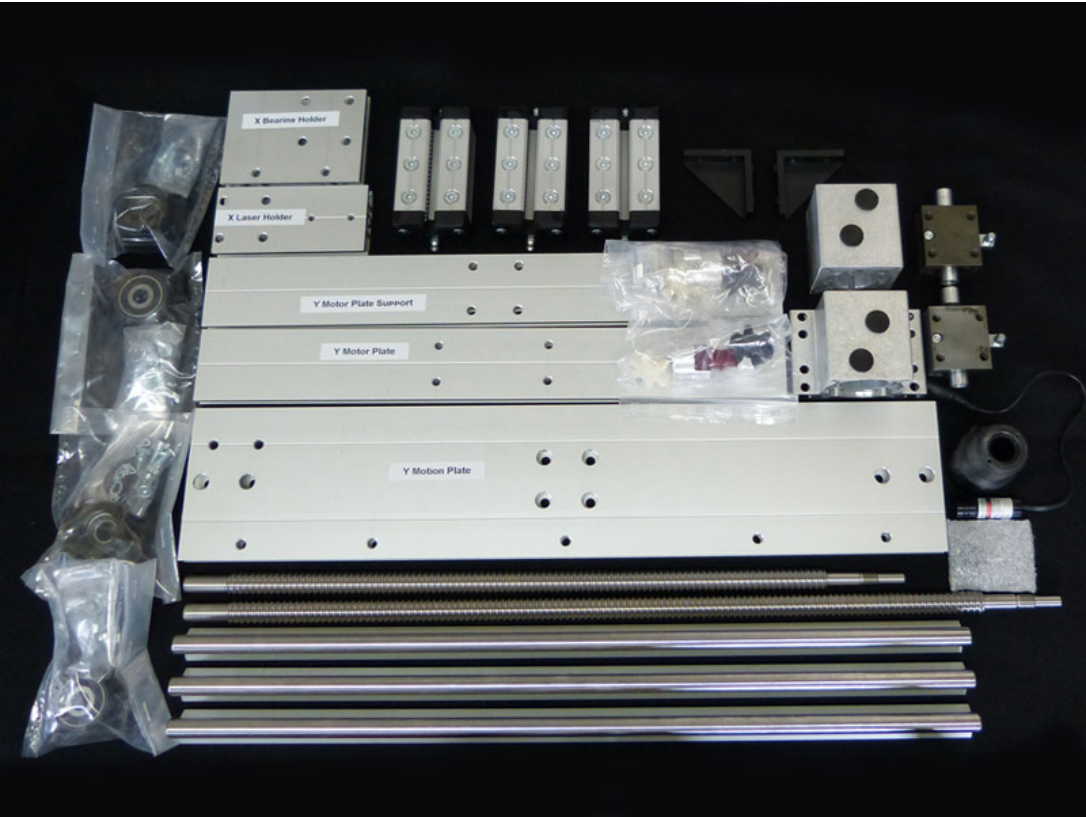


7.5 - X-Y Laser Assembly

Once you unpack everything, make sure the items described below are already in front of you and ready to be assembled. These are also the items shown in the image below. The images in these descriptions provide a good source for parts that are found inside your package. All sections of each assembly are bundled together and should be found easily. If in doubt, use the Forum to ask your questions or make notes about these instructions, so that others find it modified as per your suggestions.

Step 1



3 x Slide Blocks

1 x Motor Mount (Normal)

1 x Motor Mount (Modified)

2 x Motor Side Bearings

2 x Support Bearings

3 x Slide Rails

2 x 4mm Pitch Spindles

2 x 4mm Pitch Bearings

Nuts and Bolts Bag

Laser, Laser Mount, Iris

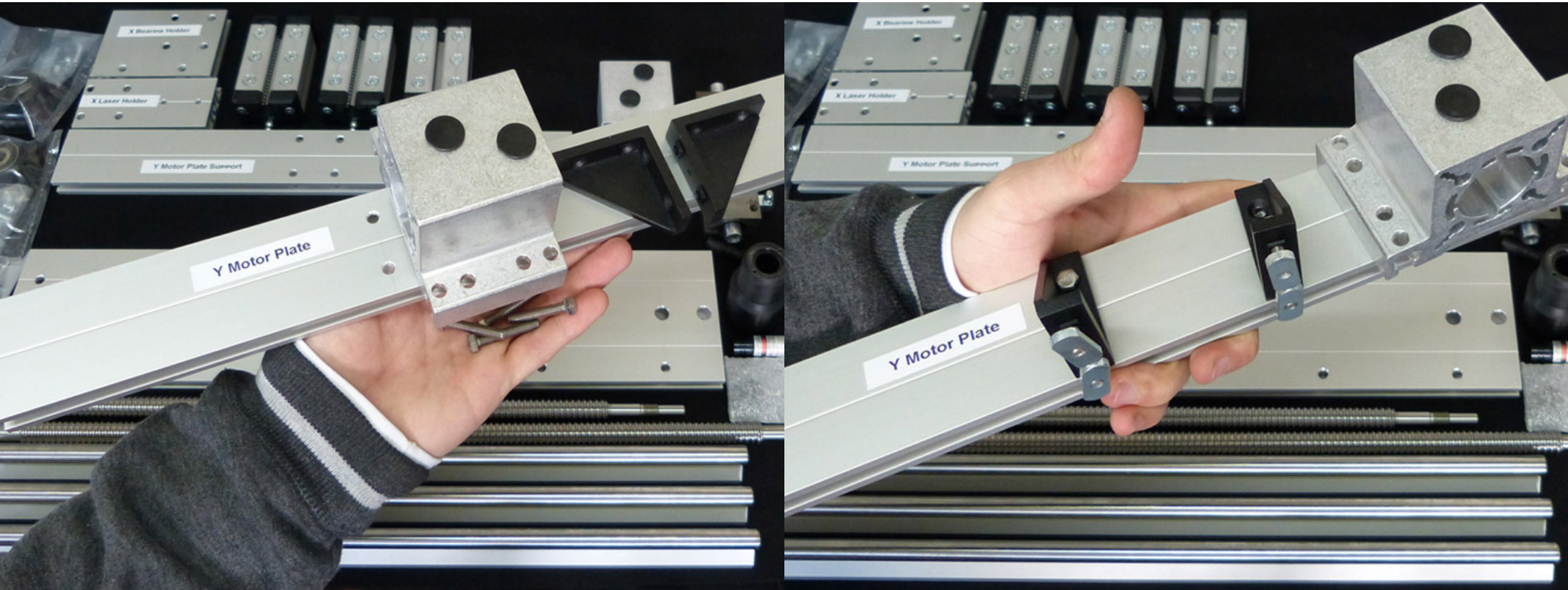
Mechanical parts as shown

Make sure you have the items, shown in the above image. It is important to note the labels on each bag and part if you get lost within the parts inside the box.

Clean your work area and prepare everything as shown.

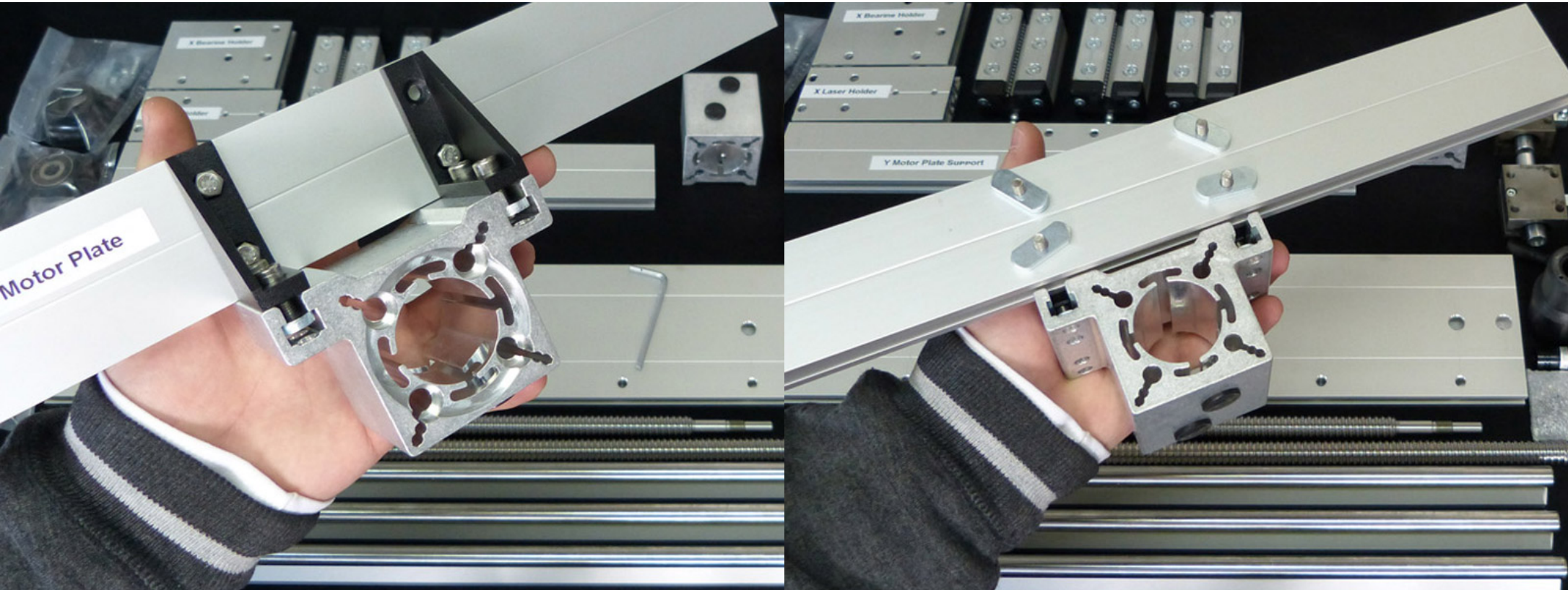
Step 2

7.5 - X-Y Laser Assembly



We begin our assembly with the motor mount for the Y axis. Make sure you have the components shown in the image in front of you.

Use the short 5mm allen bolts and the 4 sliding nuts as shown here.

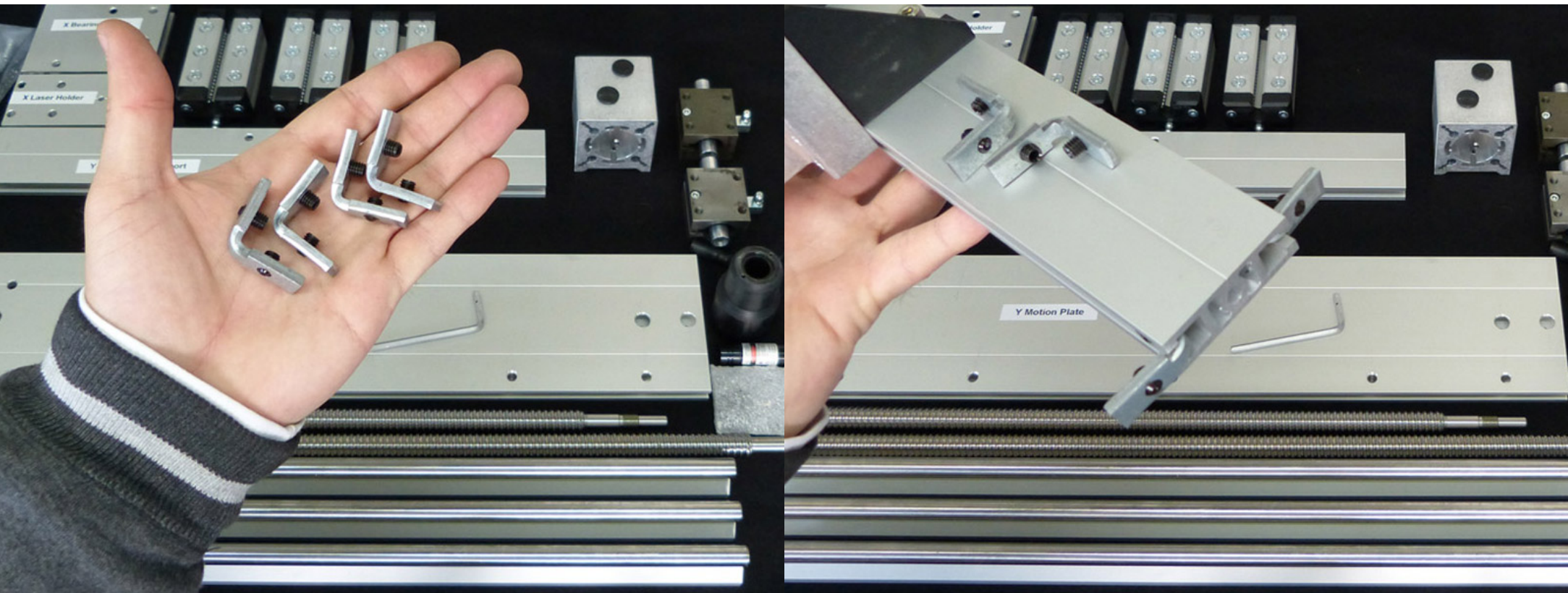


Note the orientation of the motor mount as this will be important in the future. The actual orientation of the holding plate is not really important as it is mirrored on both sides.

