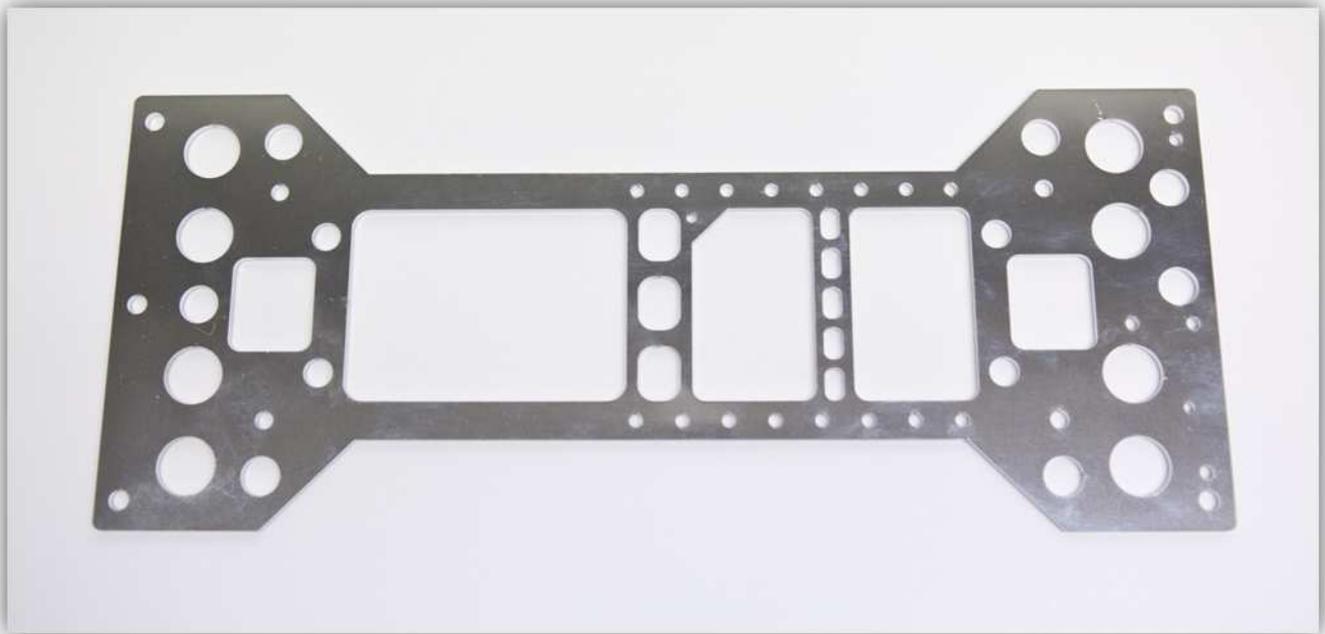


002 – ASSEMBLING THE X CARRIAGE

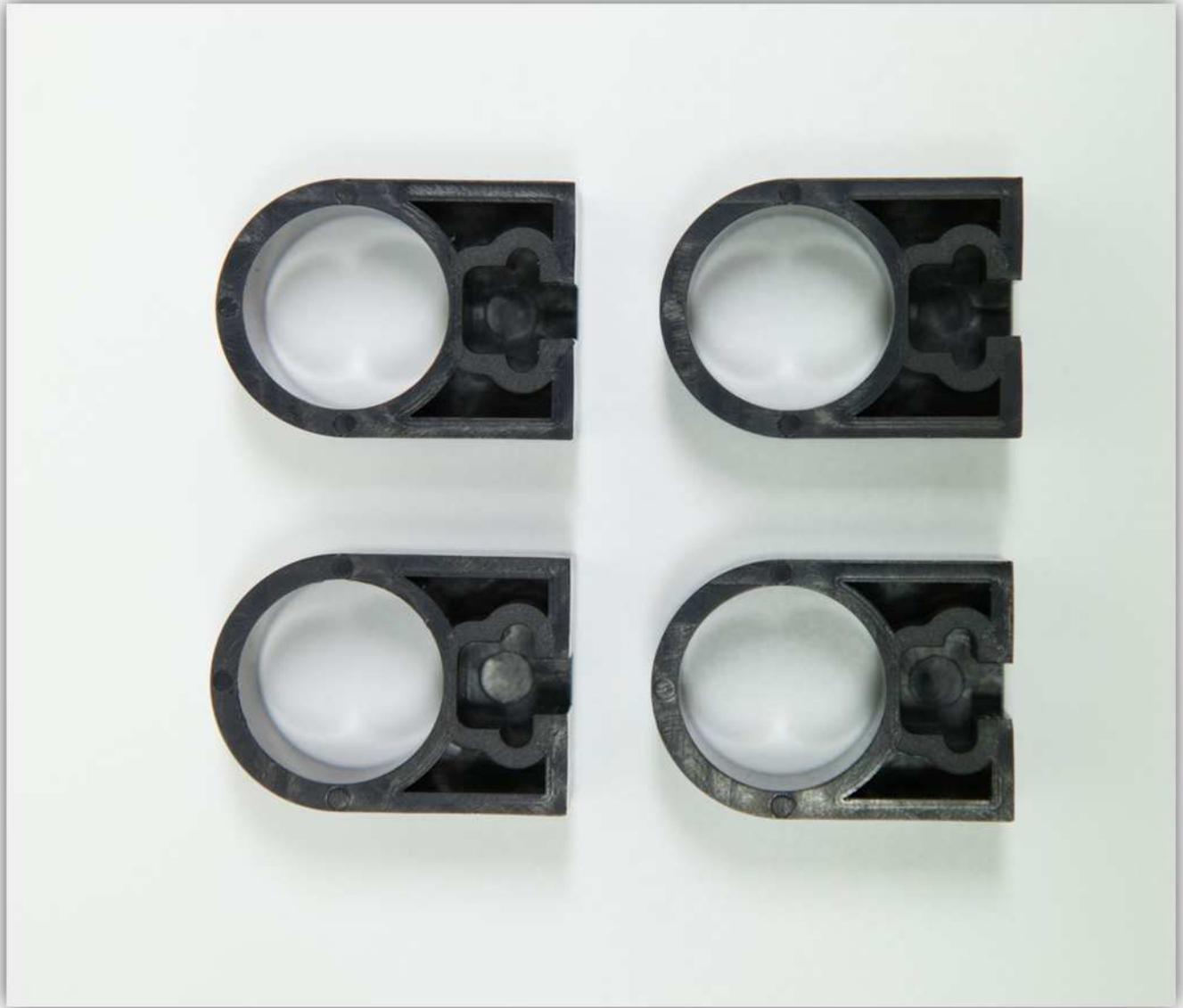
Take the X CARRIAGE out of the box.



Take the bag labelled with 3 out of the box, you should have these parts:

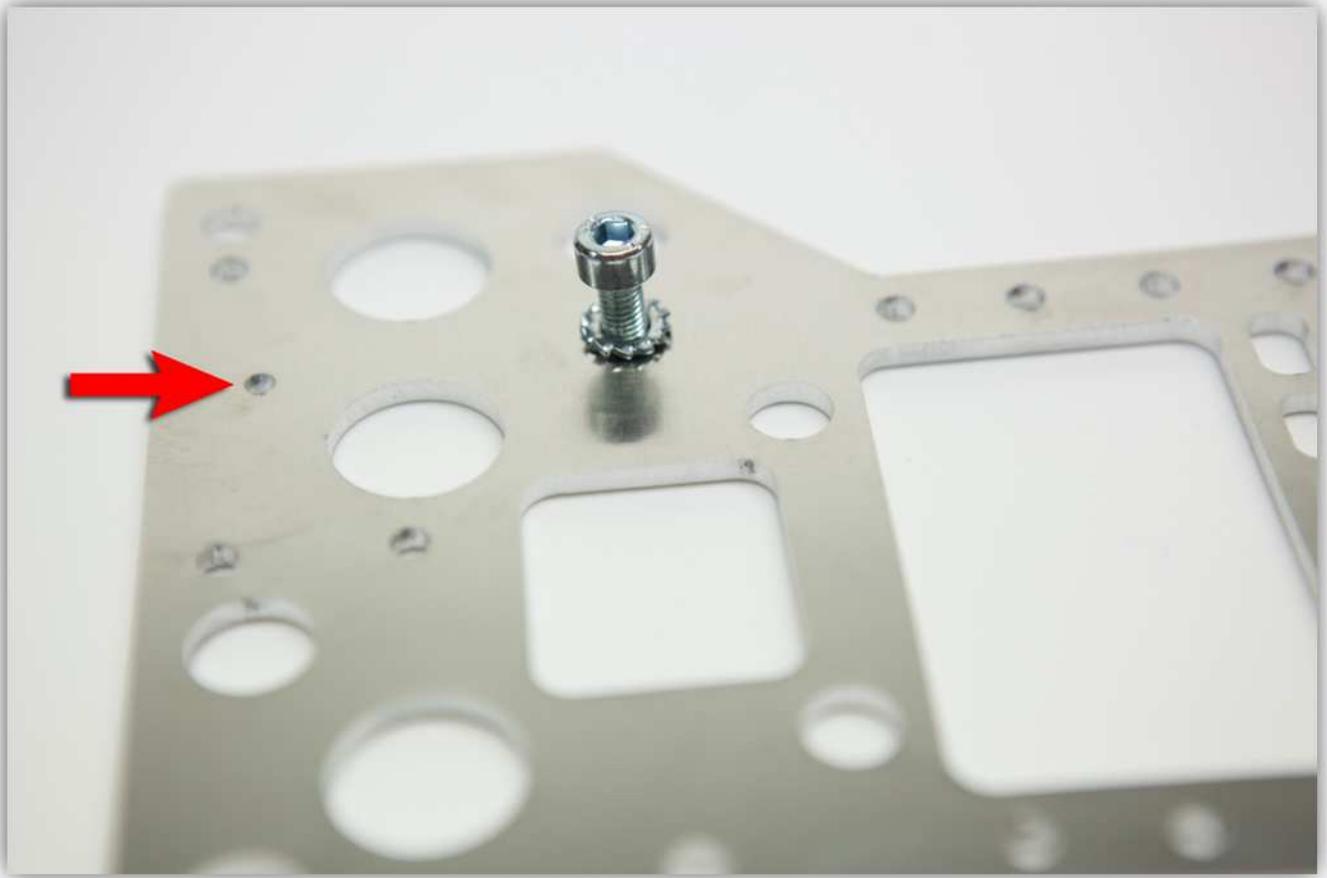


Now take 4 pieces as shown in the picture below out of the bag containing the plastic parts (BEARING CLAMP X):

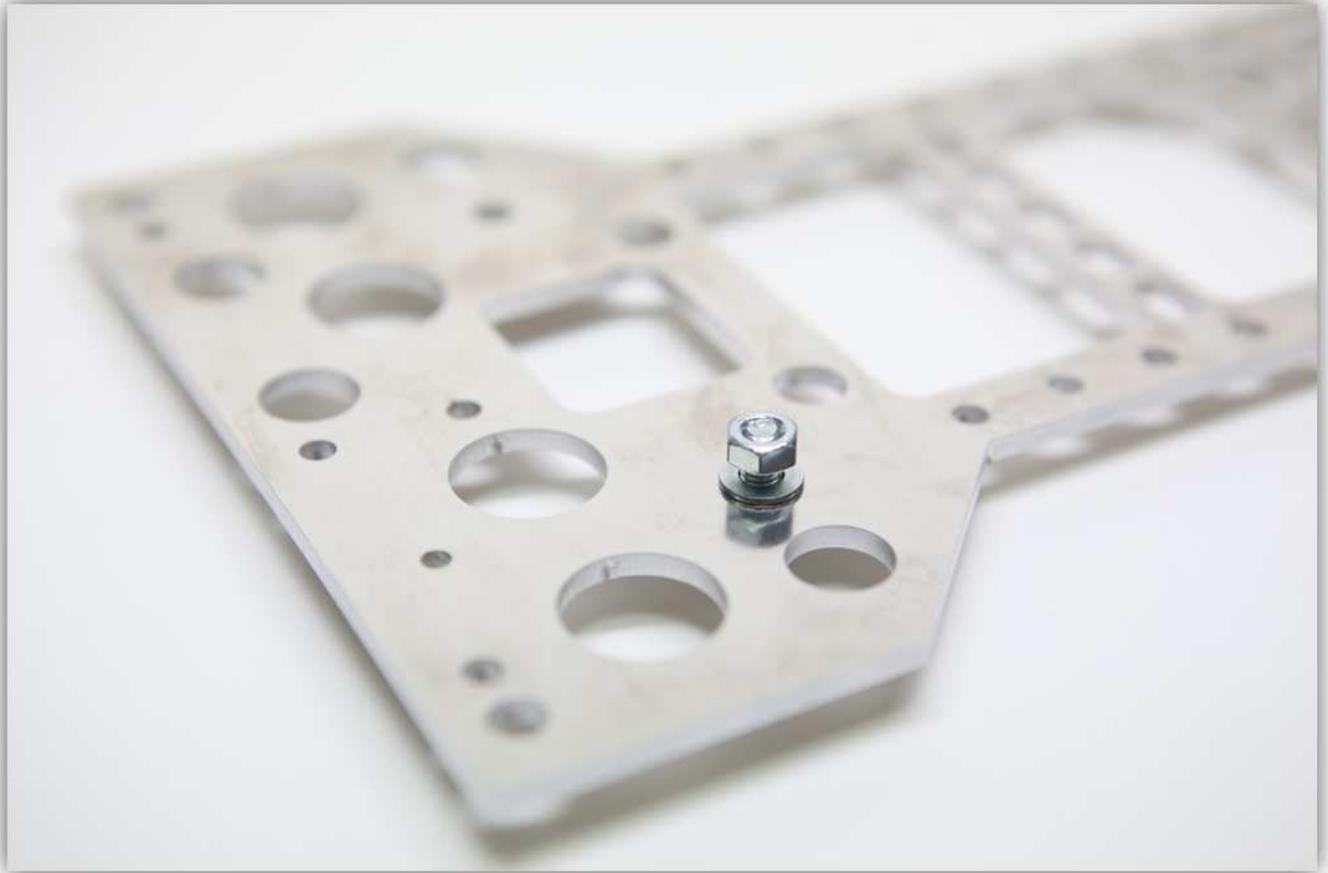


Put an M5 bolt and an M5 toothed washer through the X CARRIAGE as shown in the picture. **Take notice of the orientation of the aluminium plate. The red arrow shows a little hole, make sure this hole lines up as in the picture**

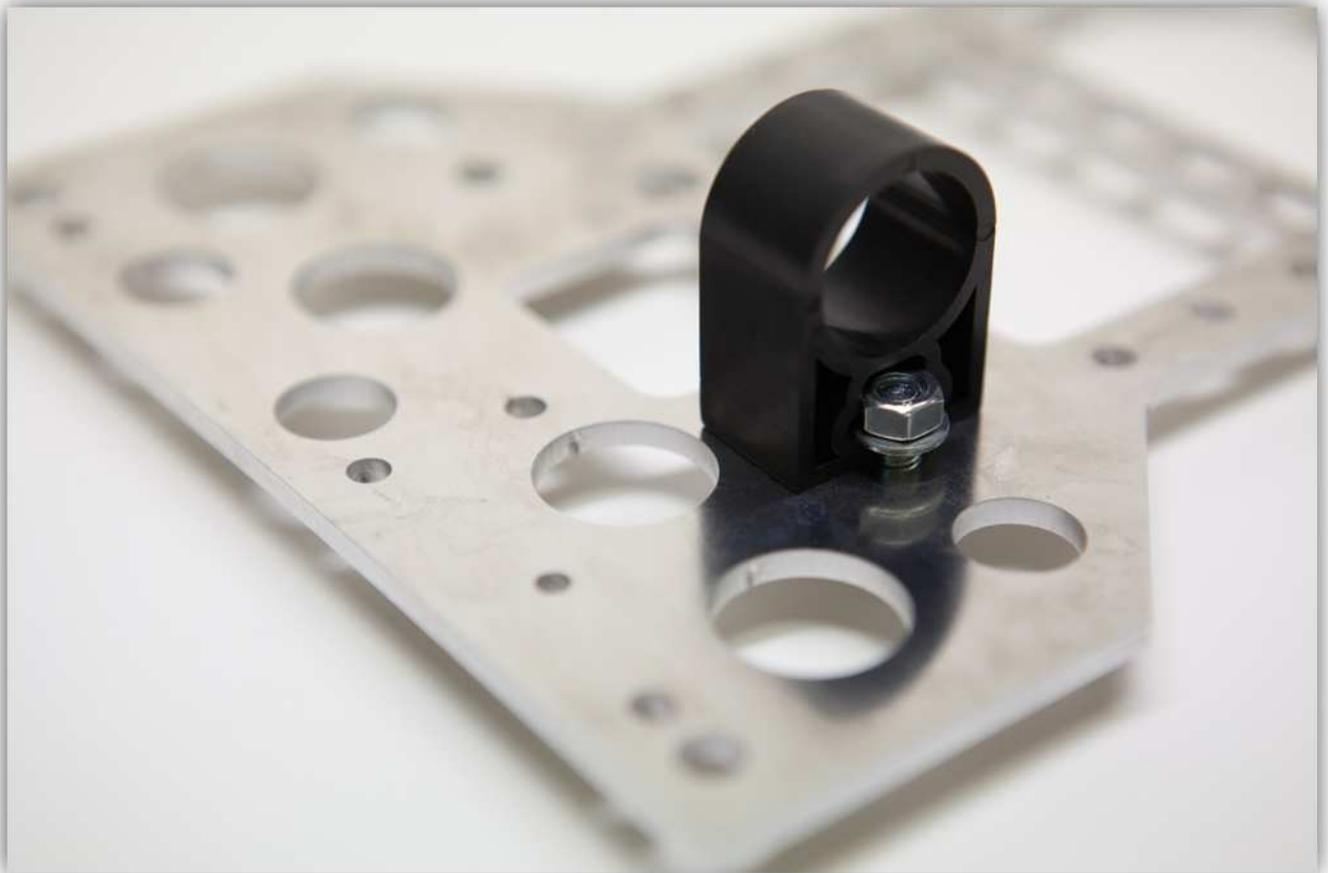
below:

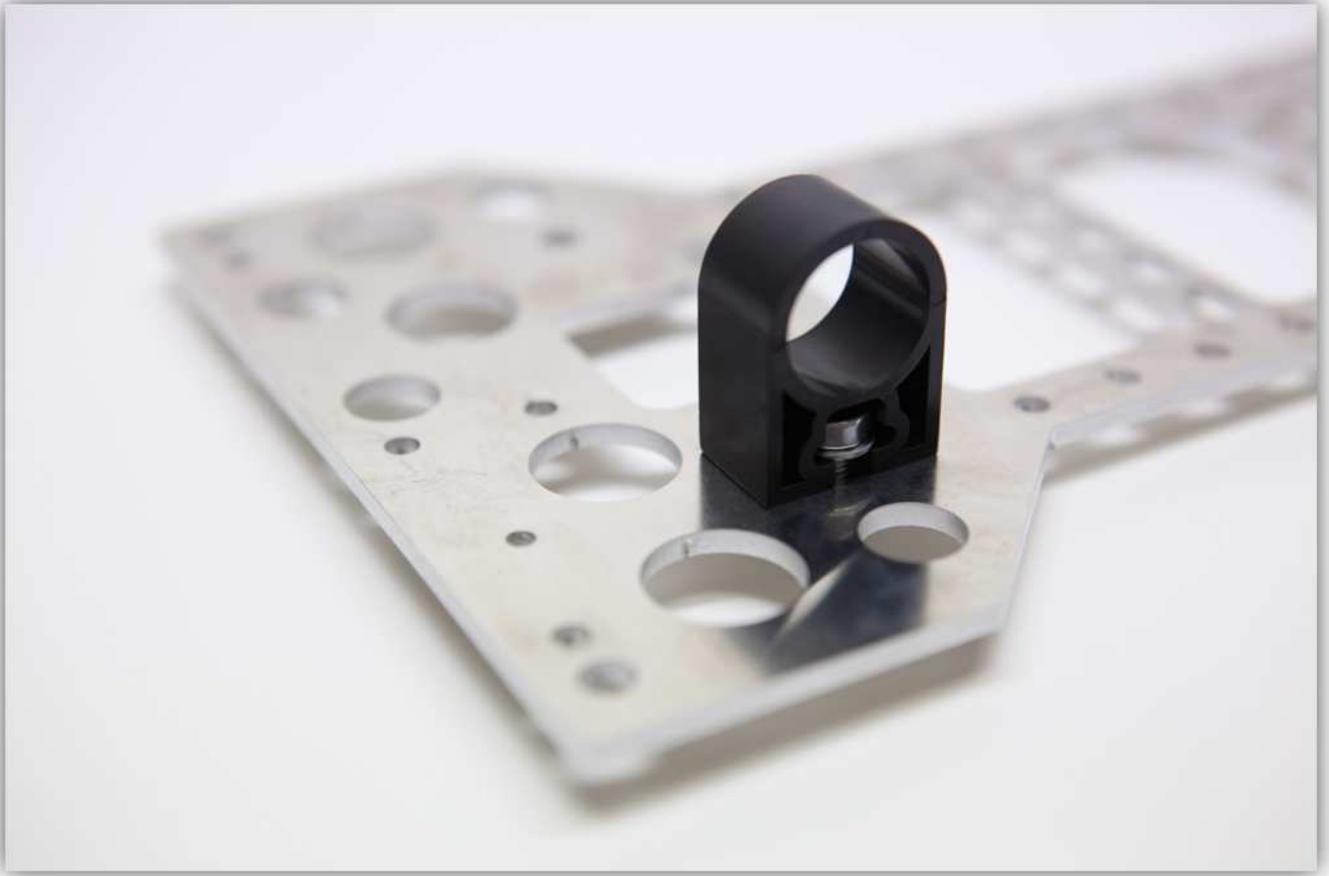


Flip the X CARRIAGE and put a M5 flat washer and an M5 nut on the M5 bolt as in the picture. **Do not tighten this nut.**

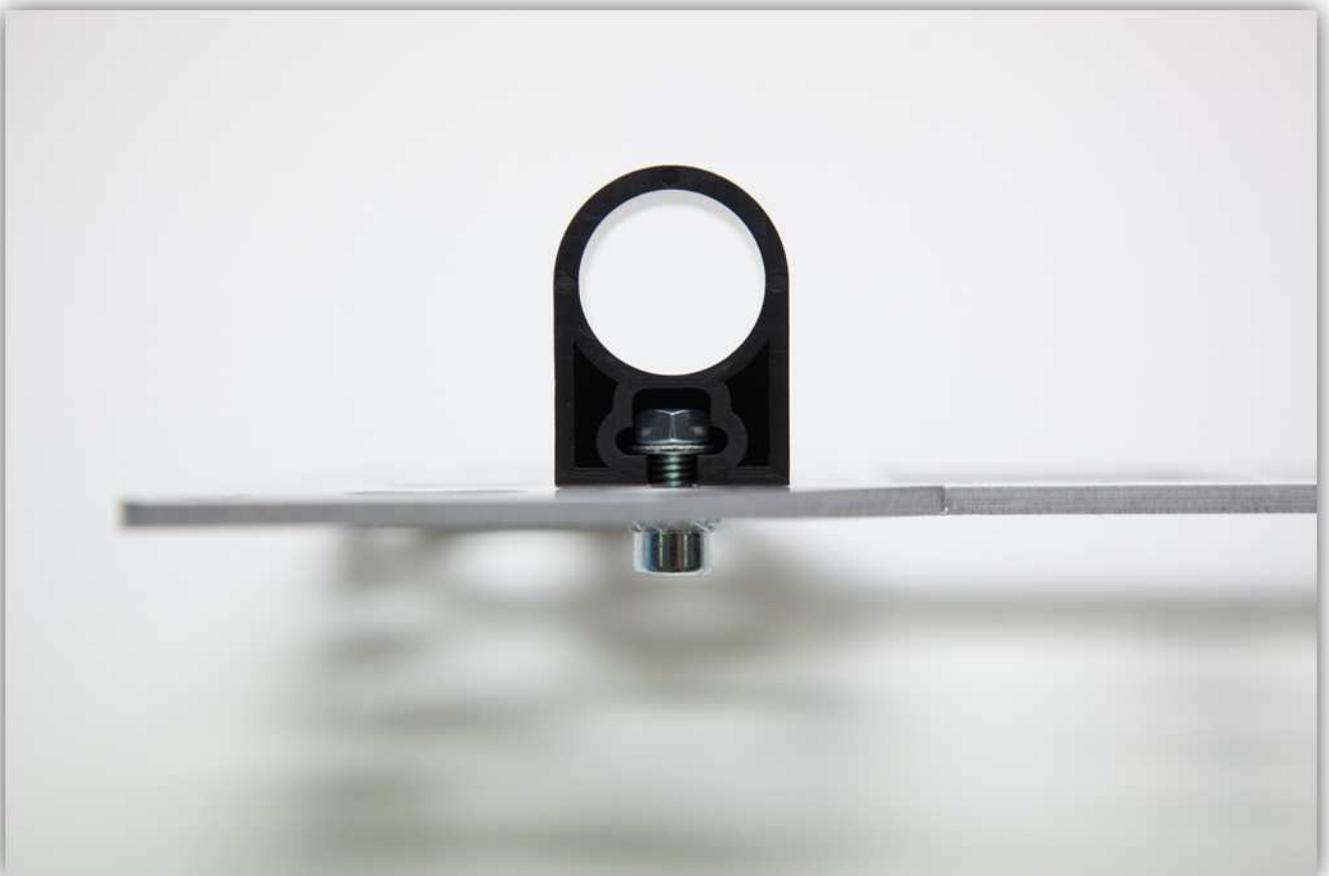


Slide 1 of the BEARING CLAMP X pieces over the washer and nut as shown in the pictures below. **Hand tighten this assembly. This part should be able to move freely but not fall off, later in the build we will tighten this piece.**

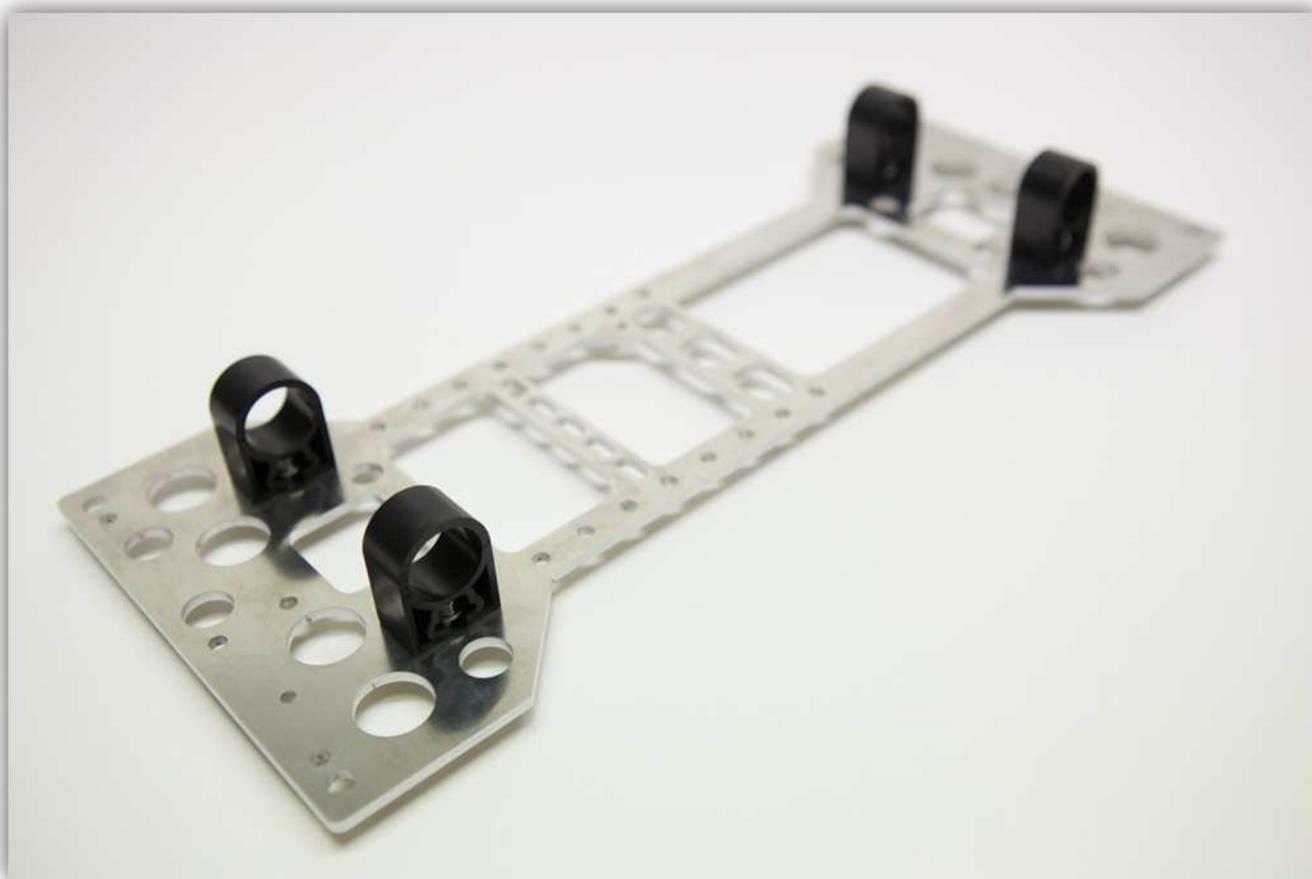




The assembly should look like this:



