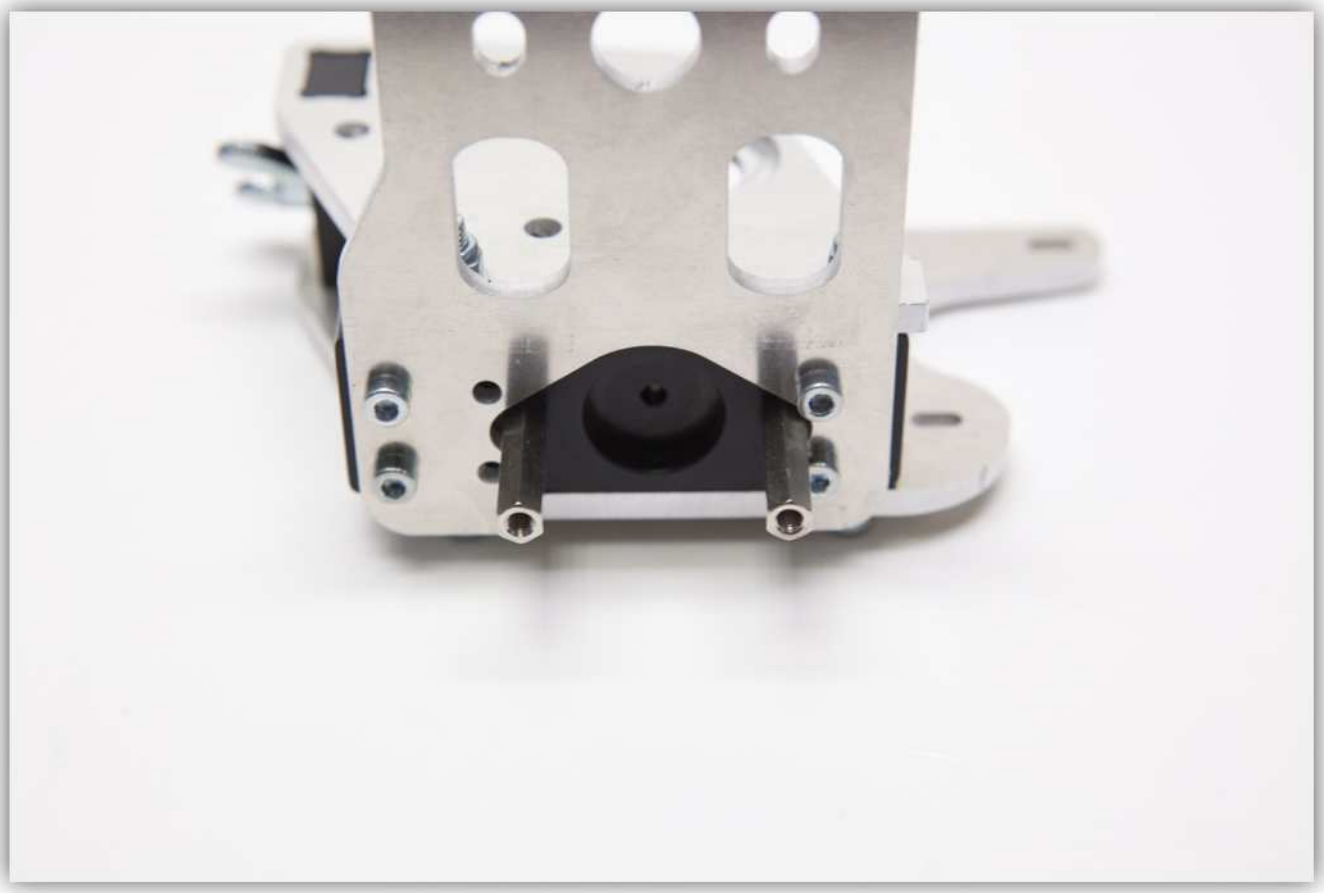
Now take the 2 metal spacers and two M3 x 16 bolts.

Slide the two bolts into the EXTRUDER BASE piece as shown in the picture below.

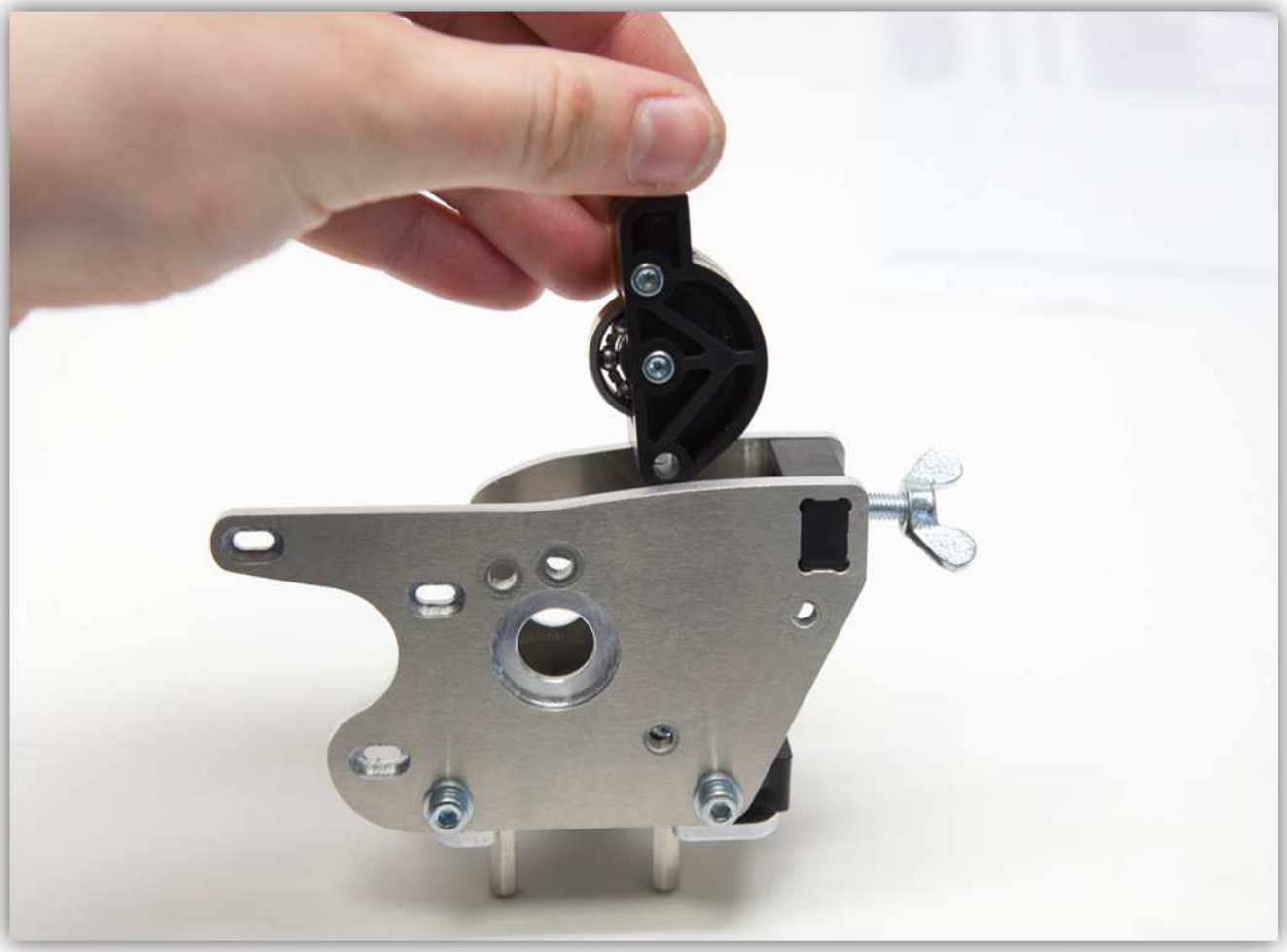




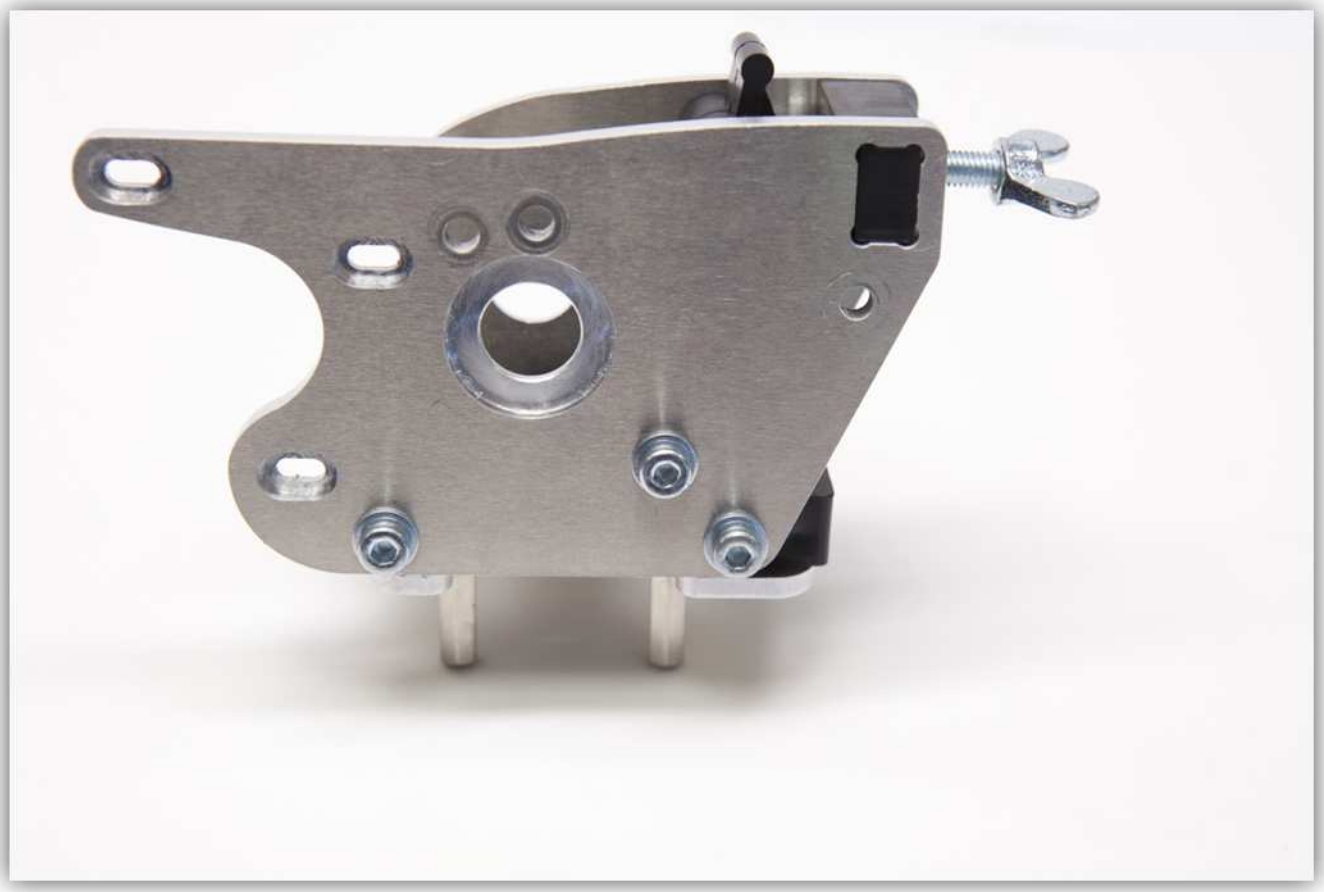
Tightly screw the metal spacers on these bolts.