Fasten the corner brackets with the longer 5mm bolts and the additional 5mm sliding nuts on the other side to hold the assembly in place.

Step 3

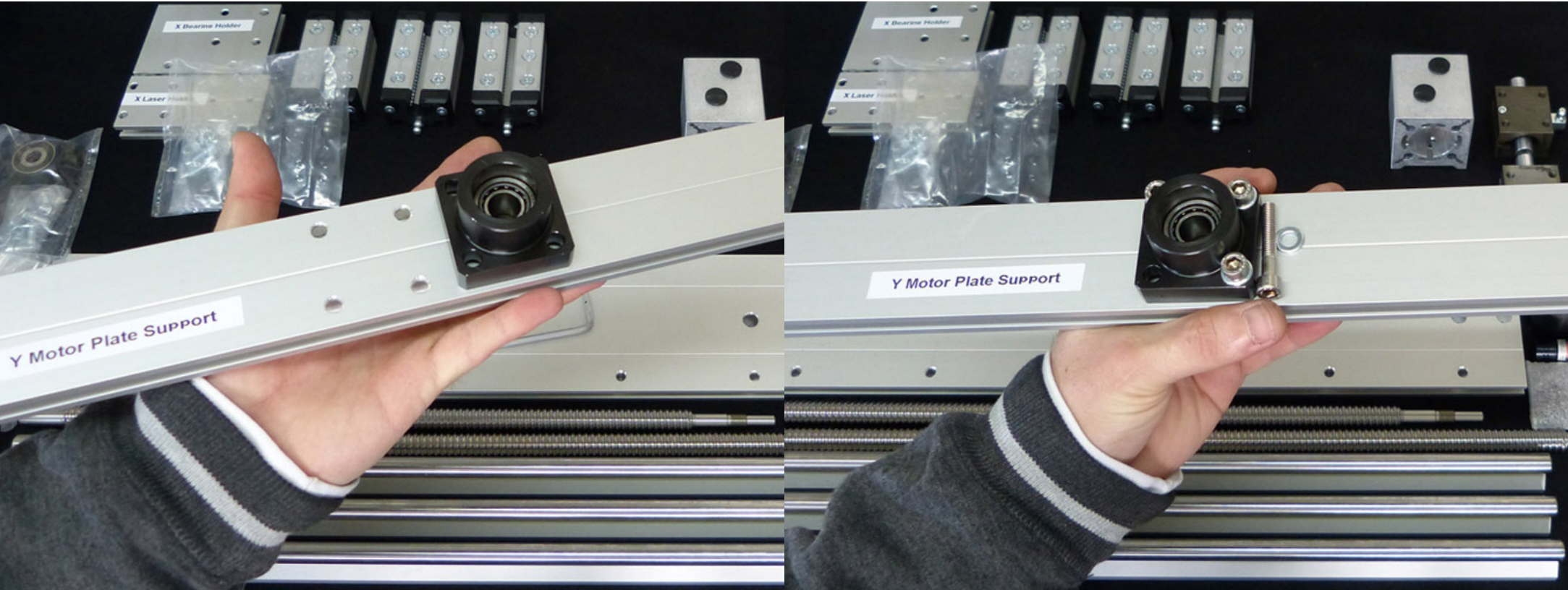
7.5 - X-Y Laser Assembly



The plate is held on the feet of the Ilios Kit with the 4 corner slides and their 6mm allen headless bolts. Note that you need to place one short (8mm) and one long (10mm) bolt on each bracket since the plate slot of the motor mount is deeper than the one on the legs of the machine.

Position the corners as shown. Note that the side that has the longer allen bolt should be the one inside the plate slot. this is the same way of attaching the plate as in the Projector Mount instructions.

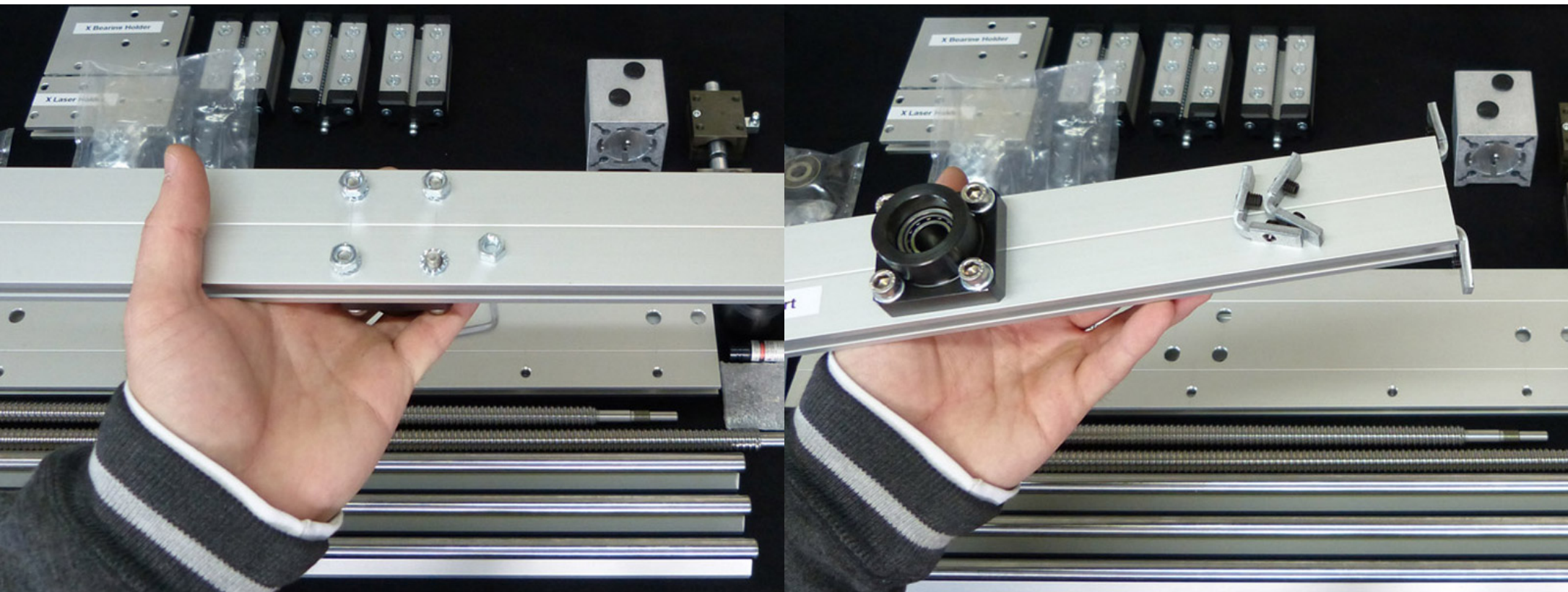
Step 4



On the opposite side of the Y assembly we have the supporting bearing. This is what shall be holding the other side of the spindle.

Use the included in the bearing, nuts, bolts and washers to attach the bearing to the plate. Once again, the orientation of the plate doesn't matter since the dimensions are exactly the same on both sides.

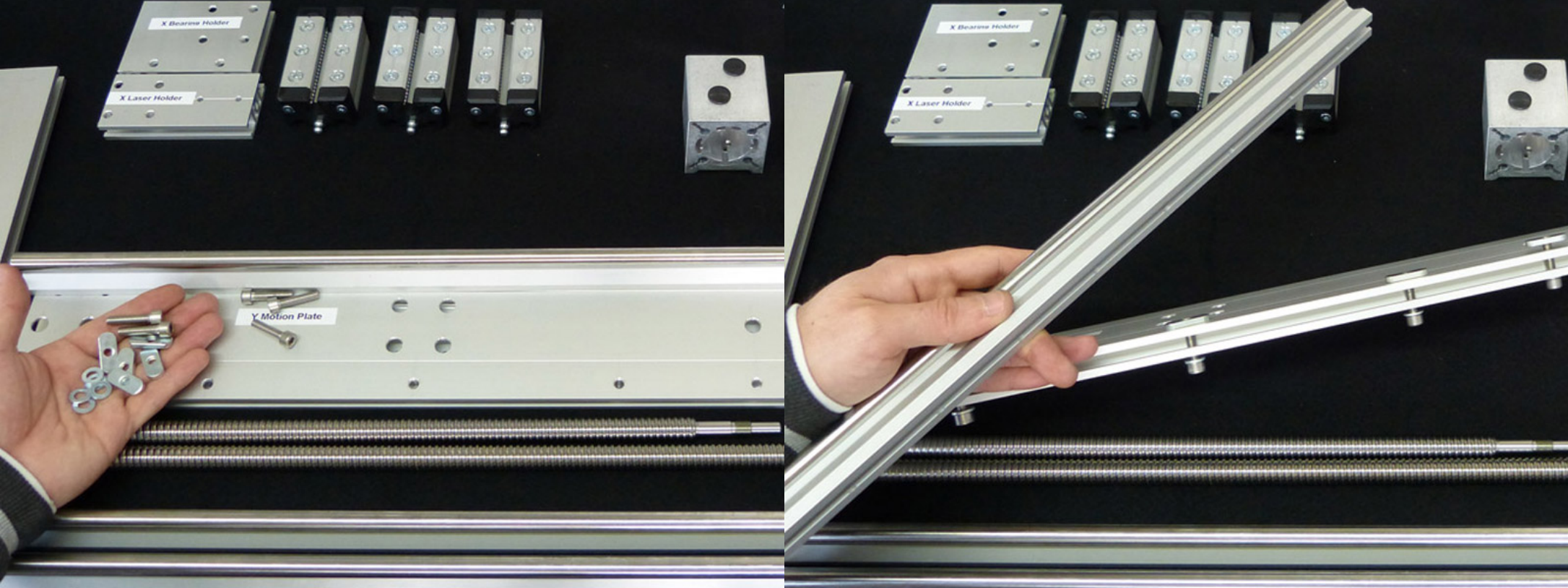
7.5 - X-Y Laser Assembly



Note the other side of the assembly. Use the locking washers here so the constructions remains solid.

Just like we did on the other side, use the corner brackets as shown here. Once again, note that you need to use one long and one short allen bolt for each bracket.