Repeat this 3 times in the positions shown on the pictures. **Remember, do not fully tighten these bolts. Just hand tighten them.**



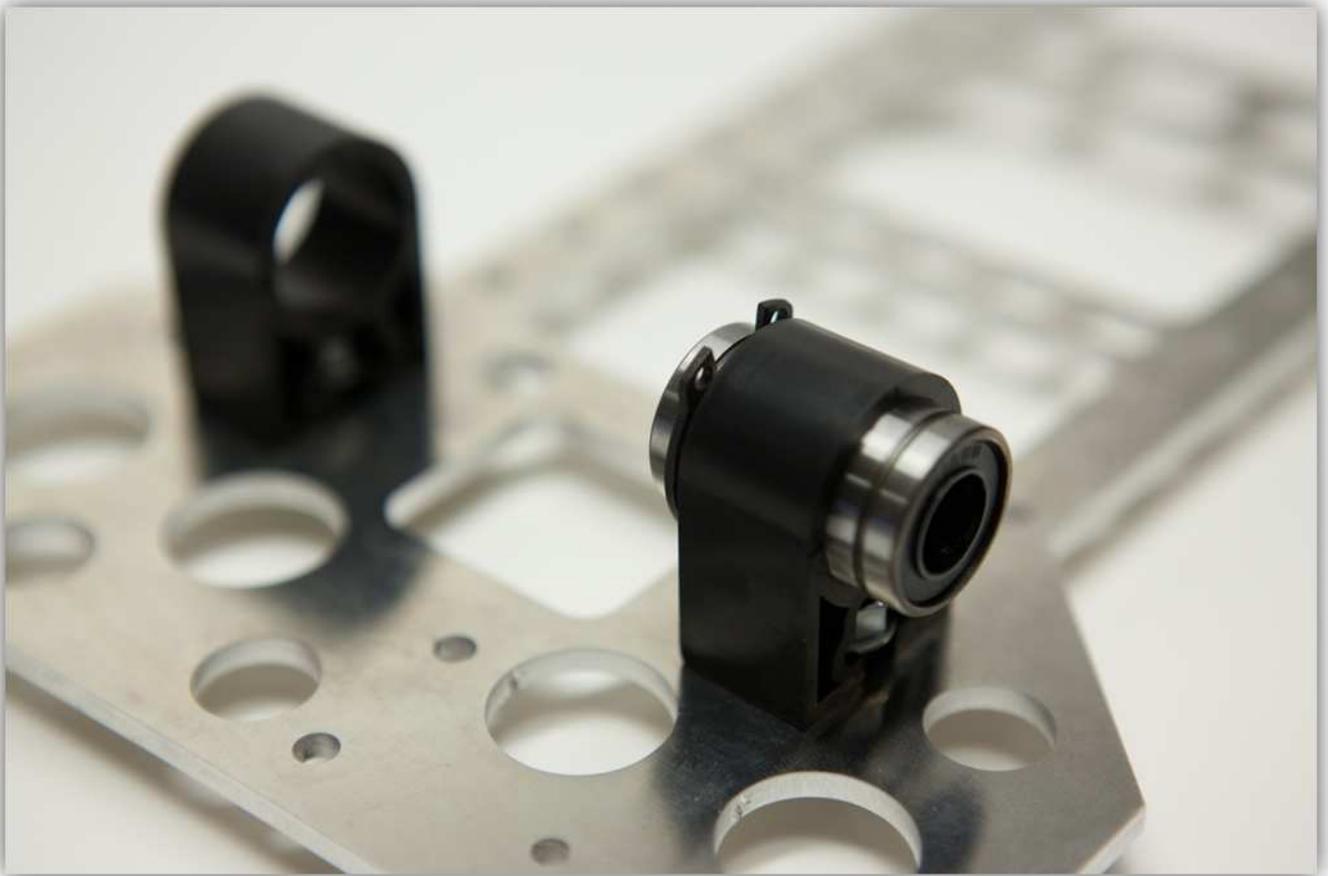
Now take the circlip pliers, a circlip and an LM10UU linear bearing:



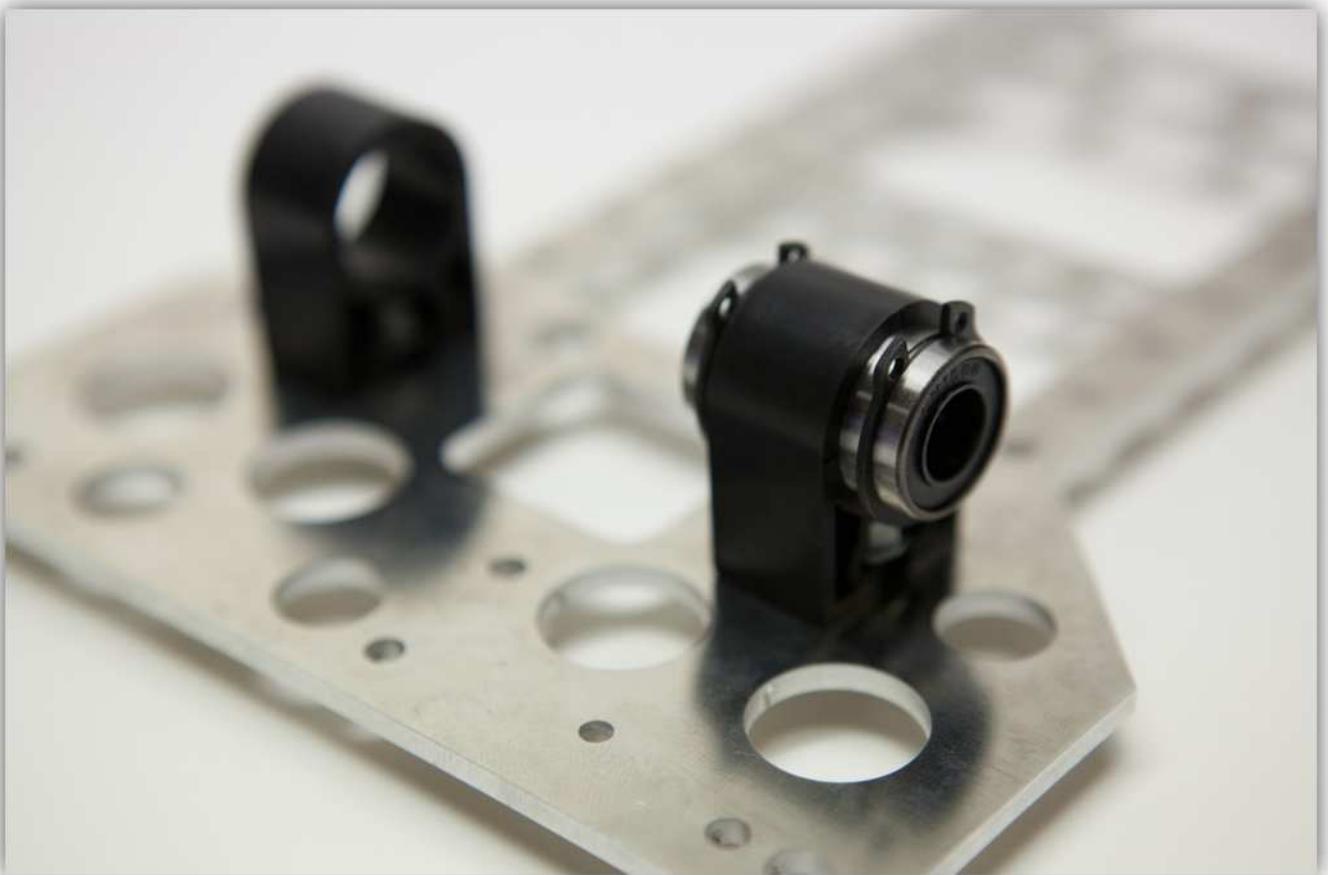
Use the circlip pliers to carefully fit the circlip around the LM10UU linear bearing.



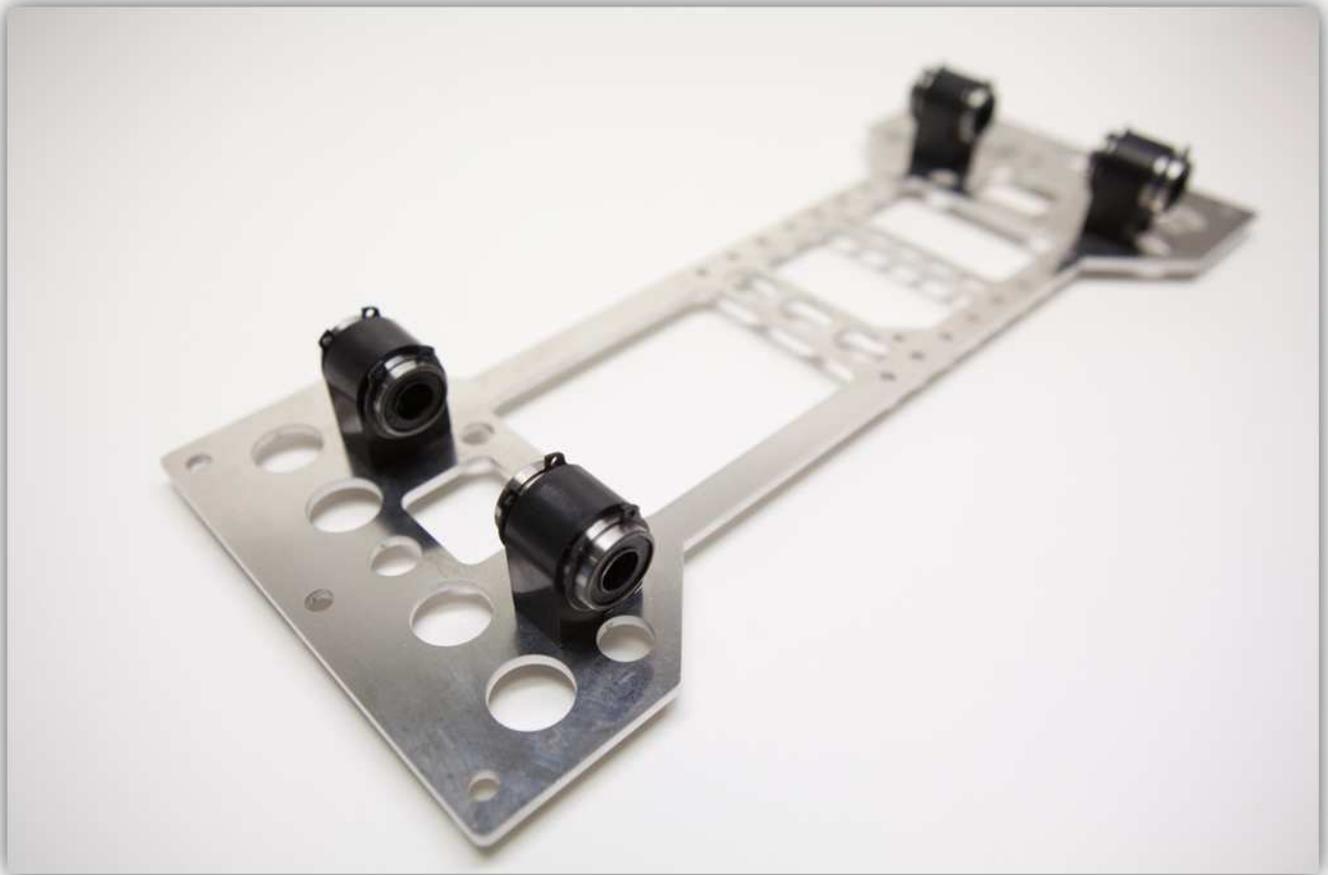
Slide the bearing with one circlip inside one of the BEARING CLAMP X pieces:



Use the circlip pliers to carefully fit the circlip around the LM10UU linear bearing and lock it in the BEARING CLAMP X piece:



Repeat this process 3 more times so all the BEARING CLAMP X pieces have a bearing with circlips:



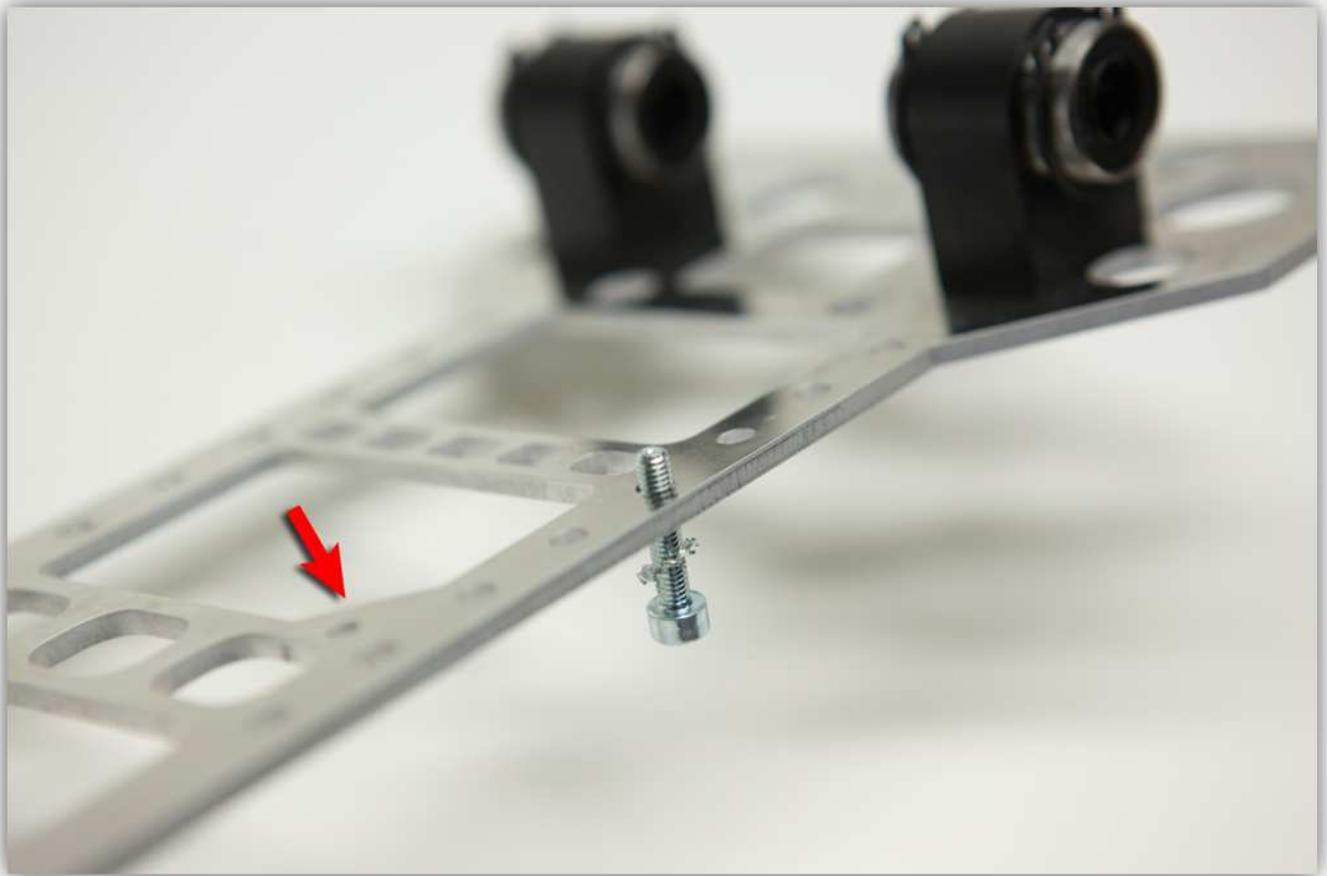
Take the bag labelled with 4 out of the box, you should have these parts. Notice the plastic piece (ADJUST SCREW BRACKET), you can find this in the bag containing the plastic parts.



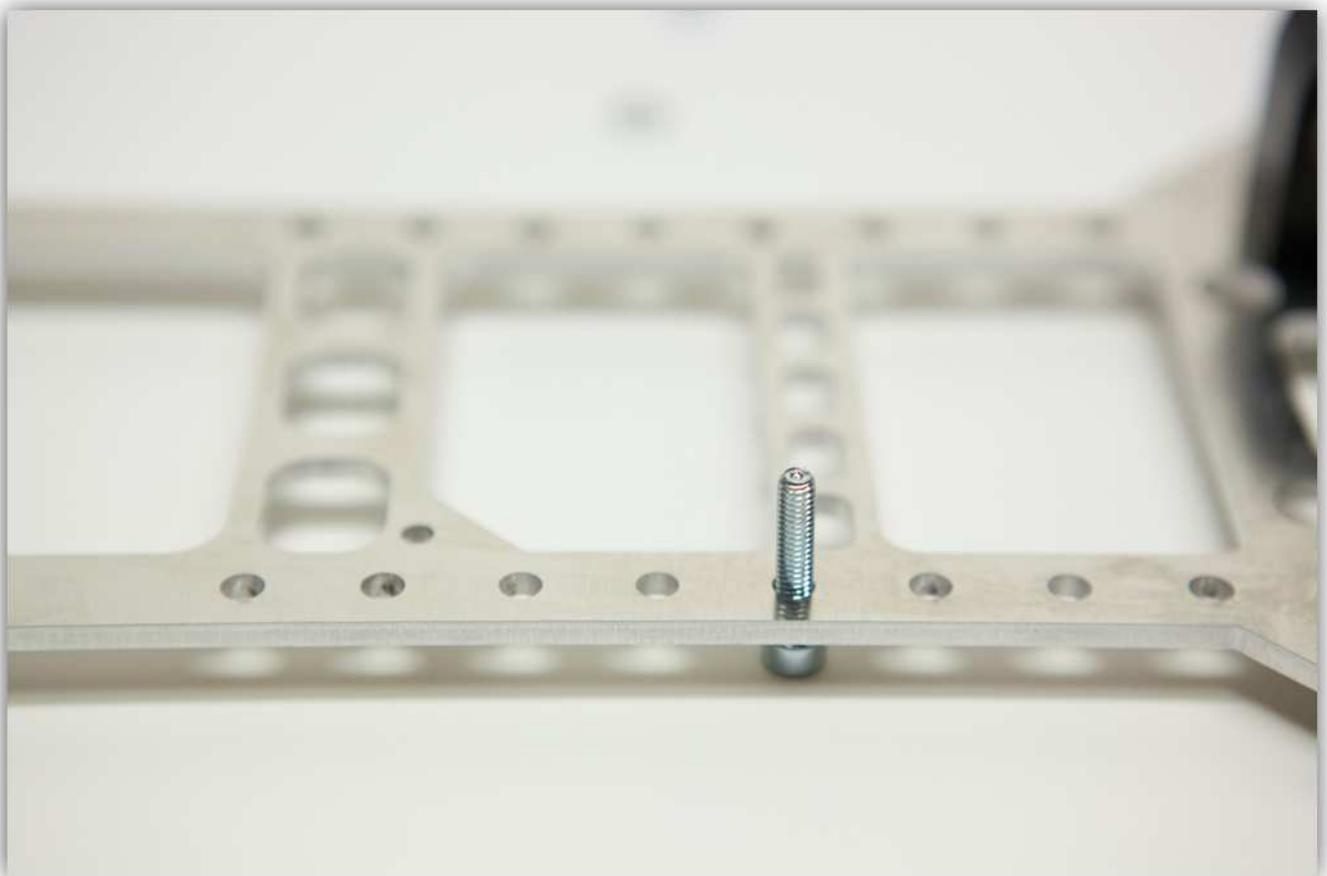
Insert a small M3 nut in the ADJUST SCREW BRACKET as shown in the picture:



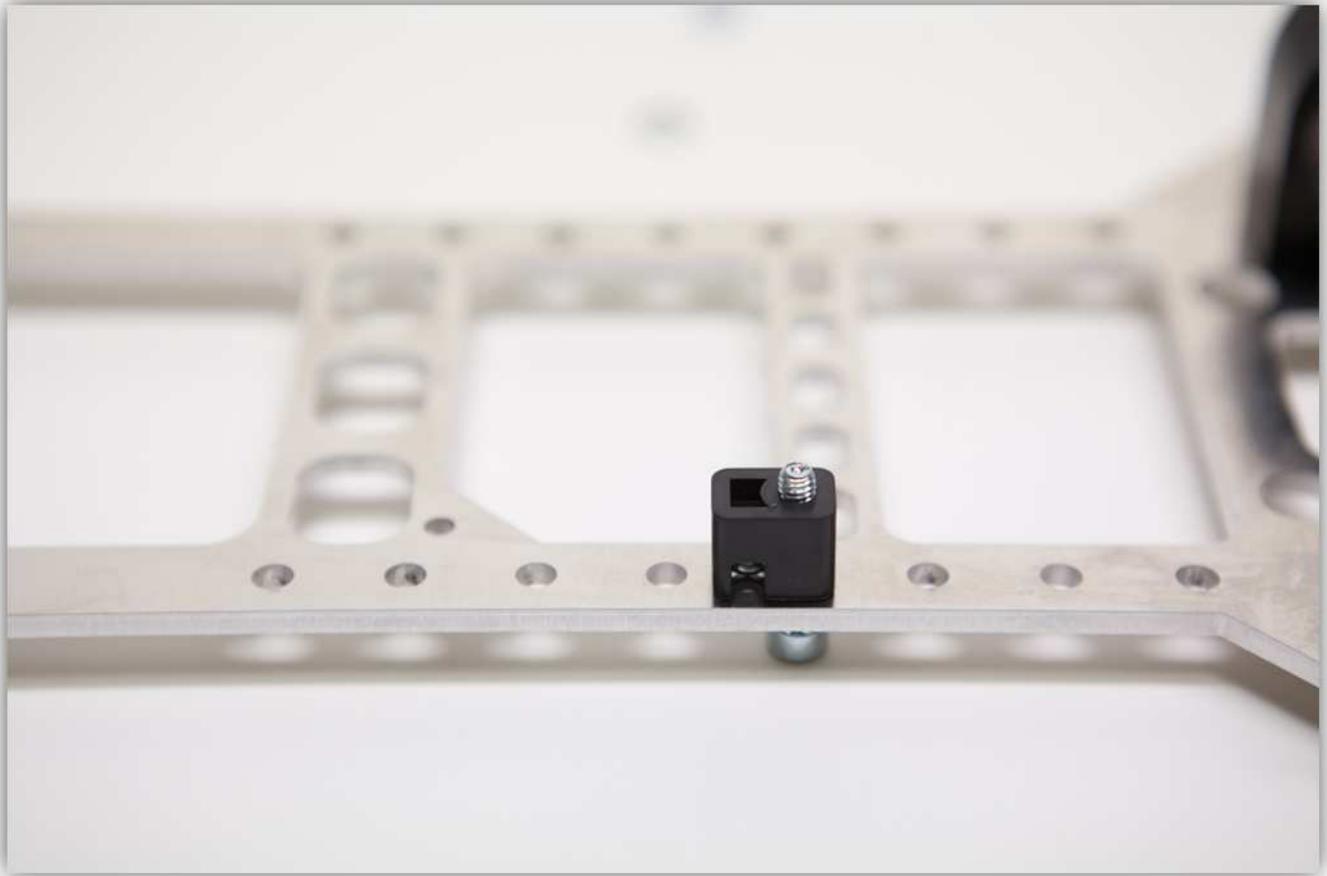
Insert the M4 bolt with a toothed washer as in the picture. **Notice the red arrow, it shows a detail that is only on one side of the X CARRIAGE. You need to insert the bolt on this side.**



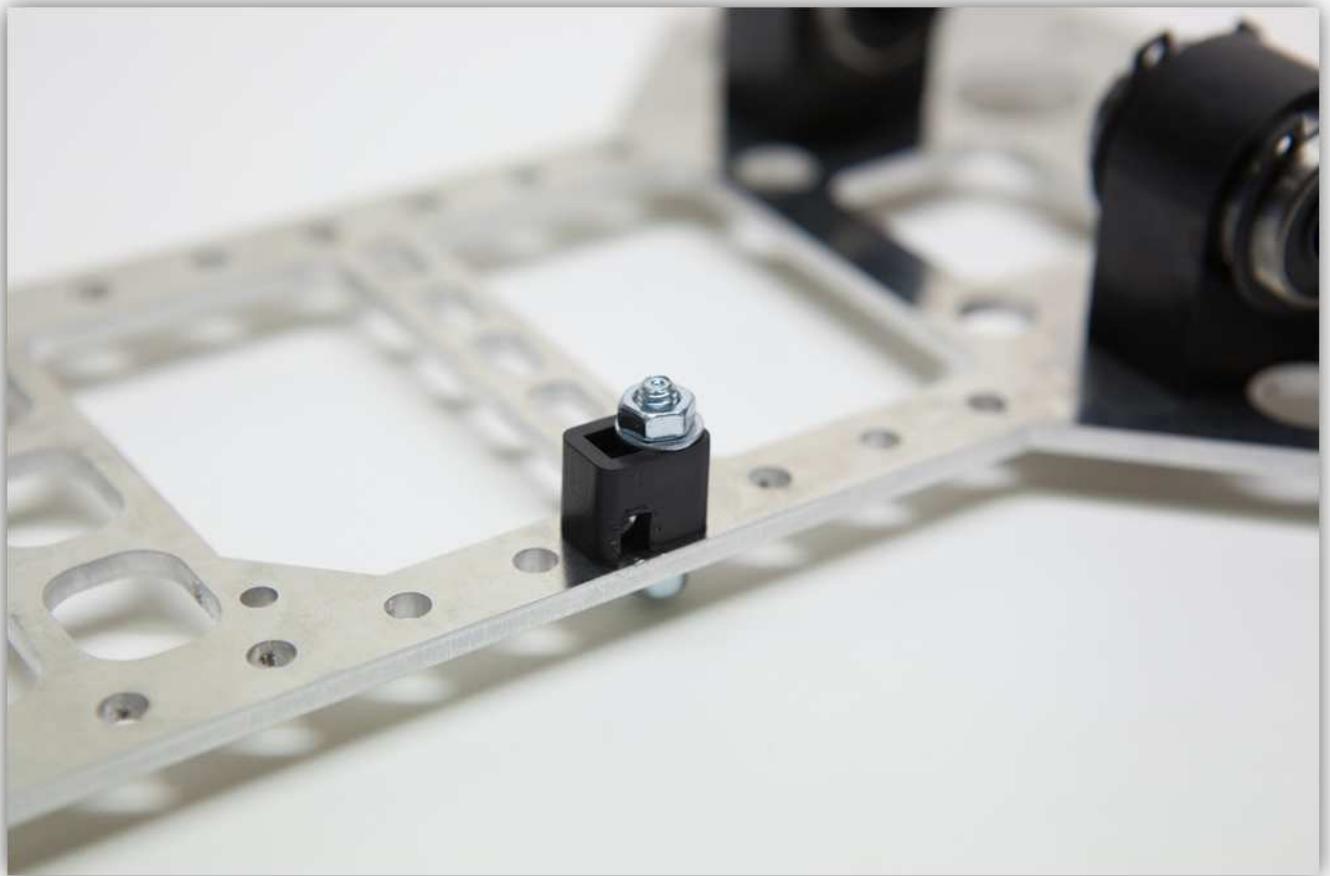
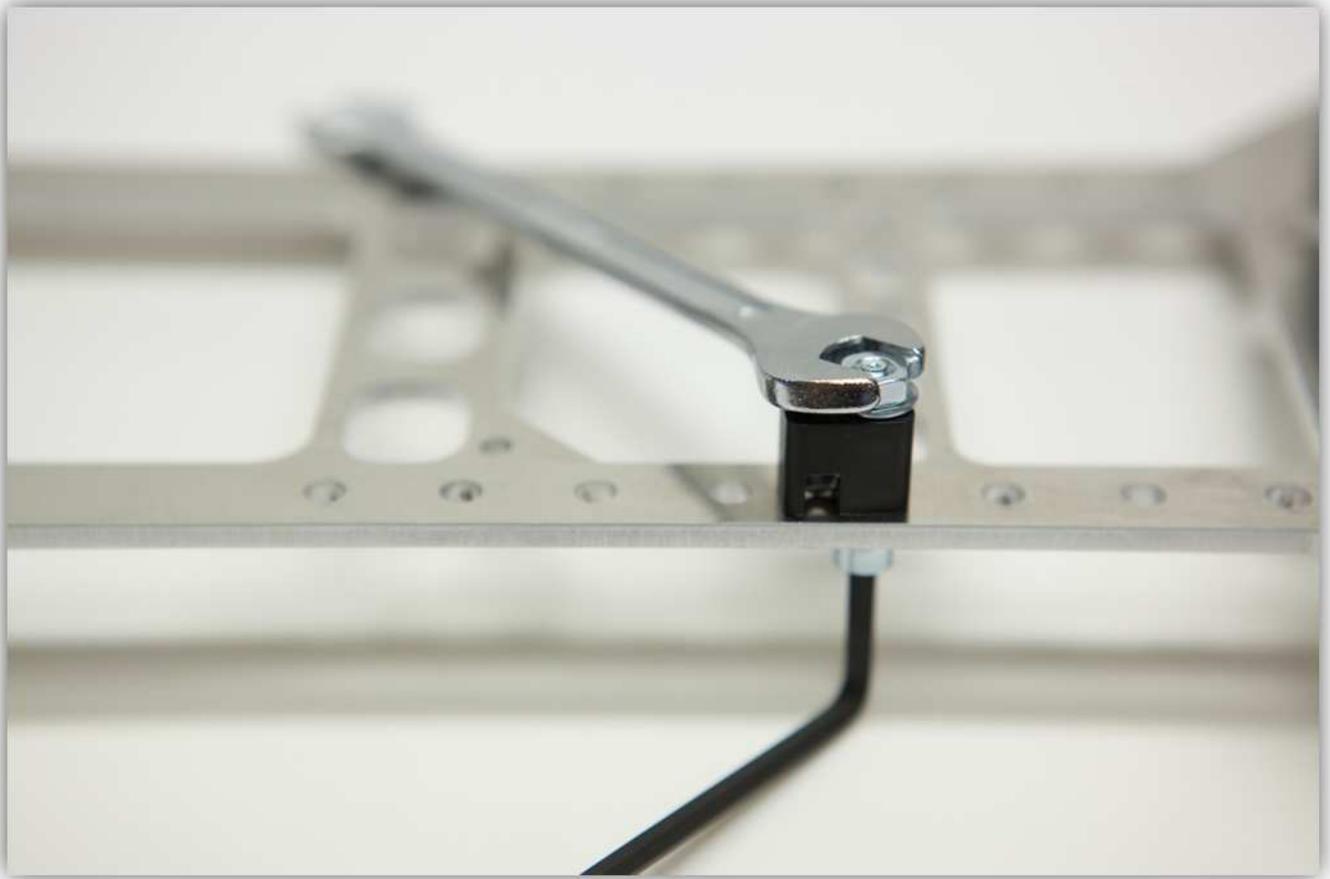
It should look like this:



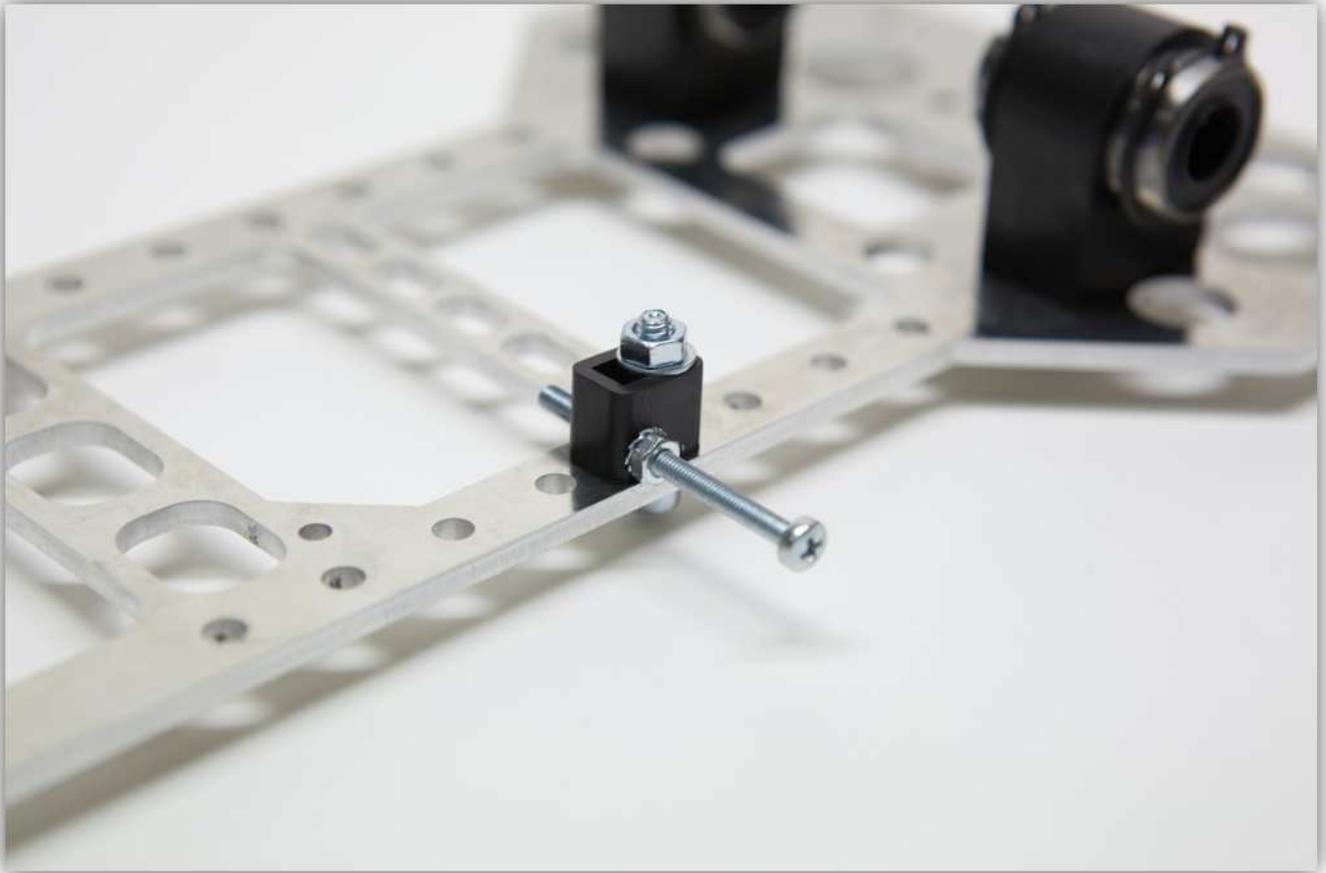
Place the ADJUST SCREW BRACKET with the small M3 nut inside over this bolt as in the picture:



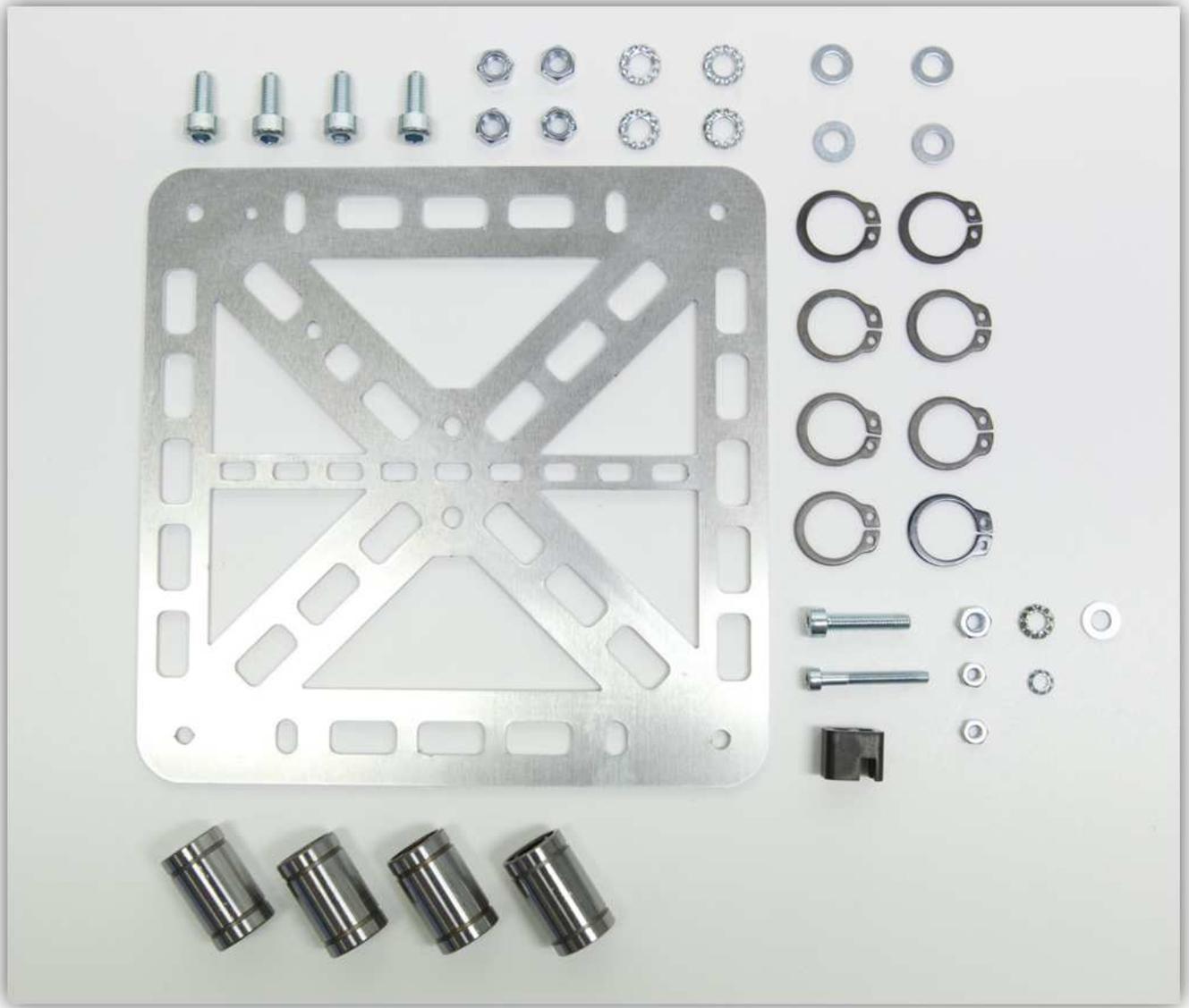
Put an M4 washer and M4 nut on this bolt and tighten everything:



Put an M3 nut and M3 toothed washer over the long bolt and screw it in the M3 nut that is inside the plastic piece:



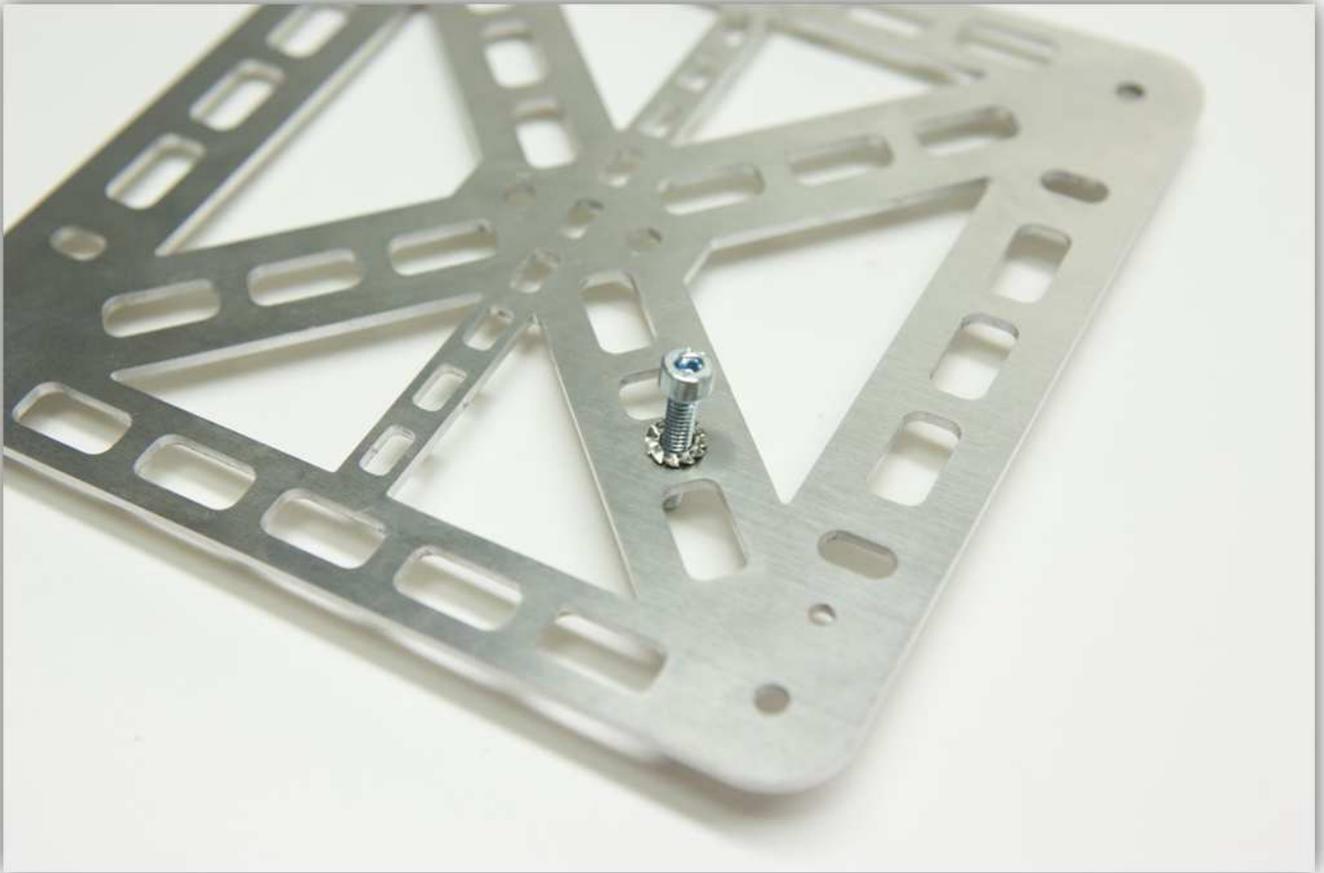
Take the bag labelled with 5 out of the box, you should have these parts. Notice the plastic piece (ADJUST SCREW BRACKET), you can find this in the bag containing the plastic parts.



Also take 4 pieces (BEARING CLAMP Y) as shown in the picture below out of the bag containing the plastic parts:



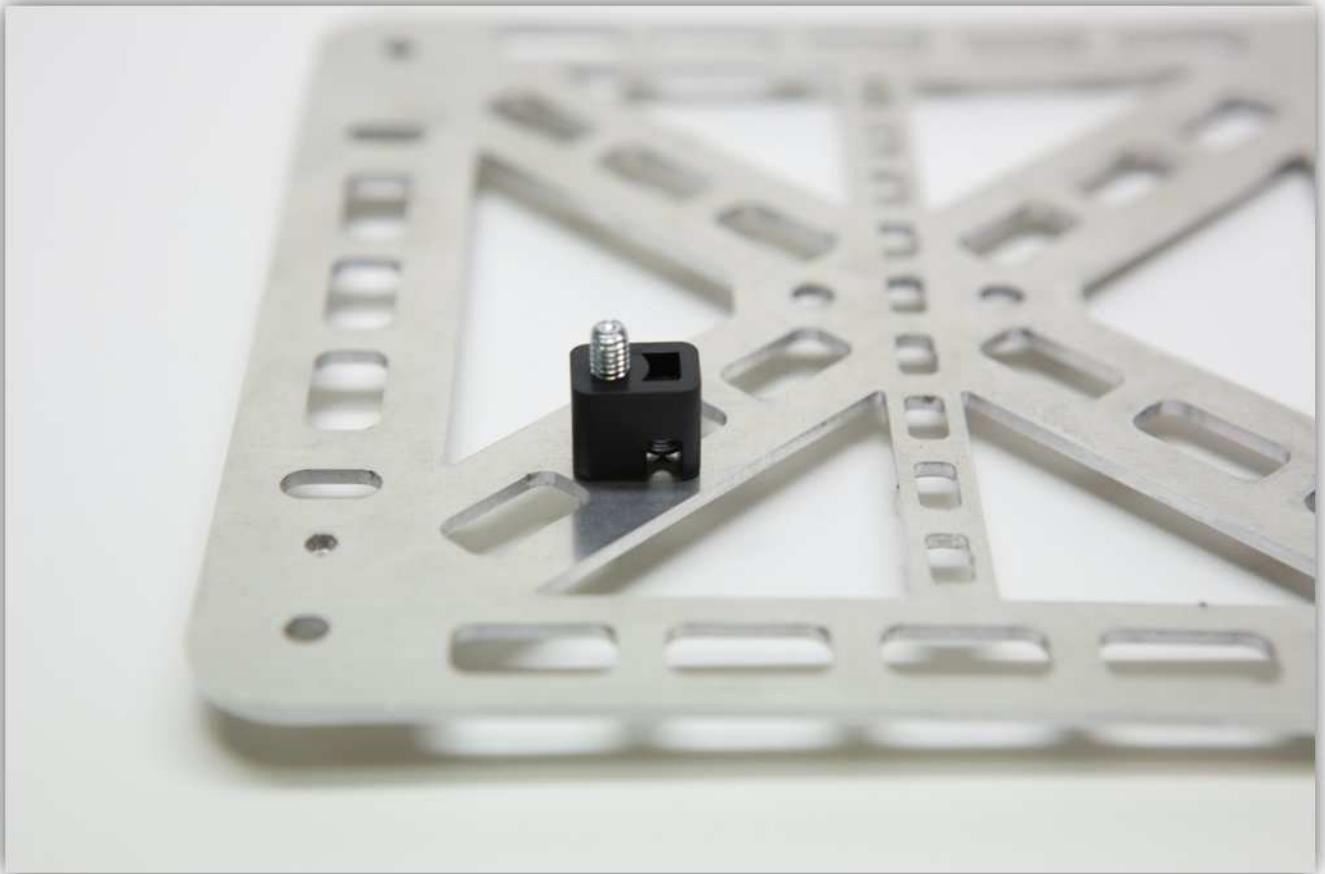
Insert the M4 bolt with an M4 toothed washer as shown in the BED SUPPORT plate (smaller aluminium plate). **Notice the orientation of the aluminium plate. Make sure it is exactly as in the picture.**



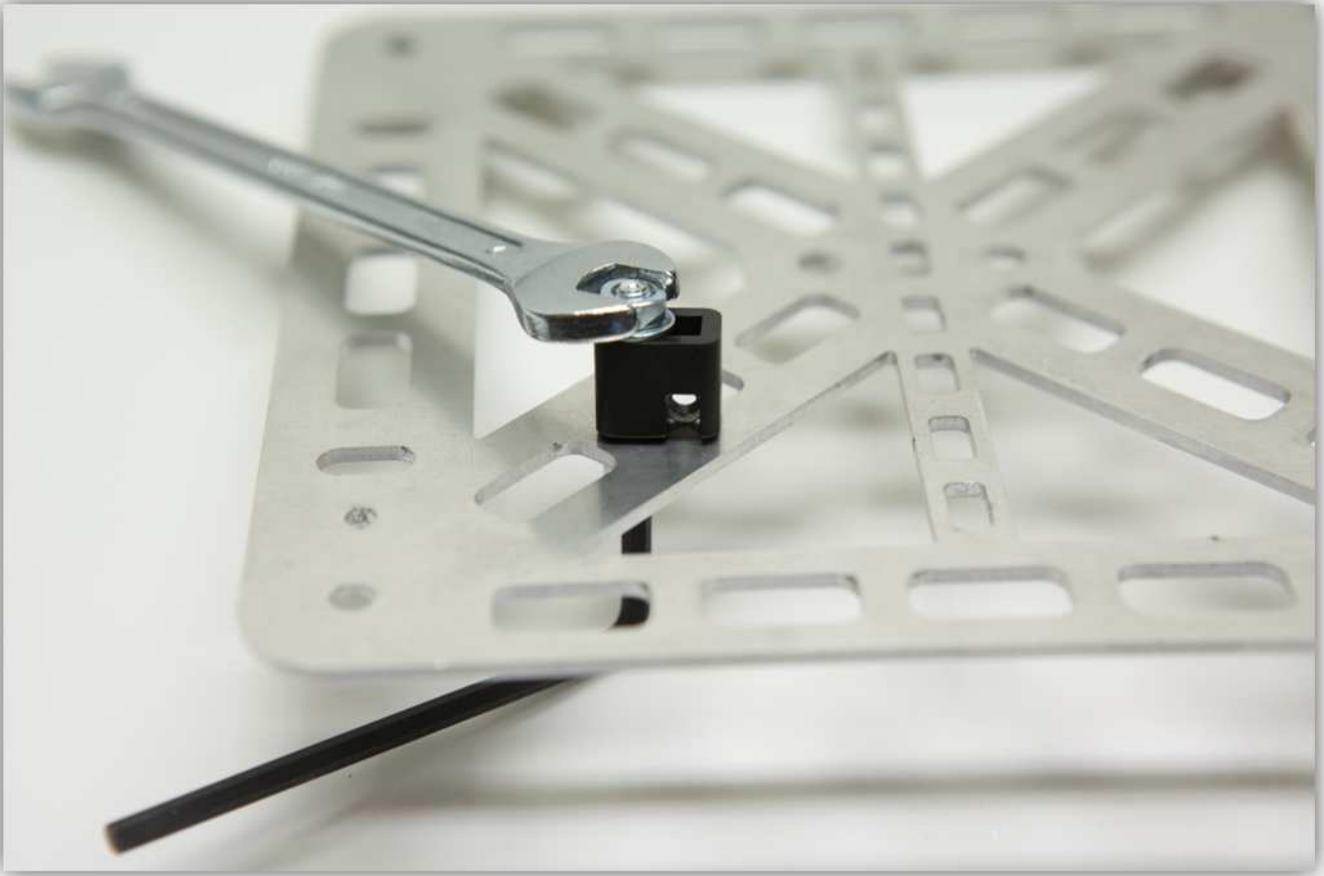
Insert a small M3 nut inside the ADJUST SCREW BRACKET:



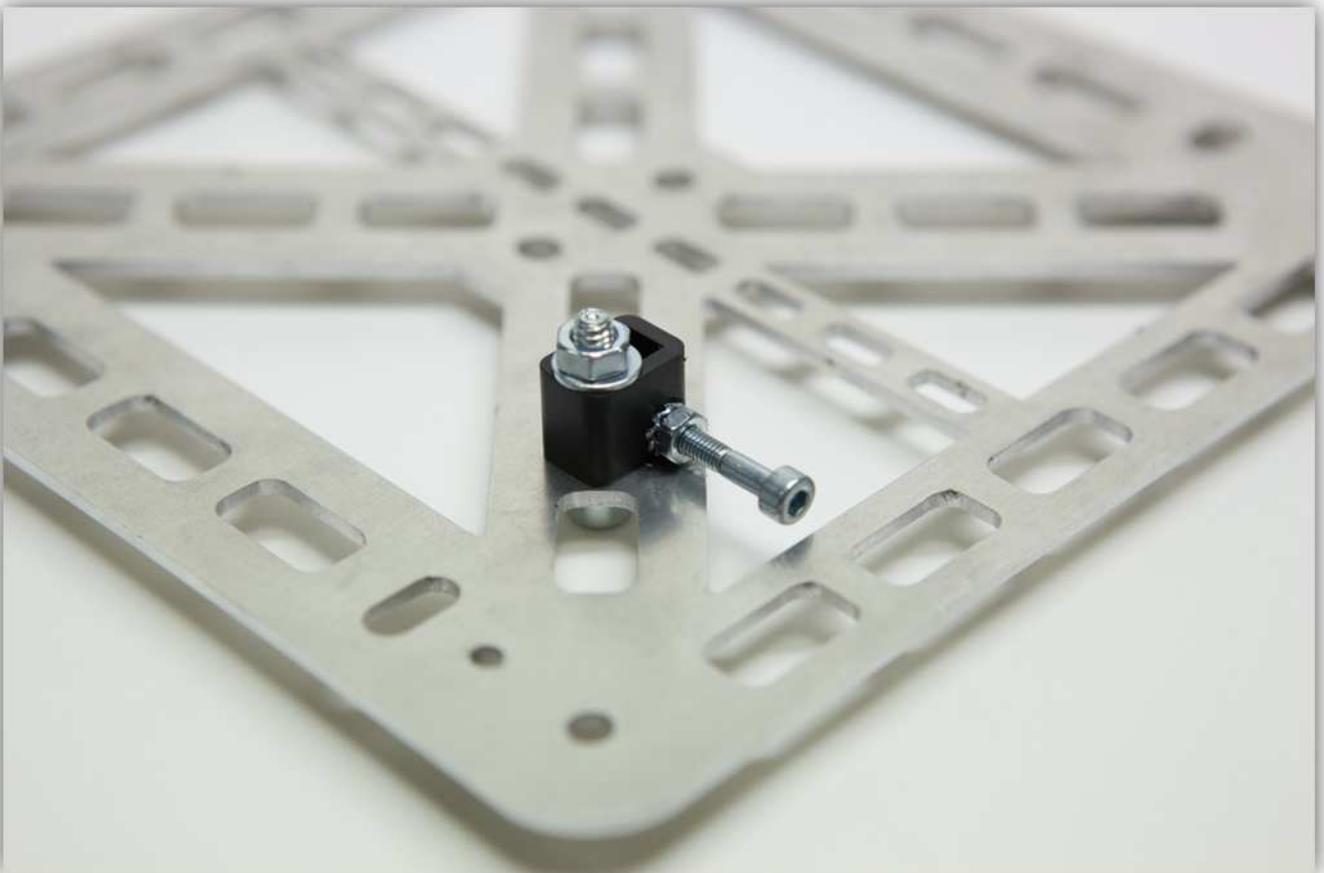
Place this over the M4 bolt. **Notice the orientation of the BED SUPPORT plate. Make sure it is exactly as in the picture.**



Place a M4 washer and an M4 nut on the bolt and tighten everything.



Screw the long M3 bolt with an M3 toothed washer and an M3 nut in the ADJUST SCREW BRACKET as shown in the picture:



Slide an LM8UU linear bearing in the BEARING CLAMP Y piece as shown in the picture



Repeat this 3 more times:

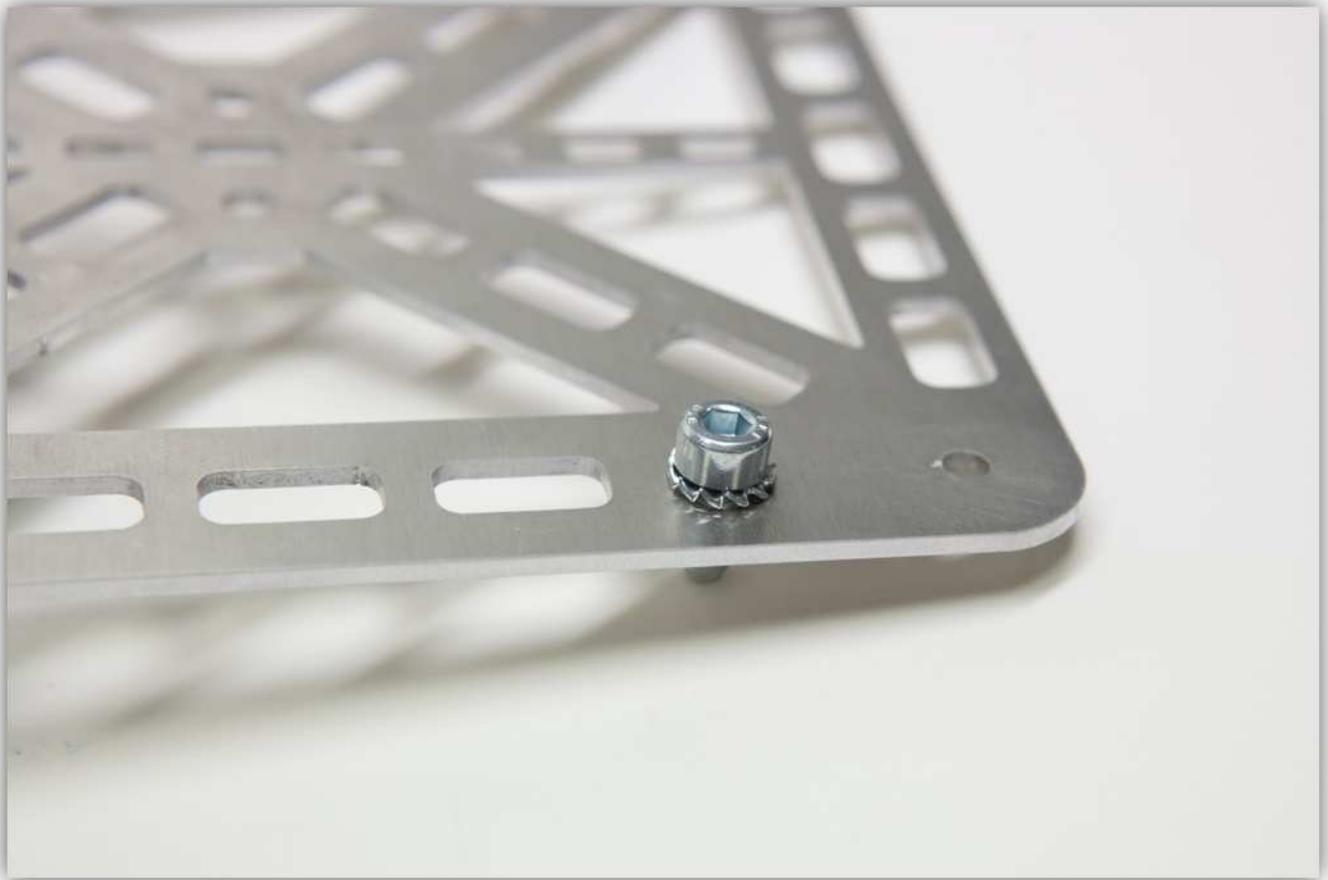


Use the circlip pliers to carefully fit the circlip around the LM8UU linear bearing.