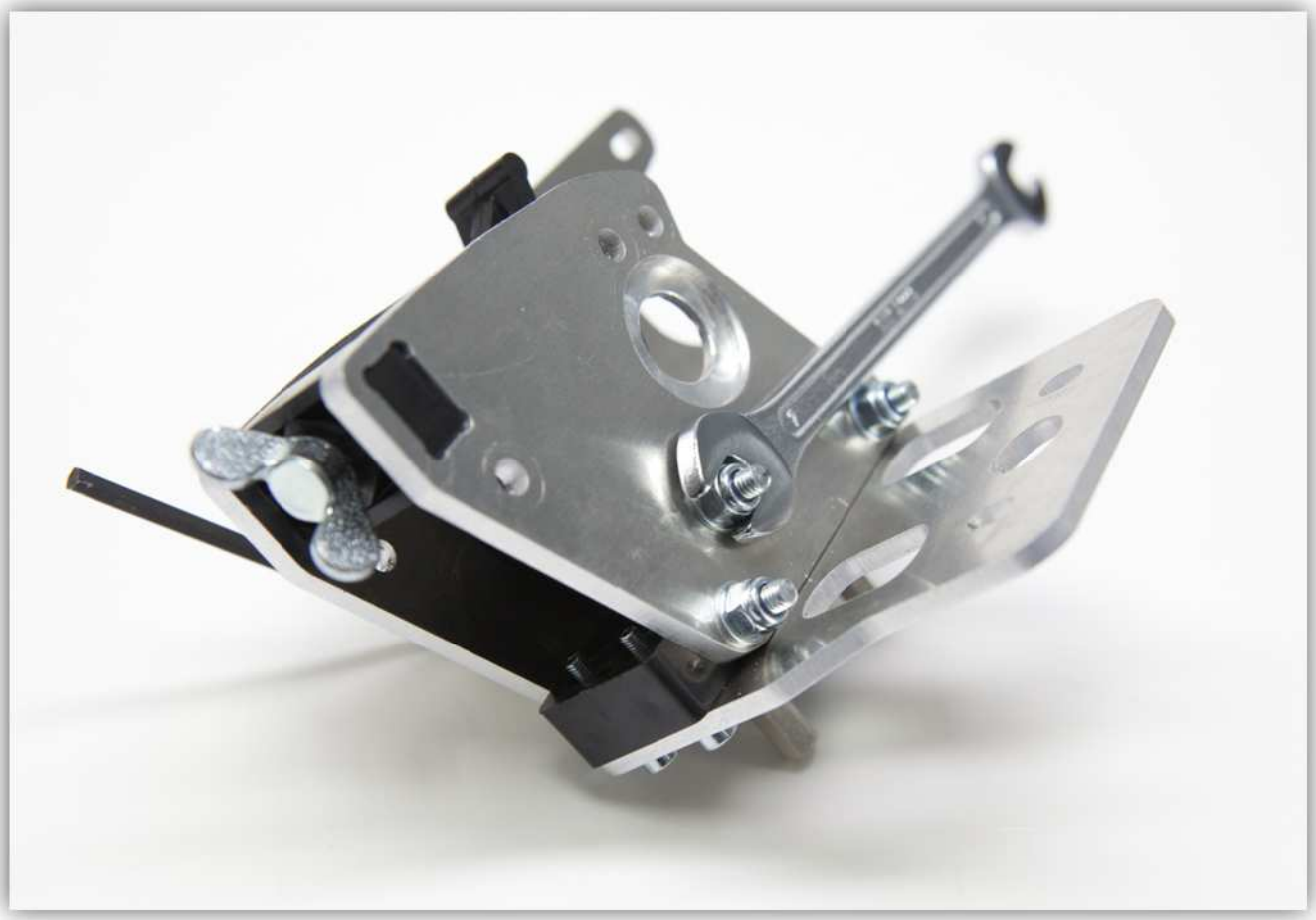
Slide the BEARING CLAMP assembly into the extruder assembly.



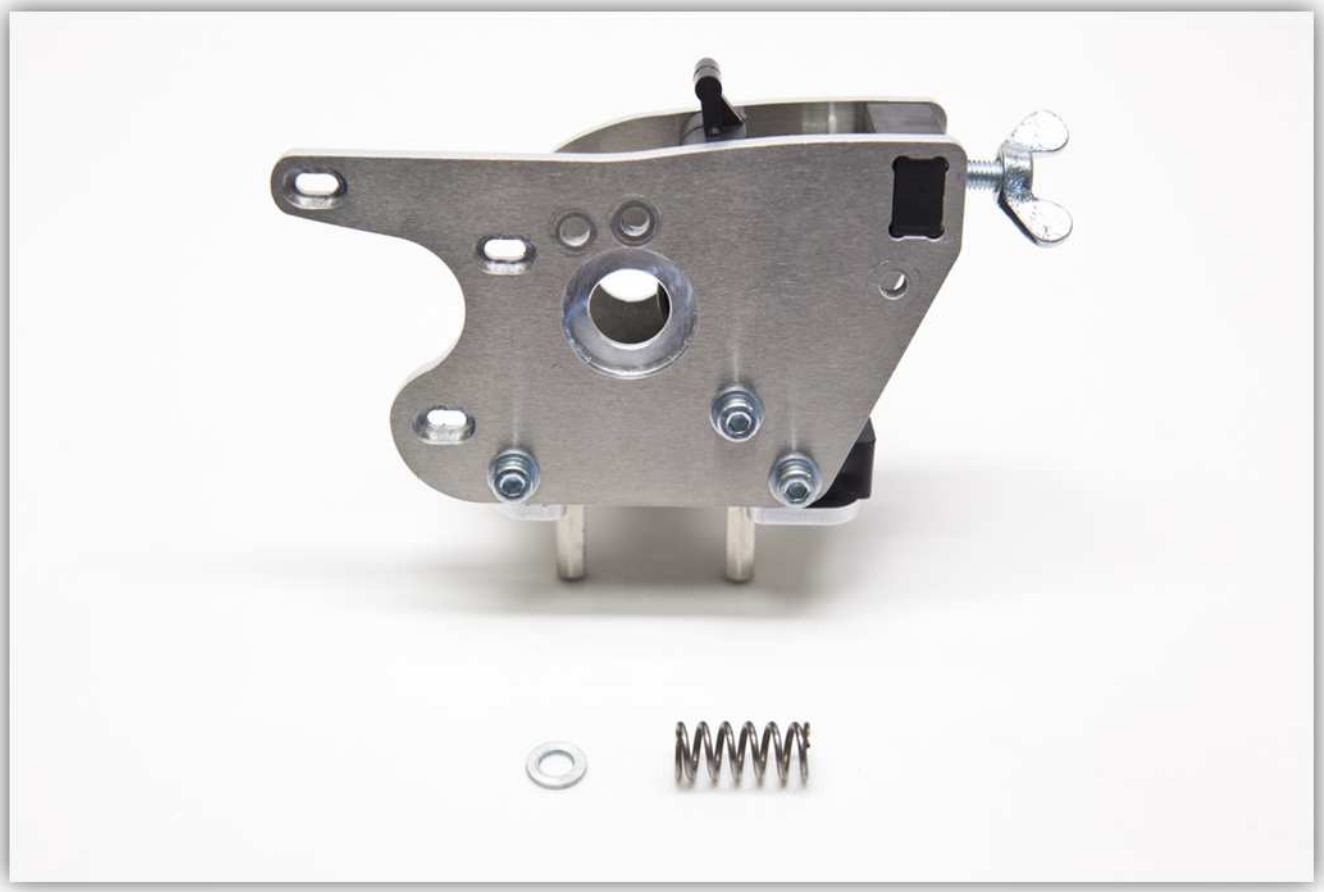
Use a long M4 bolt and an M4 washer to lock the BEARING CLAMP assembly in place.



Use an M4 washer and an M4 bolt to **slightly (!)** tighten this bolt.



Take the **small** M5 washer and the spring.



Place the spring into the cavity of the BEARING CLAMP assembly.

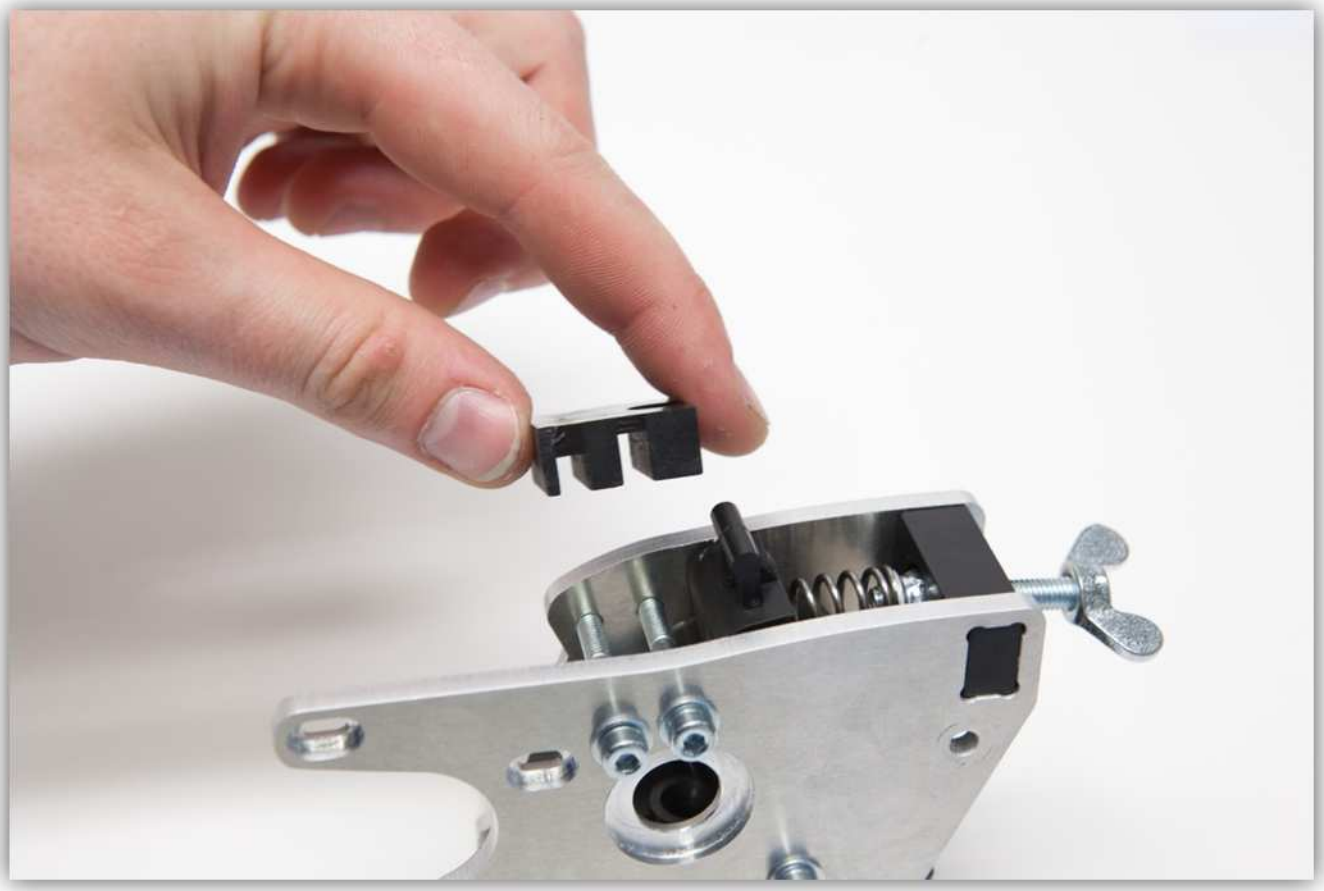
Slide the washer over the butterfly bolt.

Carefully force the spring over the butterfly bolt.