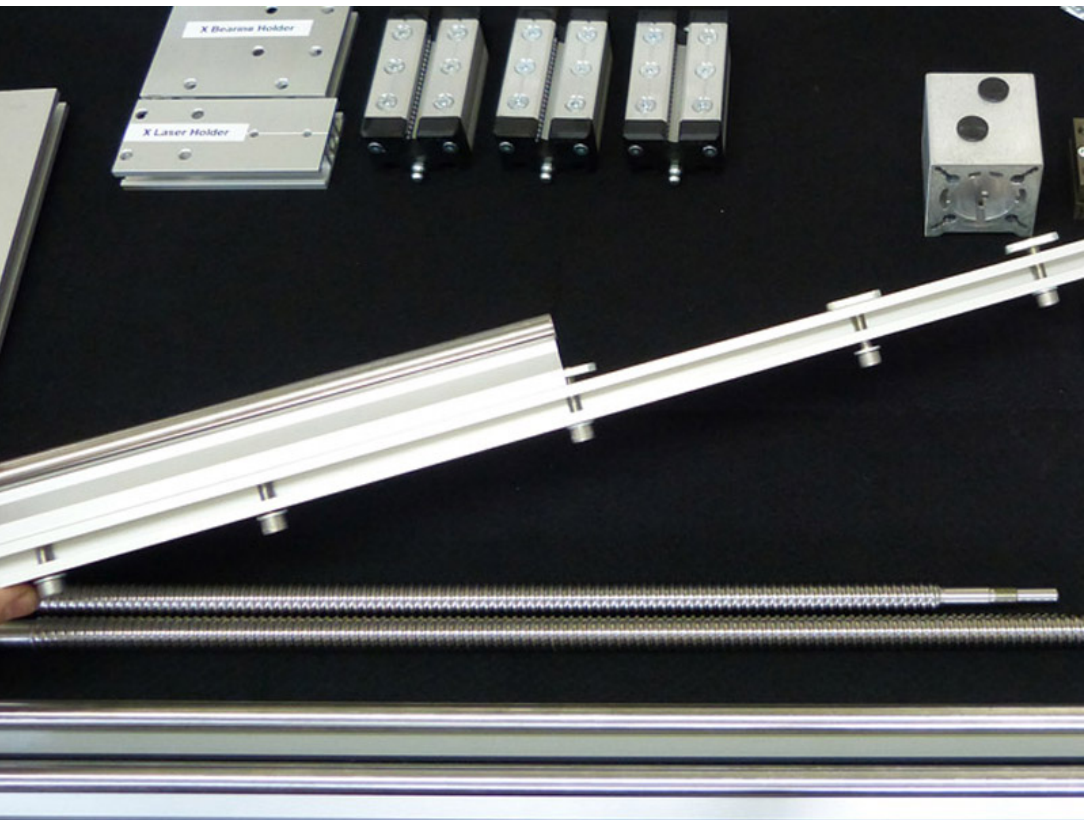
Step 5



Now its time to install the sliding rail on the main X motion plate.

This is actually the exact same way as we did it on the Motion frame for the Z axis on the machine so nothing new here. Use the bolts and sliding nuts as shown.

7.5 - X-Y Laser Assembly



Slide the rail through as shown above.



Once the rail is in, don't tighten the bolts just yet as there is more to be done.

Step 6

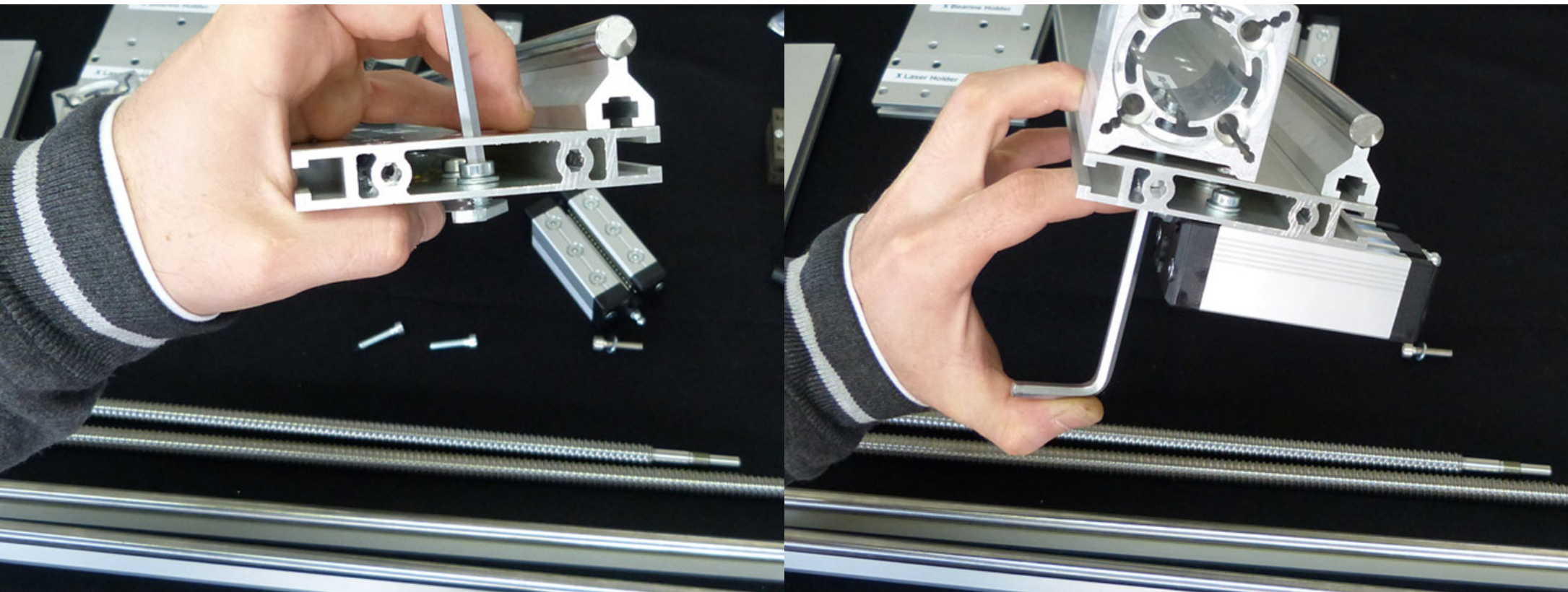


Since the slide blocks and the rail are pretty close to each other, we need to install the slide block and fasten it first, before we tighten the slide rail.



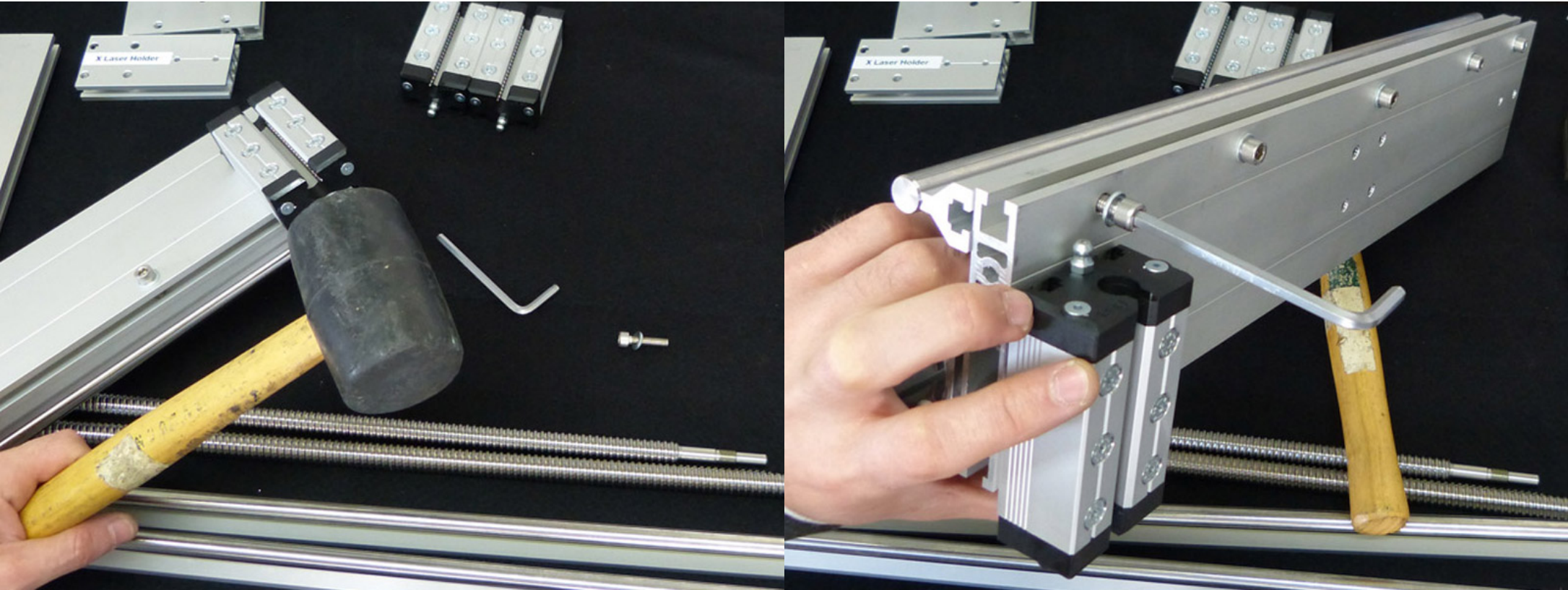
You shall notice here that we already installed the bolts for the motor support as well as the bolts for the slide block and its sliding nuts. Do it now as we shall be putting it all together later.

7.5 - X-Y Laser Assembly



Note the washer that is between the bolt and the plate. Don't forget to put it as the dimensions need to be precise.

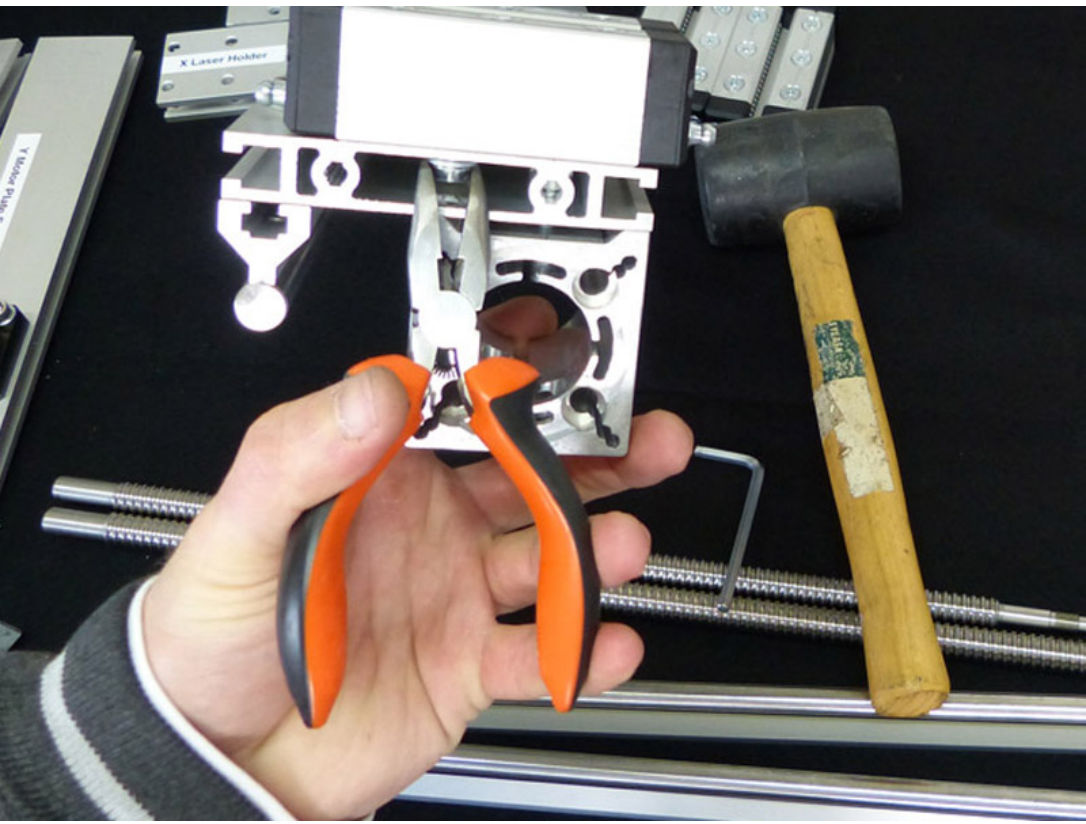
Install the motor mount, noting its orientation and tighten the mount completely so its there to stay. At the same time slide the sliding block in, through the sliding nuts.