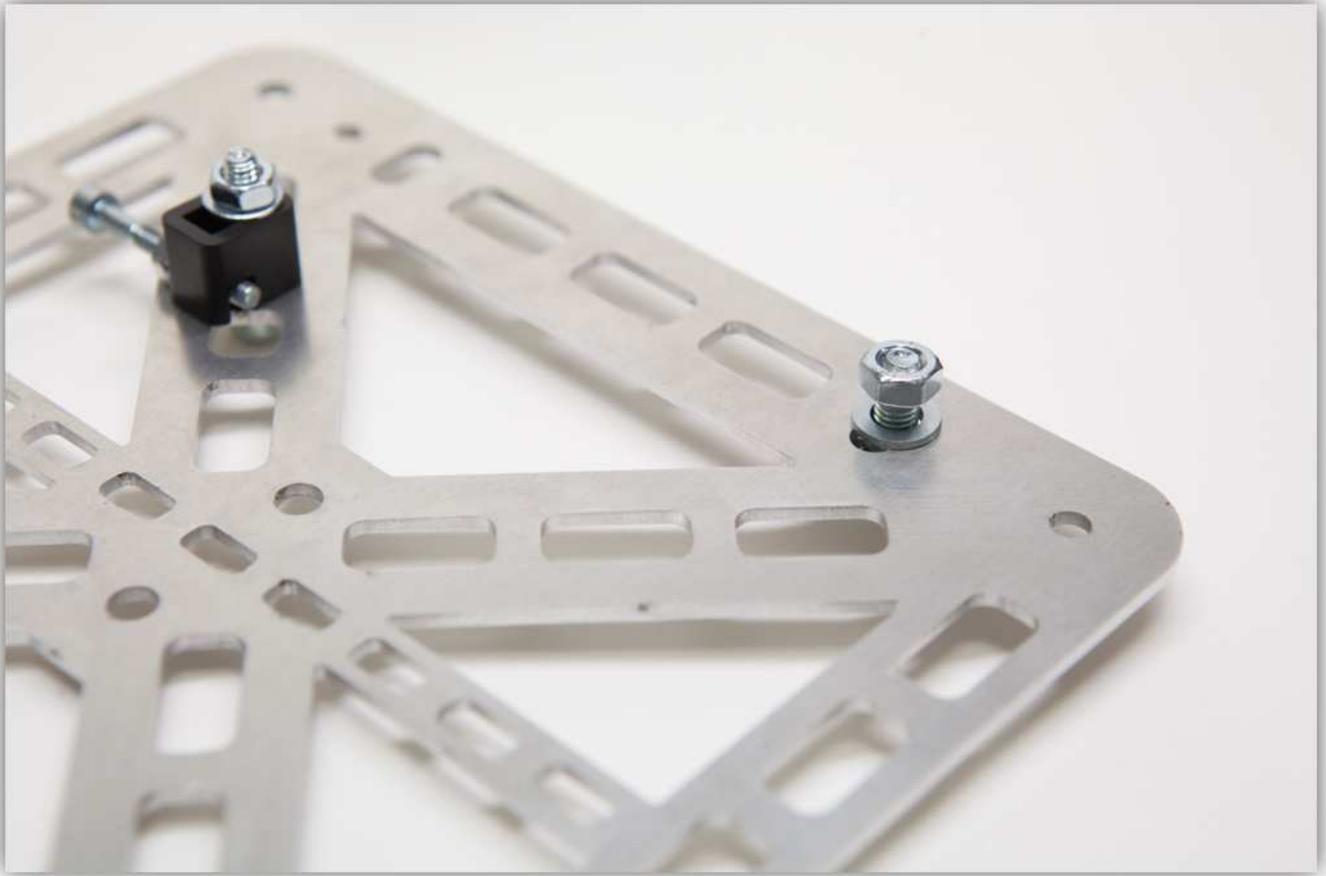




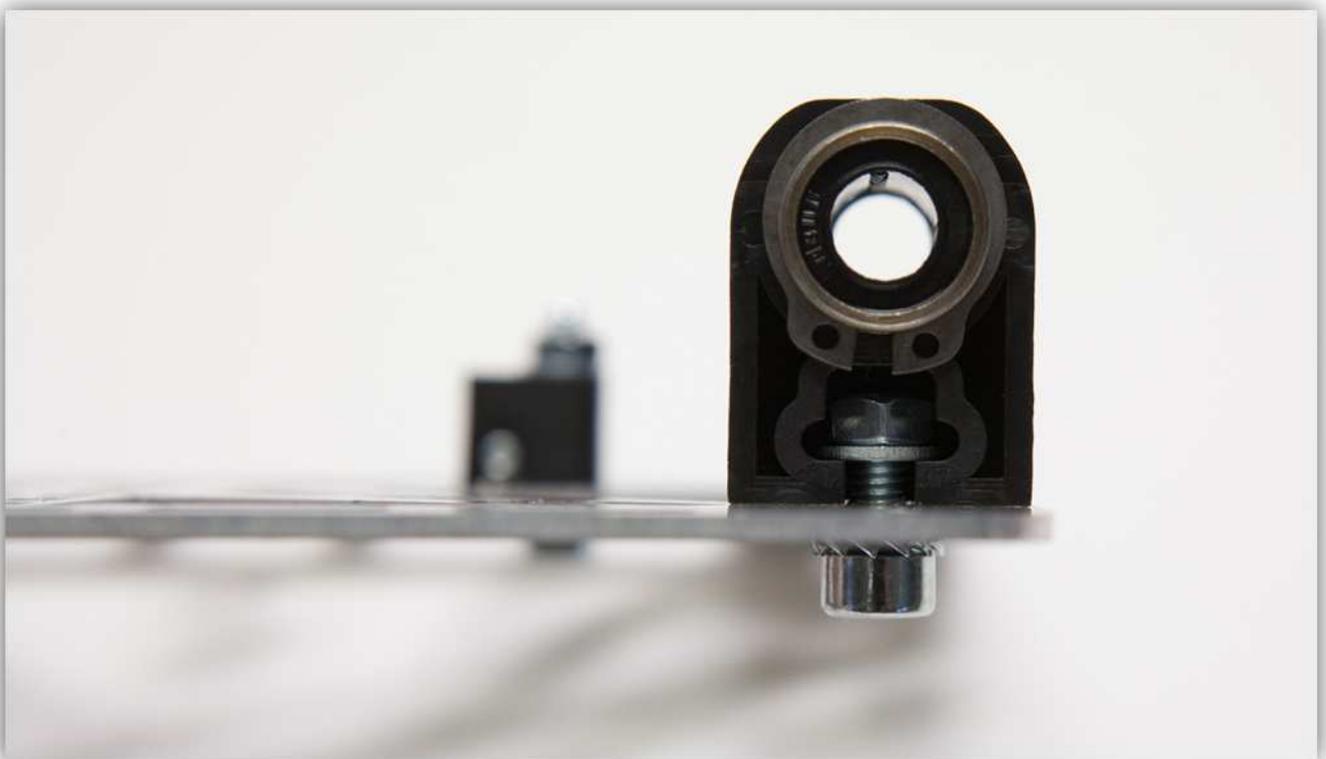
Take an M5 bolt and an M5 toothed washer and insert them in the BED SUPPORT plate as follows:



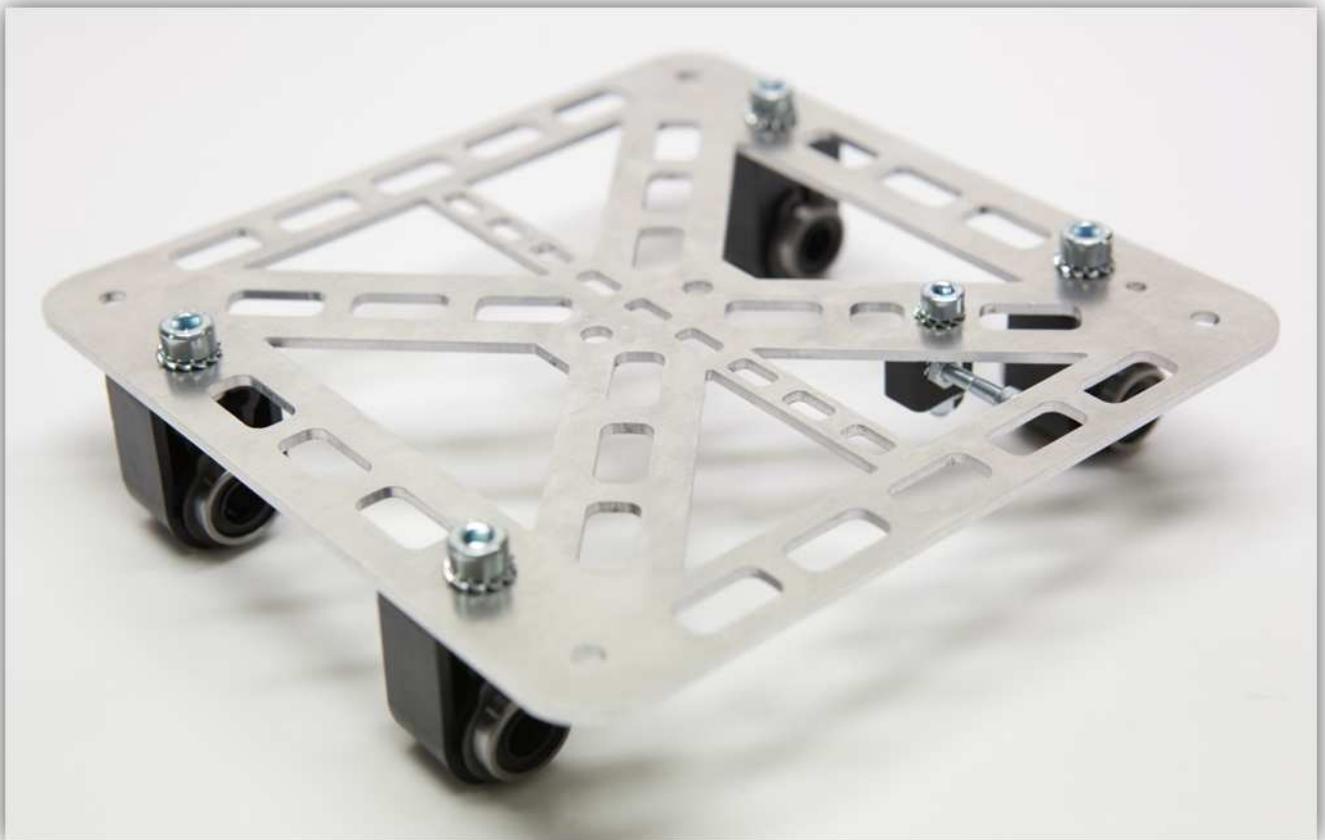
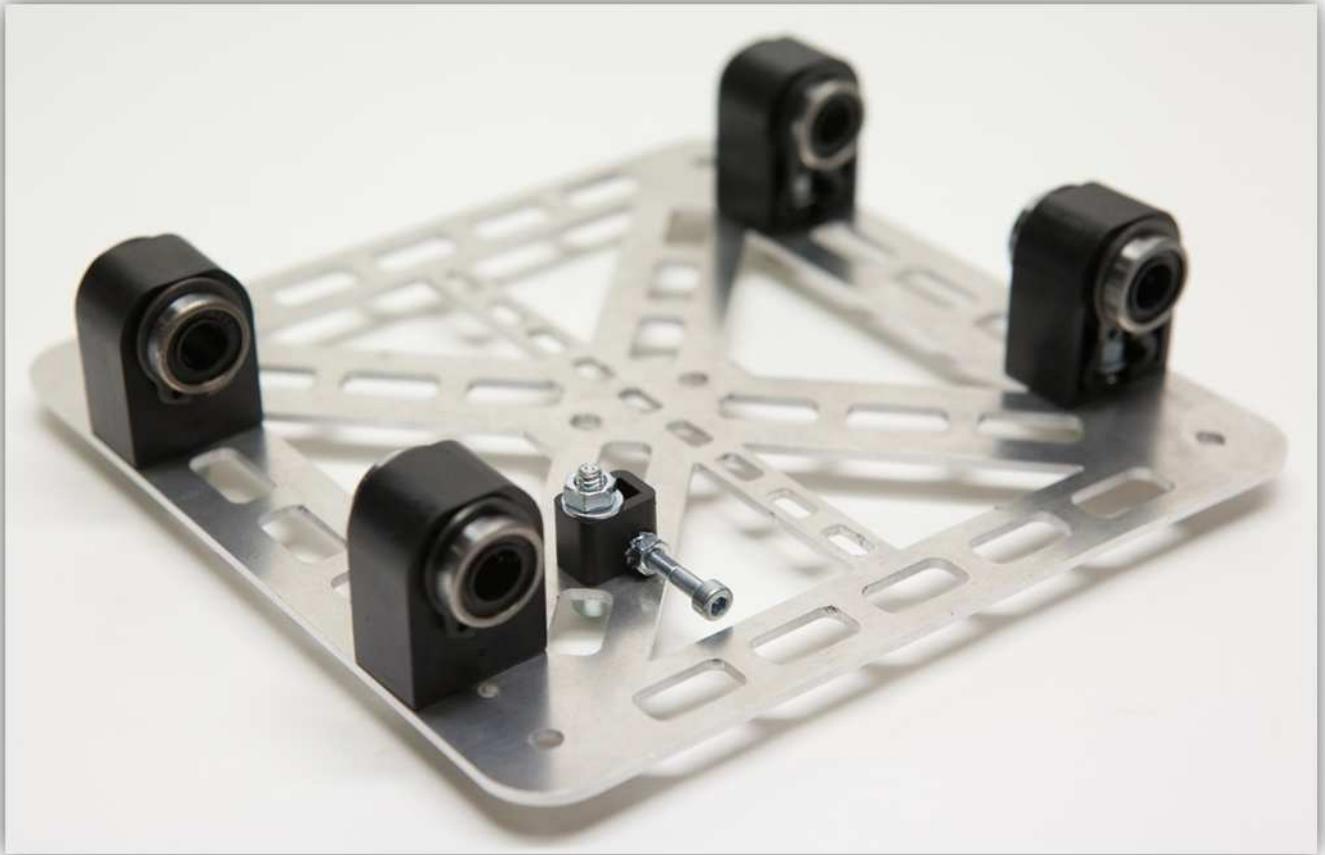
Flip the plate and use an M5 washer and an M5 bolt. **Do not tighten this nut.**



Slide a BEARING CLAMP Y piece over the washer and bolt as follows.



Repeat this process 3 more times, the assembly should look like this:



This piece will be referred as the BED SUPPORT CARRIAGE later in the manual.

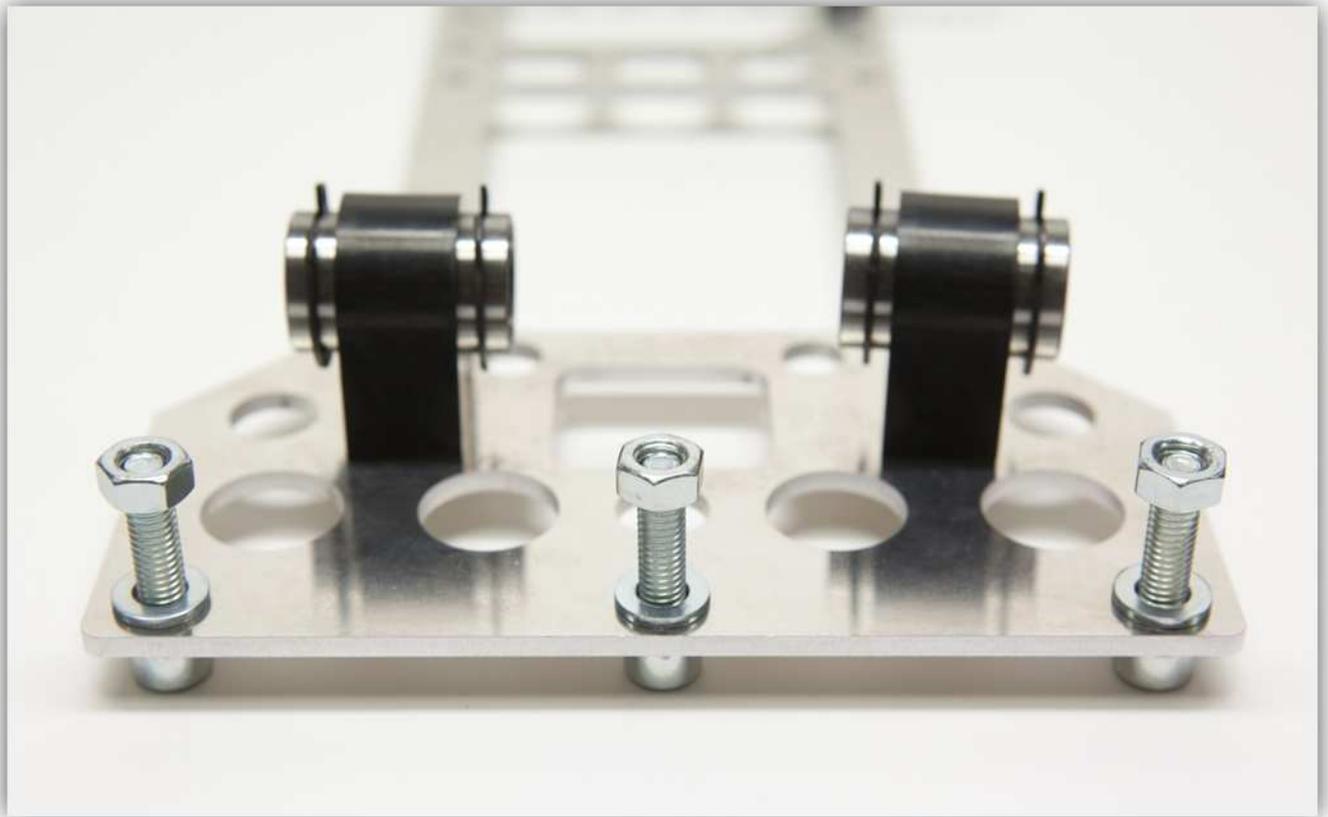
Take these pieces (BIG Y ROD CLAMP, Y ROD CLAMP RIGHT and Y ROD CLAMP LEFT) as shown in the picture below out of the bag containing the plastic parts:

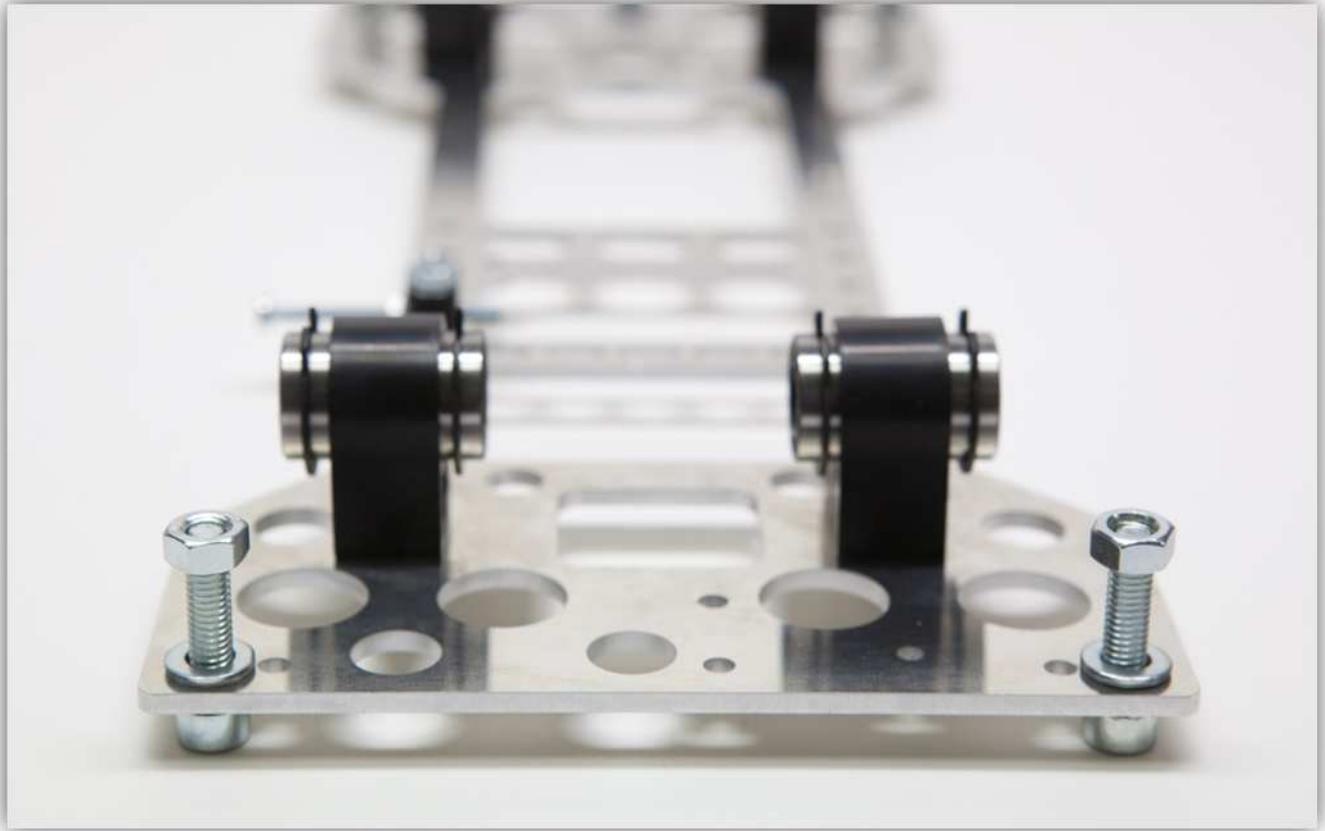


Take the bag labelled with 6 out of the box, you should have these parts:



Use the long M6 bolts with M6 toothed washers as follows:





Slide the BIG Y ROD CLAMP part over the bolts and washer on the side with the 3 M6 bolts:



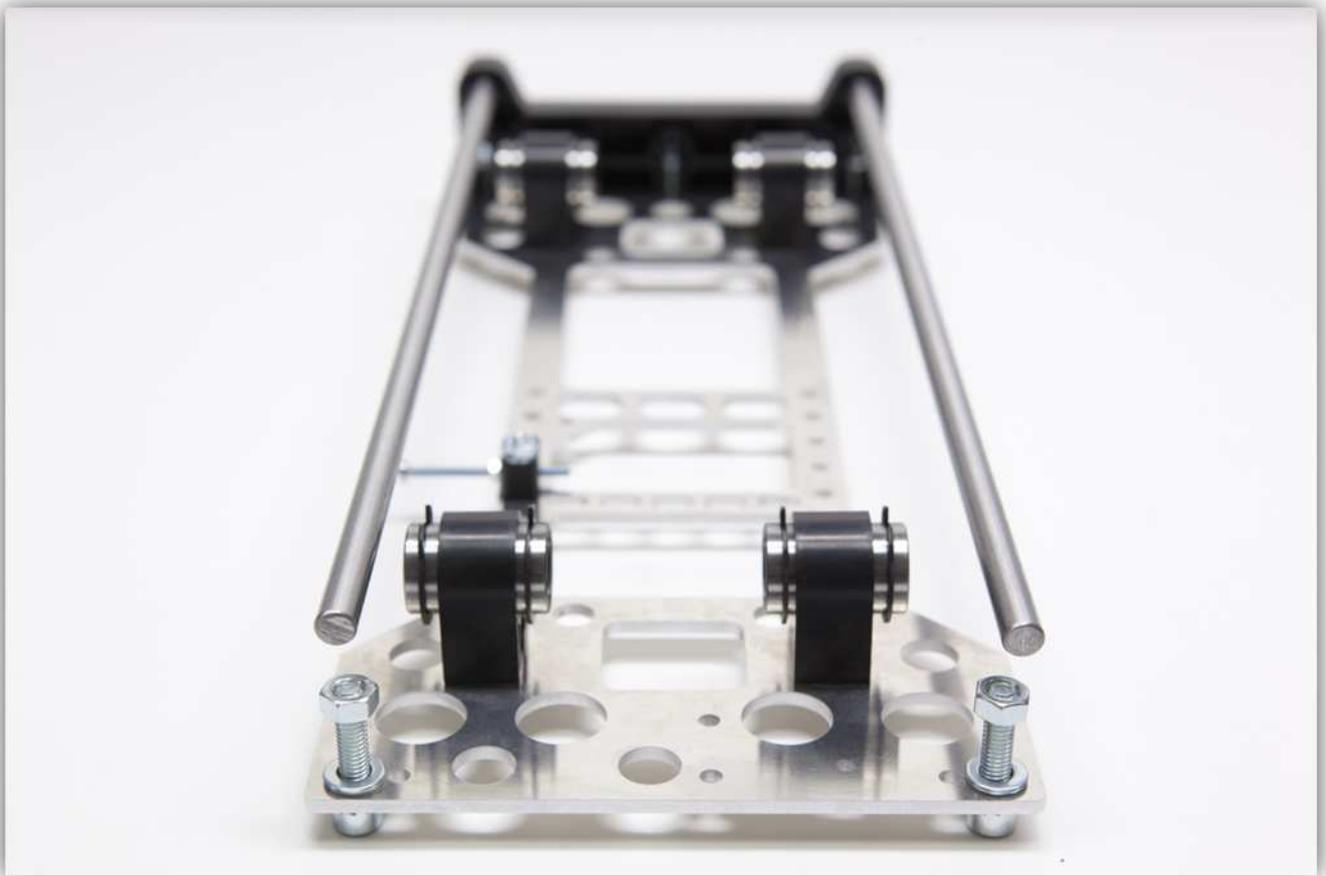
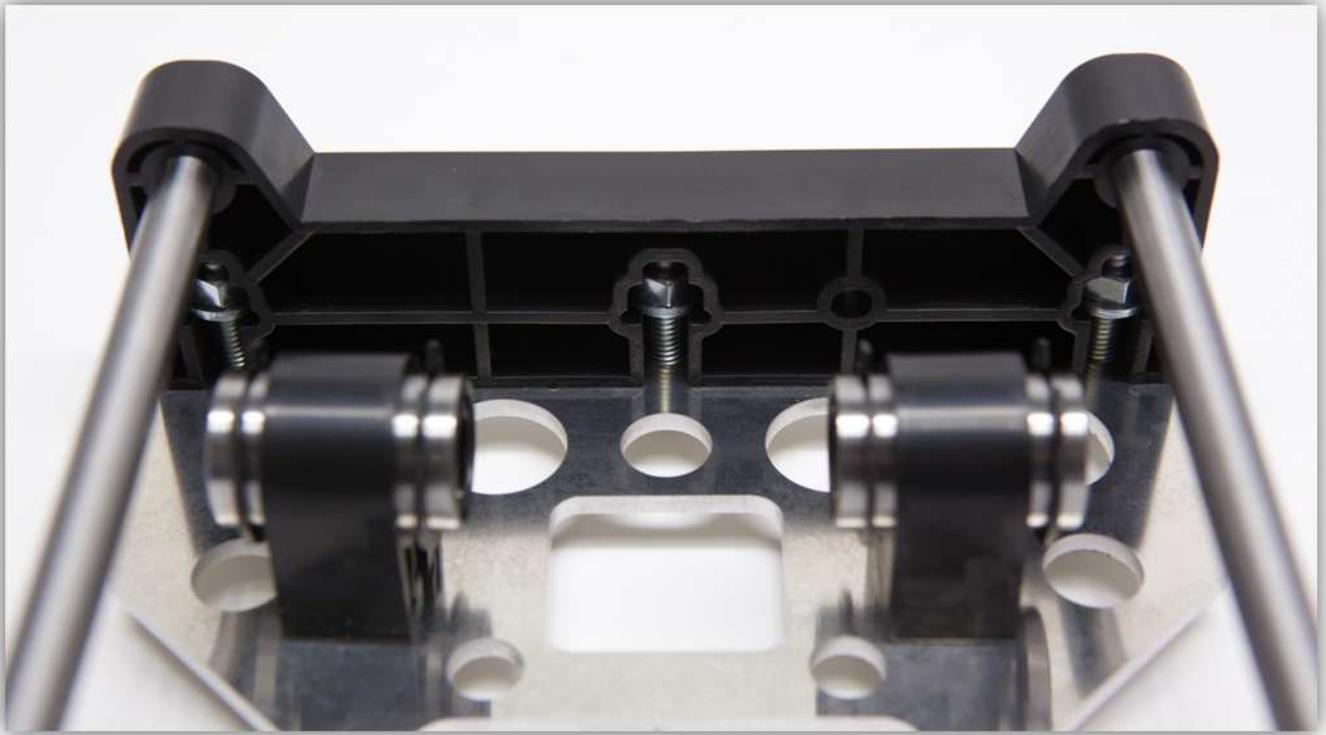
Tighten the 3 M6 bolts.