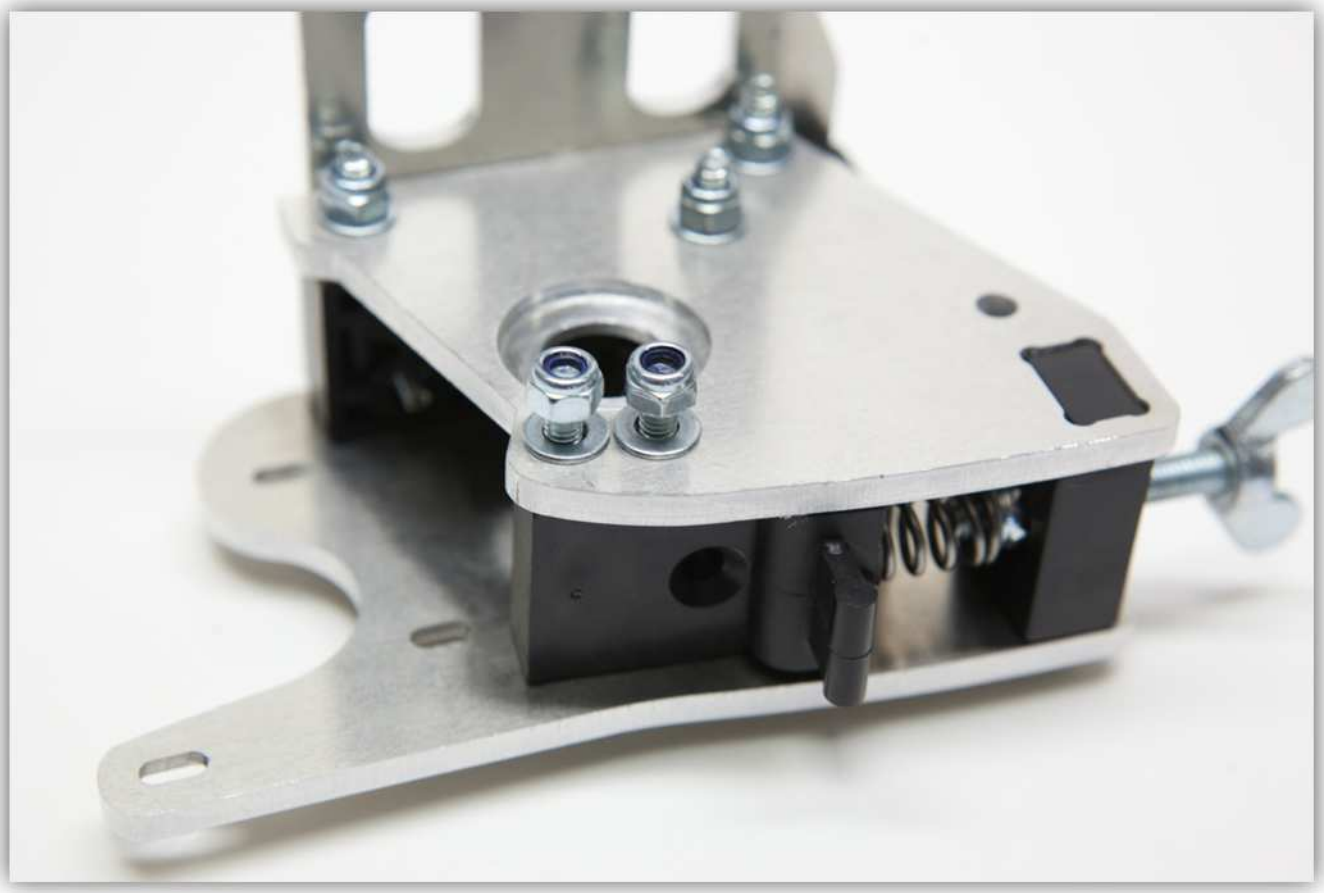
Take 2 long M4 bolts and 2 M4 washers.

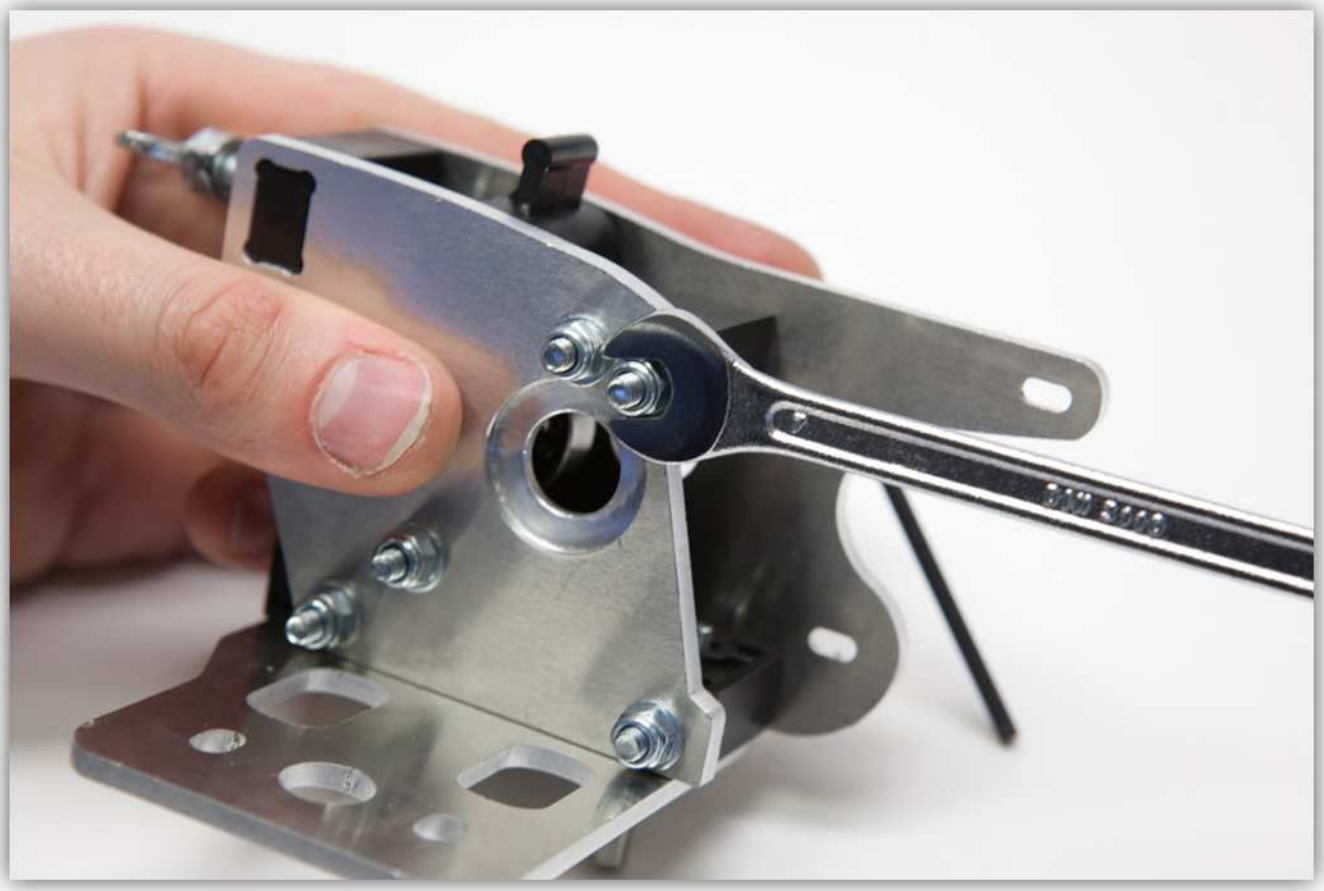
Slide these two bolts in the two holes at the top of the extruder housing.

Take the filament guide piece and slide it over these bolts. **Watch the orientation of this piece.**



Take 2 M4 washers and 2 M4 locking bolts to **slightly (!)** tighten these bolts.



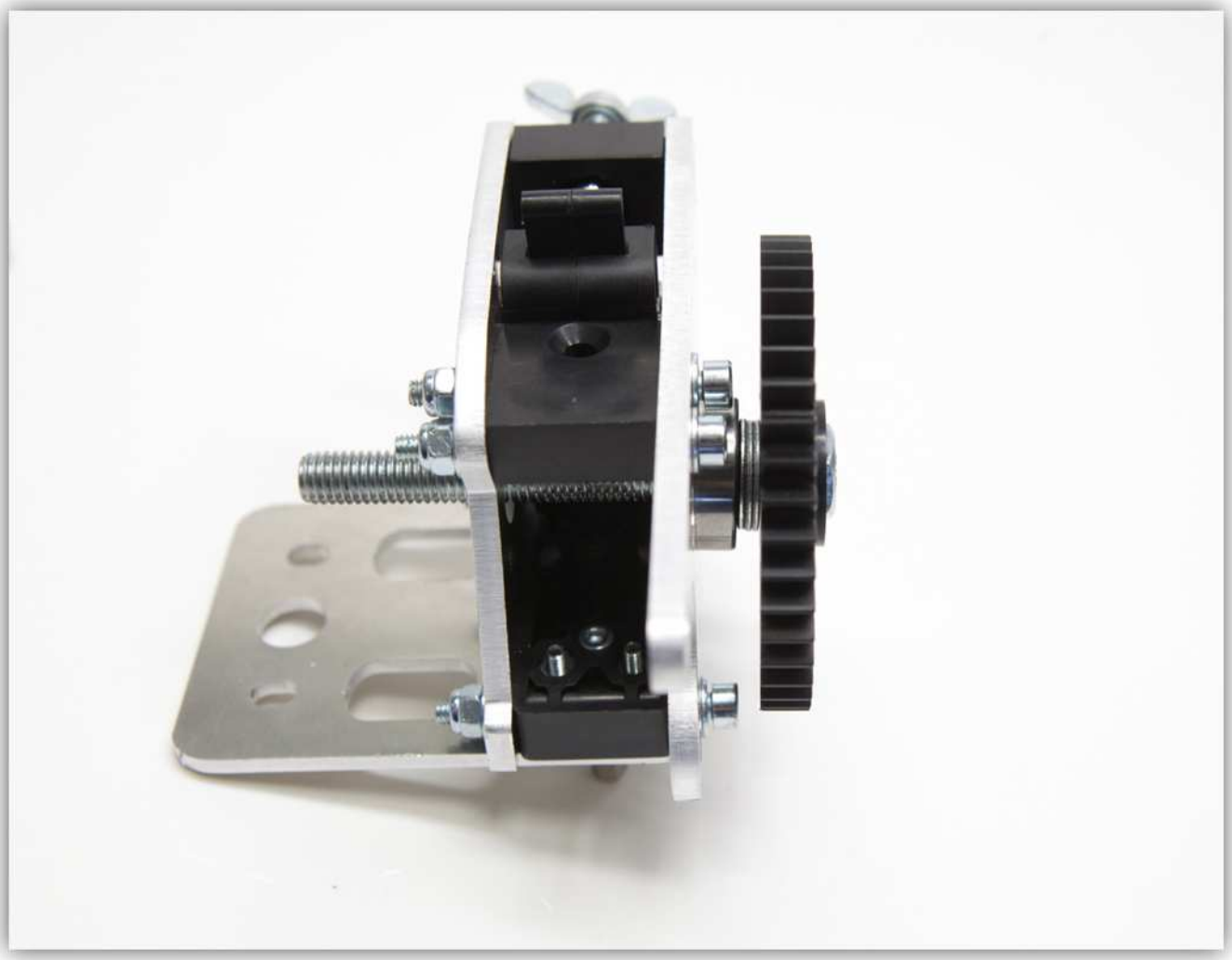


Next you will need the LARGE GEAR, 2 608 BEARINGS, 2 M8 washers and the HOBBED BOLT.

Slide the HOBBED BOLT into the LARGE GEAR so that the head of the HOBBED BOLT fits snugly in the cavity of the LARGE GEAR.