Tighten the slide block not very hard but hard enough for it to stay. We do this now because the motor mount is in the way so the bolts need to be already pretty much tight. To help you out, hit it with a mallet to go in.

Note that we had to remove this bolt for the slide block to go in, so put it back in once the slide block is in place.

7.5 - X-Y Laser Assembly

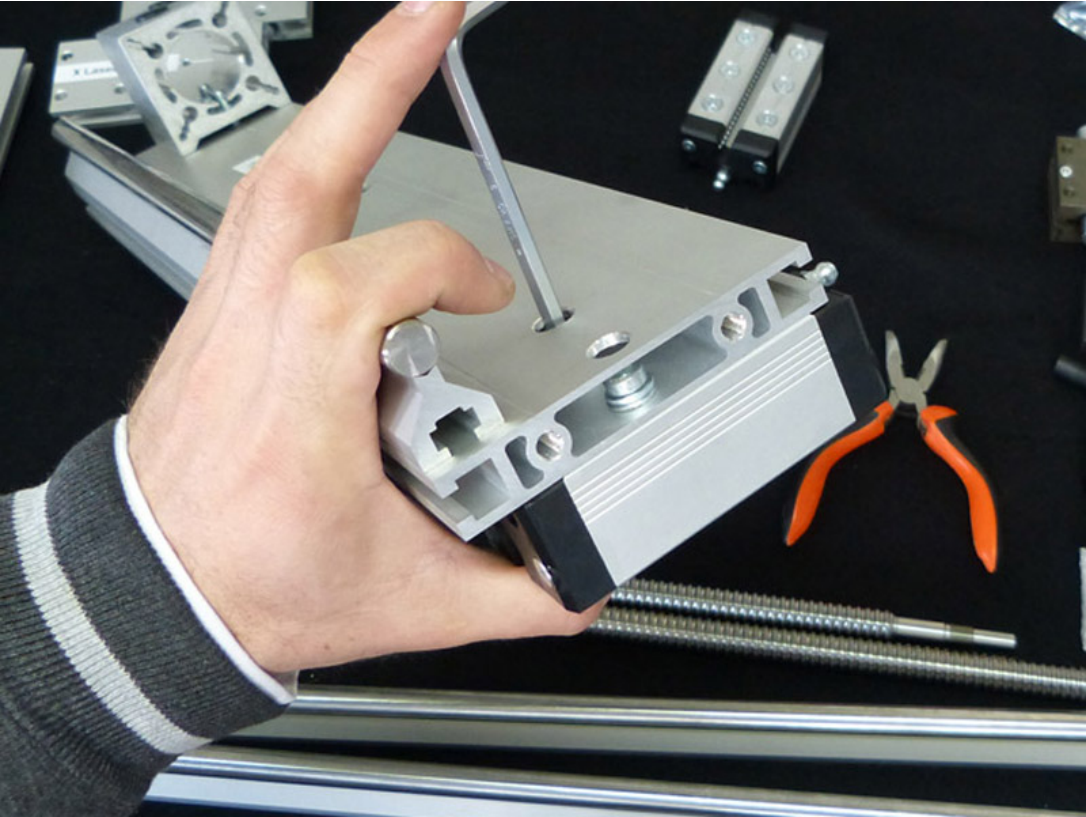


Tighten the slide block even more with pliers now, since everything is already back together. The slide block doesn't have to be very tight since its job is to simply hold the assembly in place. the motion itself is being done by the spindle.



Tighten slightly the remaining slide rail bolts but not completely since we still need to align it once the spindle is installed. Note that the slide block needs to come all the way to the end and touch the bolt as shown.

Step 7



The other side is pretty easy since there is no motor mount in the way. Tighten the slide block as shown to complete this step.



Now its time to assemble the support bearing holder, which shall be holding the X spindle in place on the other side.

Step 8

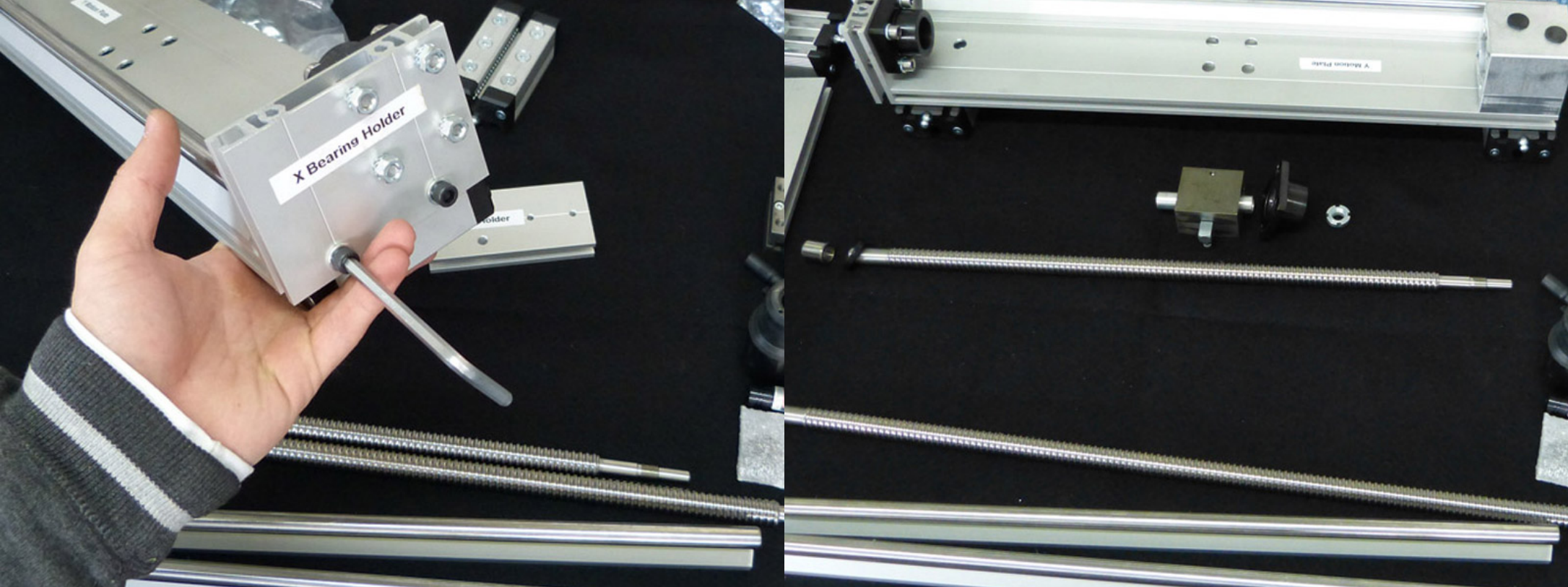
7.5 - X-Y Laser Assembly



Use the provided bolts and nuts to put it all together. Note the locking washers on the back.

Use the provided 2 nuts and washers to fasten the assembly to the main plate.

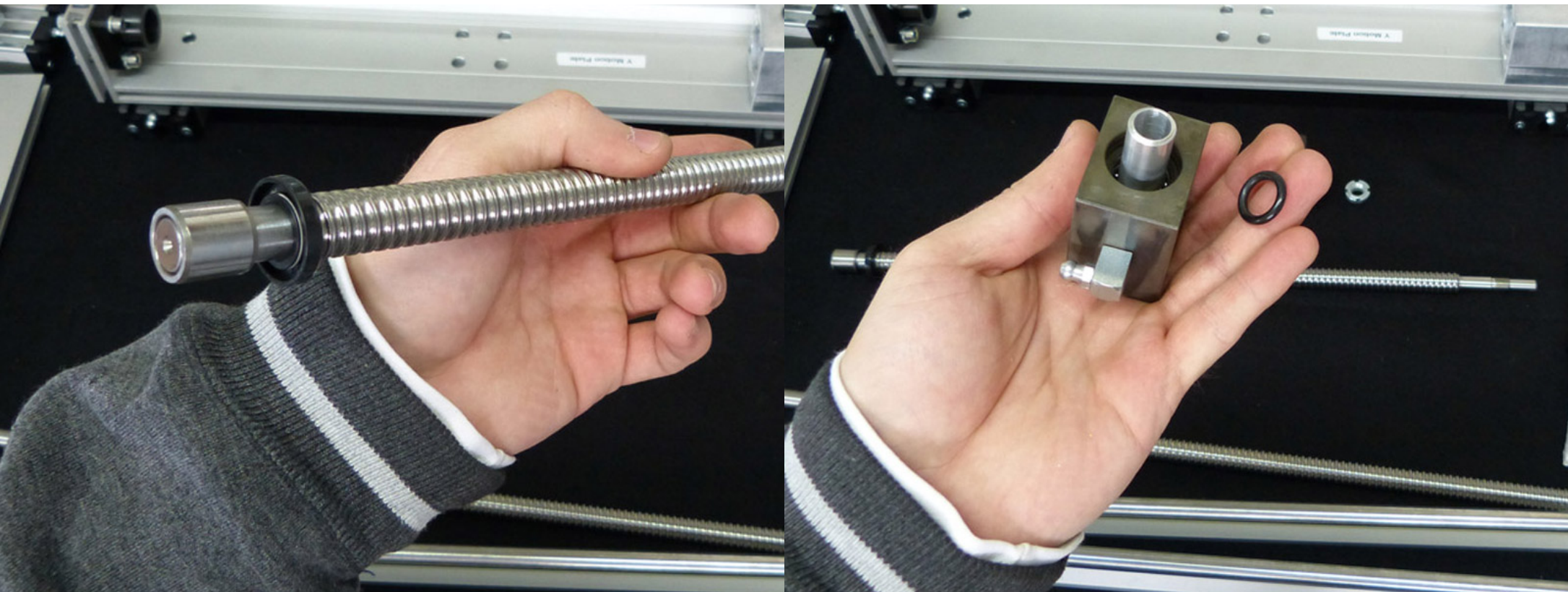
Step 9



Screw the bolts in but don't tighten the assembly yet since we need to install the spindle first.