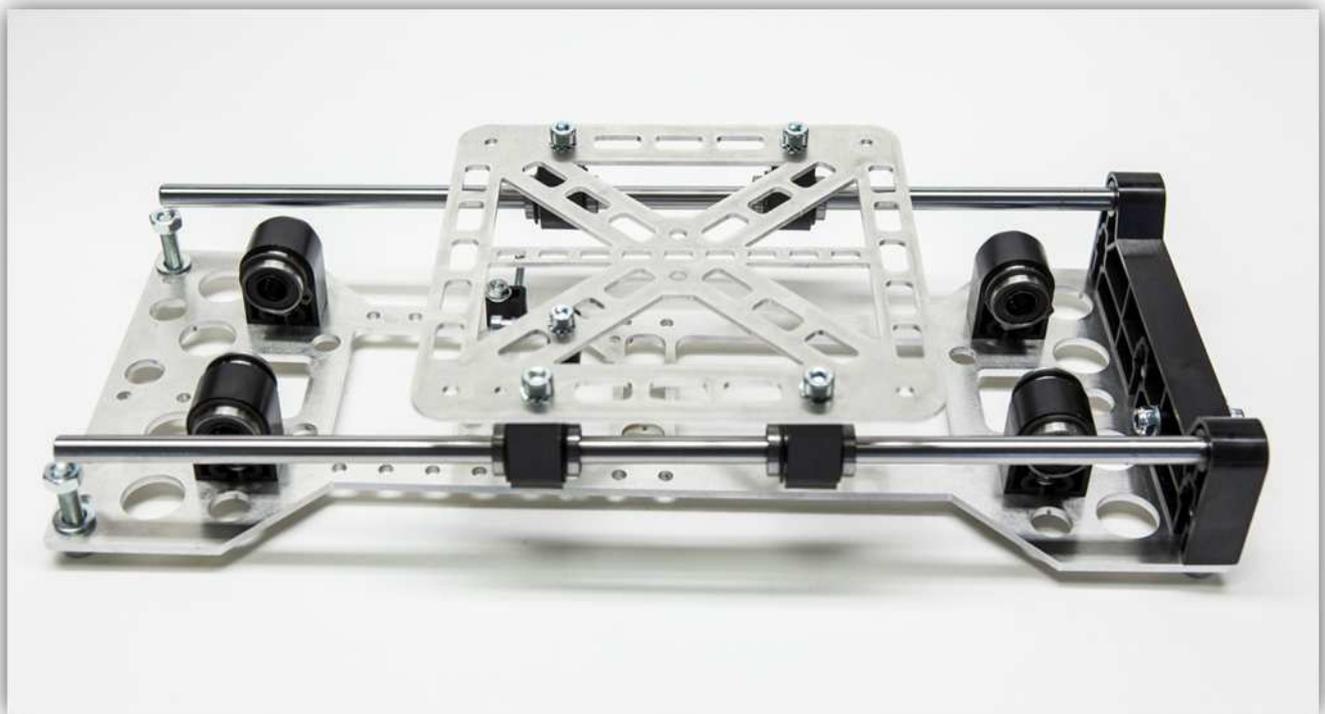
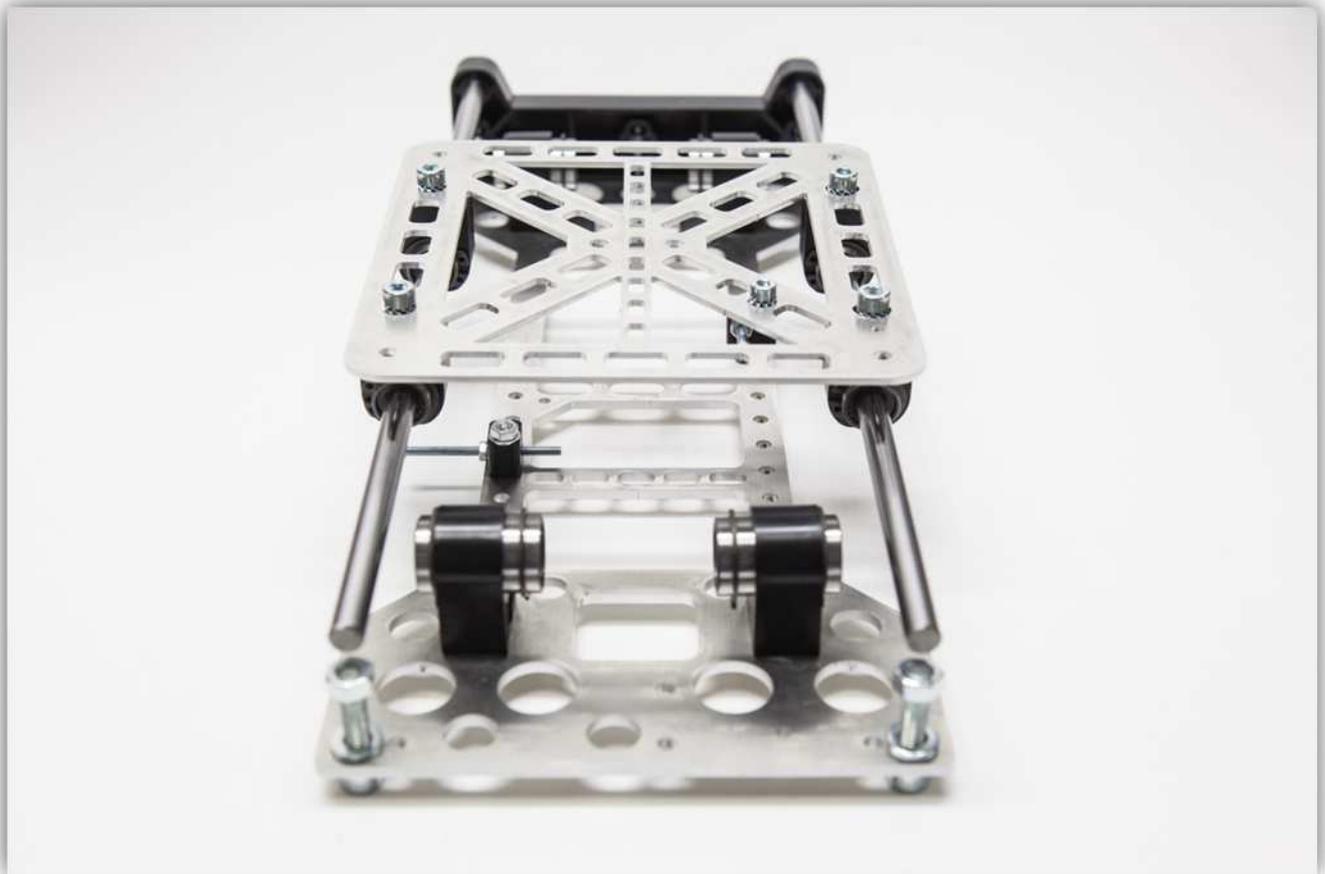
Out of the bag labelled with 7 get two smooth rods with a diameter of 8 mm (0.31") and a length of 32.5 cm (12.8").



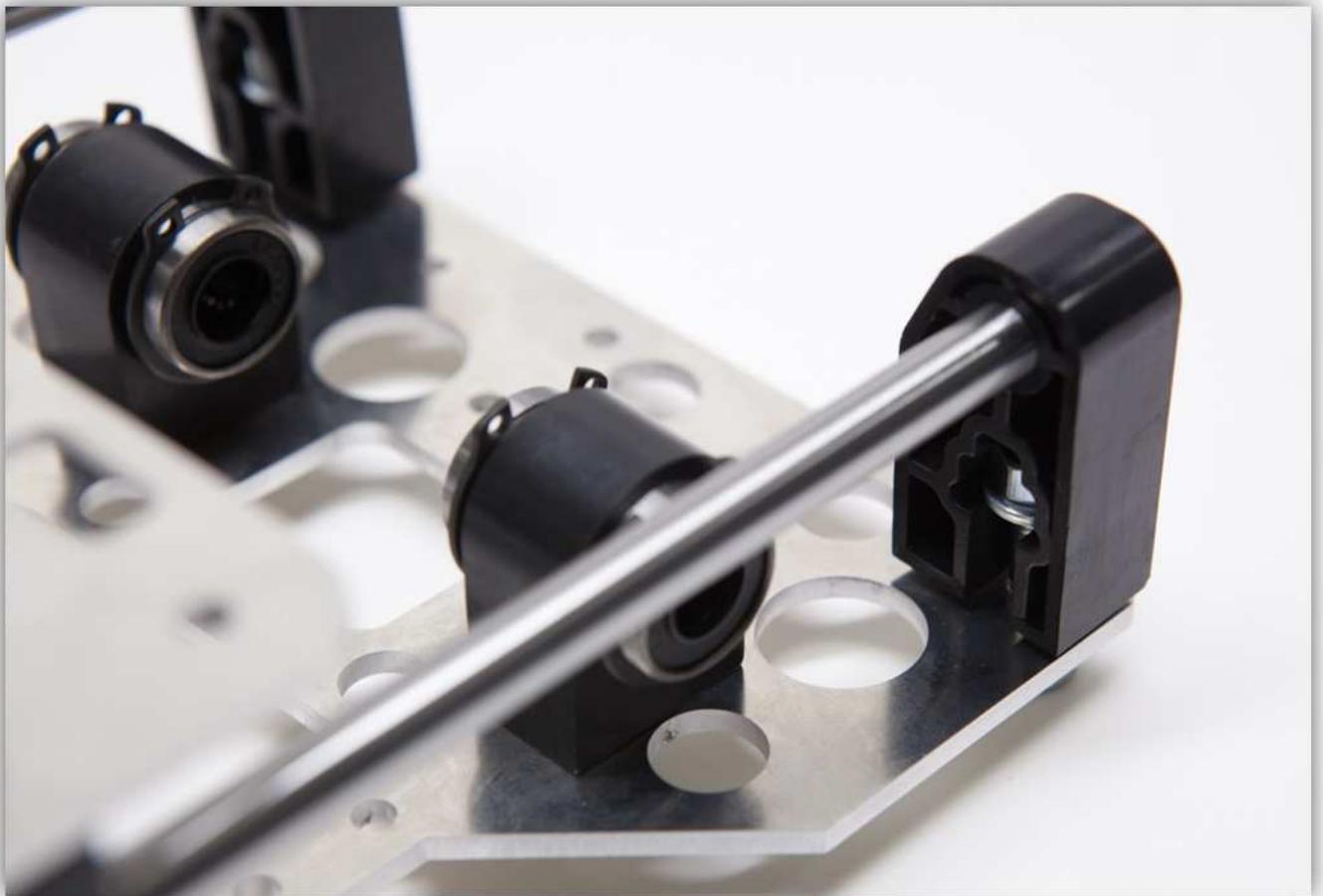
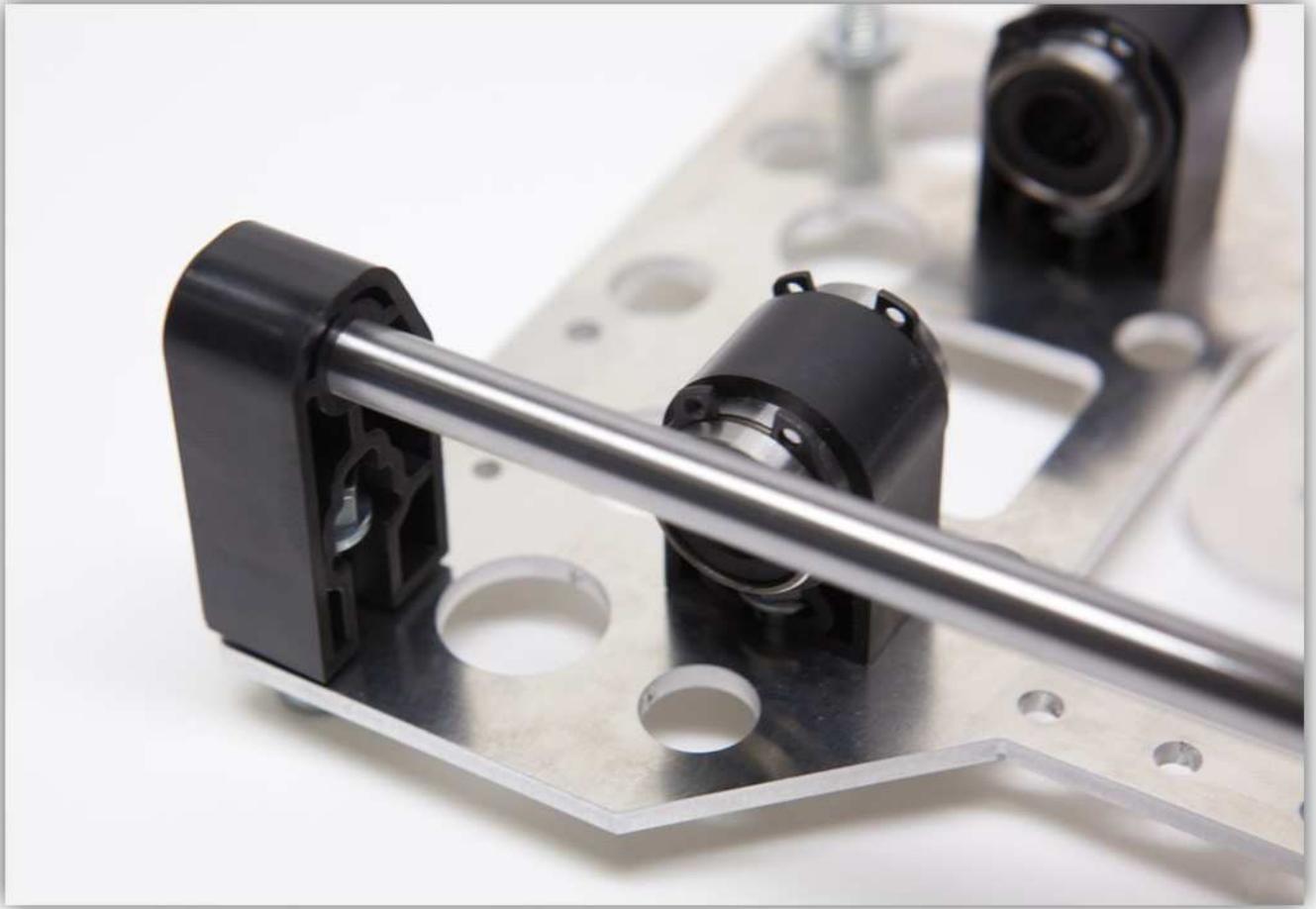
Slot the two rods in the BIG Y ROD CLAMP part.



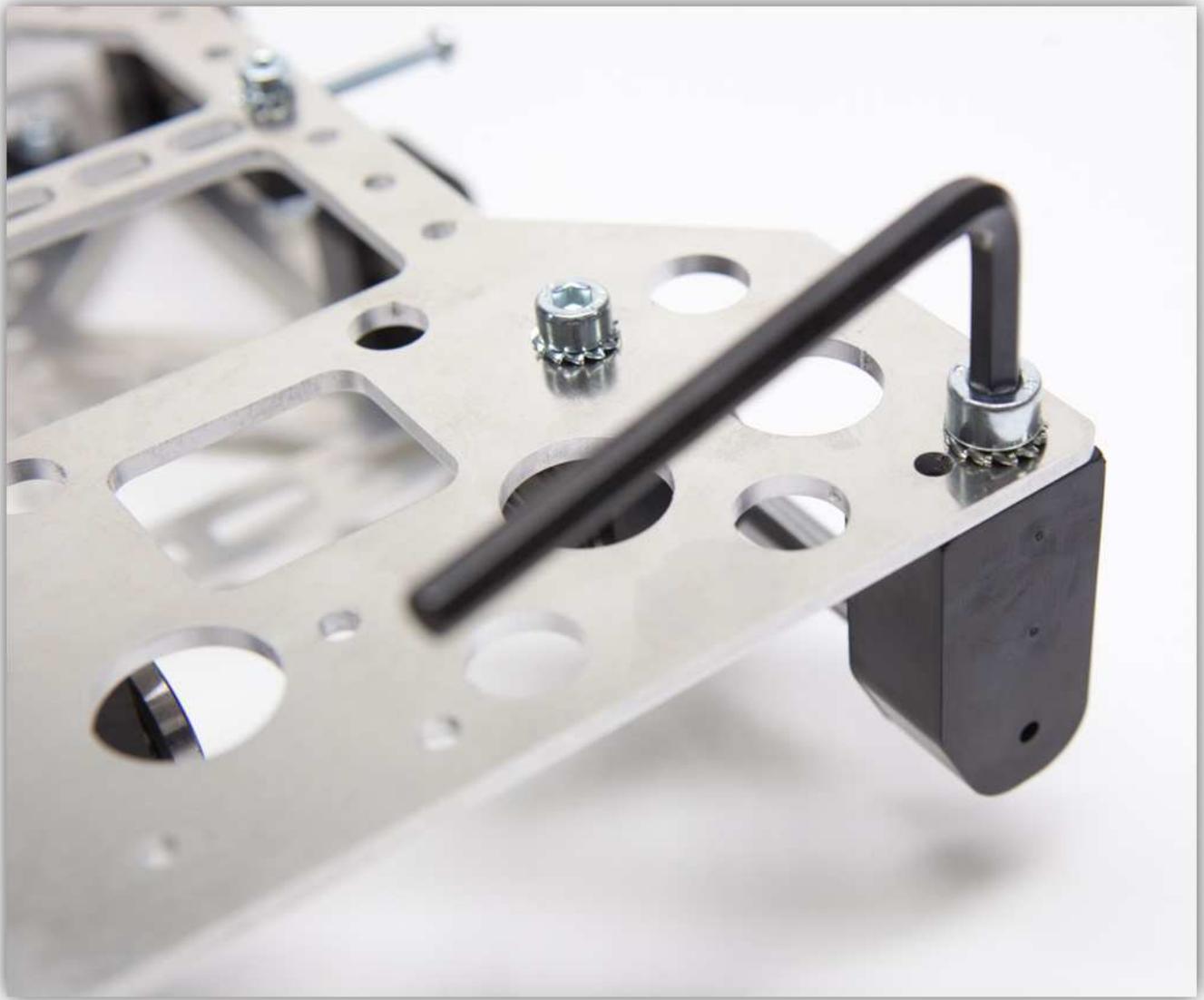
Slide the BED SUPPORT CARRIAGE over these two rods. **Notice the orientation.**



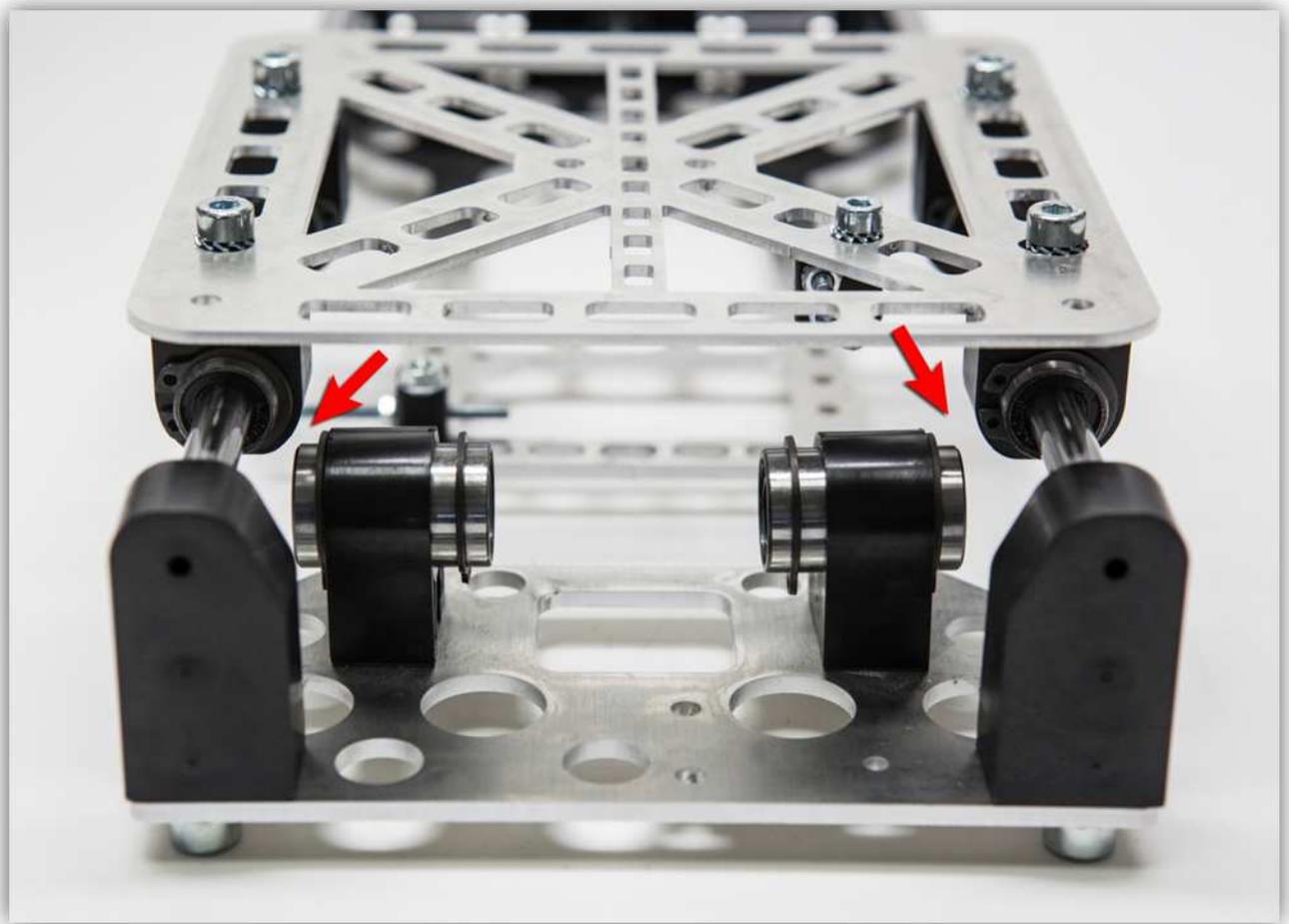
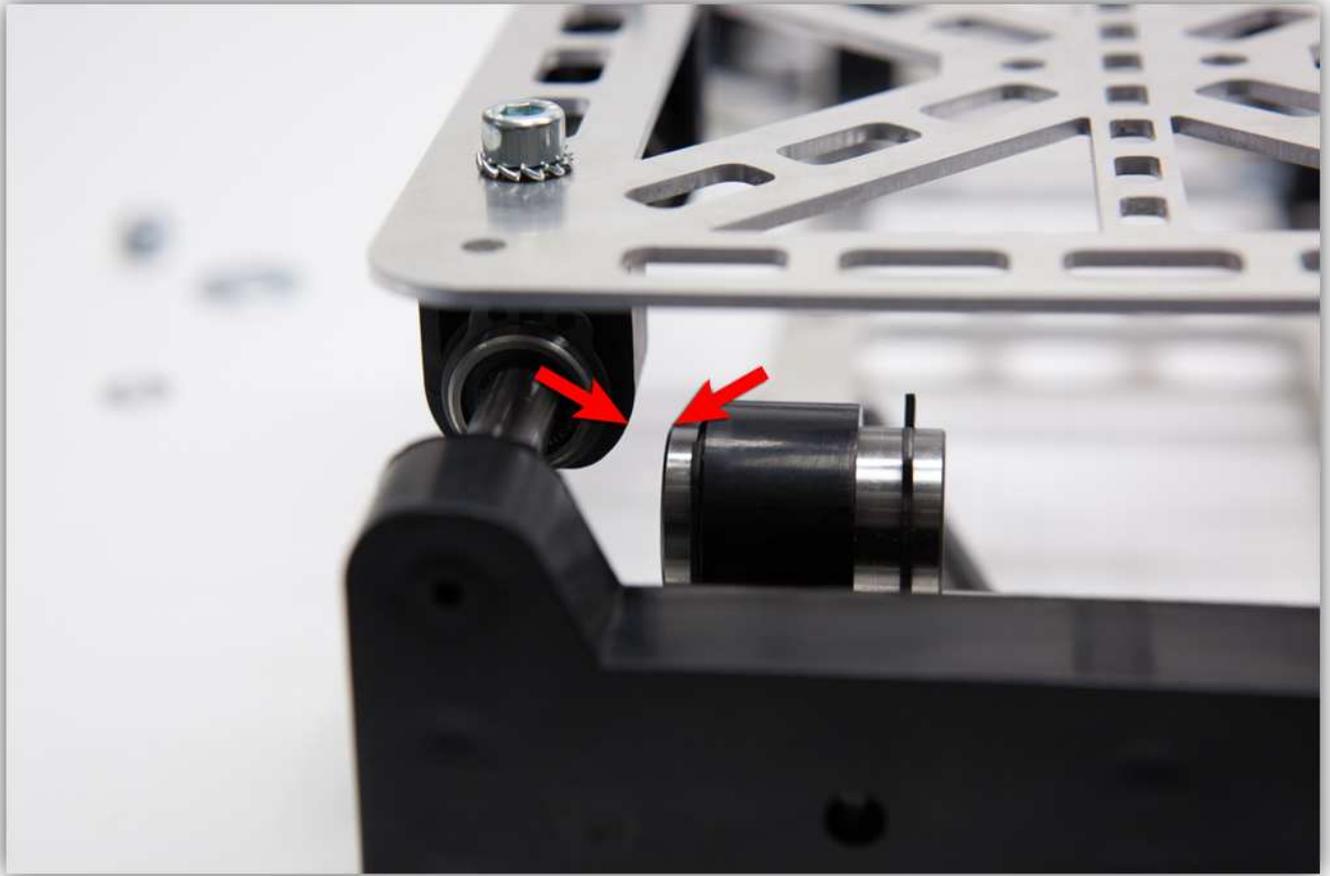
Slide the two smaller plastic pieces (Y ROD CLAMP LEFT and Y ROD CLAMP RIGHT) over the bolt and washer and make sure that the rods slot nicely in these parts.