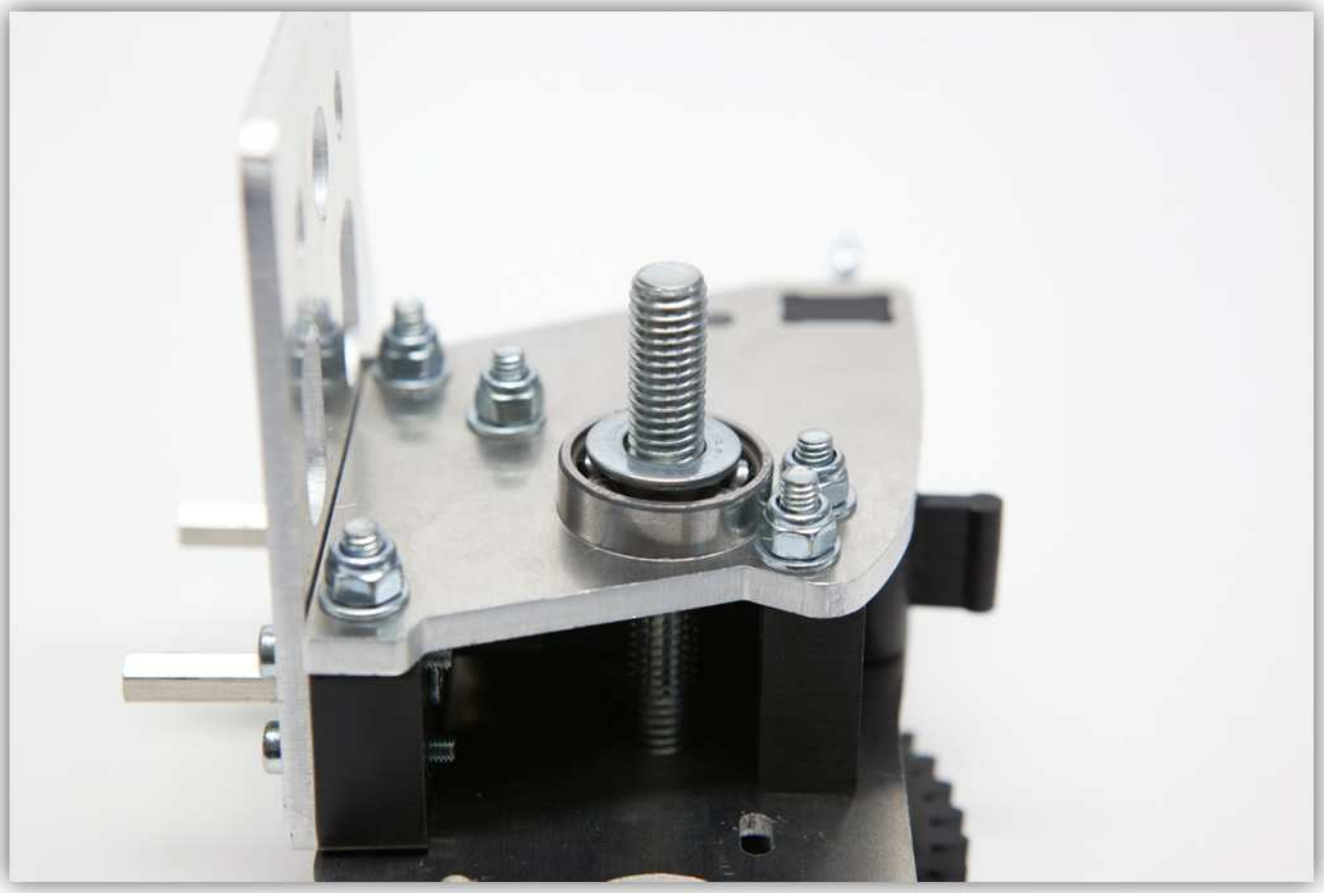
Slide the 3 M8 washers over the bolt followed by a 608 BEARING.

Slide this assembly into the extruder housing. **Watch the orientation carefully.**

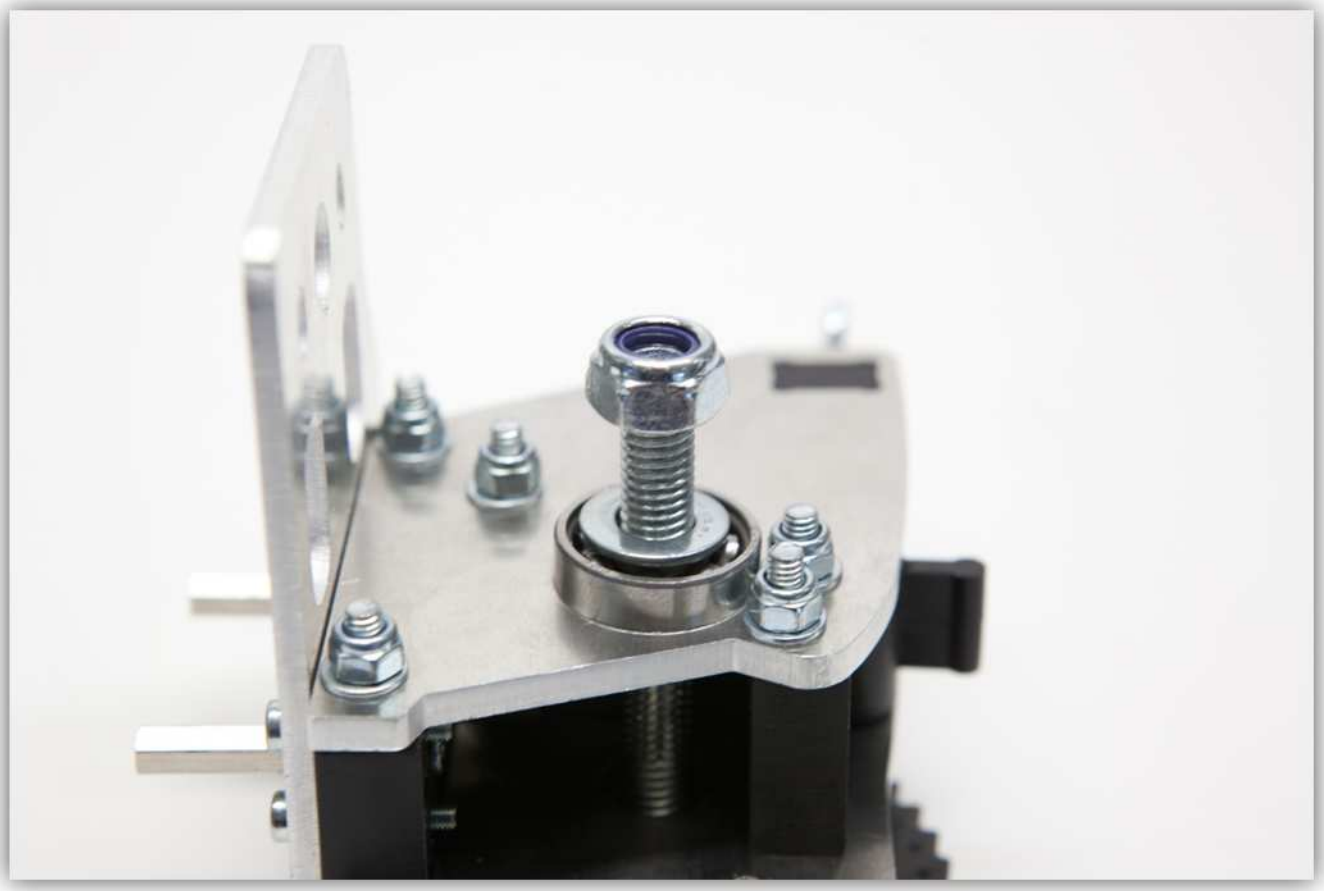


Slide a 608 BEARING over the other end of the HOBBED BOLT.

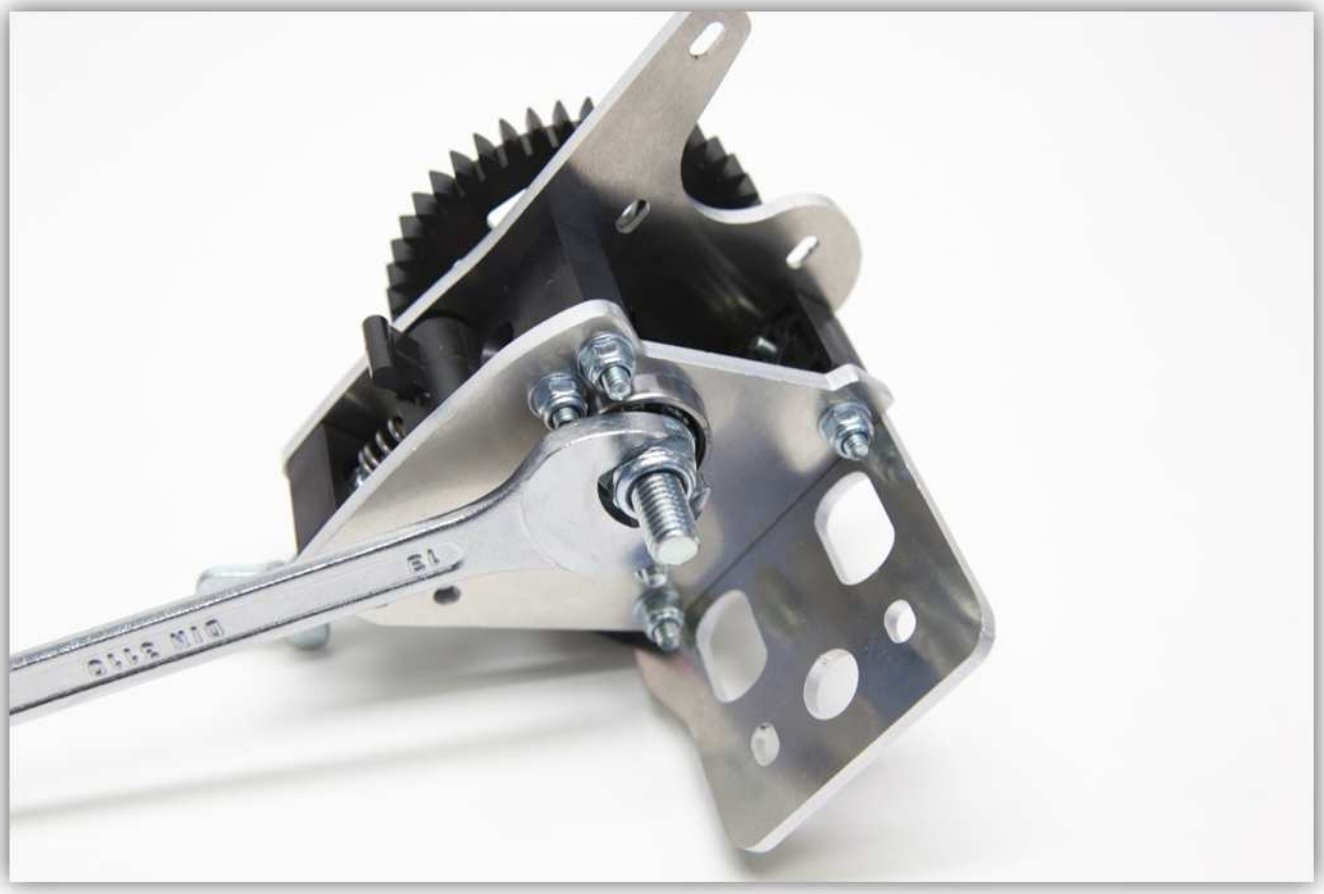
Slide an M8 washer to cover the 608 BEARING.



Screw an M8 locking nut on the HOBBED BOLT.