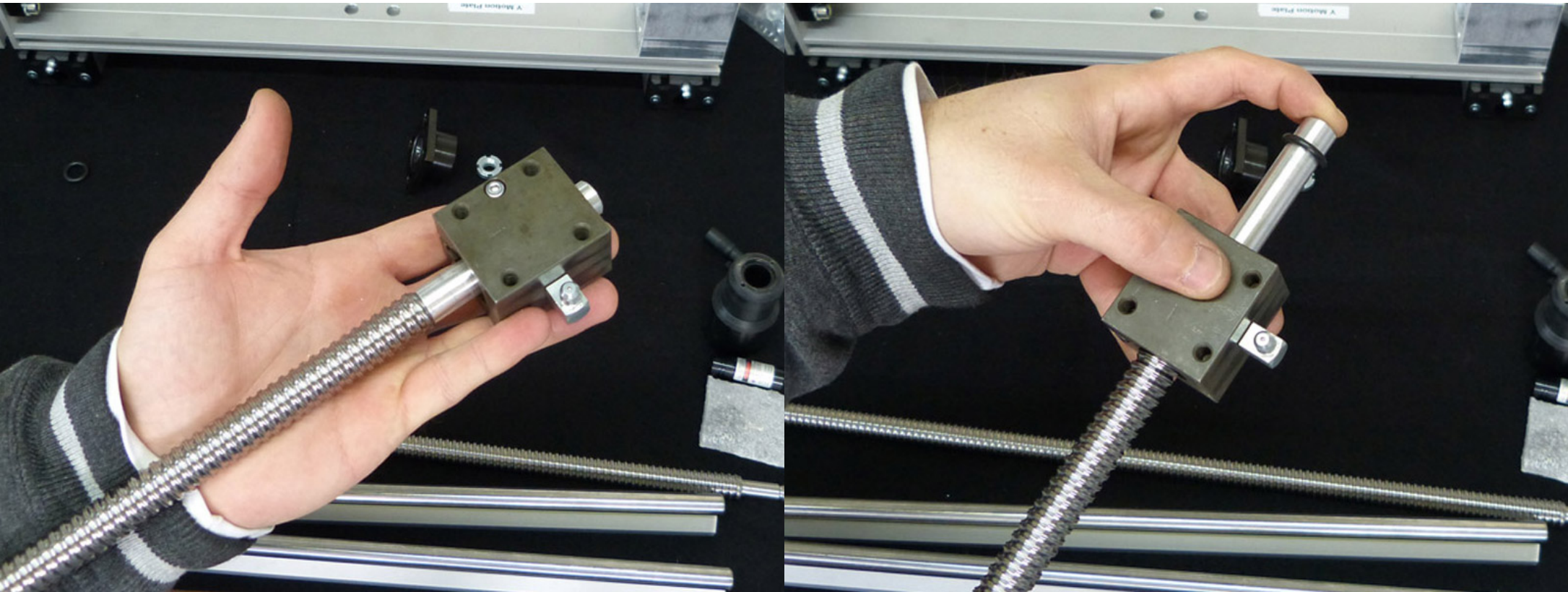
Begin this step by placing the spindle and its components as shown and understand how it all goes together. This should not be news to you since it was already done the exact same way for the Z axis on the machine.

7.5 - X-Y Laser Assembly



Note that we need to install the gasket first and then the ring from the support bearing. It may take some effort to get the ring on but use soft materials to fit it in place since the outside surface needs to remain smooth for the bearing to do its job.

It is also time now to install the spindle bearing. This bearing is somewhat different from the one on the Z axis but the principle of installation is the same.

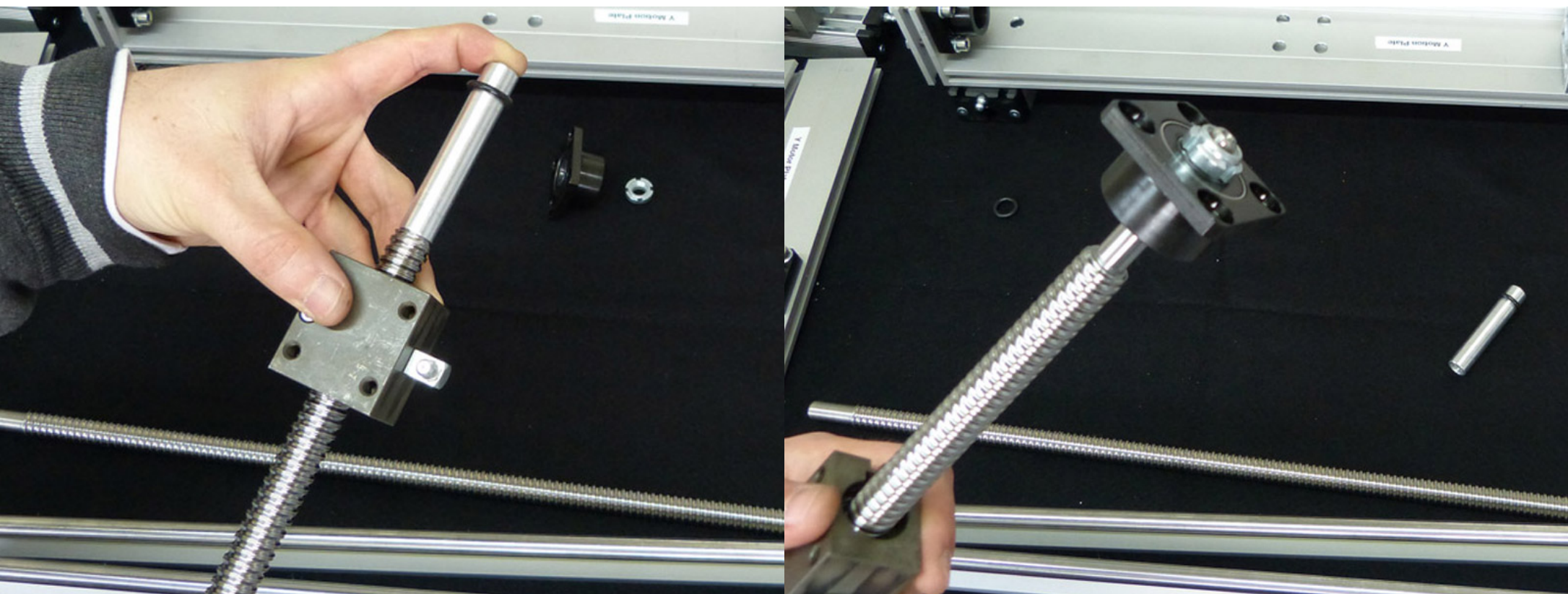


Please note that you need to remove the Rubber O-Ring from one of the aluminum tube sides so you don't leave it in the spindle when its through.

Please be careful when doing this since if you loose any bearings from the assembly then the spindle might get damaged. Press the aluminum tube well against the spindle and begin rotating it. Always be gentle since no force is required for this step. If you must, back up and rotate again so the spindle screws in smoothly.

Step 10

7.5 - X-Y Laser Assembly



Once the spindle is through, you can relax and remove the aluminum tube as you won't be needing it anymore.

Now we need to install the drive side bearing on the spindle. Put the pieces together as shown in the picture.

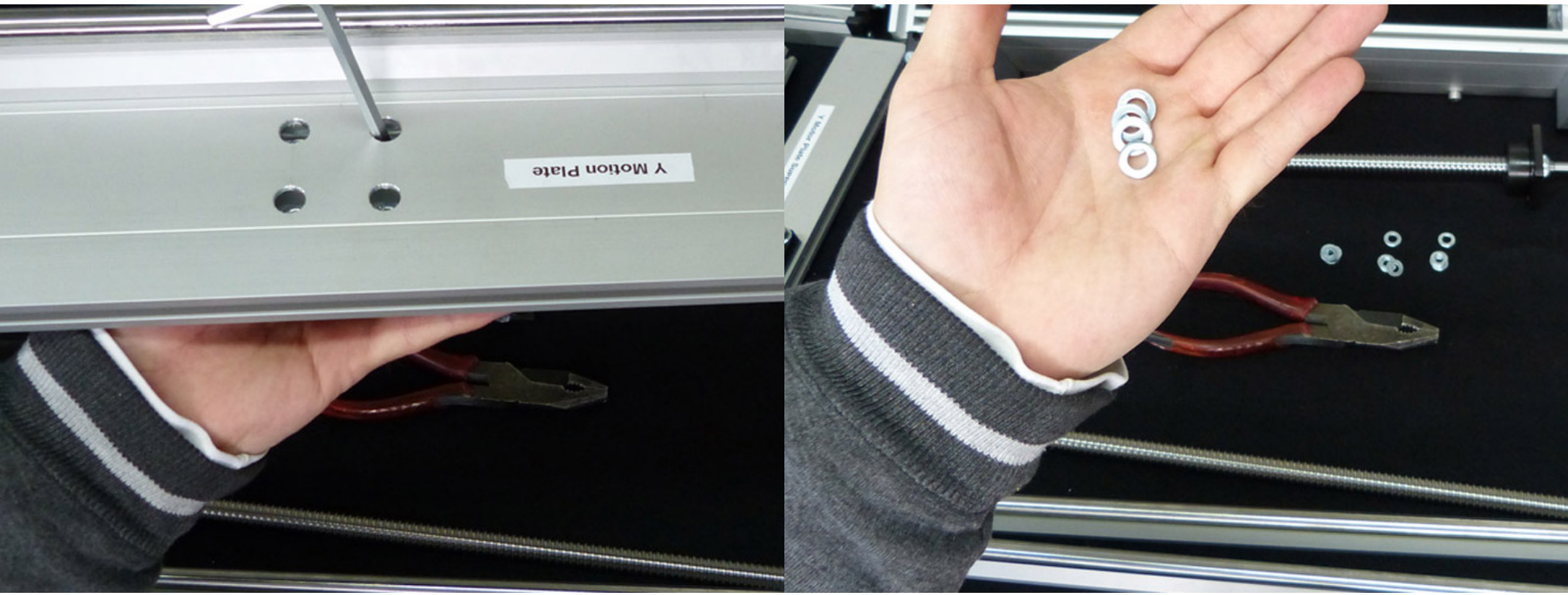
Step 11



This neat trick was introduced to me by another Ilios user so i take no credit for it, however it shall make your life much easier if you do it this way.

Take the second bearing for the Y spindle and the bolts as shown.

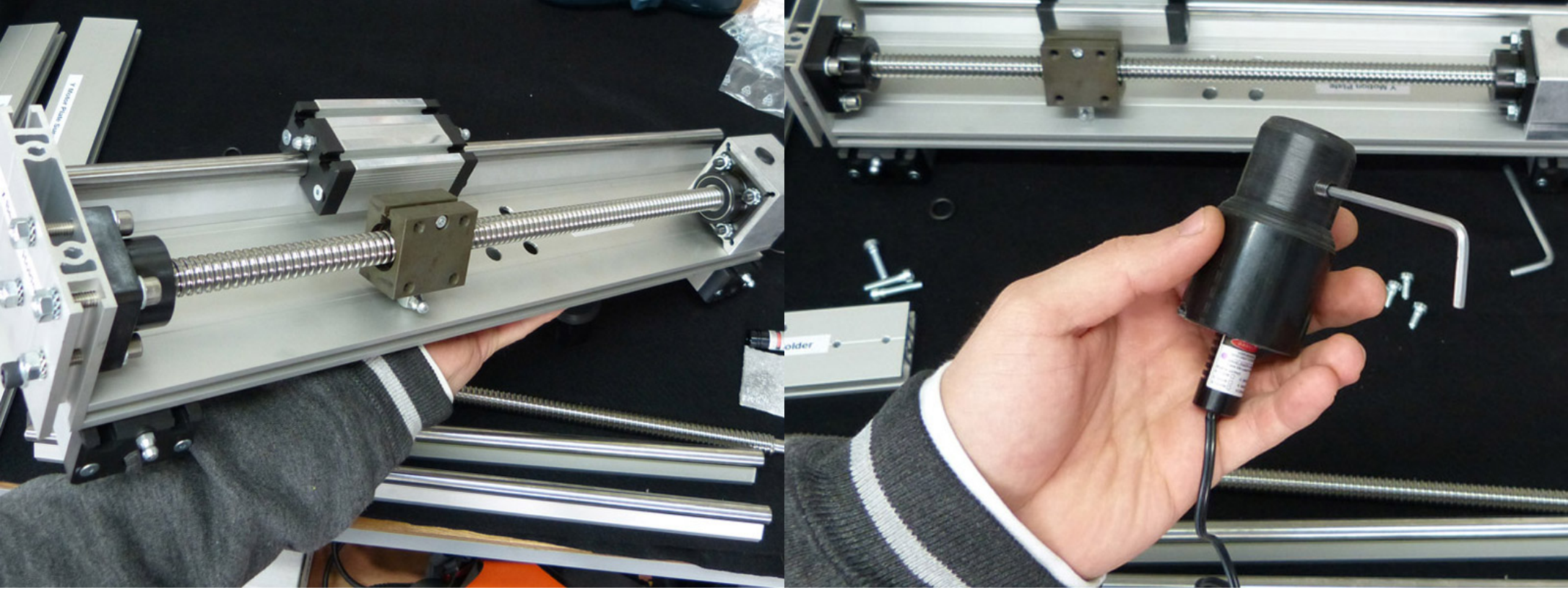
7.5 - X-Y Laser Assembly



Install it on the bottom side of the X plate and make sure that you have 4 washers as a spacer between the bearing and the plate as this spacing will be crucial later when you install the spindle.

Once again, note the washers and install them accordingly.

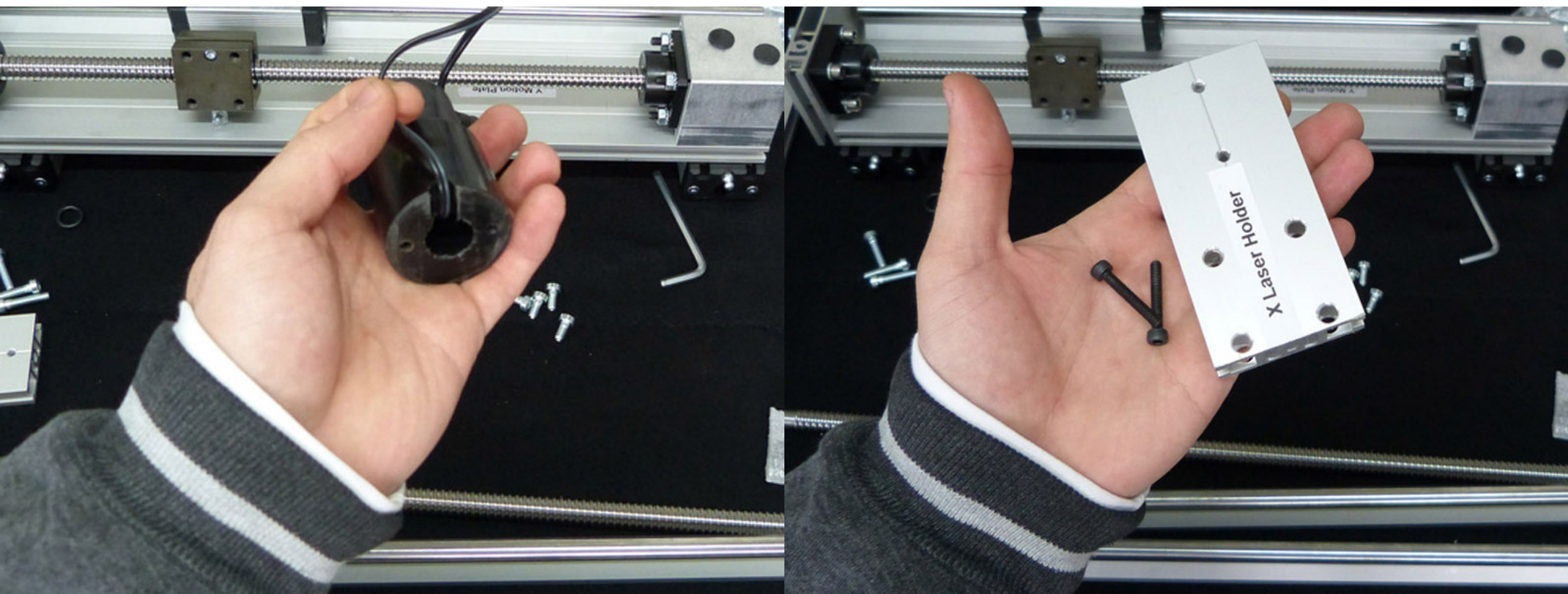
Step 12



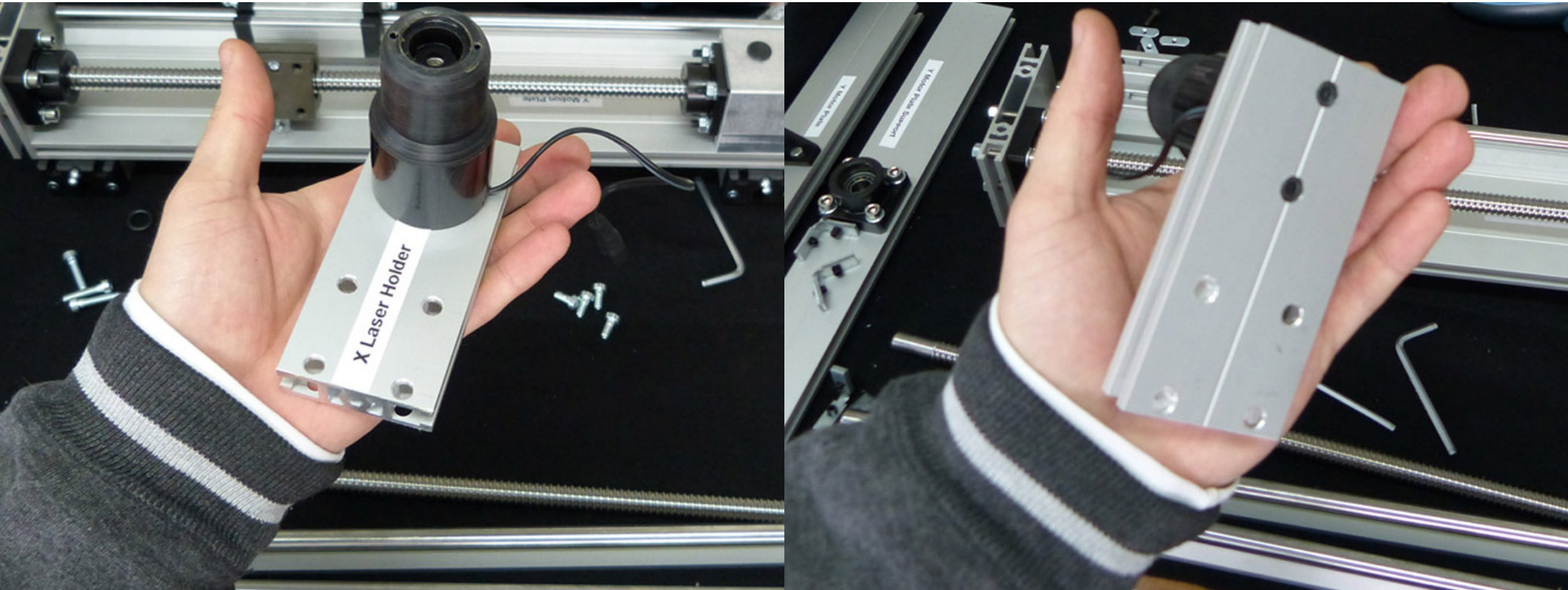
Install the X spindle as shown. The process is pretty much identical to the Z axis so nothing new here.

Lets begin assembling the laser. You shall find that the allen nut shall already be installed in the laser holder so leave it there for the time being and tighten the laser inside the holder. Don't do it too hard as there is no need for that.

7.5 - X-Y Laser Assembly



Note that the laser wire should be able to go into the groove made for it. Install the laser holder and the laser on the corresponding plate as shown.

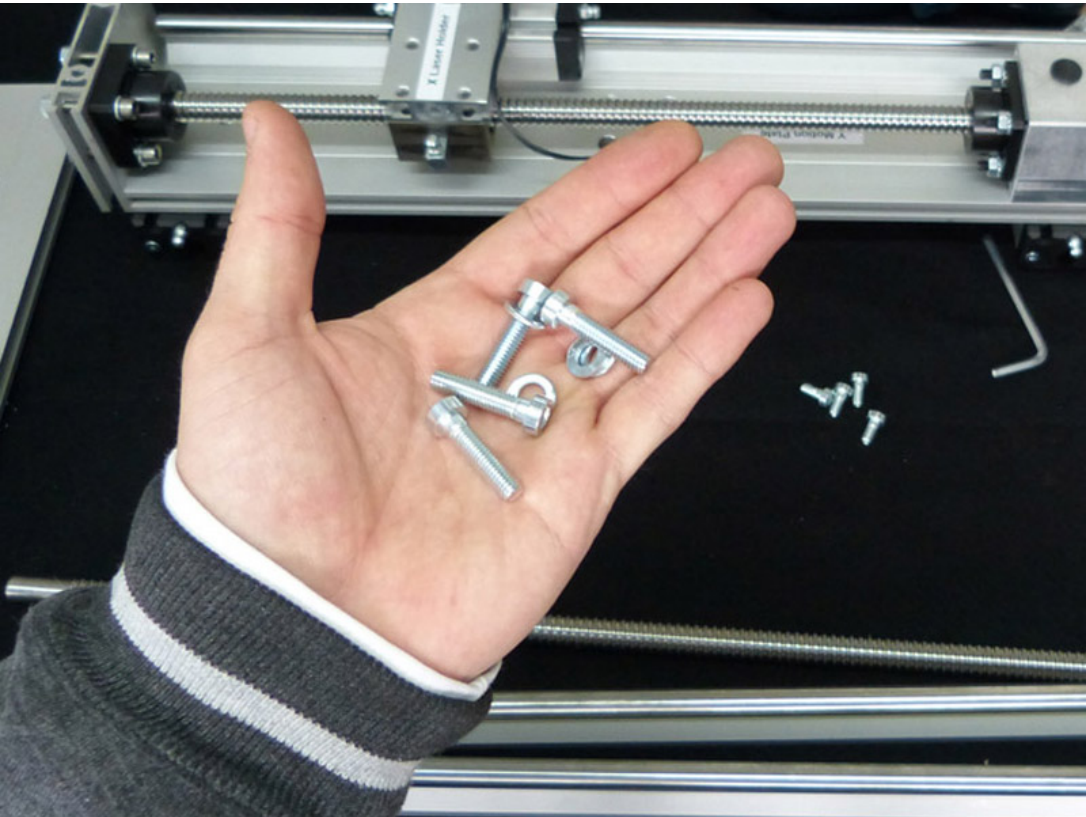


Use the bolts in the image to install it.

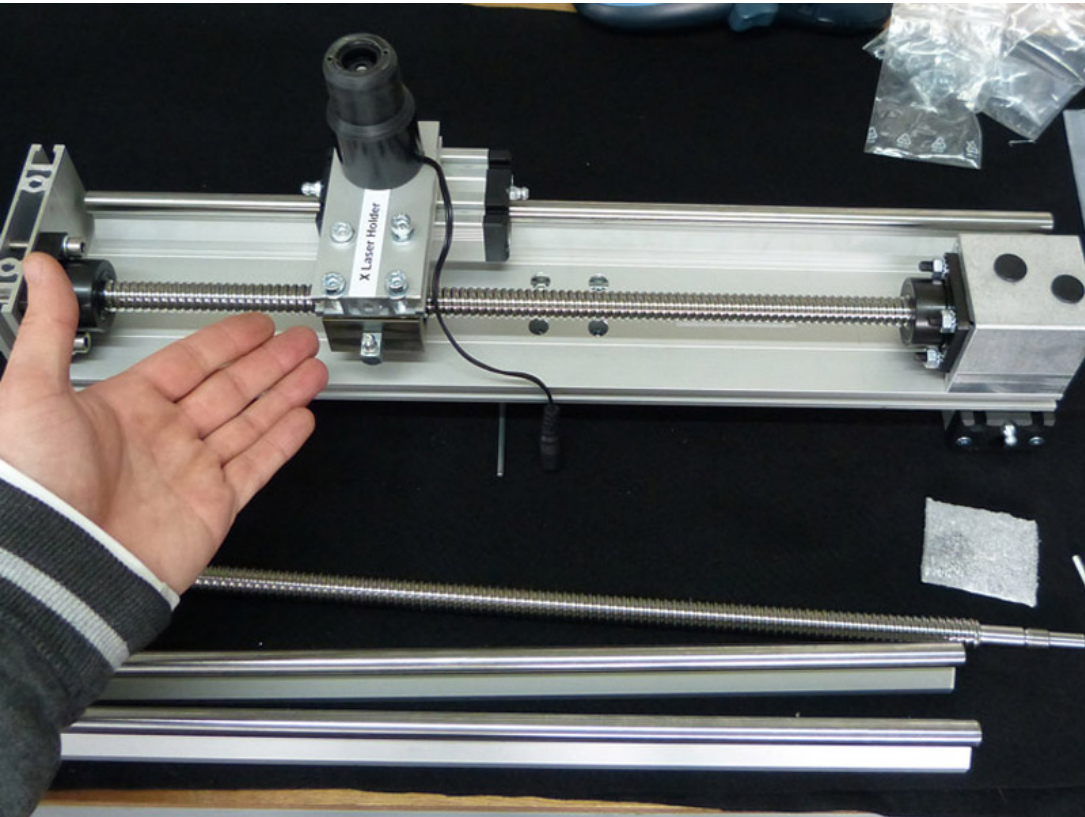
Note the orientation of the plate and that the bolts need to go through the indentations for them on the other side so that the bottom plate is flush.

Step 13

7.5 - X-Y Laser Assembly

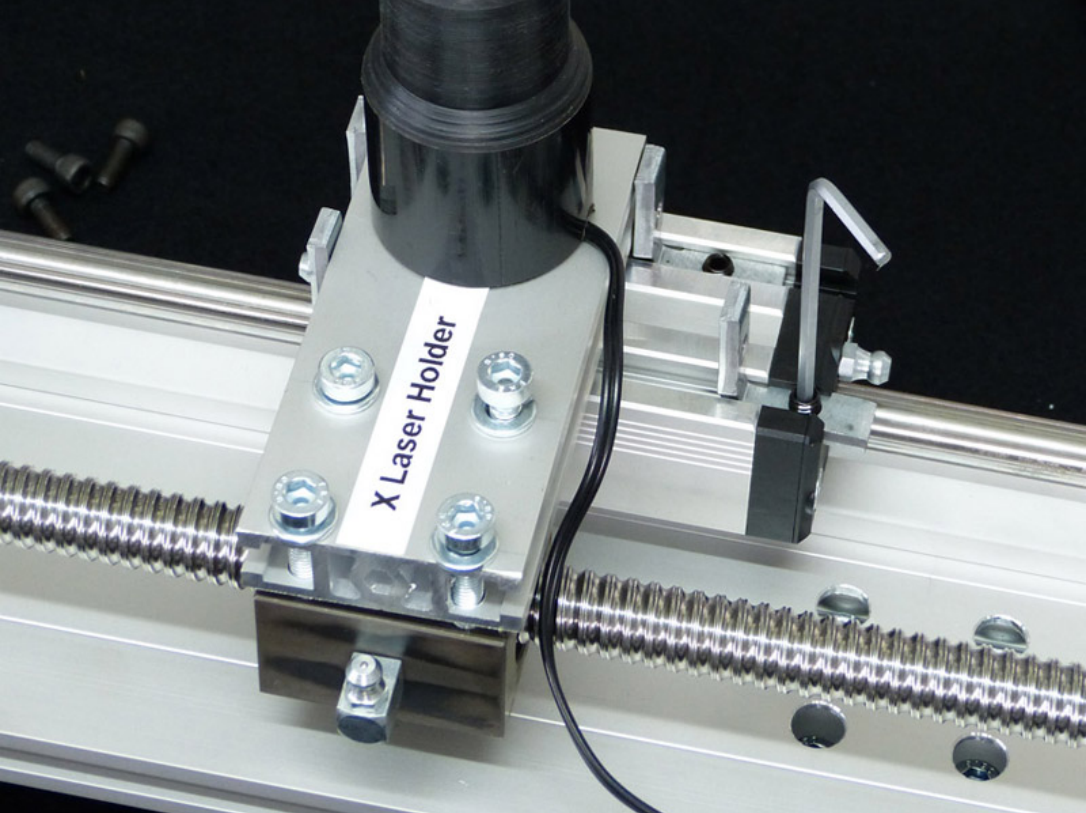


Use these bolts and washers to attach the laser holder to the spindle bearing. Don't tighten it yet.

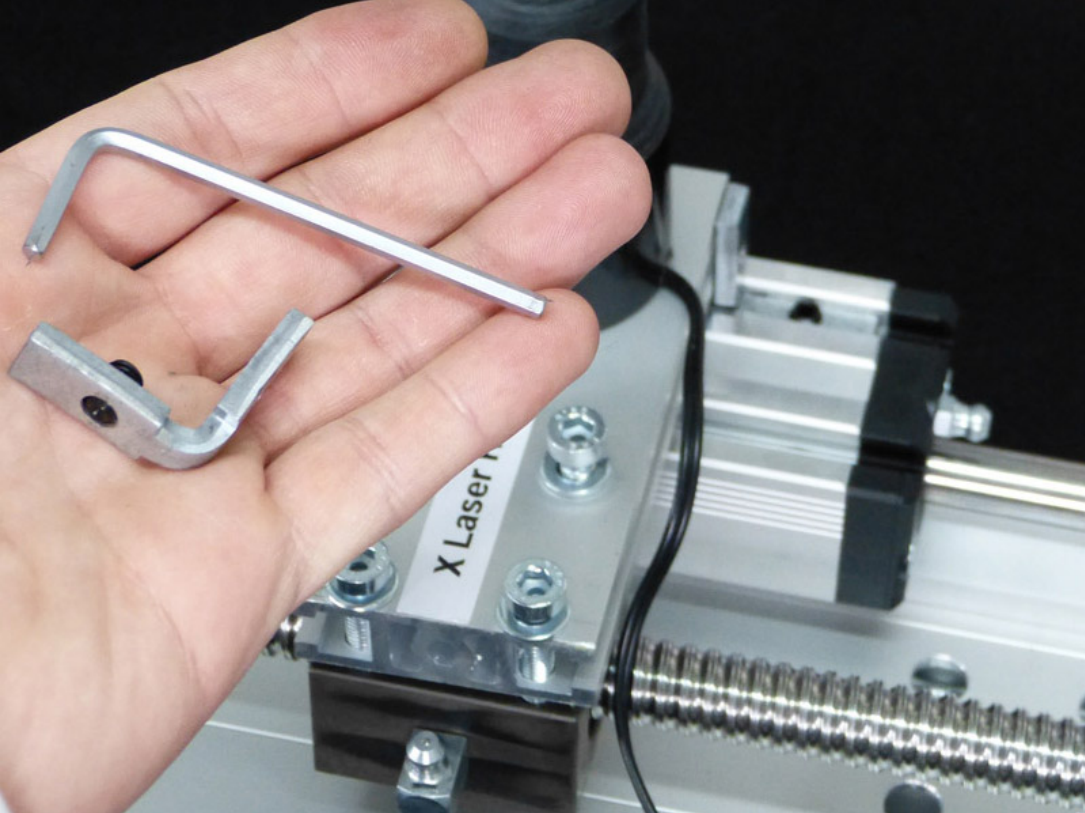


The finished assembly of the laser should look like the image above.

Step 14

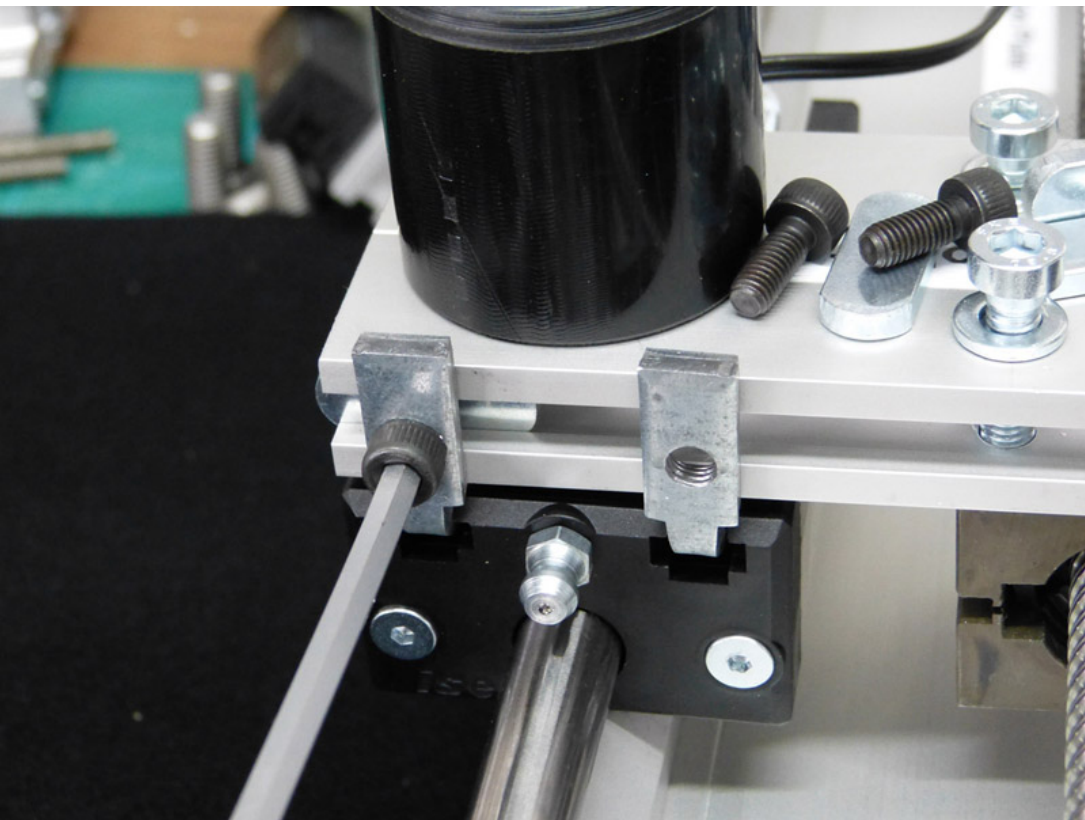
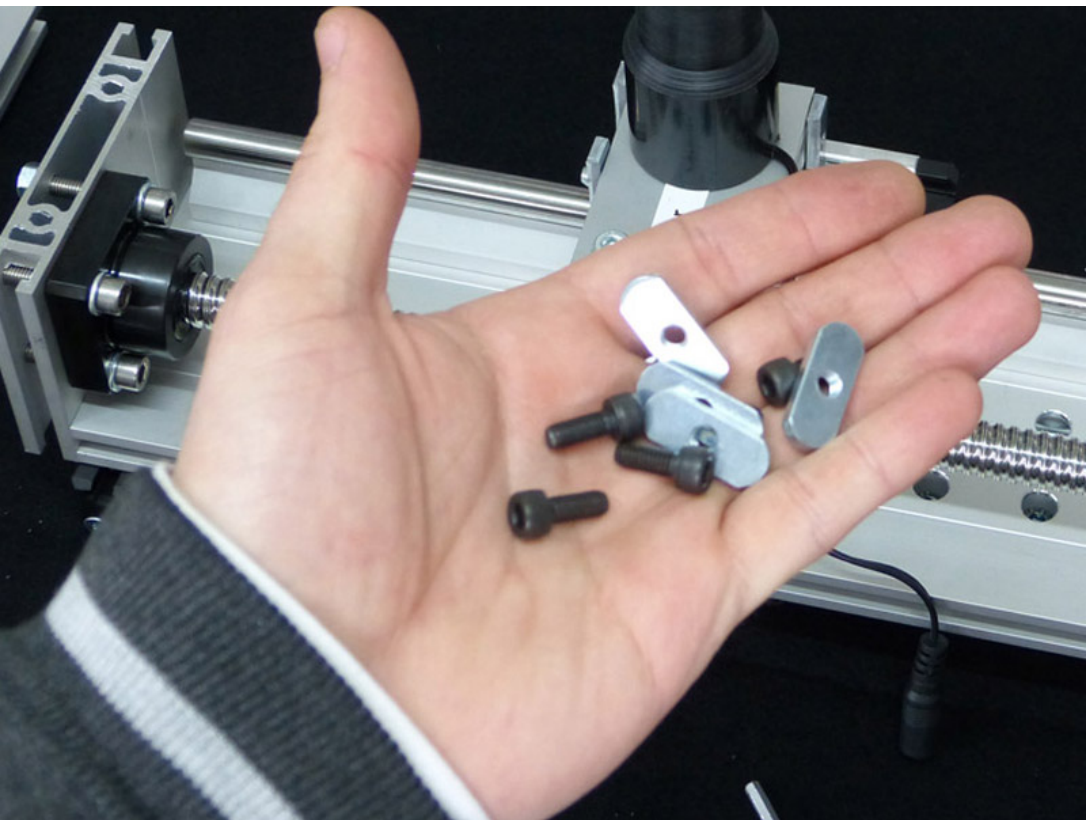


Now that we attached the laser mount to the bearing, we need to do the same to the sliding block.



Use the corner brackets and the allen bolts for each one.

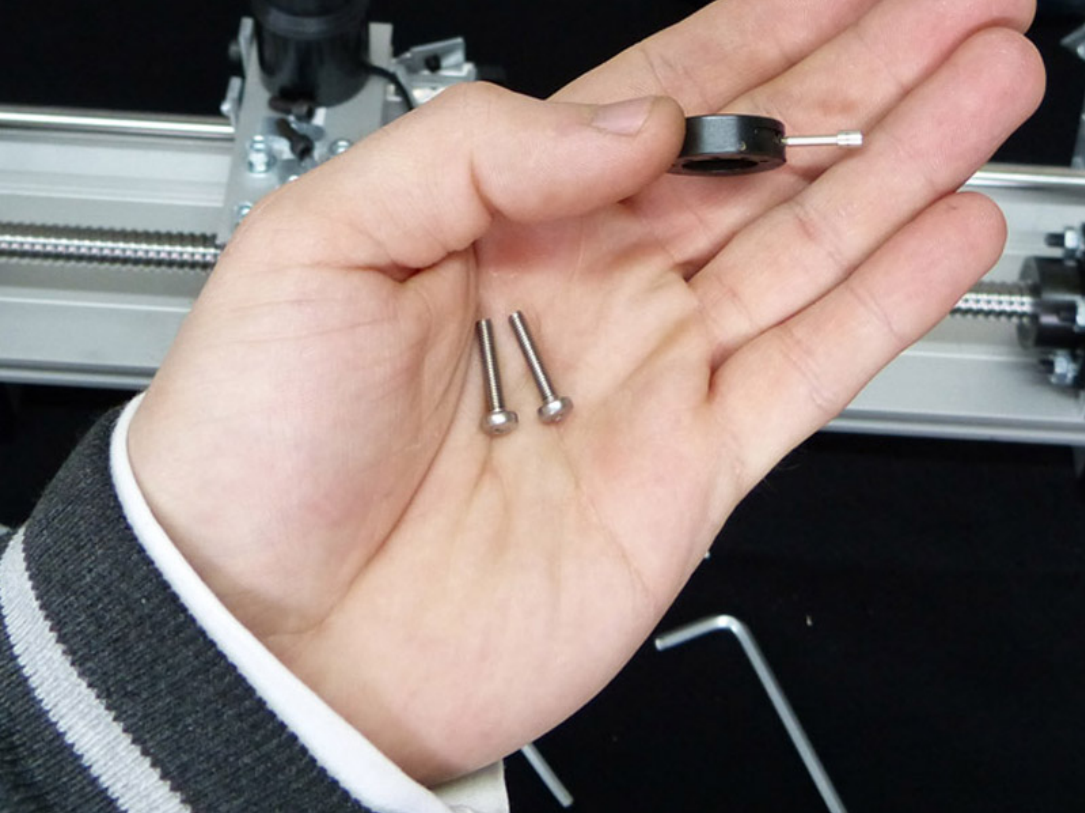
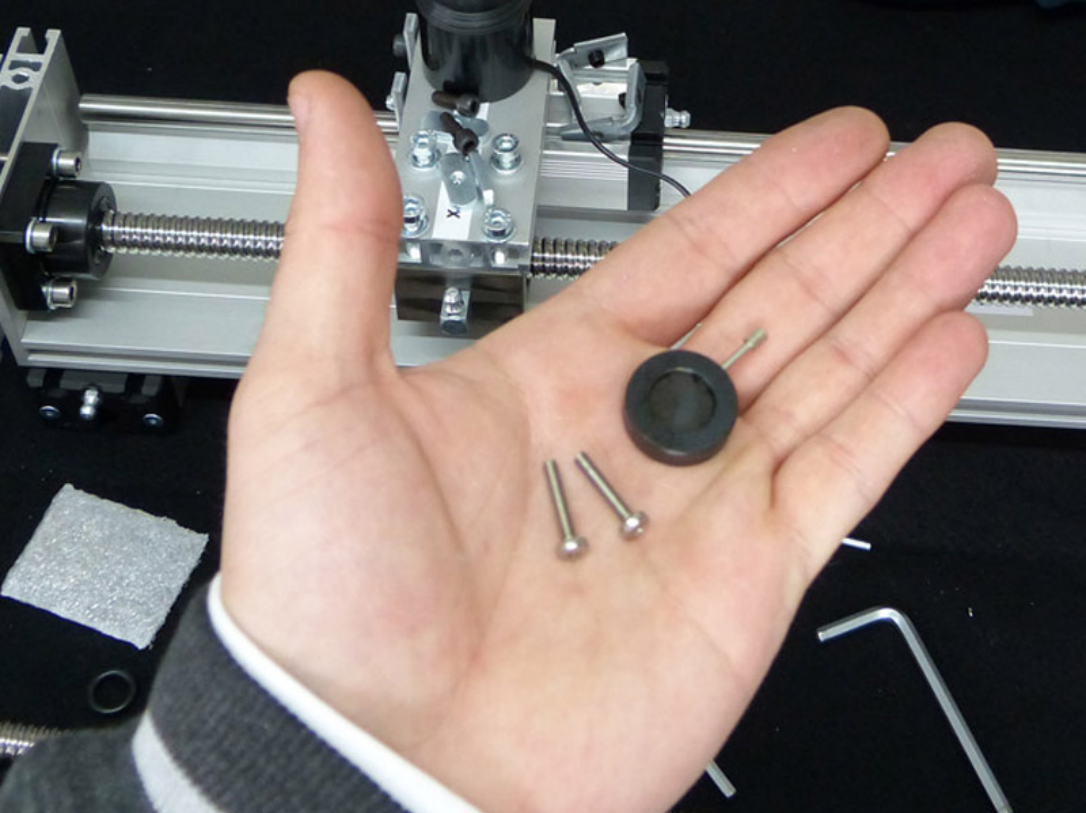
7.5 - X-Y Laser Assembly



This assembly is not exactly like the rest so check out this and the following image to understand how it all goes together.

Tighten the assembly as shown.

Step 15

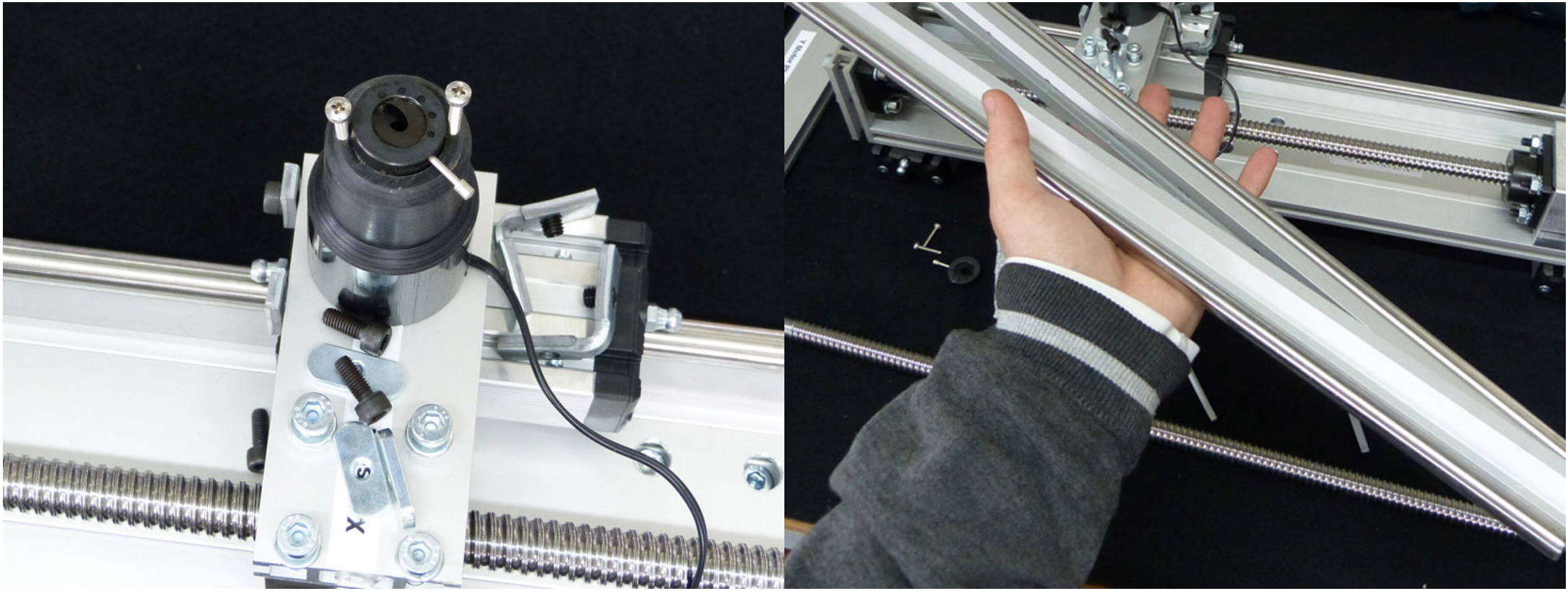


The Iris is most probably one of the most delicate parts in this assembly so please be careful when handling it.

Use the 2 bolts as shown in the image to attach the iris to the laser mount.

Step 16

7.5 - X-Y Laser Assembly



don't tighten it too much as there is no need for that.

Use the 2 remaining slide rails and install them on the Feet Supports for which the holes have already been drilled. Attach the Y Bearing and Motor plates accordingly as shown in the Projector mount 1 assembly instructions, under the step 7. In a nutshell you need to have the X and Y motion for the laser so that it can move in both directions. The distance of the laser to the VAT doesn't play much of a difference since you shall be controlling it through the iris.