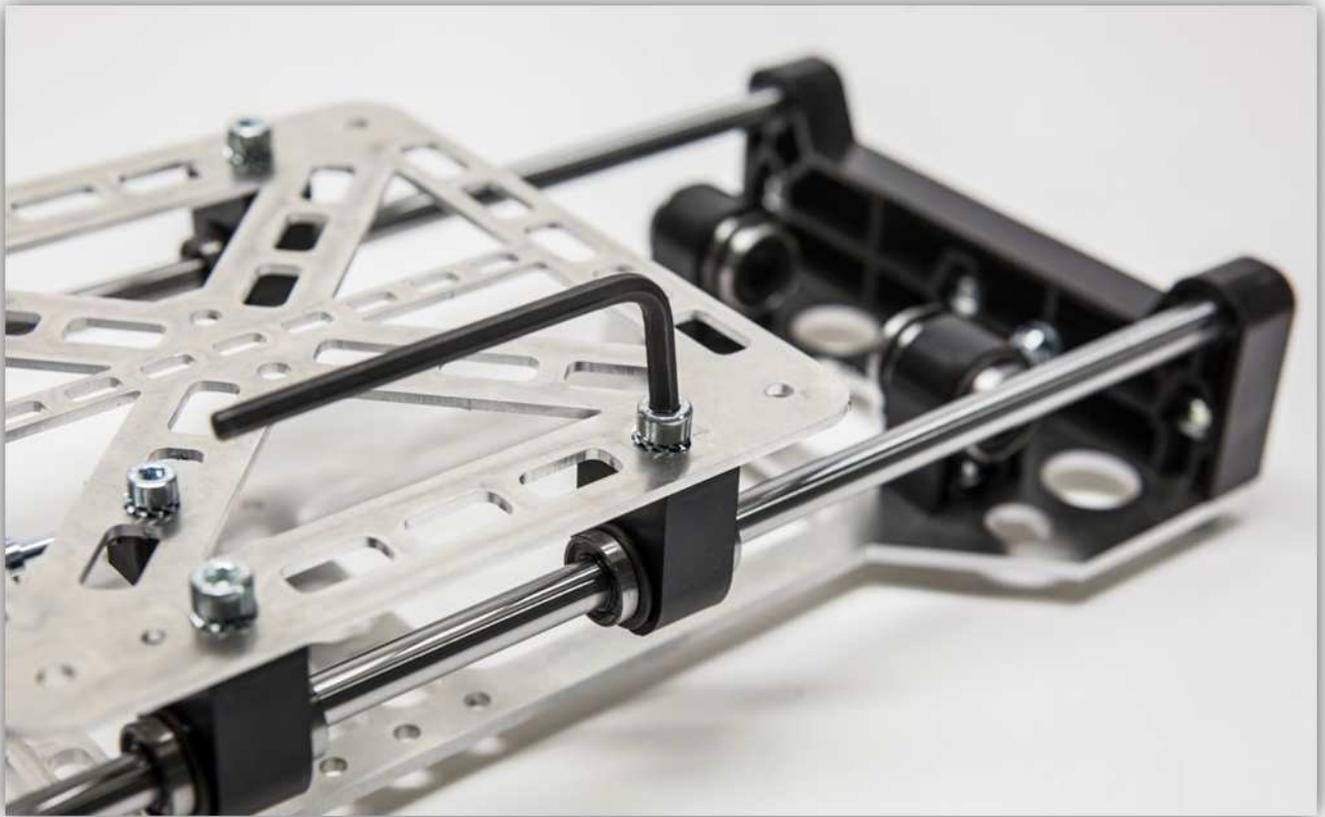
Tighten these bolts firmly.



Make sure there is enough clearance between the points marked with a red arrow.



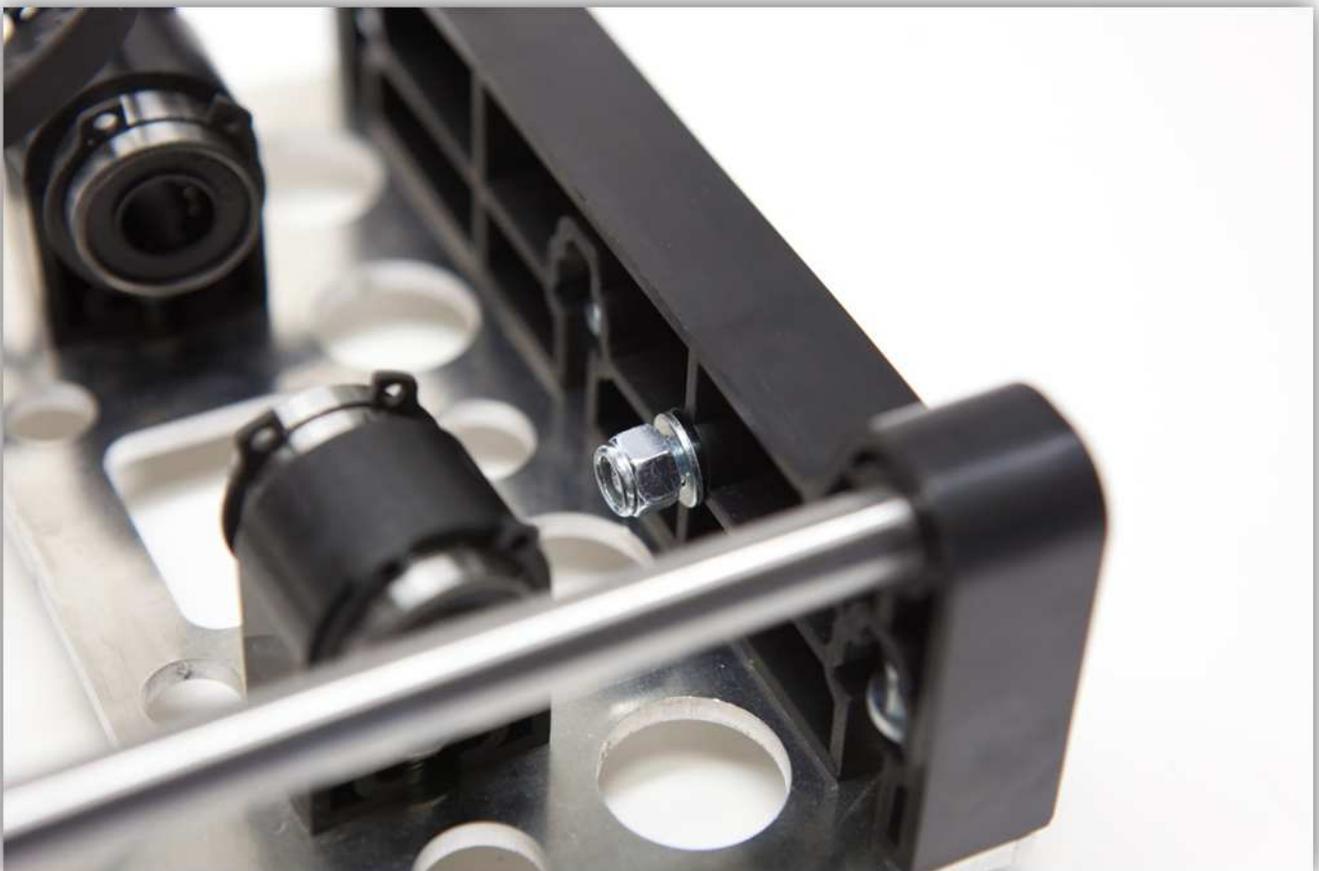
Now while moving the BED PLATE SUPPORT CARRIAGE left and right you can tighten the bolts that keep the LM8UU linear bearings in place. Ensure a smooth motion while tensioning these bolts. When the motion is not fluid, loosen the bolts and start over tensioning them.



Use the M5 bolt and the large M5 washer as follows:



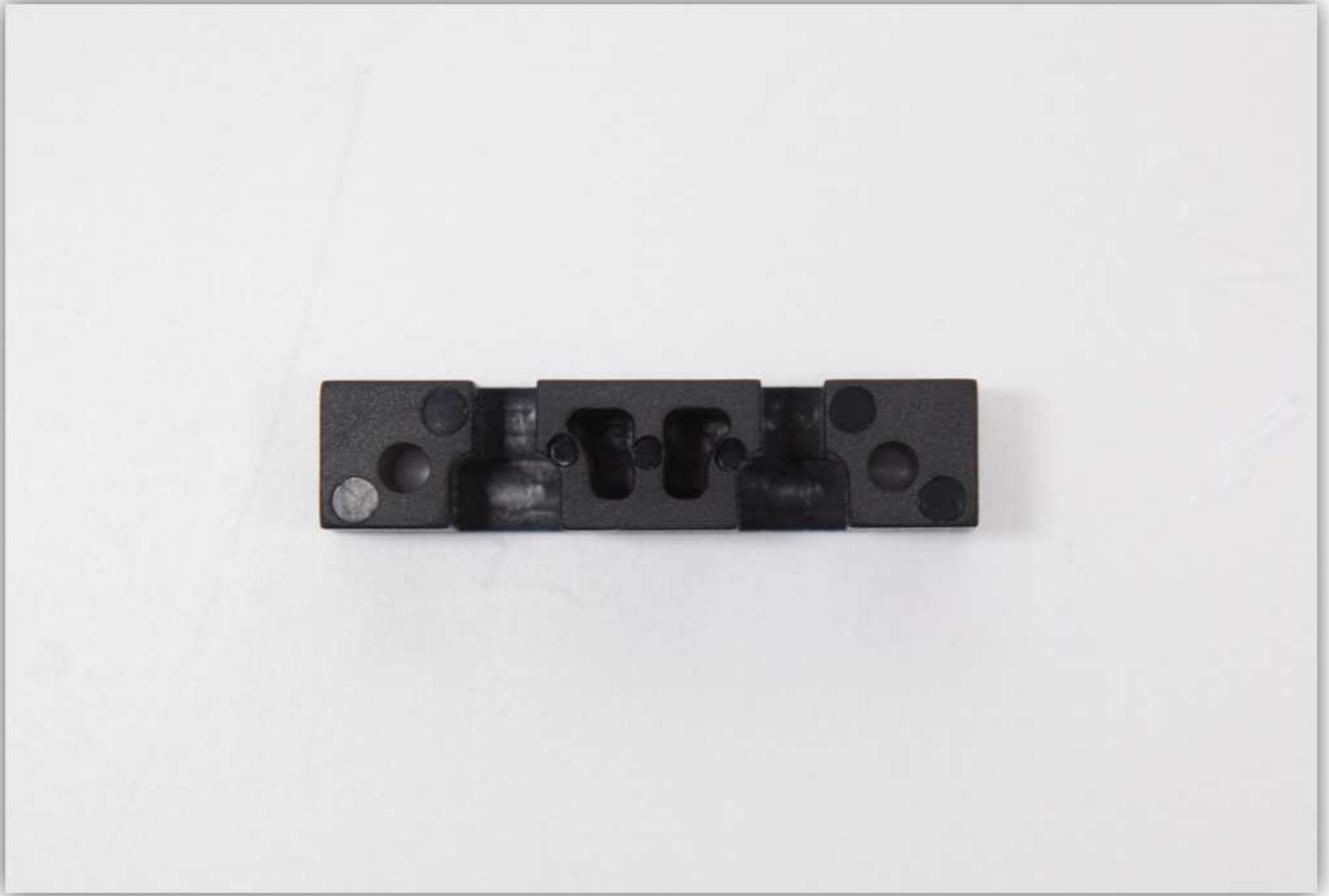
And the small M5 washer and an M5 locking nut on the other end. **Do not tighten the locking nut. Just put it on so it won't fall off. We will come back to this part in a few steps.**



Take the bag labelled with 8 out of the box, you should have these parts:



Search the piece (MOTOR MOUNT) as shown in the picture below out of the bag containing the plastic parts:



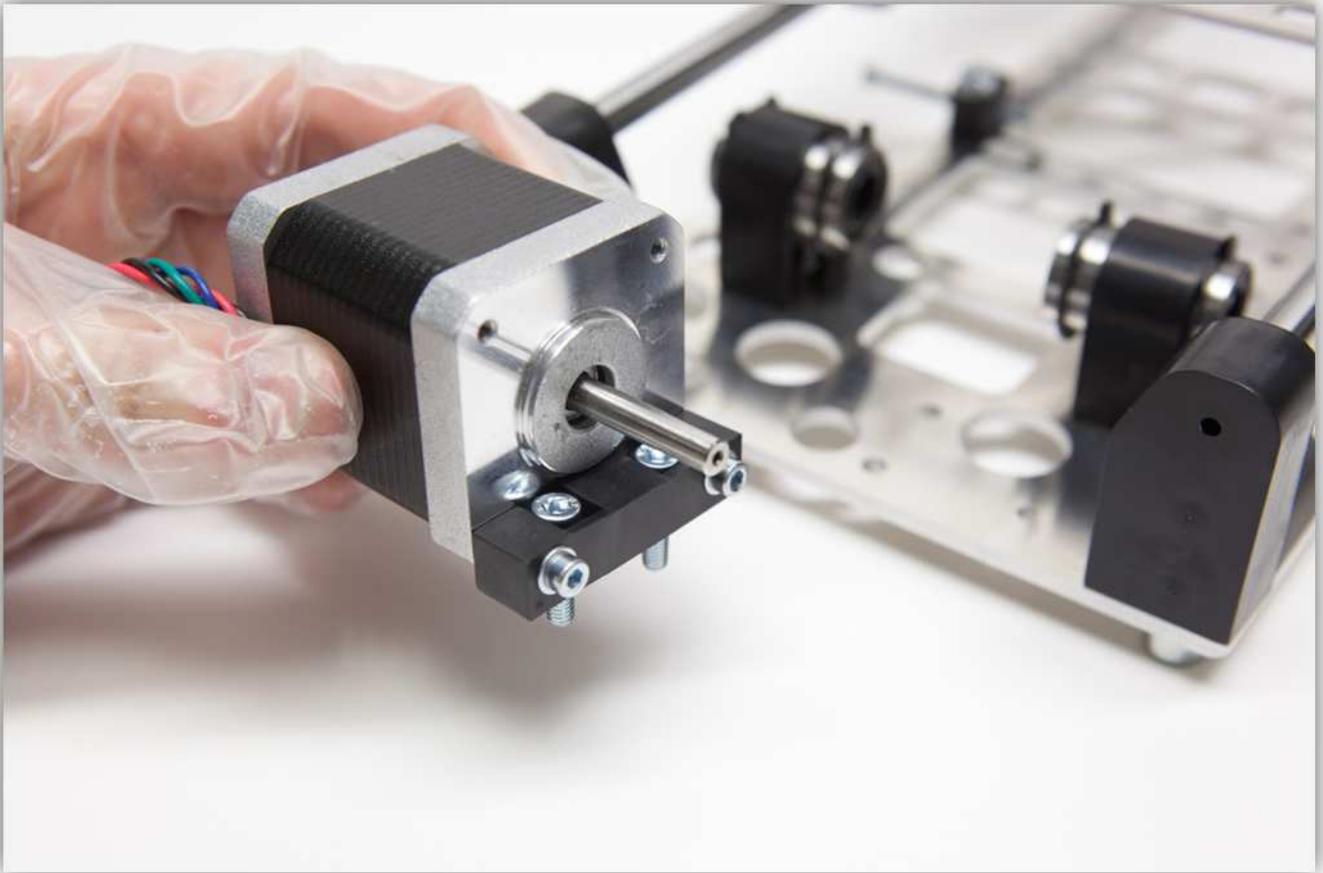
Take 1 motor out of the package labelled 9.



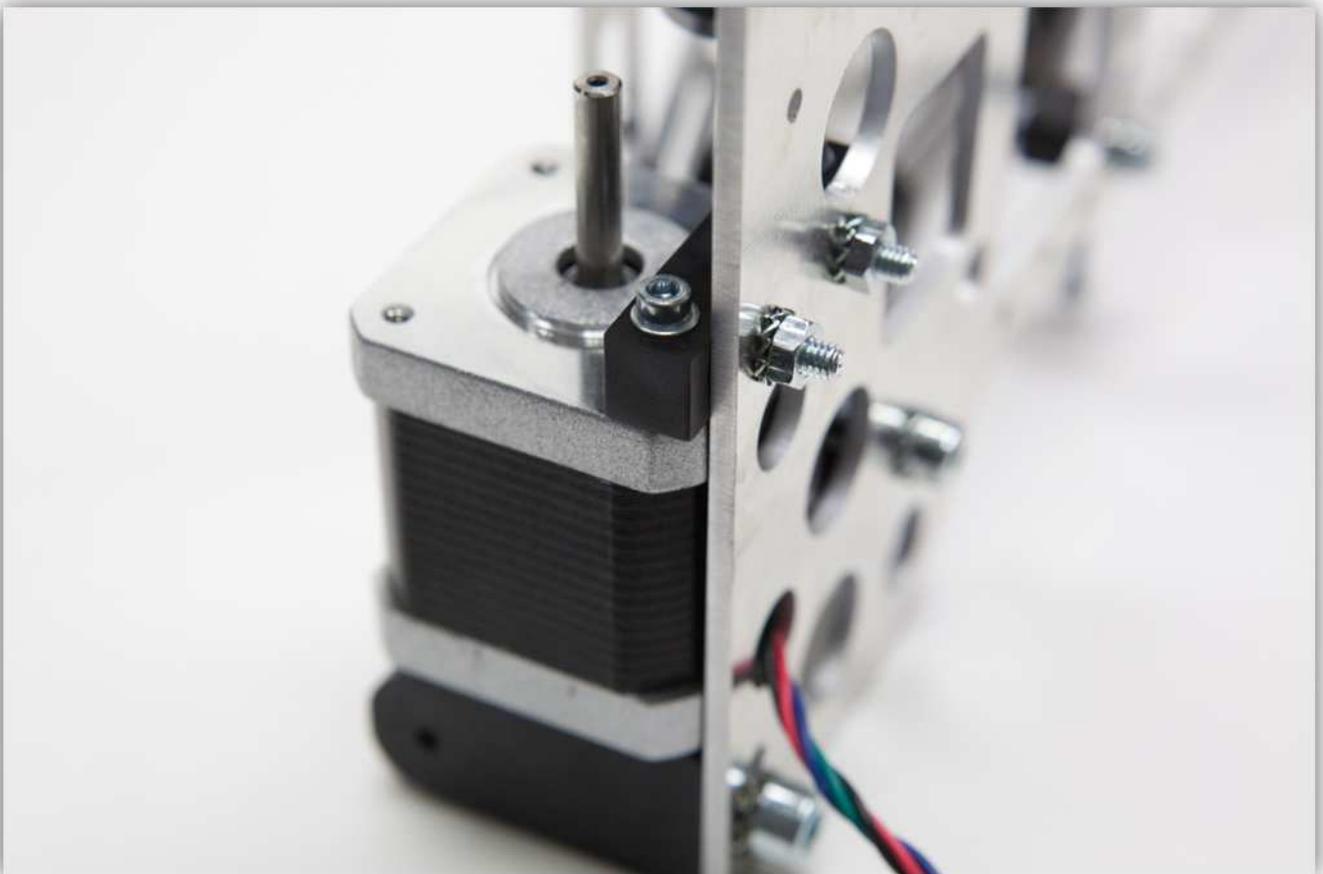
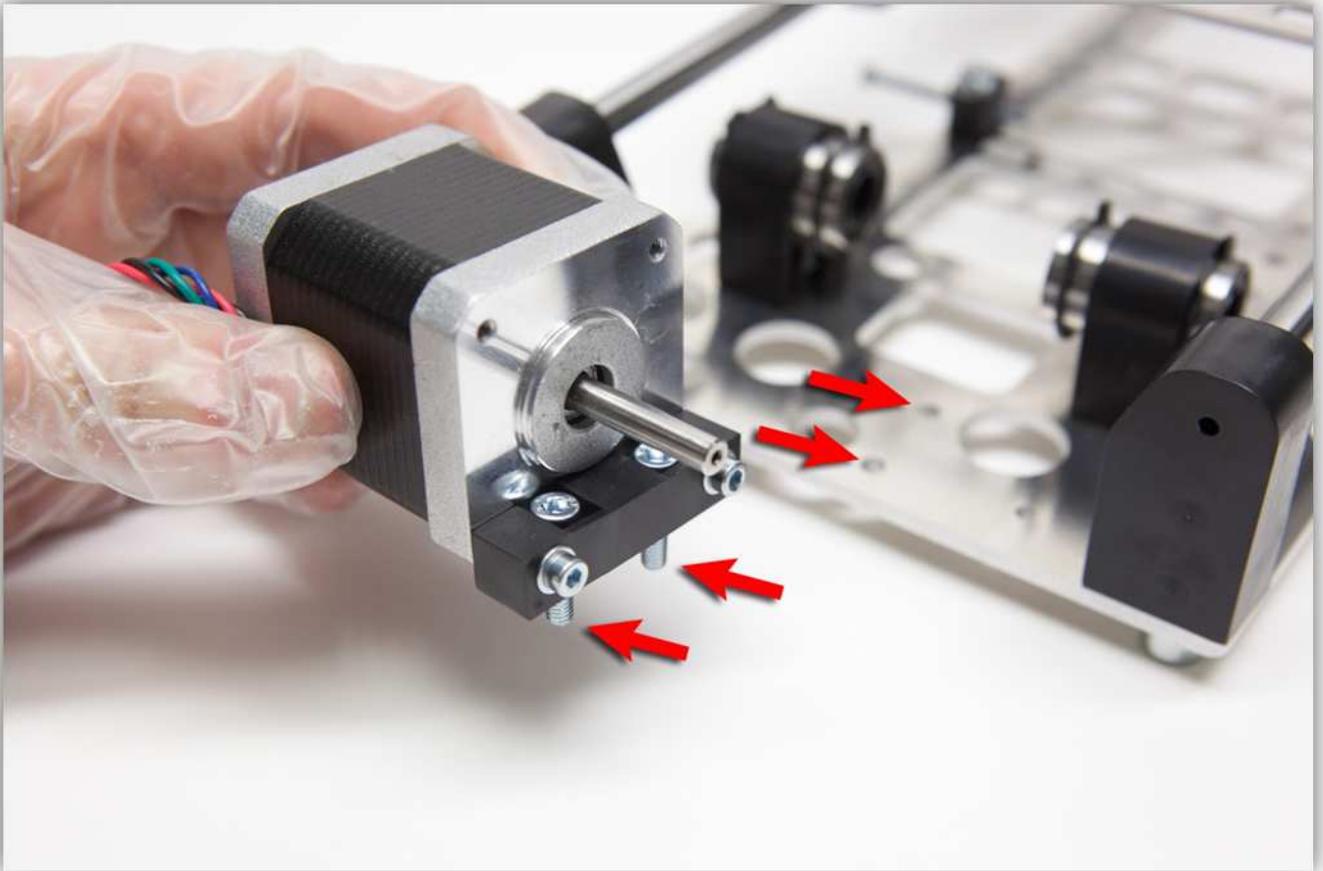
Use the 2 M3 bolts with an M3 washer to bolt the MOTOR MOUNT to the motor. **Notice the orientation of the wires.**

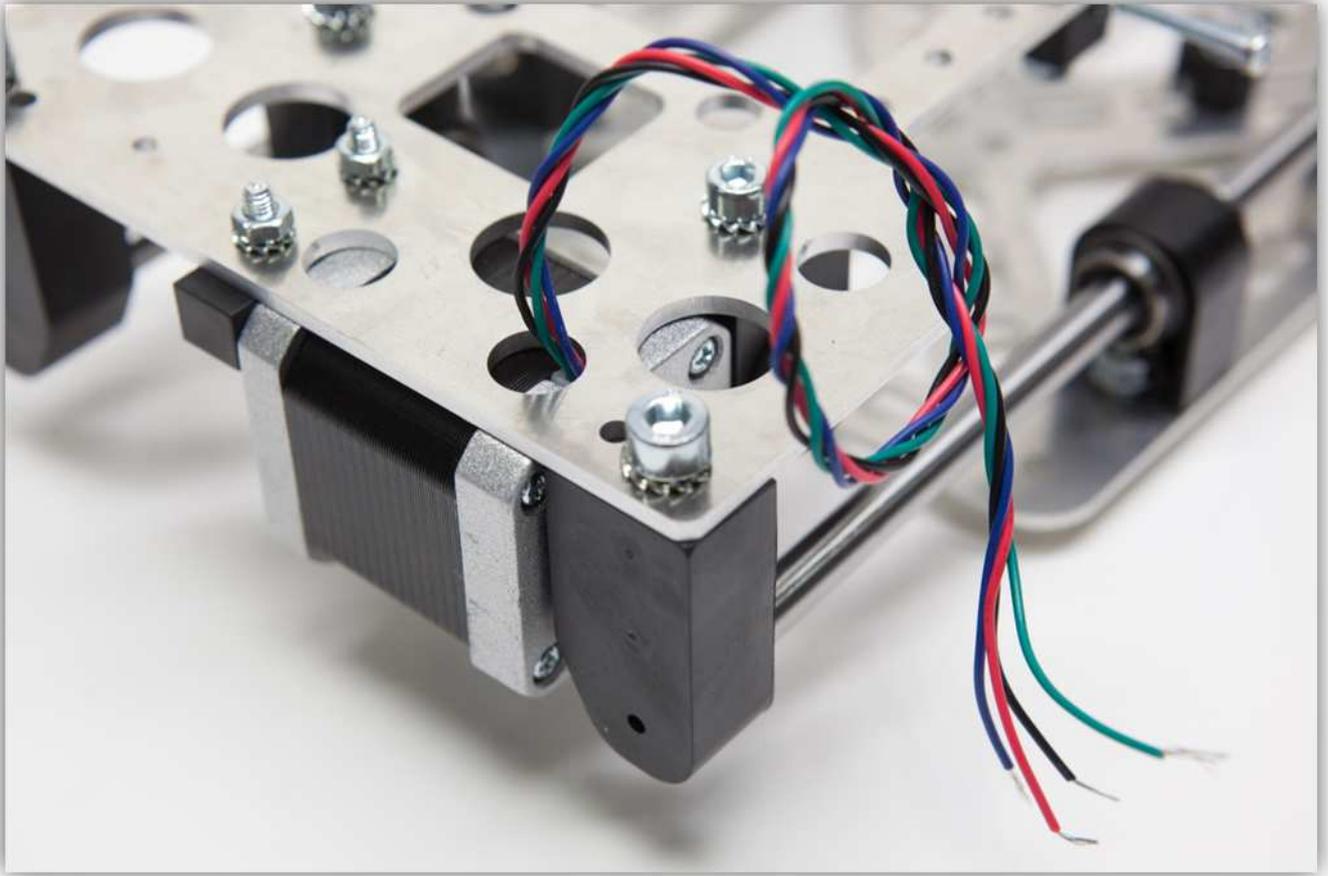


Insert the 2 M4 bolts as follows:



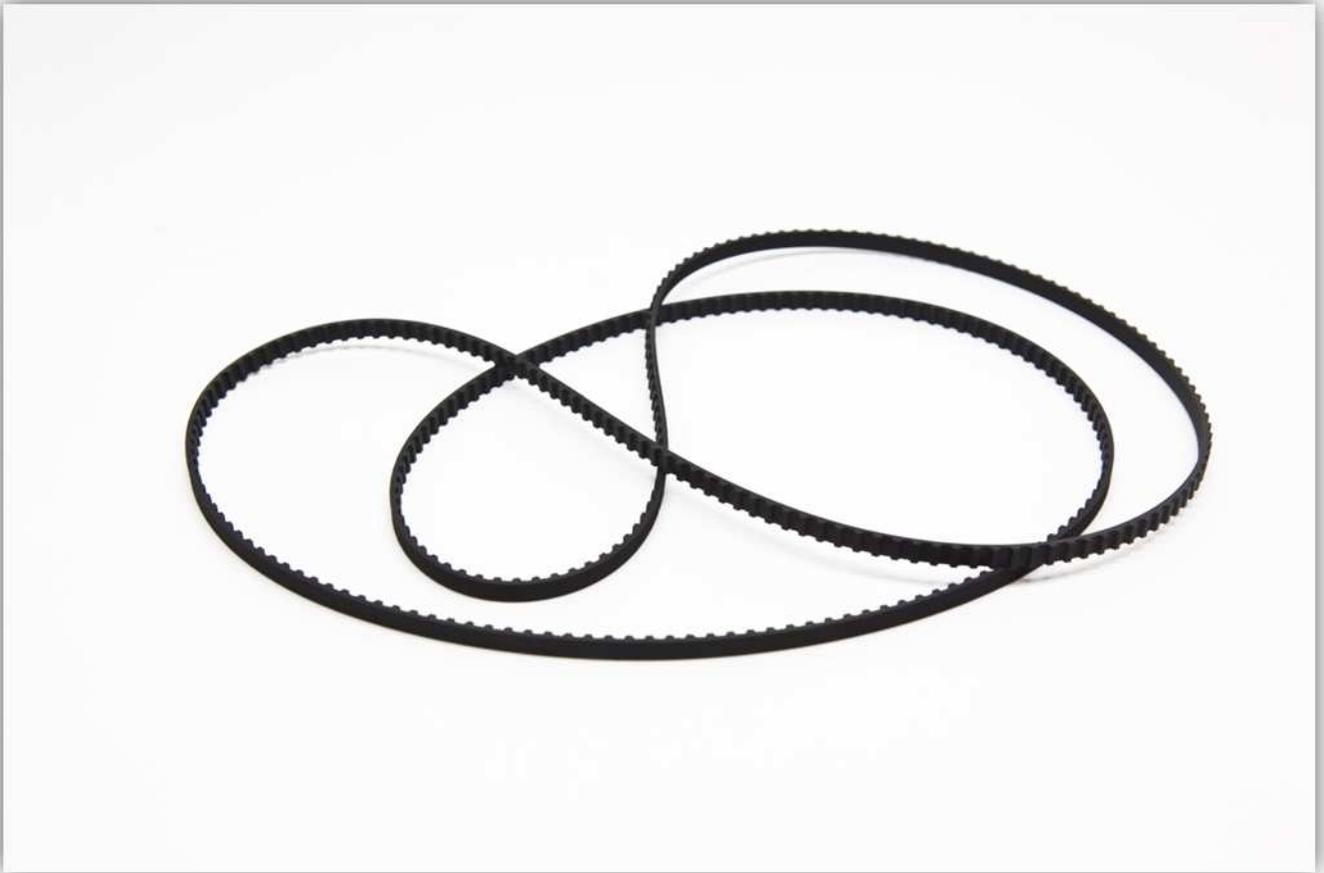
Place the assembly as follows on the X CARRIAGE and use 2 M4 toothed washers and M4 bolts to secure the motor. Make sure that the motor is mounted level and on a 90° angle with the rods and that the wires are through the large hole of the X CARRIAGE.