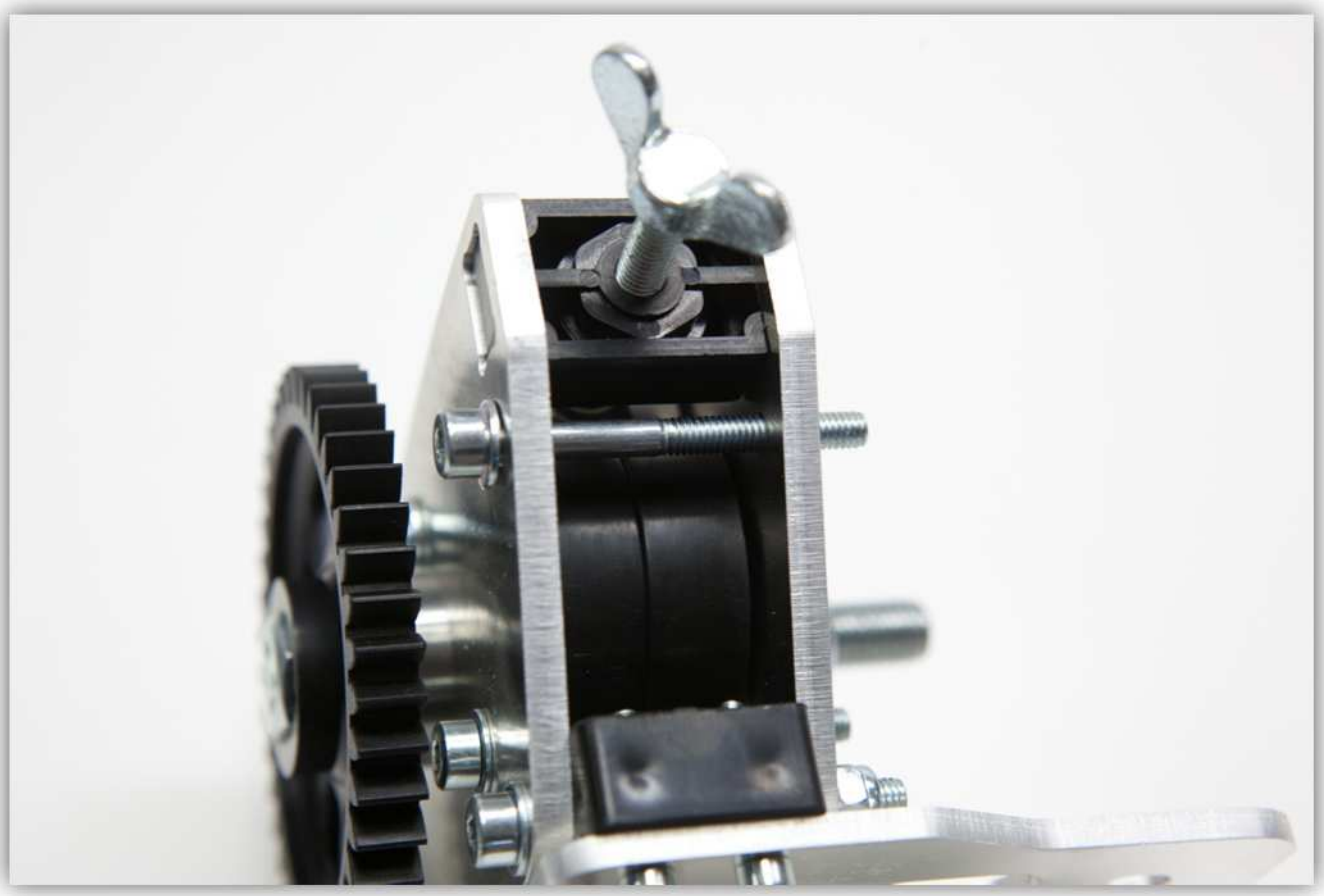
Tighten this bolt but make sure that the large gear turns smoothly.



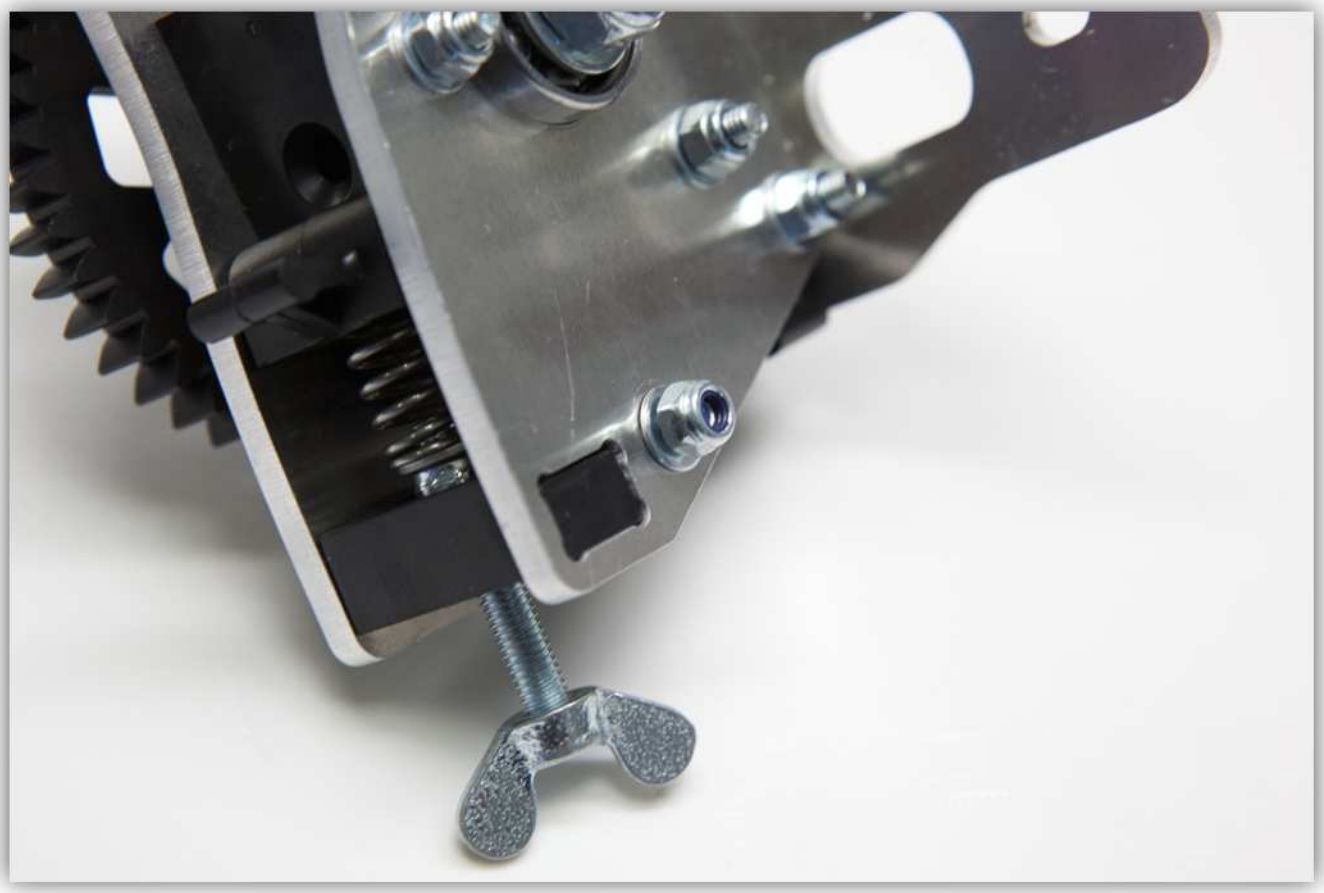
The extruder housing should look like this.

Take a long M4 bolt and an M4 washer.

Place it as shown in the picture below.

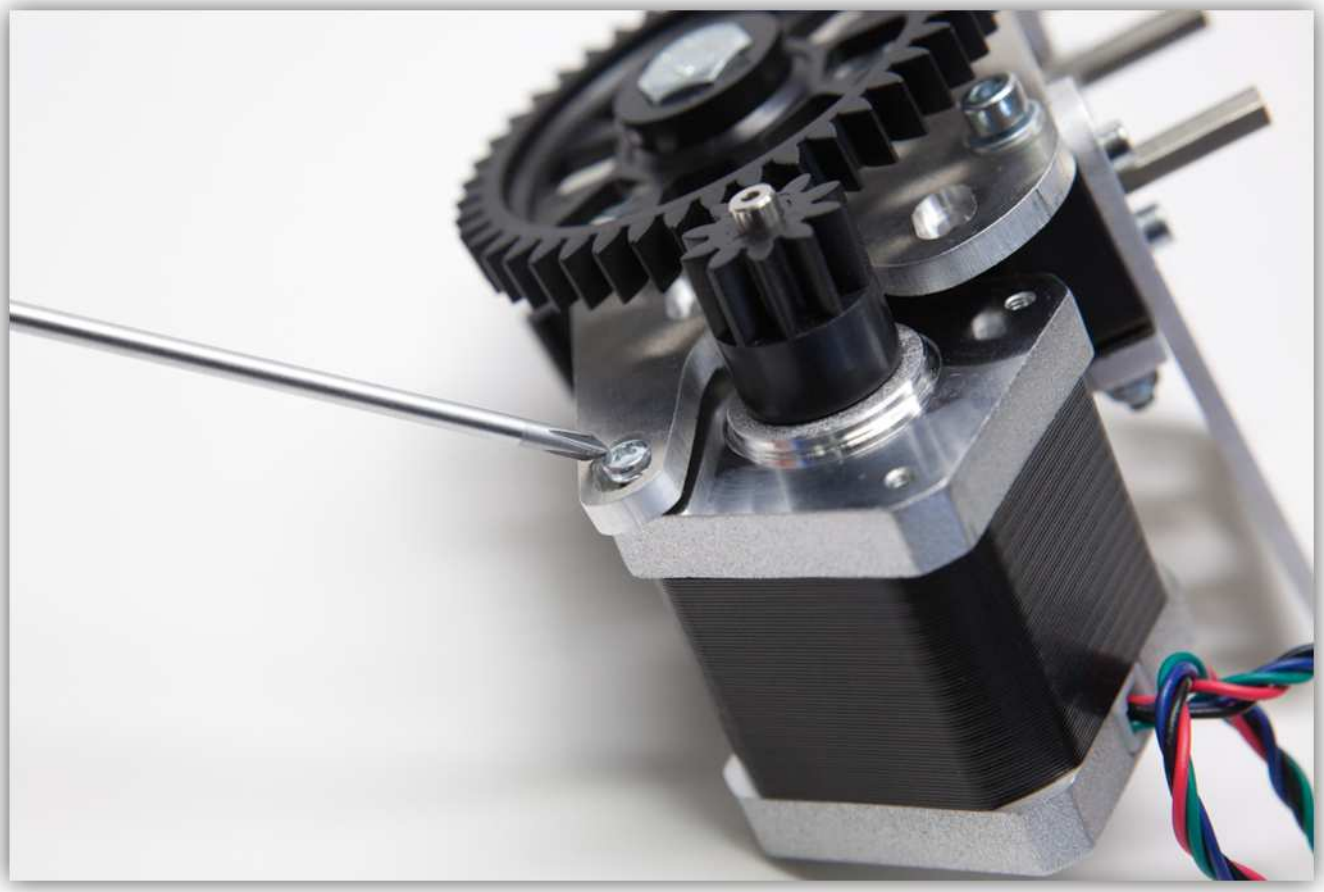


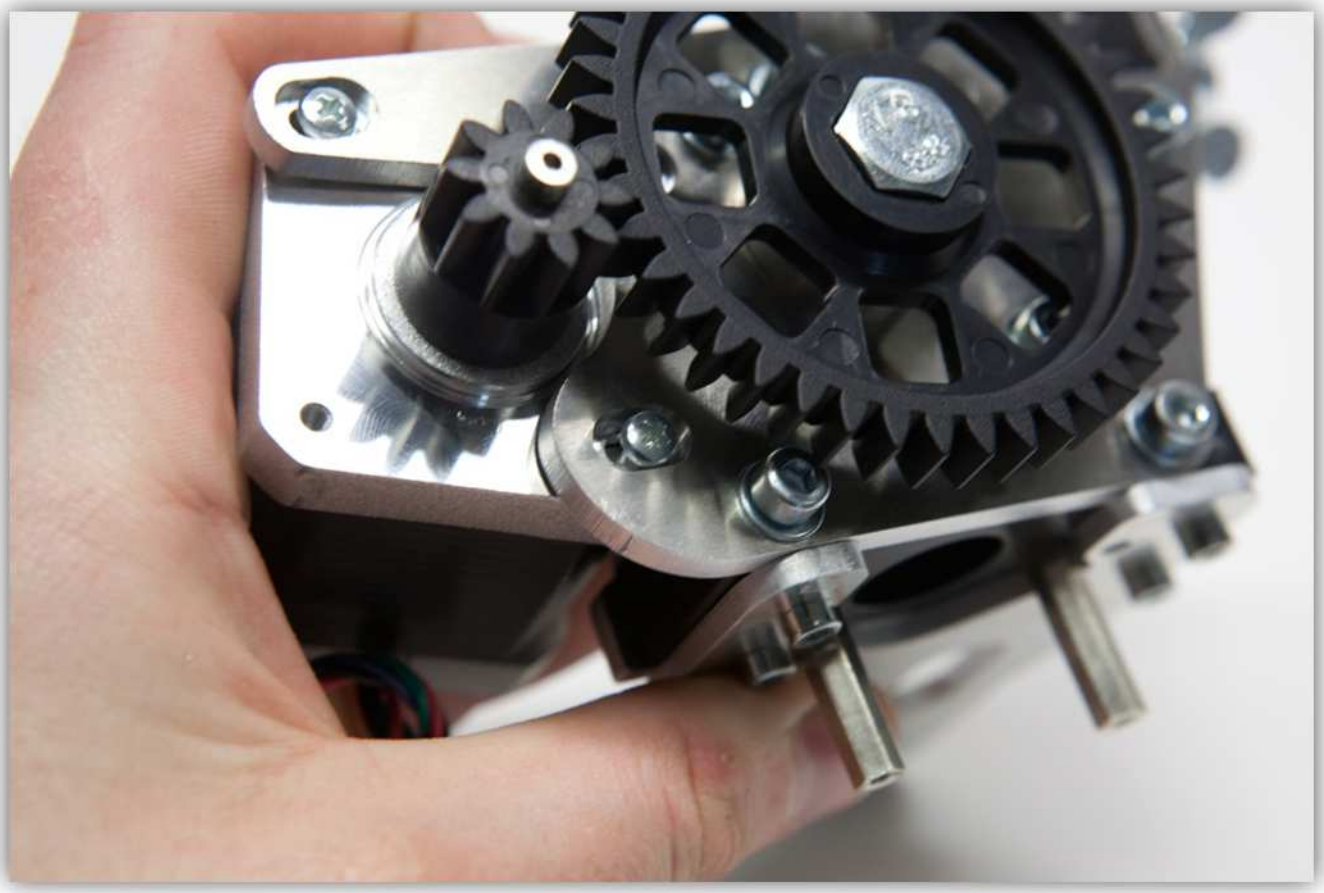
Tighten this bolt **slightly (!)**



Take the 3 M3 x 6 bolts.

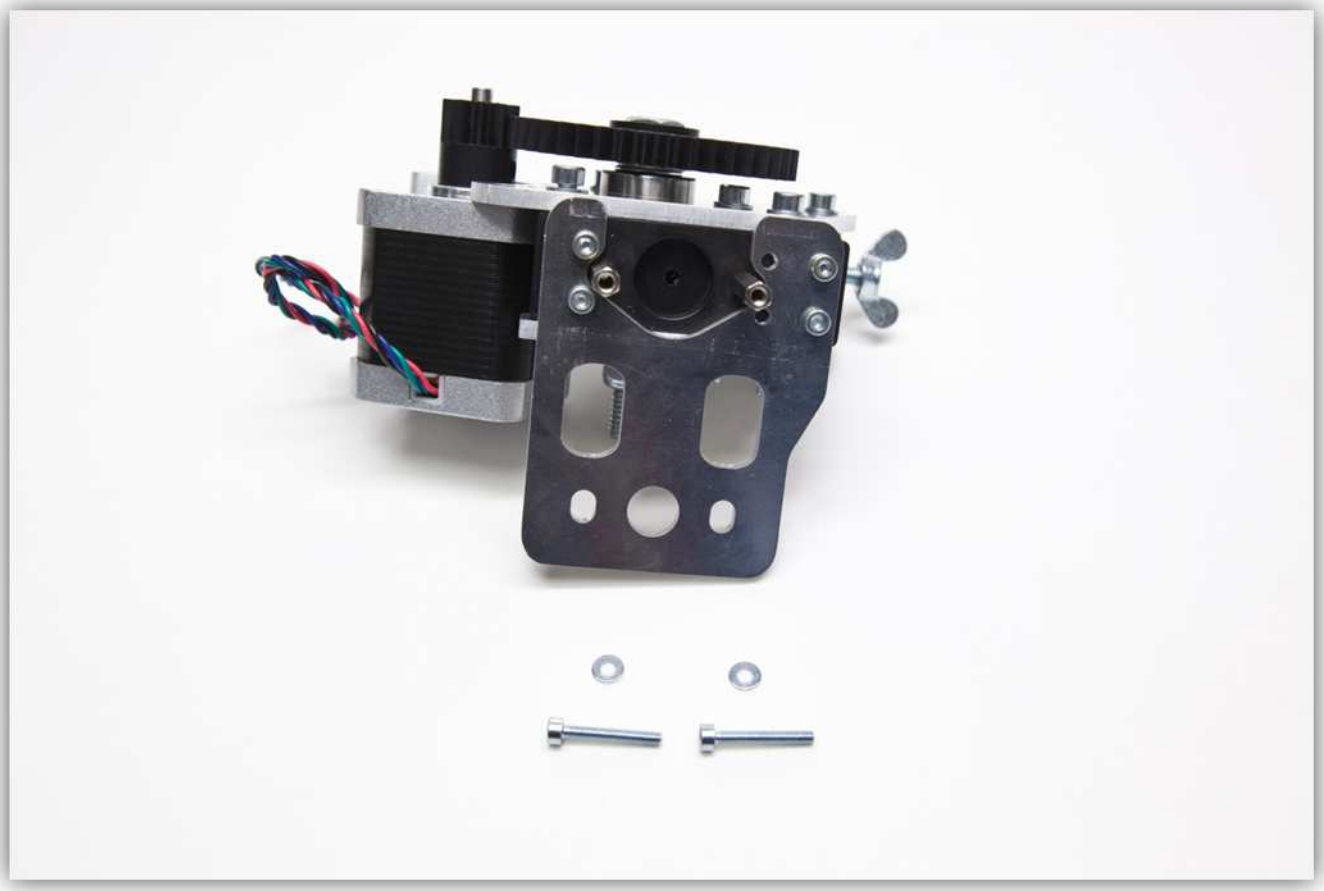
Bolt the motor to the extruder housing. **Do not fully tighten these bolts.**



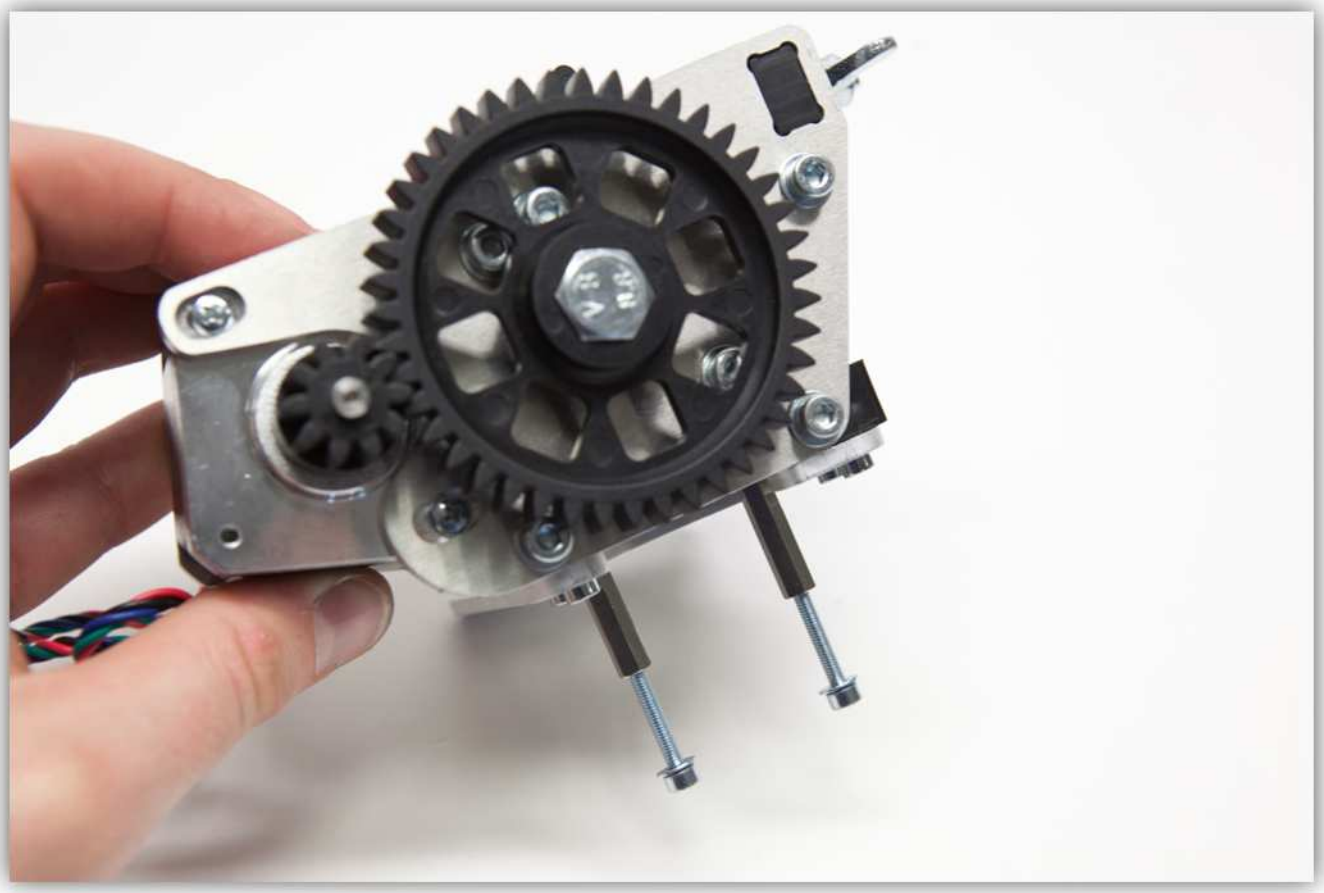


Position the motor so the teeth of the gears interlock as shown in the picture below. **Then you can fully tighten the bolts.**

Take 2 M3 x 25 bolts and 2 M3 washers.

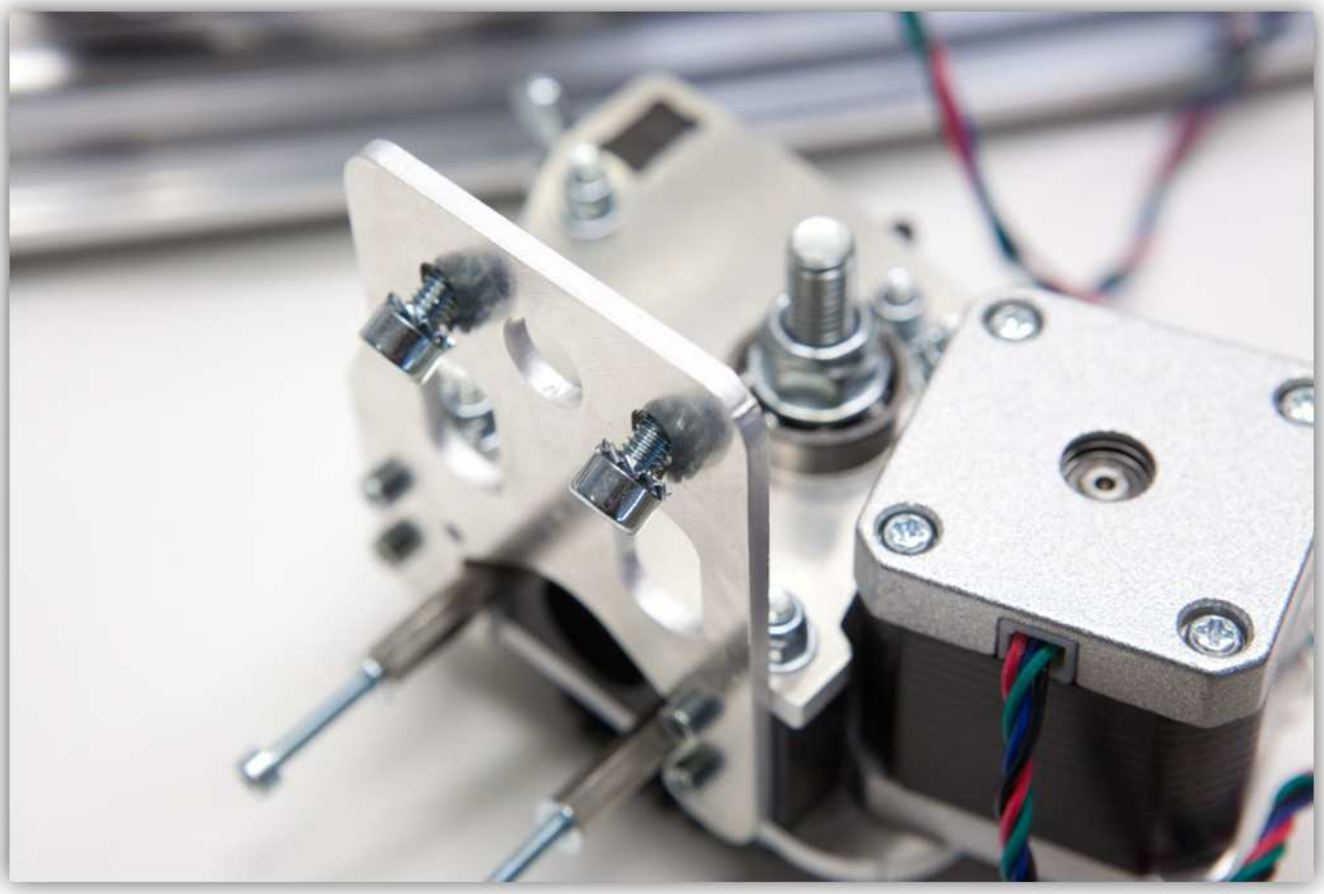


Screw these into the spacers for later use (the extruder itself will be mounted with these bolts.)

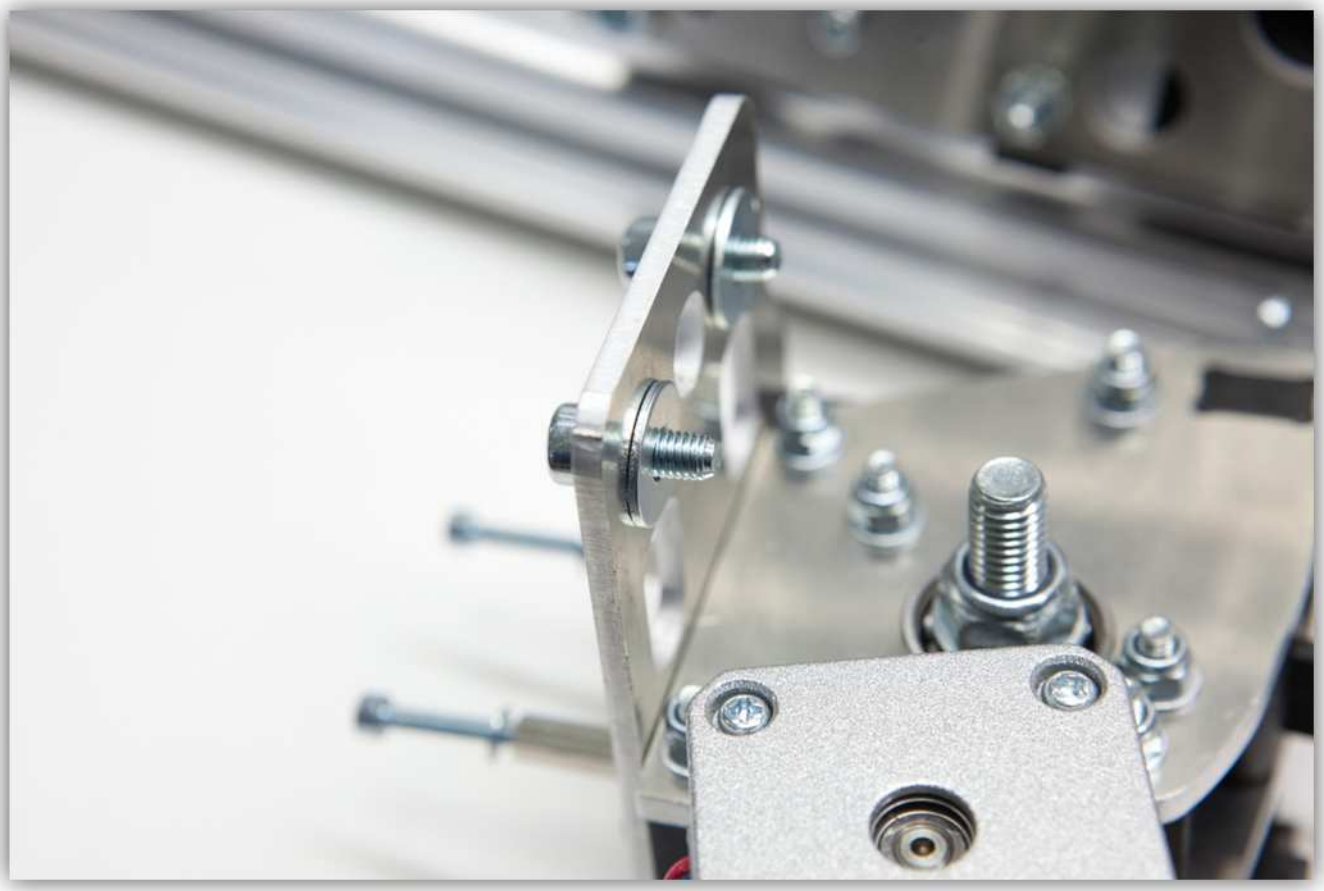


Take the 2 M5 bolts, the two large M5 washers and 2 M5 toothed washers

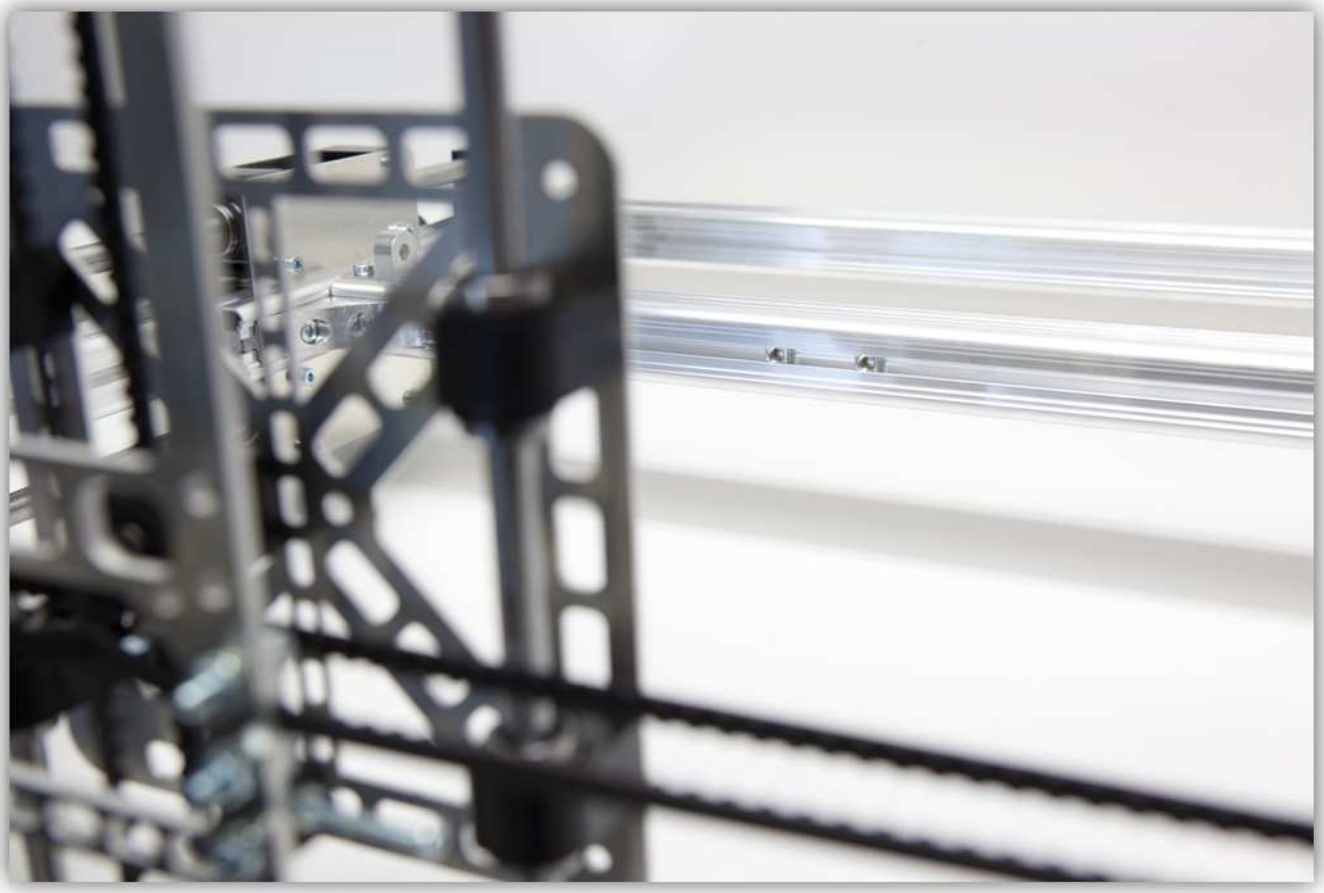
Place these bolts and washers as shown in the pictures below.



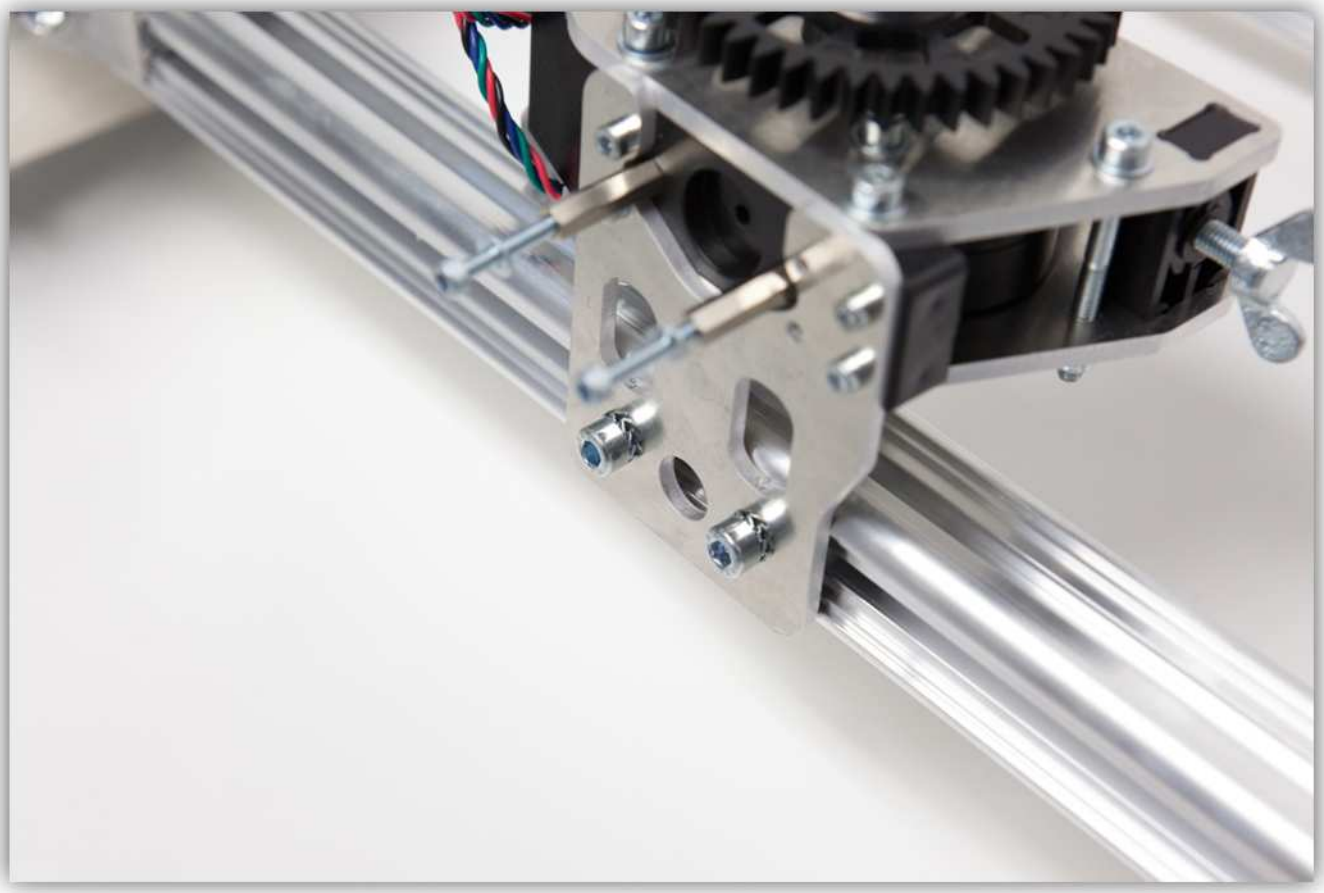
Notice the 2 large M5 washers.

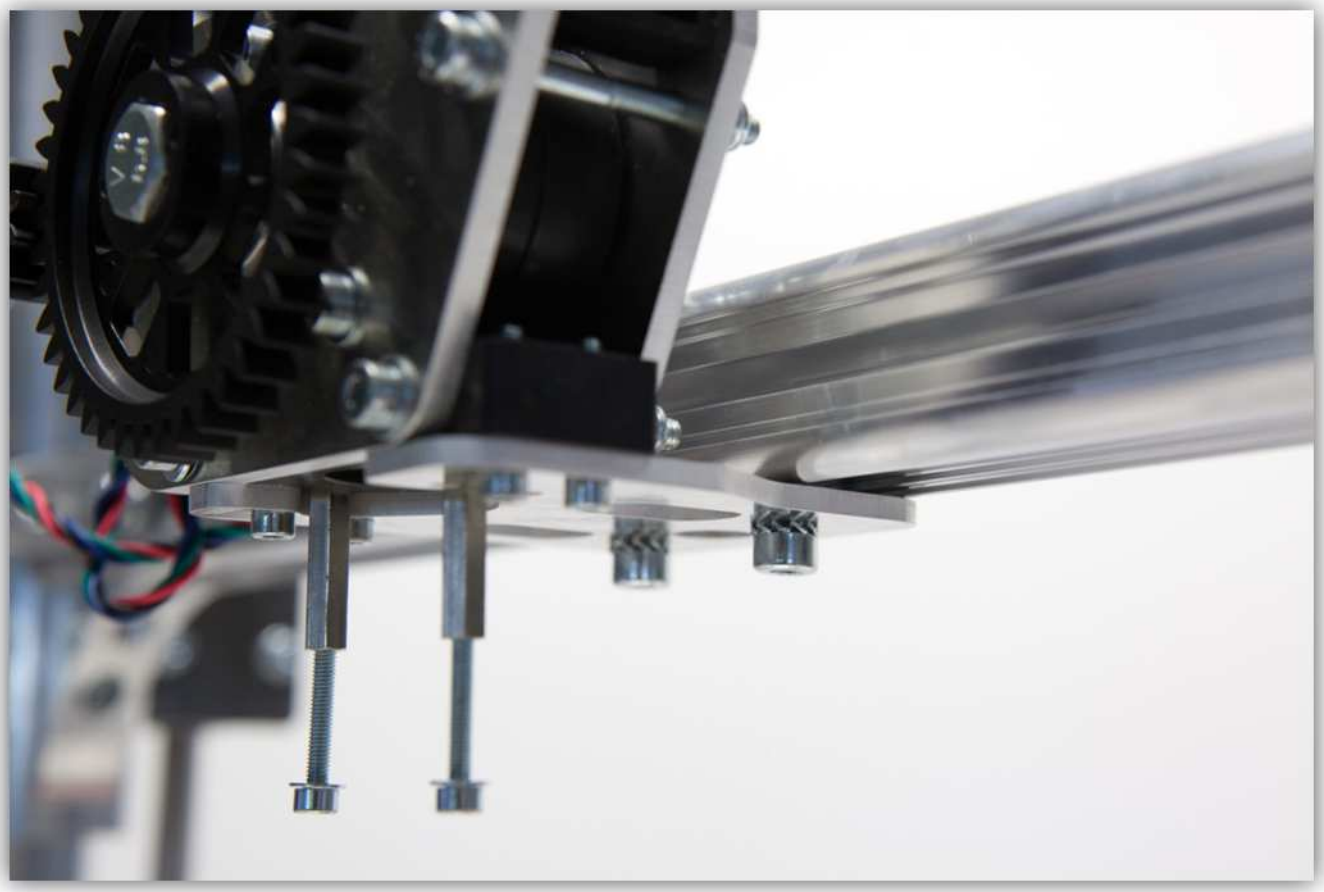


Locate the 2 square M5 nuts in the bottom of the extruder arm profile you put there before.

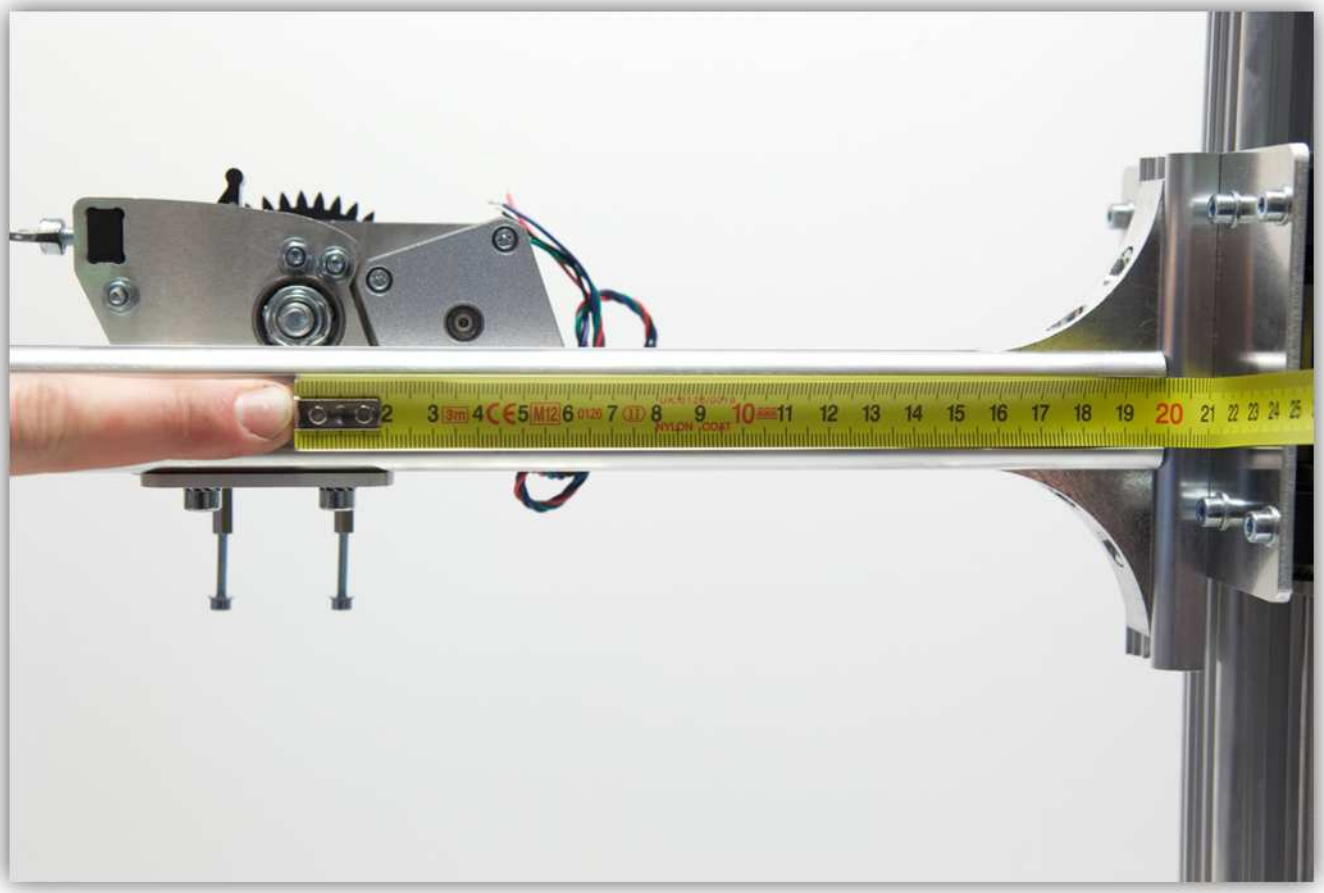


Bolt the extruder to these two nuts. **Do not tighten these bolts fully. Notice the orientation, the extruder housing should be facing forward.**

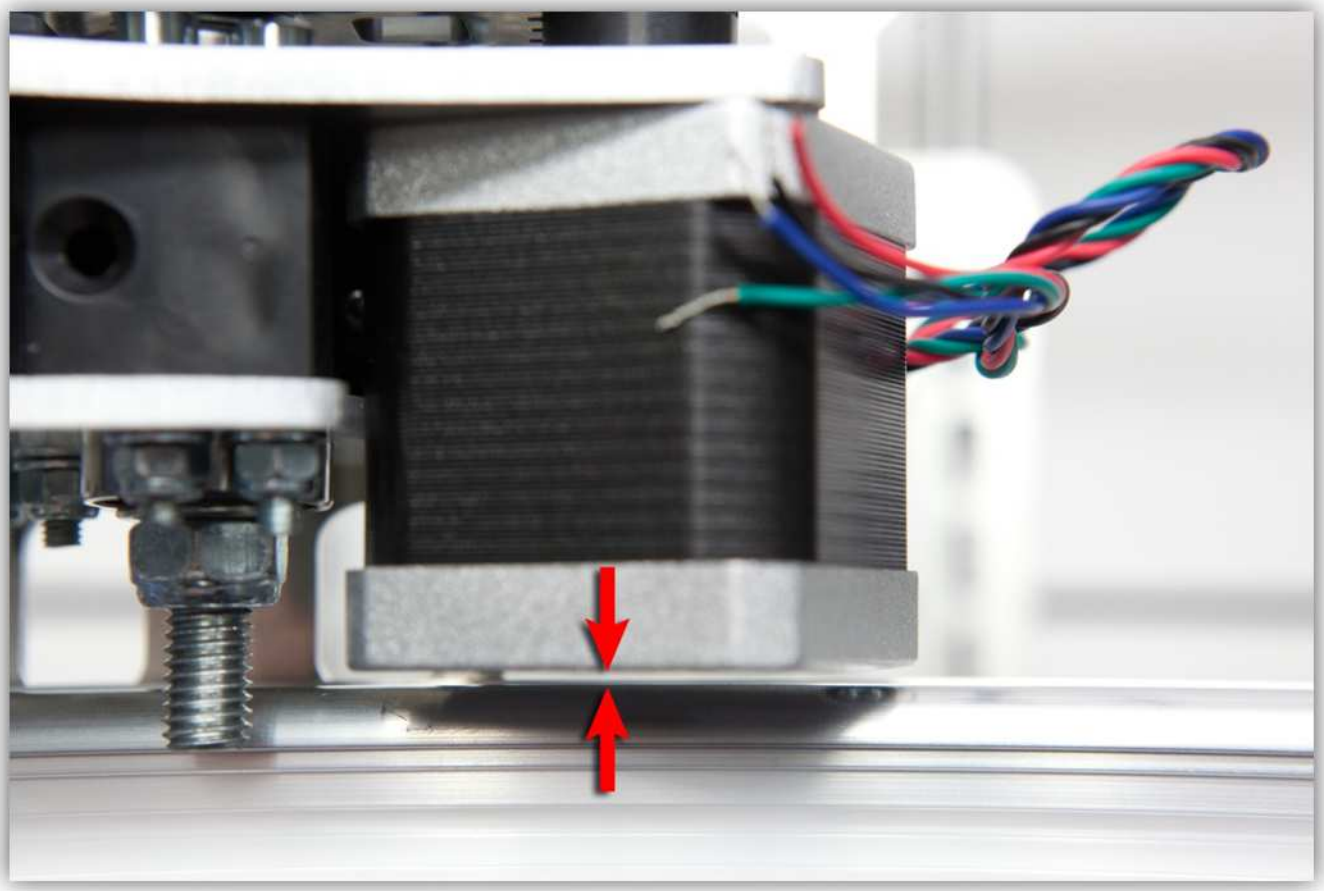




Slide the housing so the centre of the HOBBED BOLT sits at 20 cm (0.79") of the Z CARRIAGE.



Now make sure the extruder housing sits level and there is about a 1 mm (0.04") gap between the extruder arm profile and the back of the motor.



Now you can tighten the bolts that hold the extruder in place.