Take the bag labelled with 10 out of the box, you should have these parts:





Cut the belt once.





Now from the end you just cut, measure the belt for **63.5 cm (25")** or **127 teeth**. **This measurement is critical. We advise to count the teeth and also measure the distance before cutting.**

The other half should be approx. 86 cm (33.9"). For this stage in the build we shall need the piece of 63.5 cm (25"). Store the piece of 86 cm (33.9") for later use.



Take these pieces (BELT CLAMP A and BELT CLAMP B) as shown in the picture below out of the bag containing the plastic parts:



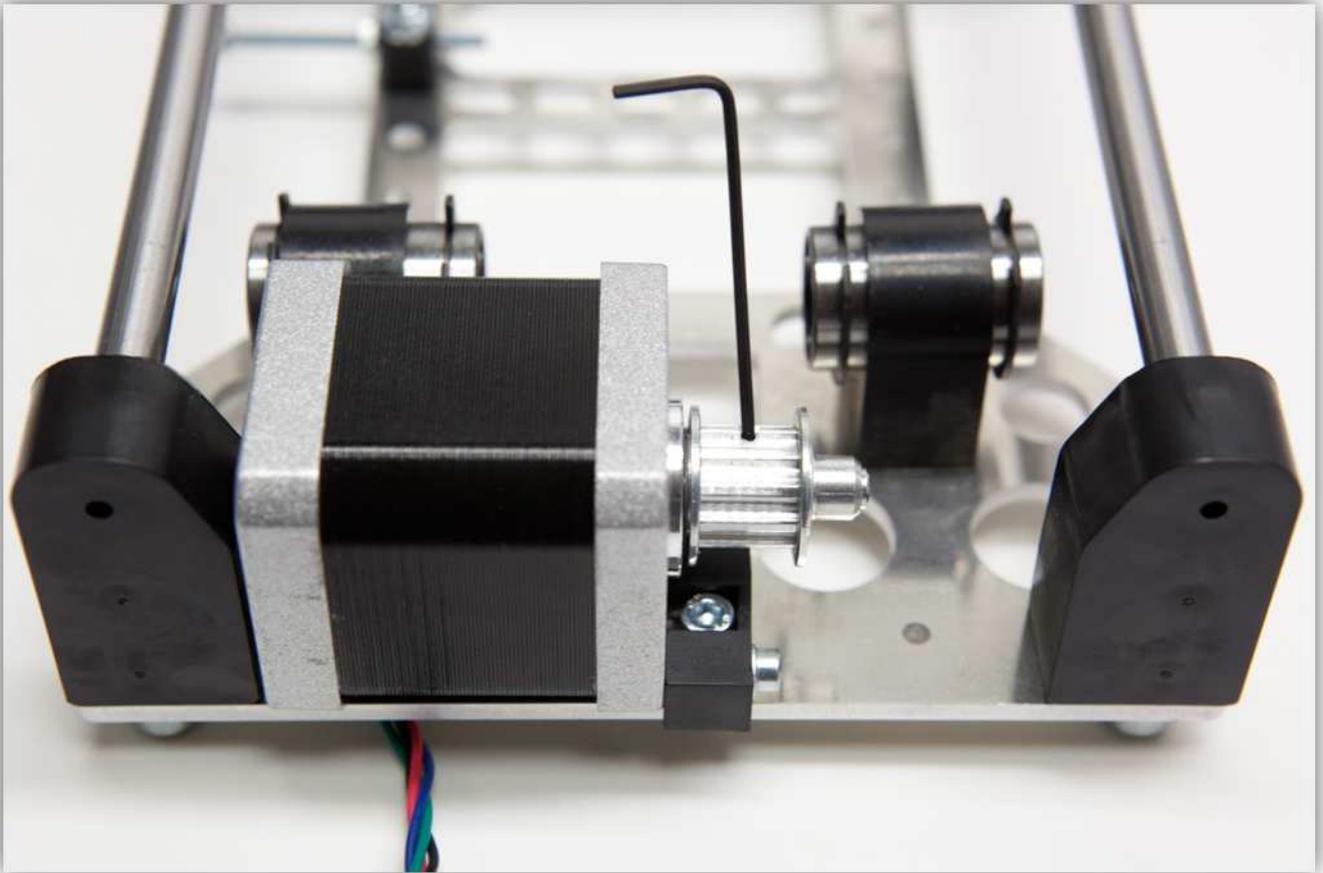
Take the pulley and the small M3 locking bolt.



Screw the bolt into the pulley.



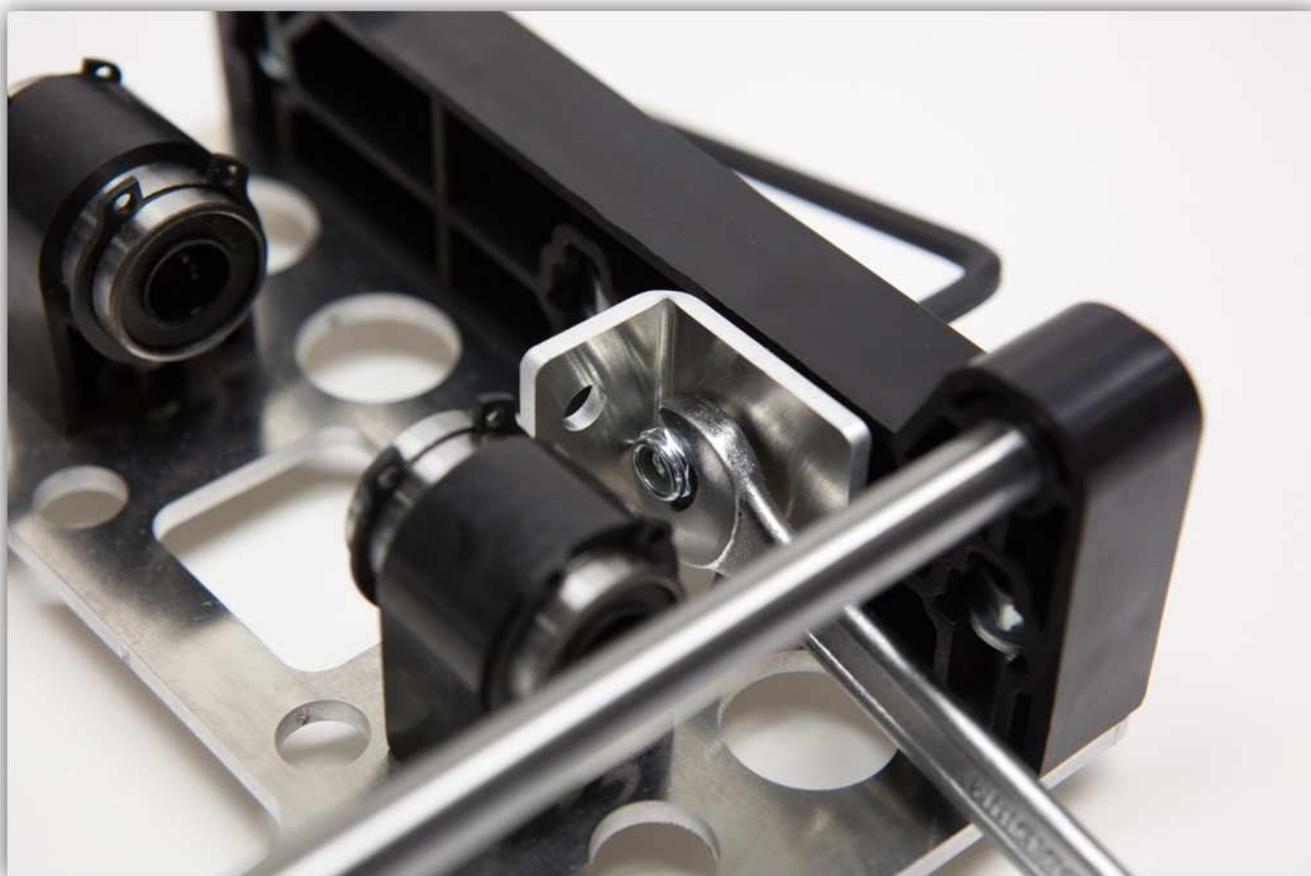
Slide the pulley over the motor shaft as shown and tighten the small locking bolt.



Loosen the bolt and washer on the BIG Y ROD CLAMP you mounted earlier.



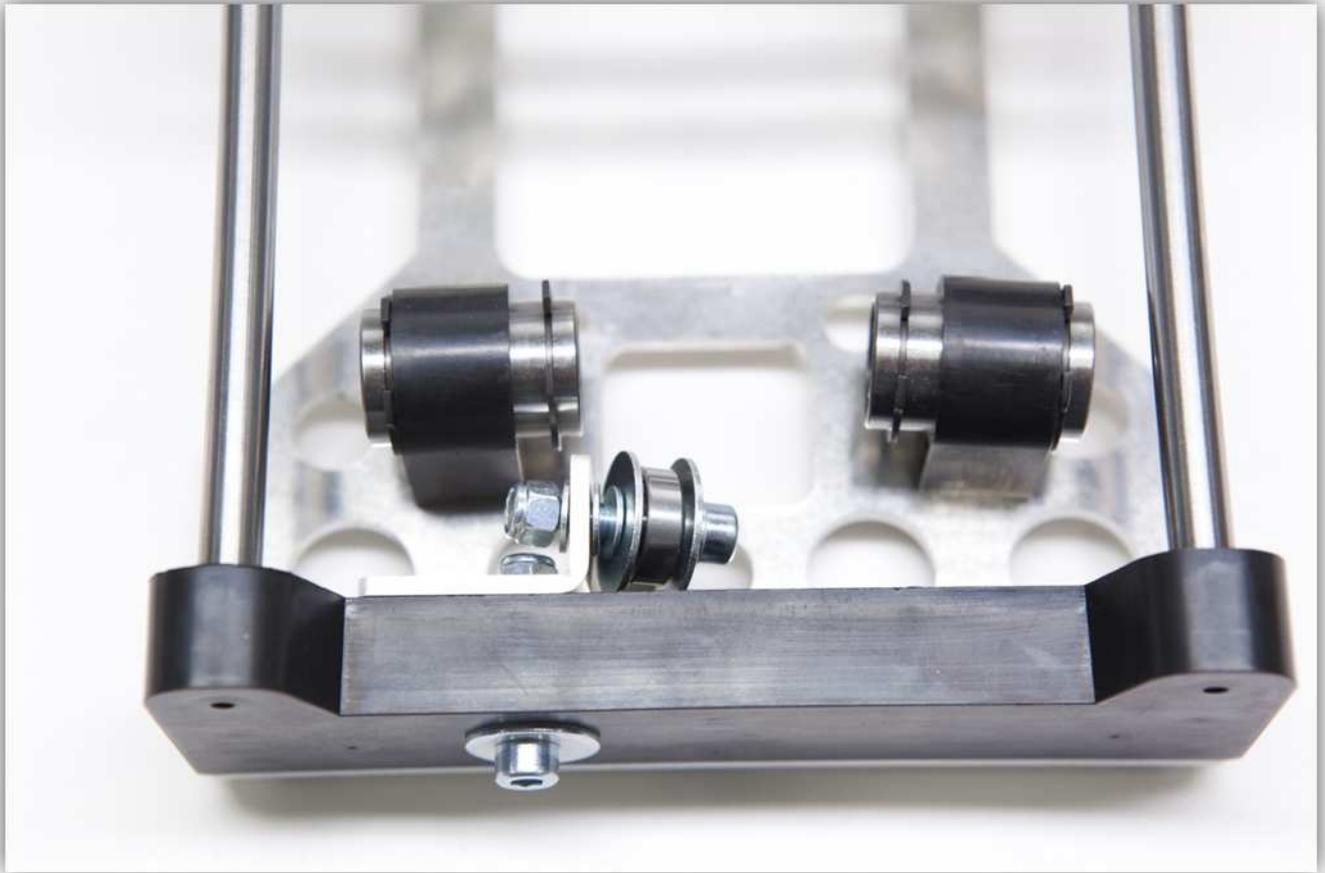
Place the small aluminium bracket as shown in the picture and tighten the assembly.



Use the M5 bolt, the 625 bearing, 6 M5 washers and 2 large M5 washers to assemble the following:



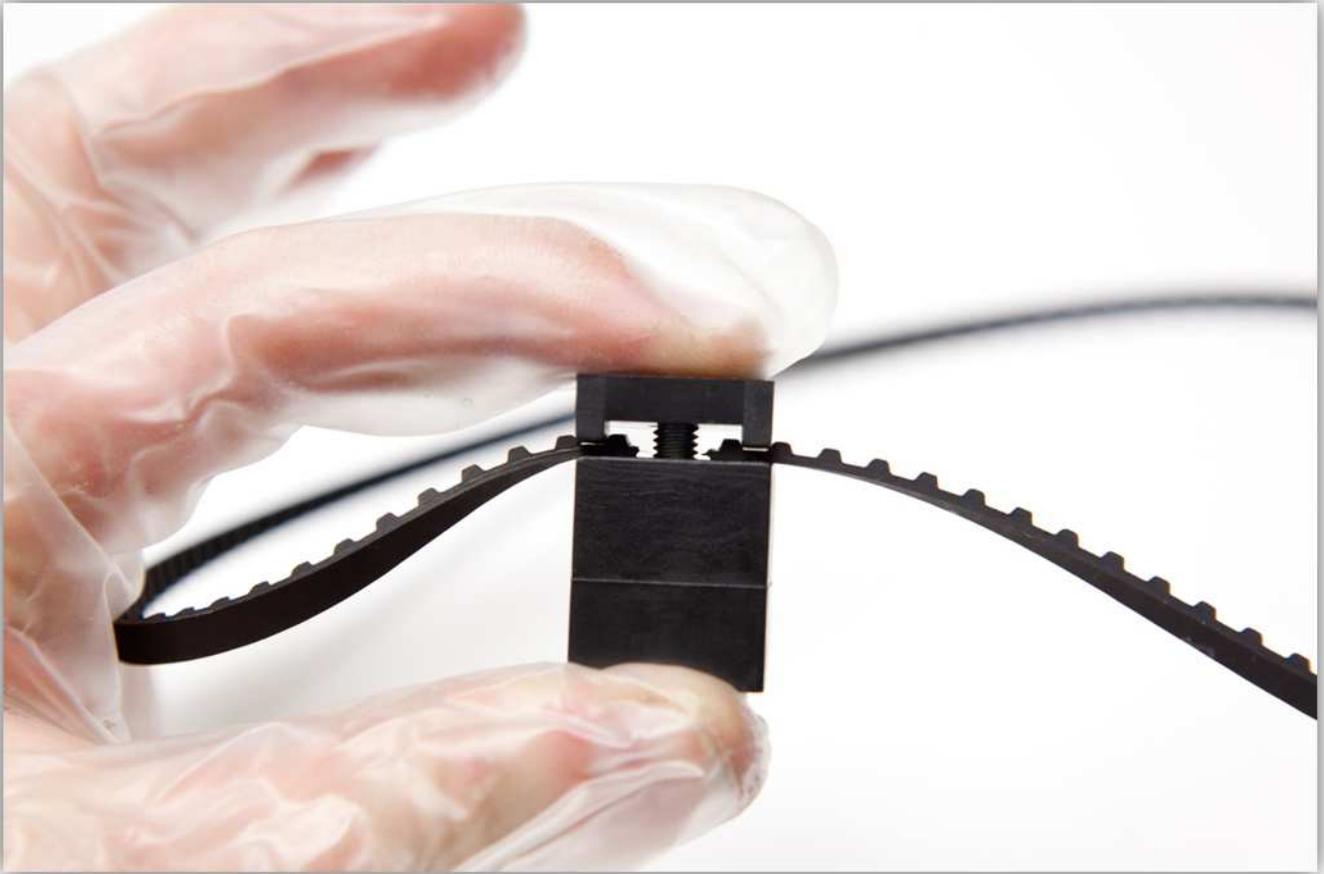
Use an M5 locking nut and an M5 washer and mount the assembly as shown in the picture. **Do not tighten this assembly.**



Take the long M5 bolt, the belt and the 2 plastic pieces (BELT CLAMP A and BELT CLAMP B).

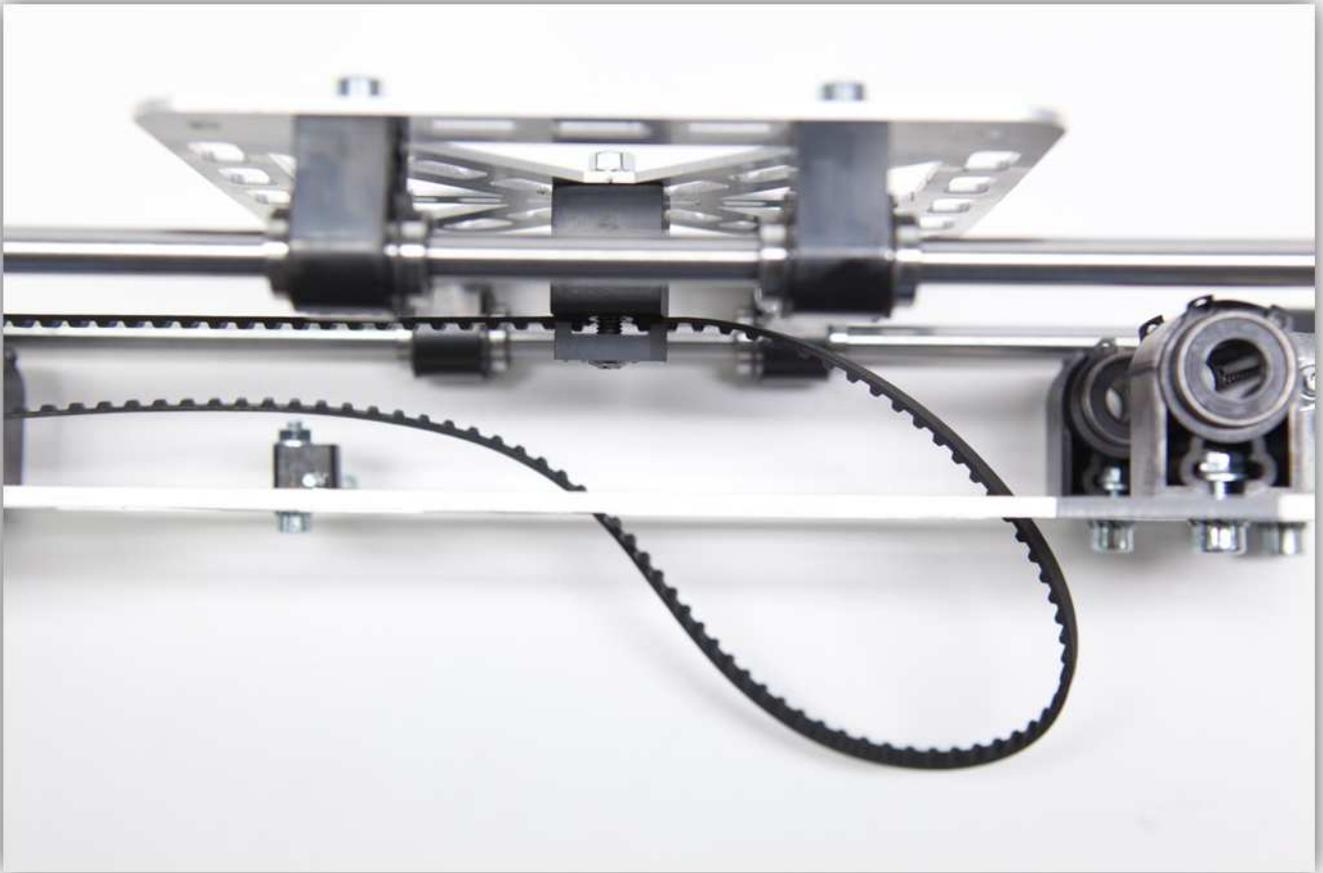


Assemble them as shown in the picture. **Take notice that the belt sits between the clamps exactly as in the picture.**



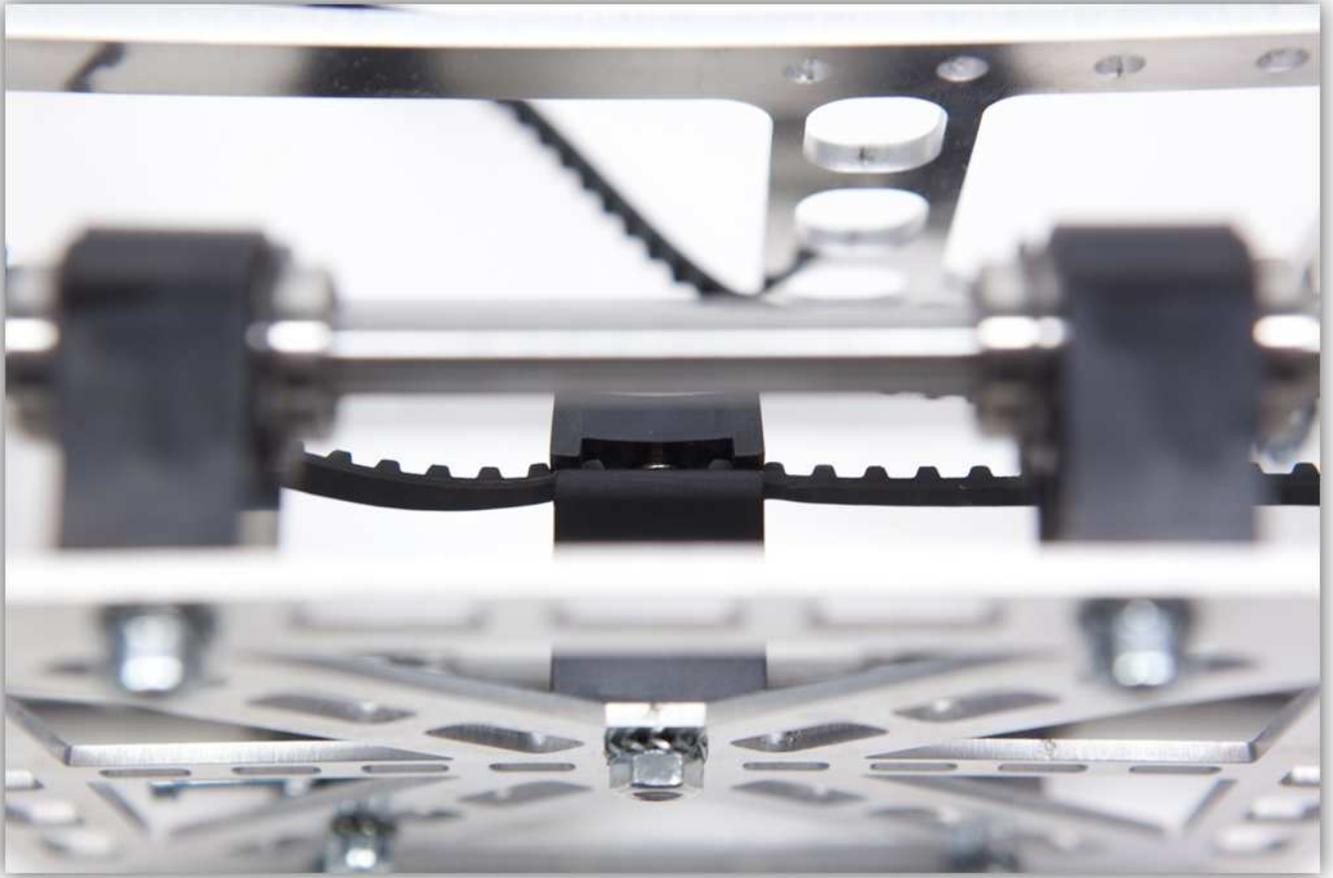
Use an M5 washer and bolt to secure this assembly to the BED SUPPORT CARRIAGE as shown in the pictures:

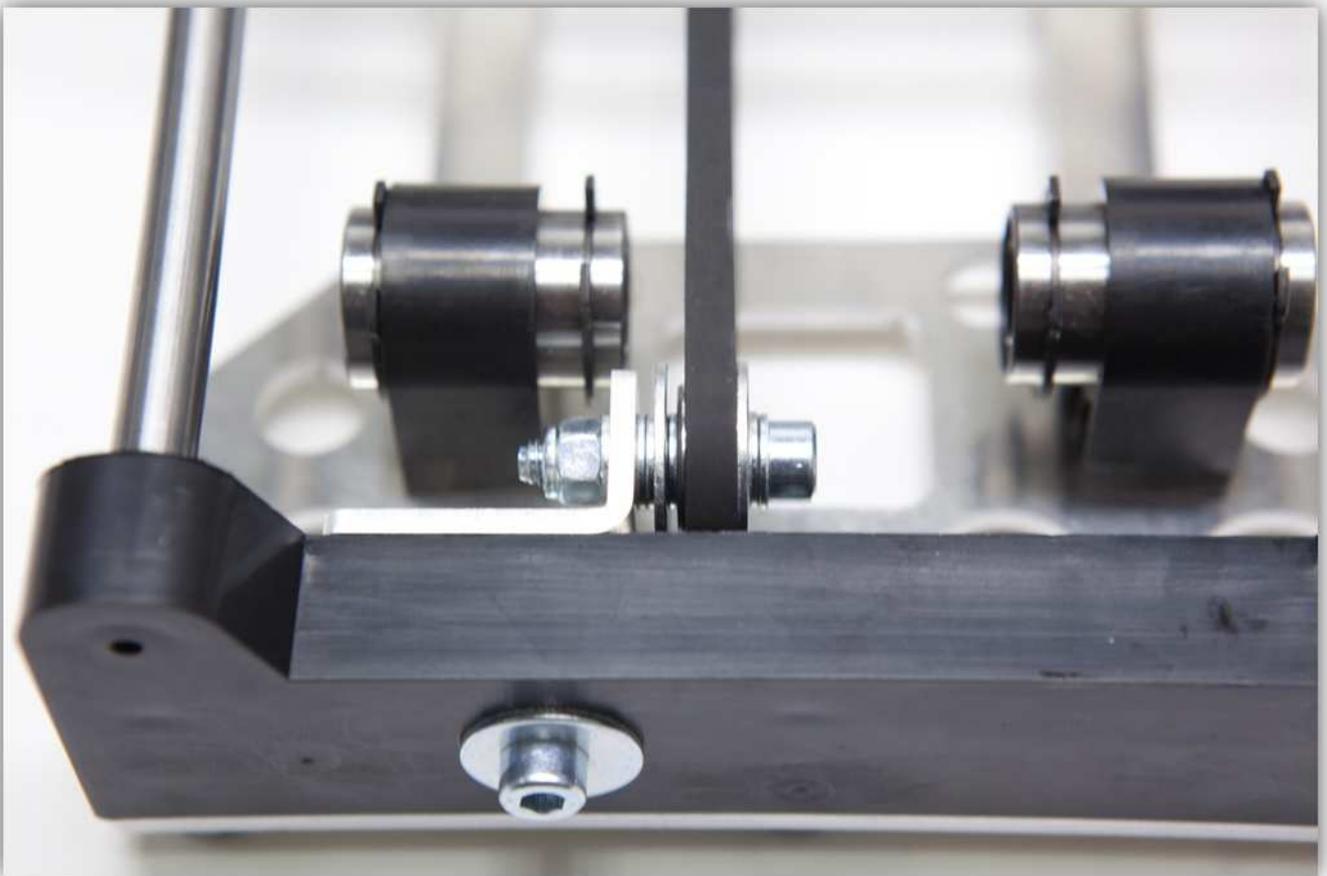
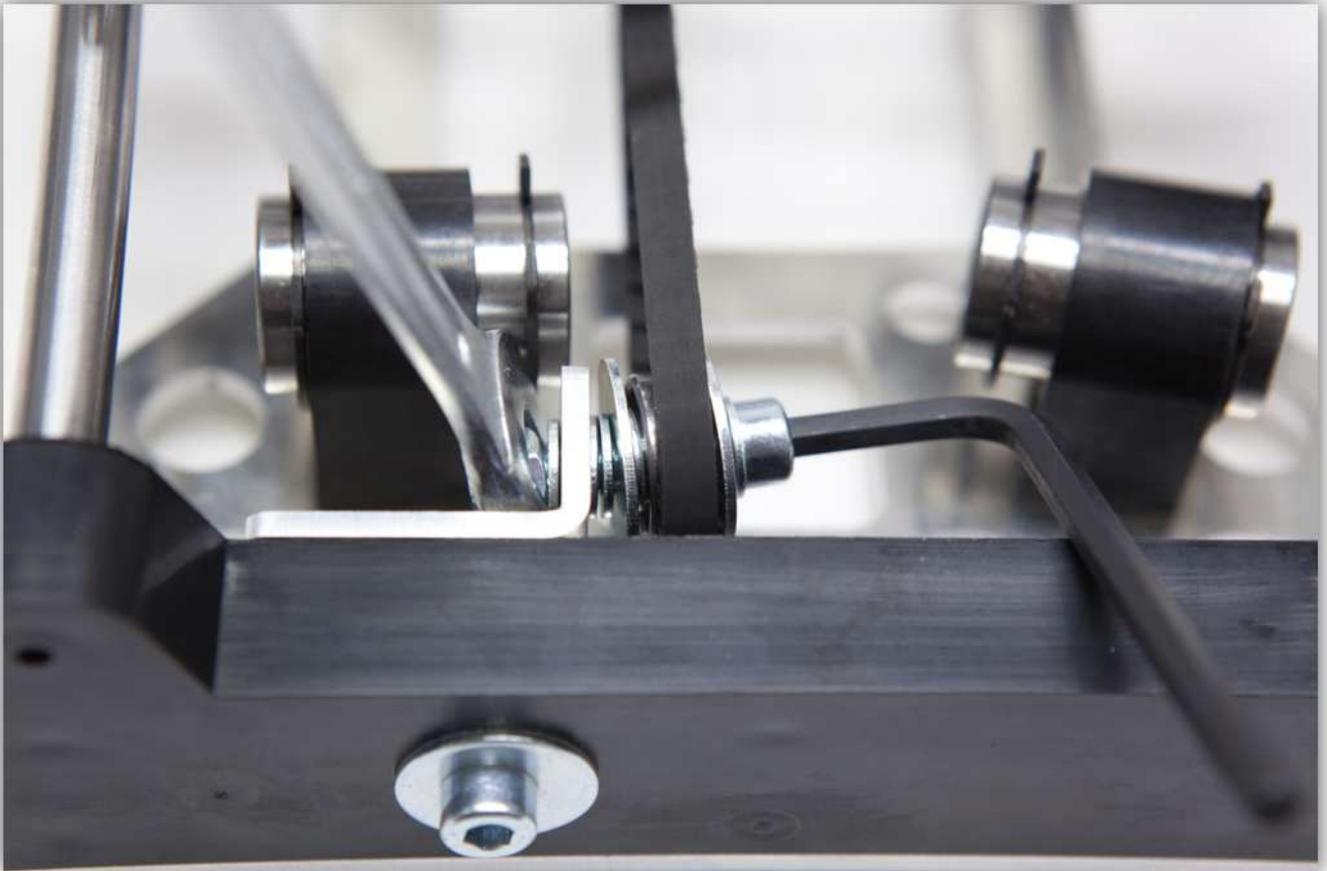




Loop the belt around the pulley and around the 625 BEARING. Now tighten the bolt with the 625 BEARING as shown in the pictures to put tension on the belt.







Take the bag labelled with 11 out of the box, you should have these parts:



Search the piece (MICROSWITCH MOUNT) as shown in the picture below out of the bag containing the plastic parts:



Insert 2 M3 bolts with M3 washers as shown:

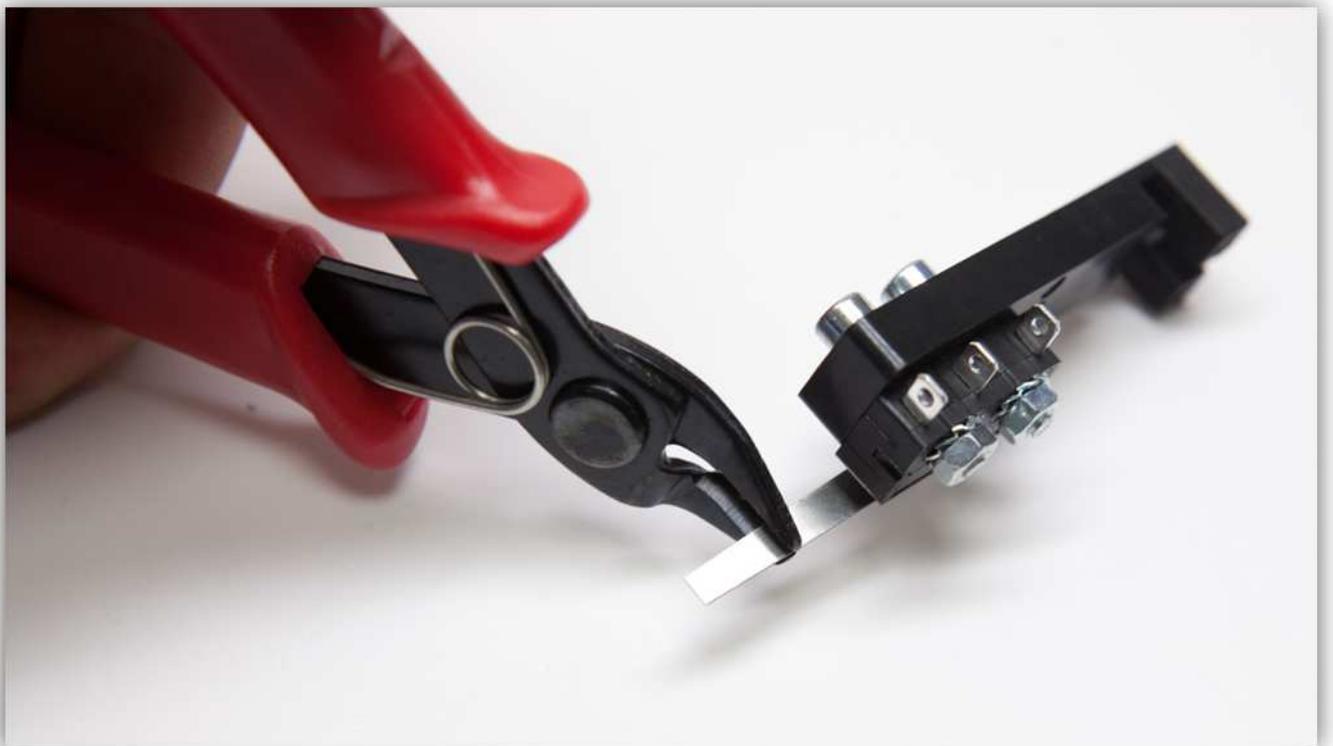


Add a micro switch and 2 M3 toothed washer and 2 M3 bolts. Tighten these bolts.

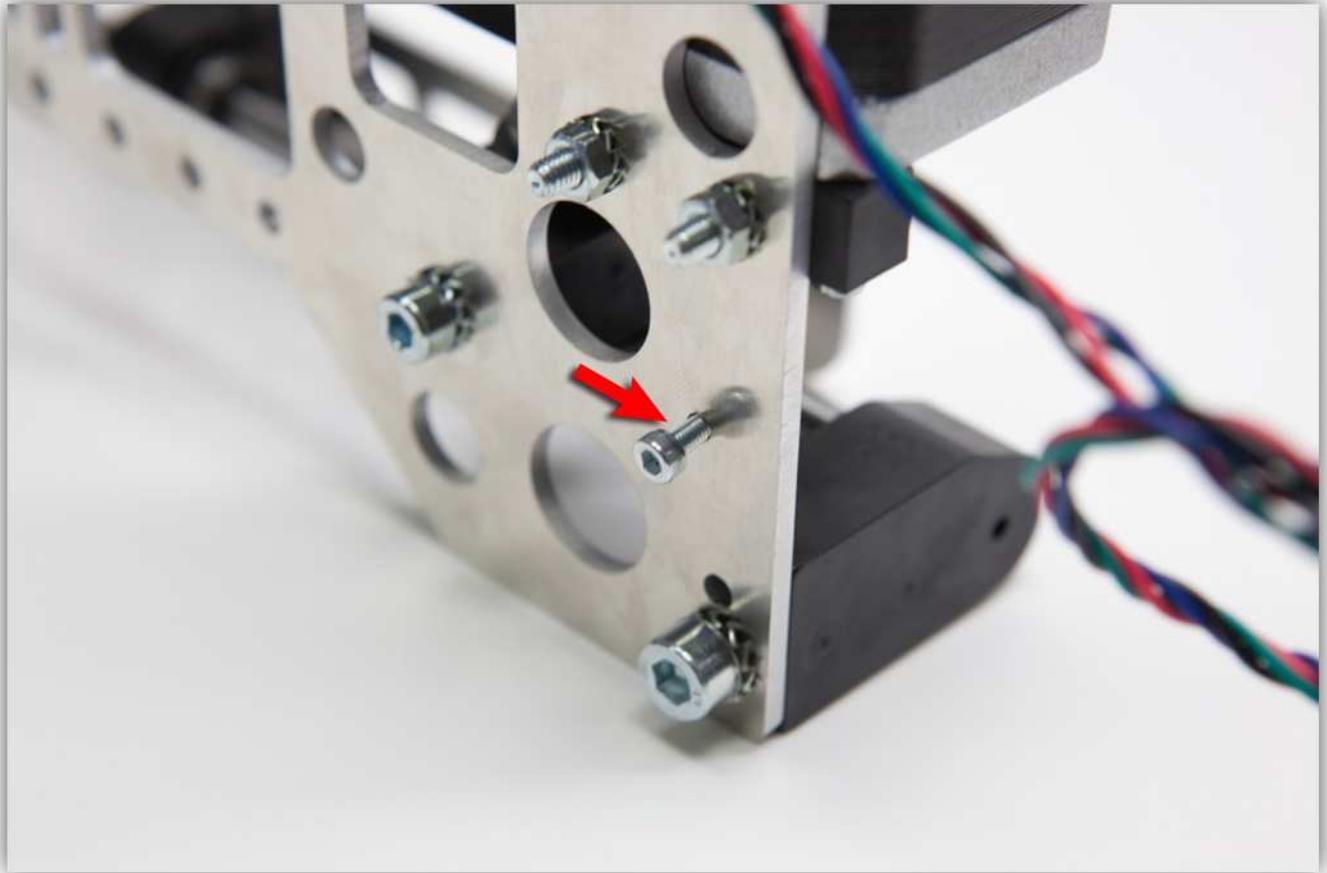




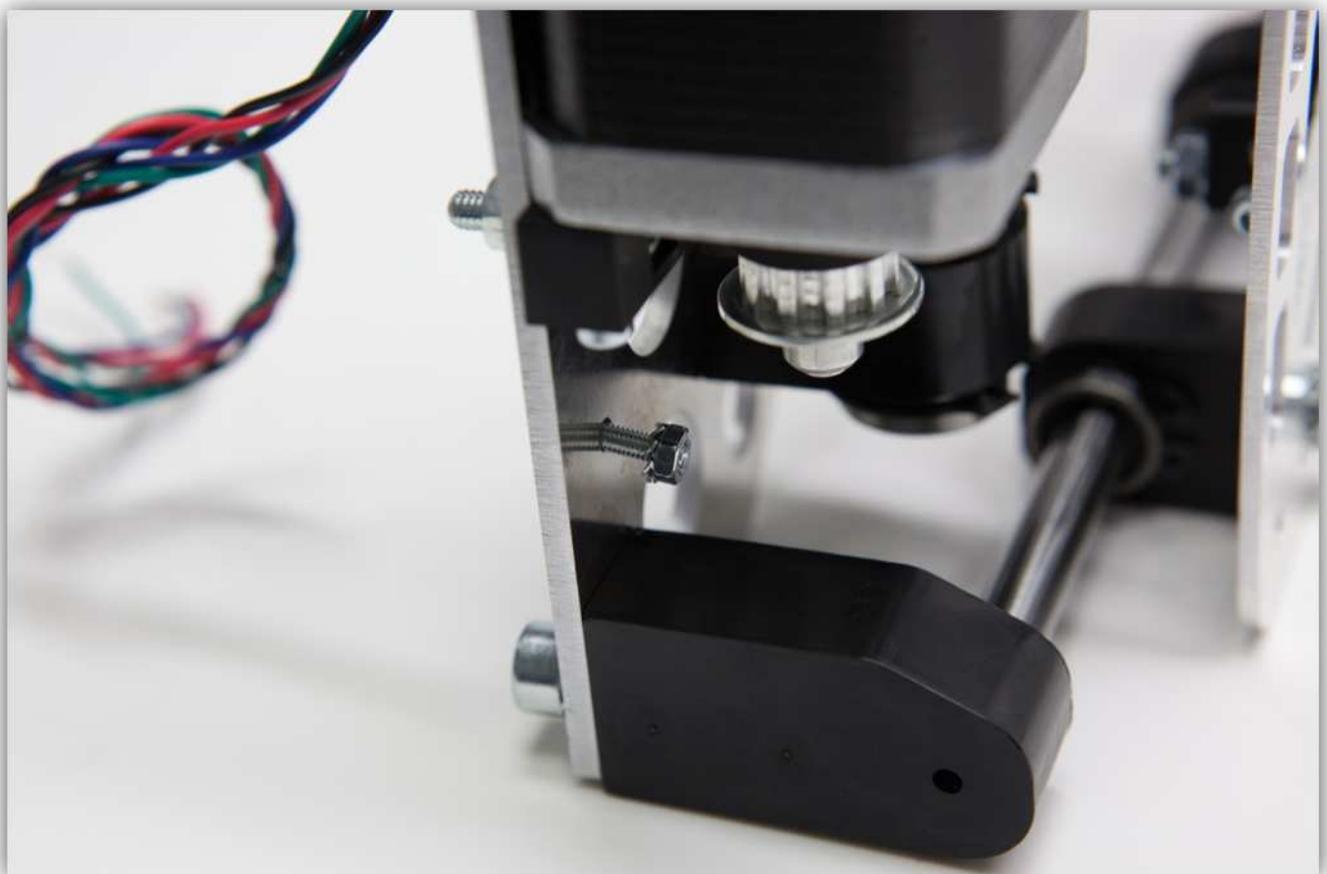
Cut 10 mm (0.39") of the lever of the micro switch, be careful not to cut too much.



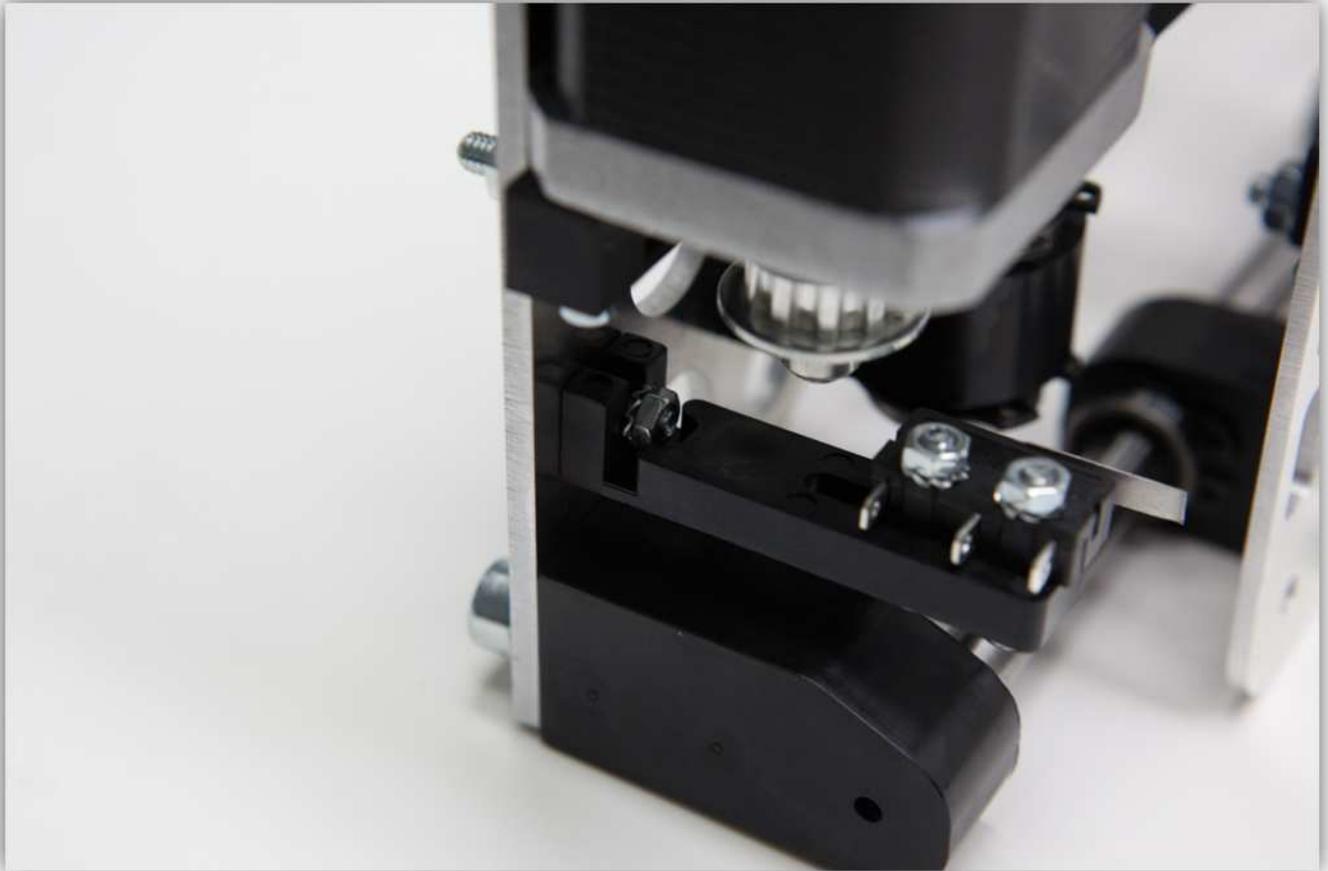
Slot the remaining M3 bolt in the X CARRIAGE as in the picture:



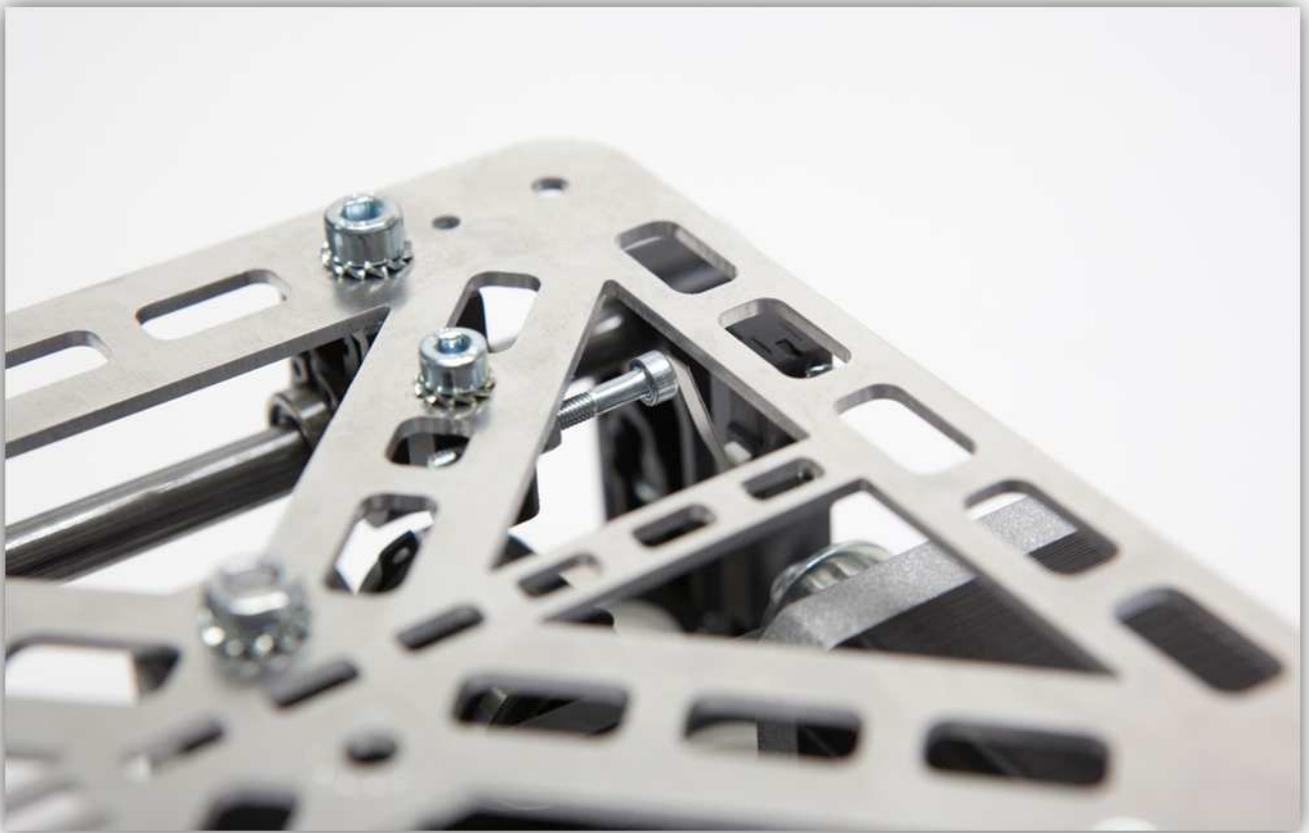
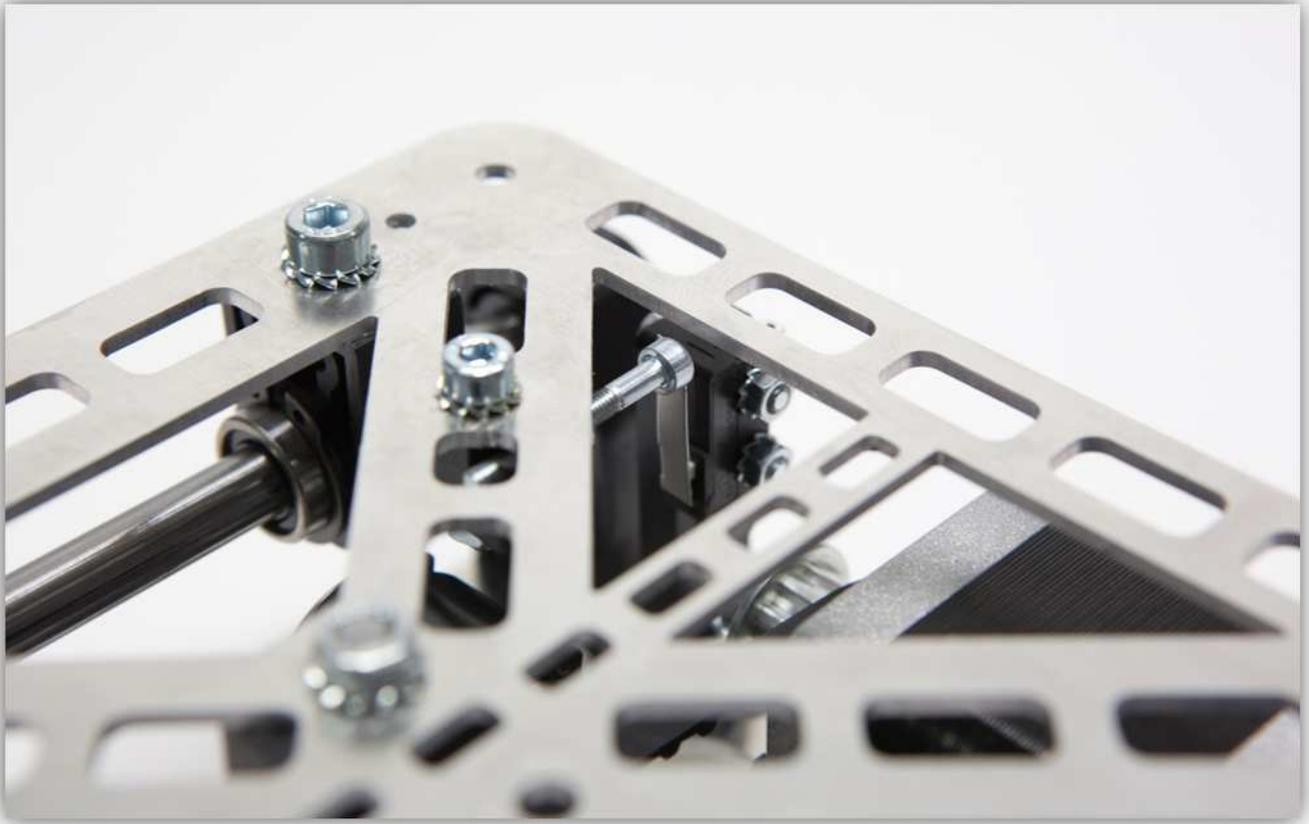
Use an M3 toothed washer and an M3 bolt to hold it in place. **Do not tighten this bolt.**



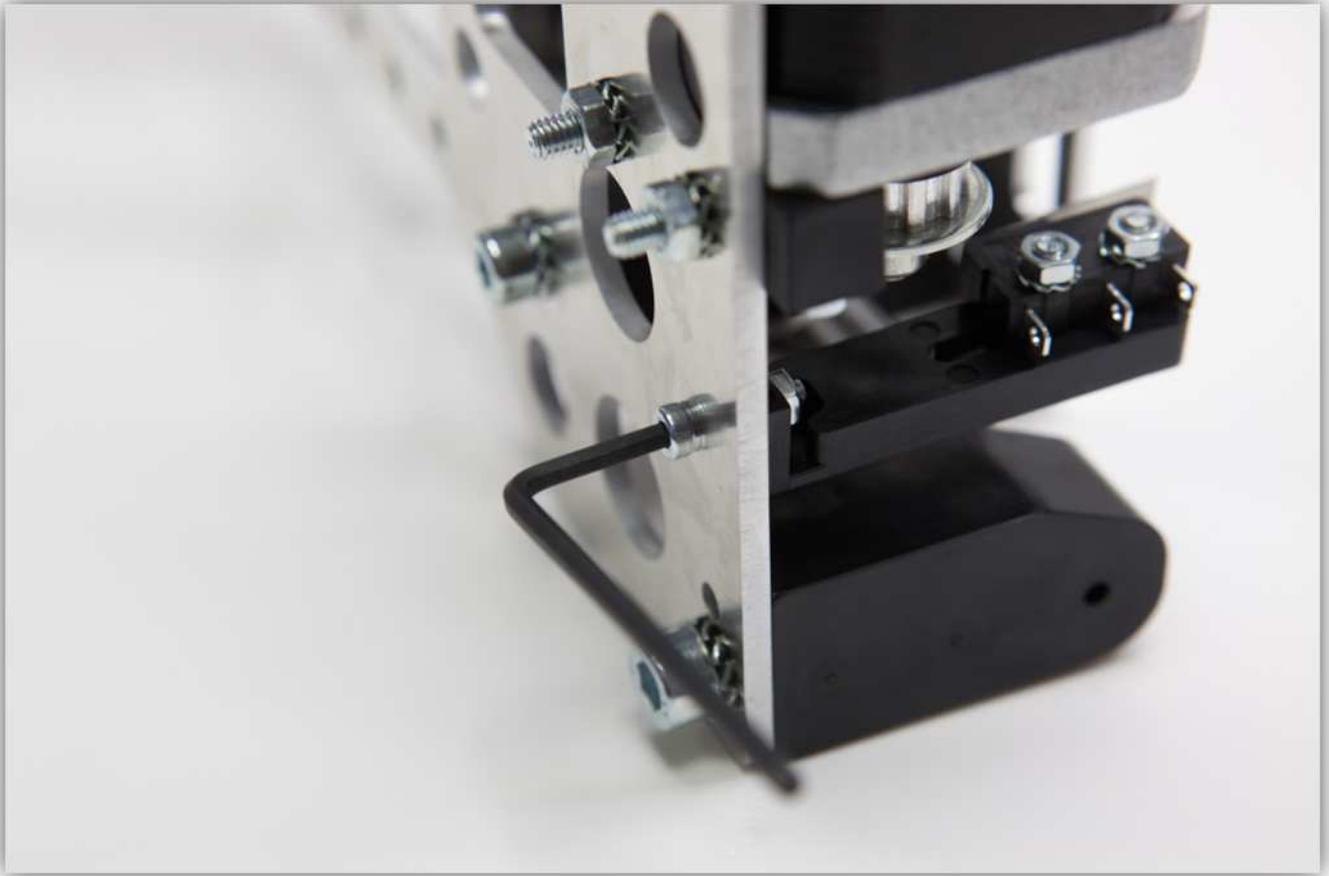
Slide the MICROSWITCH MOUNT under the washer and nut as shown. Hand tighten this nut.



Make sure that the screw on the BED support carriage actuates the micro switch as shown in the pictures below. If this is not the case you can loosen the 4 bolts that hold the BEARING CLAMP Y pieces in place, move the BED SUPPORT PLATE left or right and tighten the bolts again, ensuring a fluid motion.



Tighten the bolt that holds the MICROSWITCH MOUNT in place.



You have now finished the second chapter of your build. You should have a completed X CARRIAGE as shown in the picture below:

