

# **ZINC Assembly Guide**

**Version 1.2 - 3/20/2021**

**118 Design**

# **NOTICE:**

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# Introduction

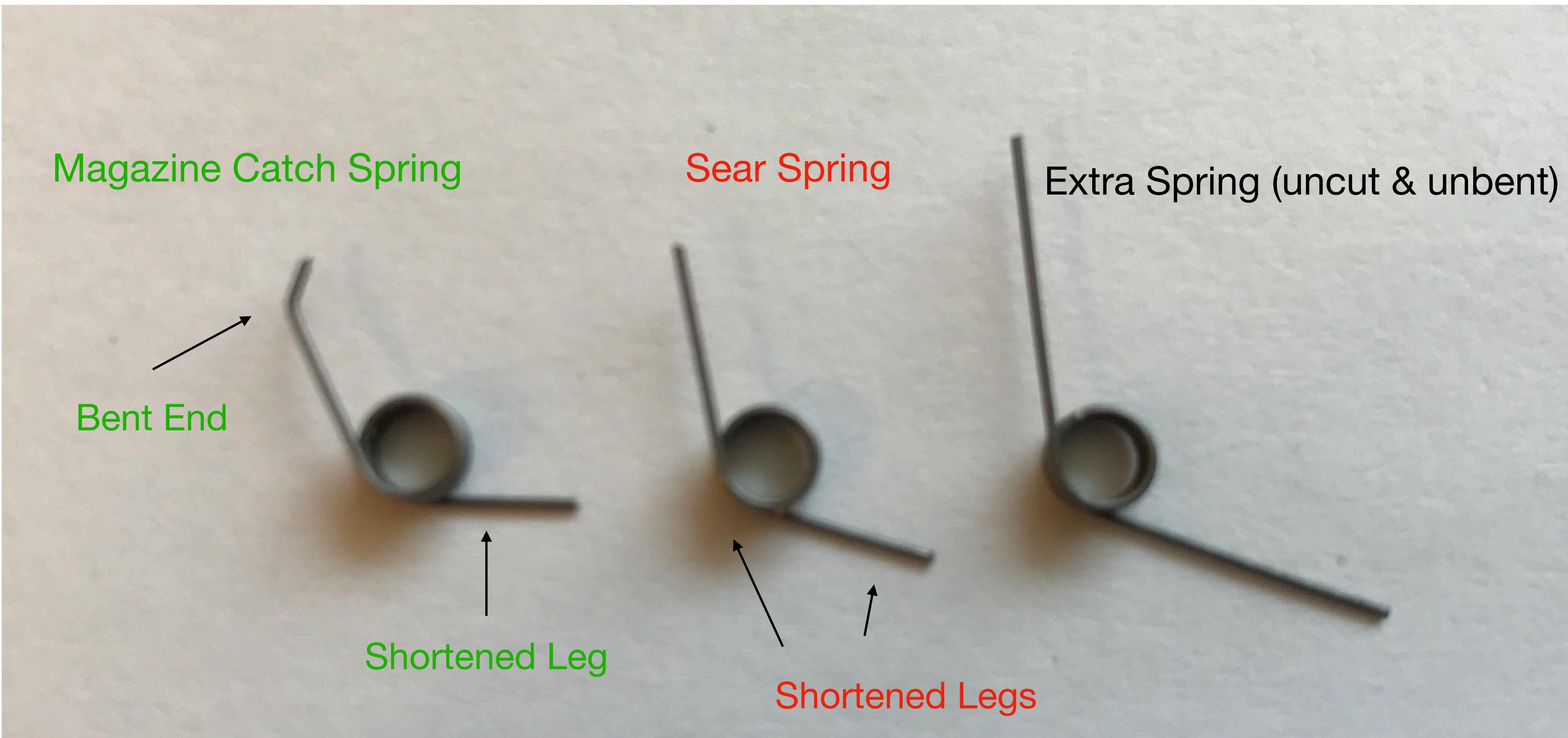
- The files for all 3D printed parts can be found at: <https://github.com/118design/ZINC/>
- Please send any questions or comments to [support@118.design](mailto:support@118.design)
- Hardware kits may be purchased at: [www.118.design](http://www.118.design)

# Required tools & materials

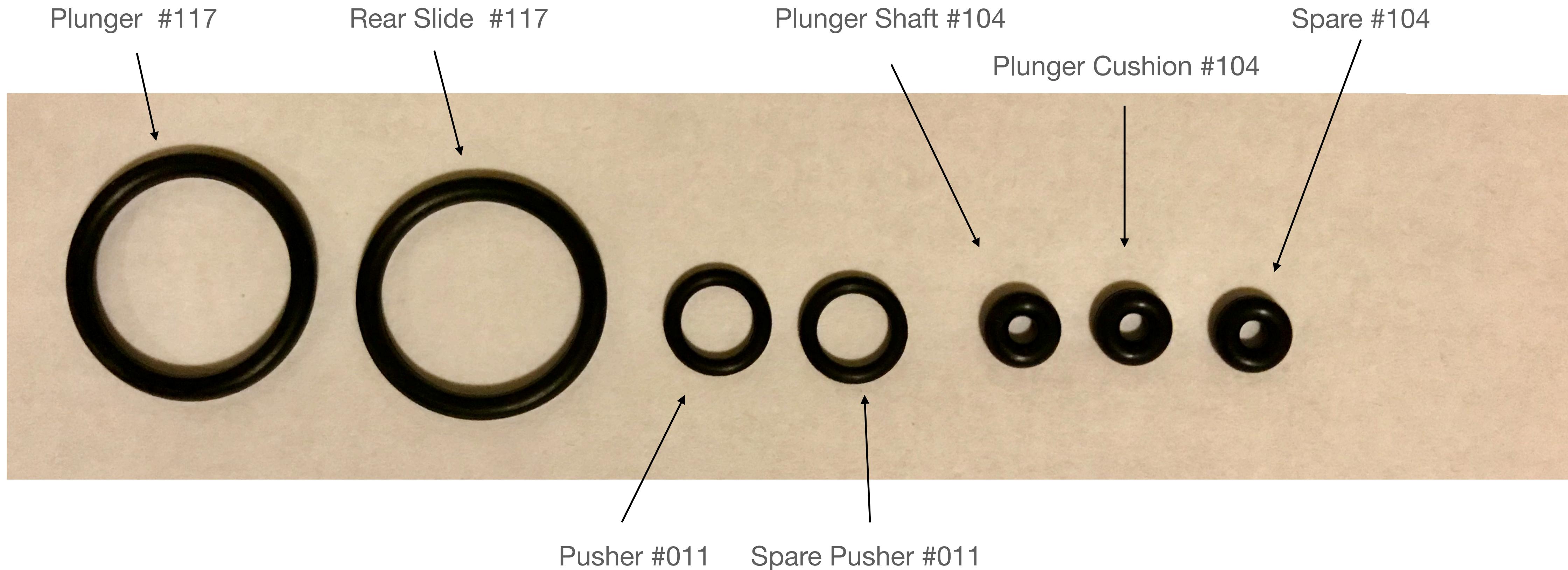
**The following tools/materials are required for assembly:**

- PETG filament and a 3d printer with *at least* 210mm x 210mm x 210mm build volume. (Ender 3 & Prusa I3 MKS both work)
- A high-quality CA glue
- A "red" or permanent grade threadlocker **AND** a "blue" or semi-permanent grade threadlocker
- 3/16" allen wrench
- 1/16" allen wrench
- Silicon based lubricant
- Metal file with a square edge
- Sand paper and a hobby knife to clean up 3D printed parts
- Soldering Iron (for heat set inserts, helpful but not strictly required)

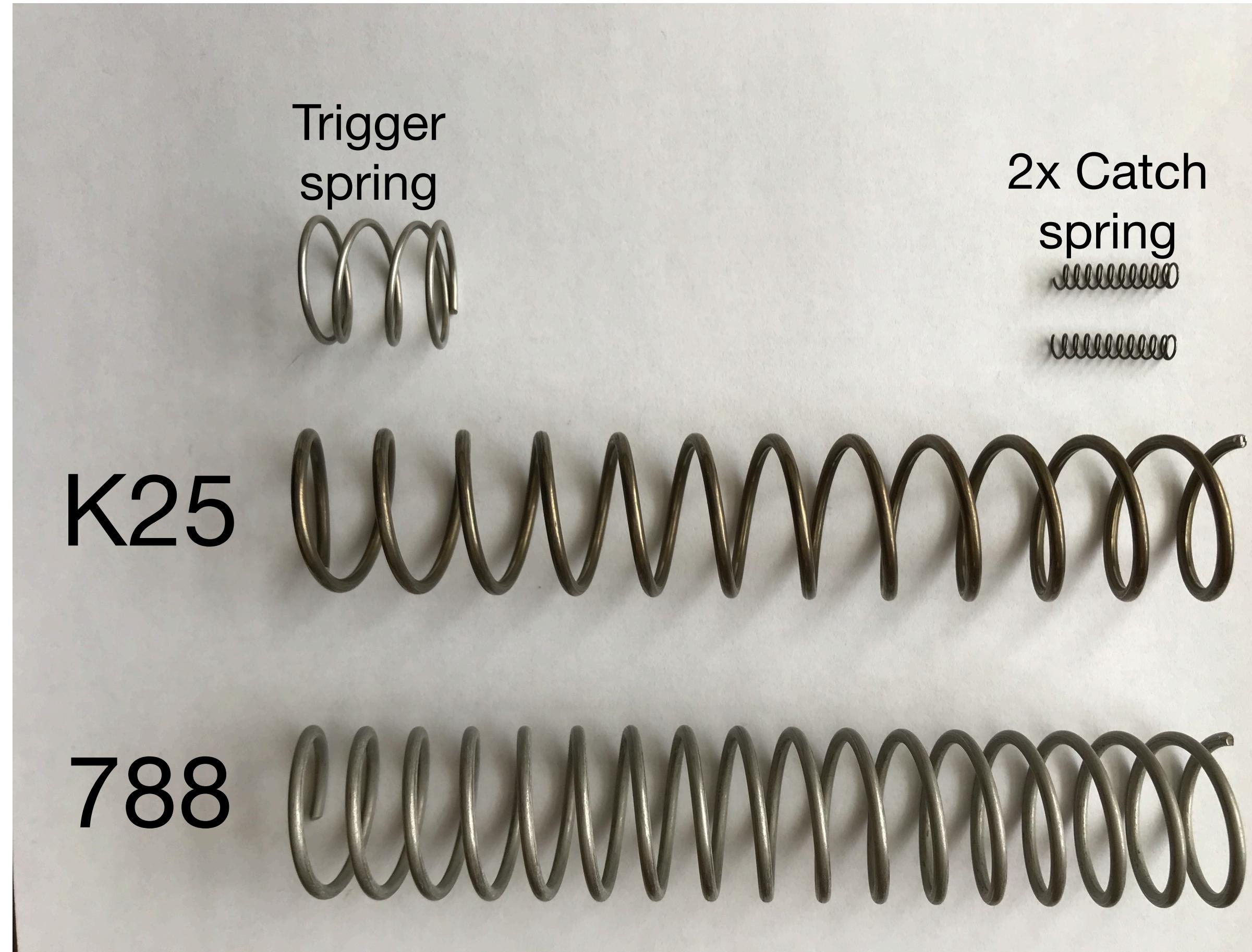
# Torsion Spring Guide



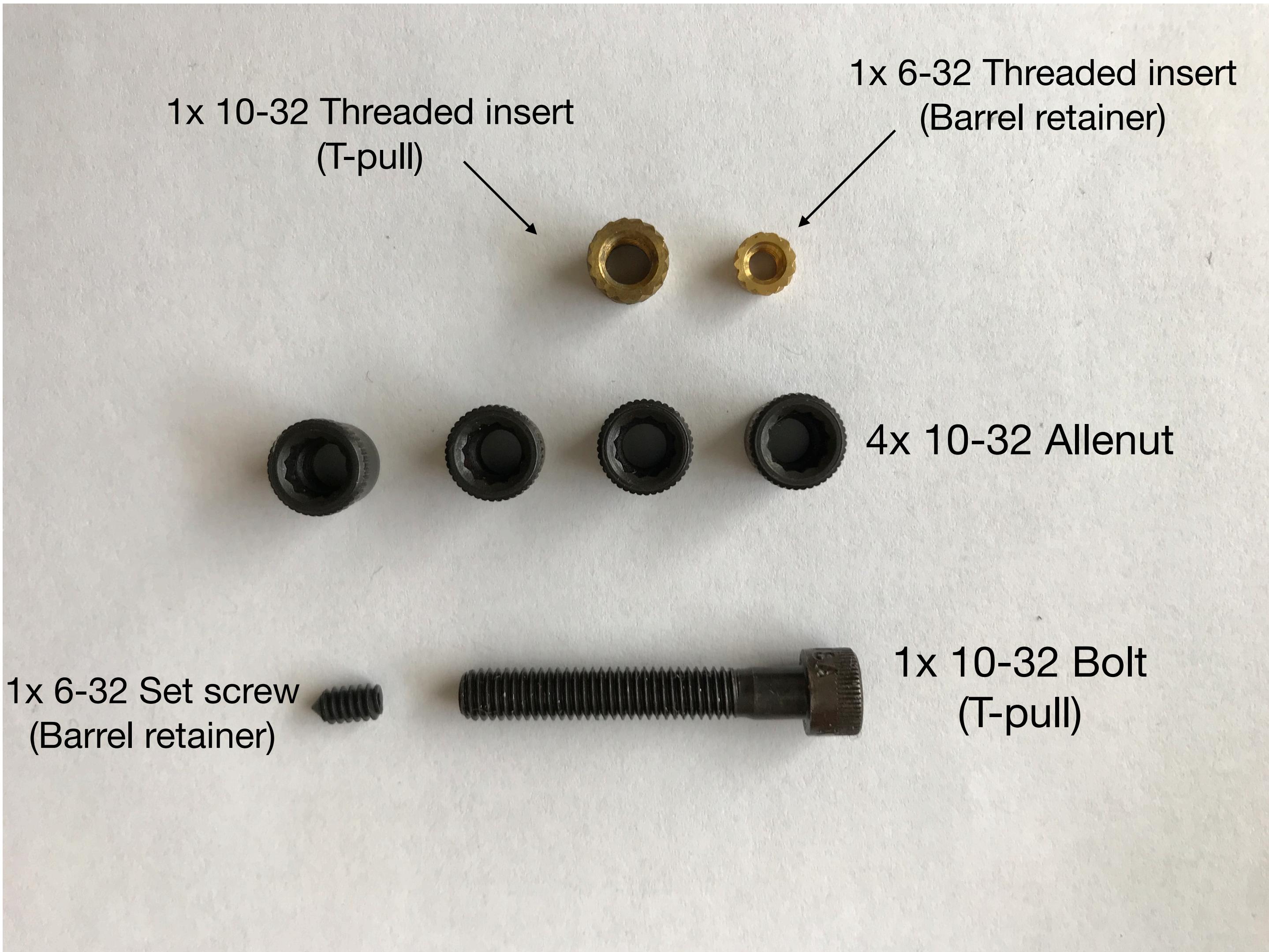
# O-Ring Guide



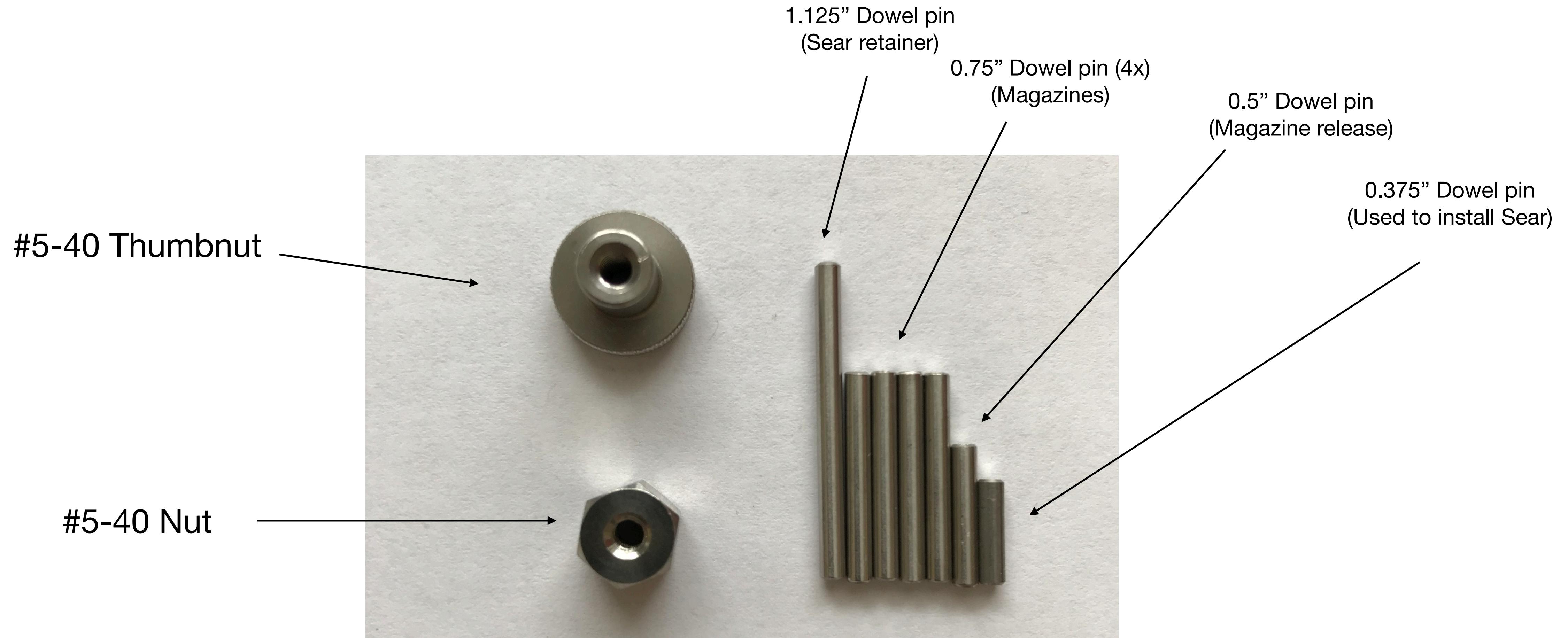
# Compression Spring Guide



# Inserts & Screws Guide



# Dowel pin & Nut Guide



# Step 1.0

## Guide Rods - required parts

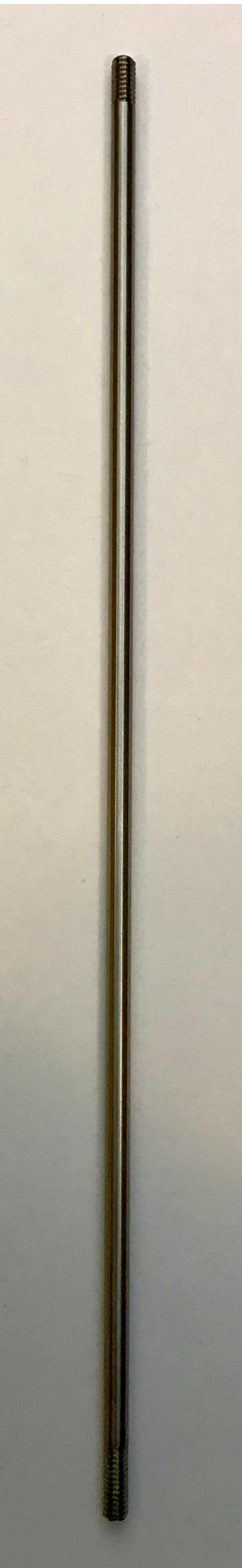
- *The following parts and tools are required:*
- 2x #10-32 Allenuts
- 1x #5-40 Stainless Hex nut
- 1x 1/8" OD Stainless shaft
- 2x 3/16" OD Stainless Shaft
- Permanent grade thread locker. (**DO NOT** substitute for a “blue” grade!)



# Step 1.1

## Guide Rods - plunger rod

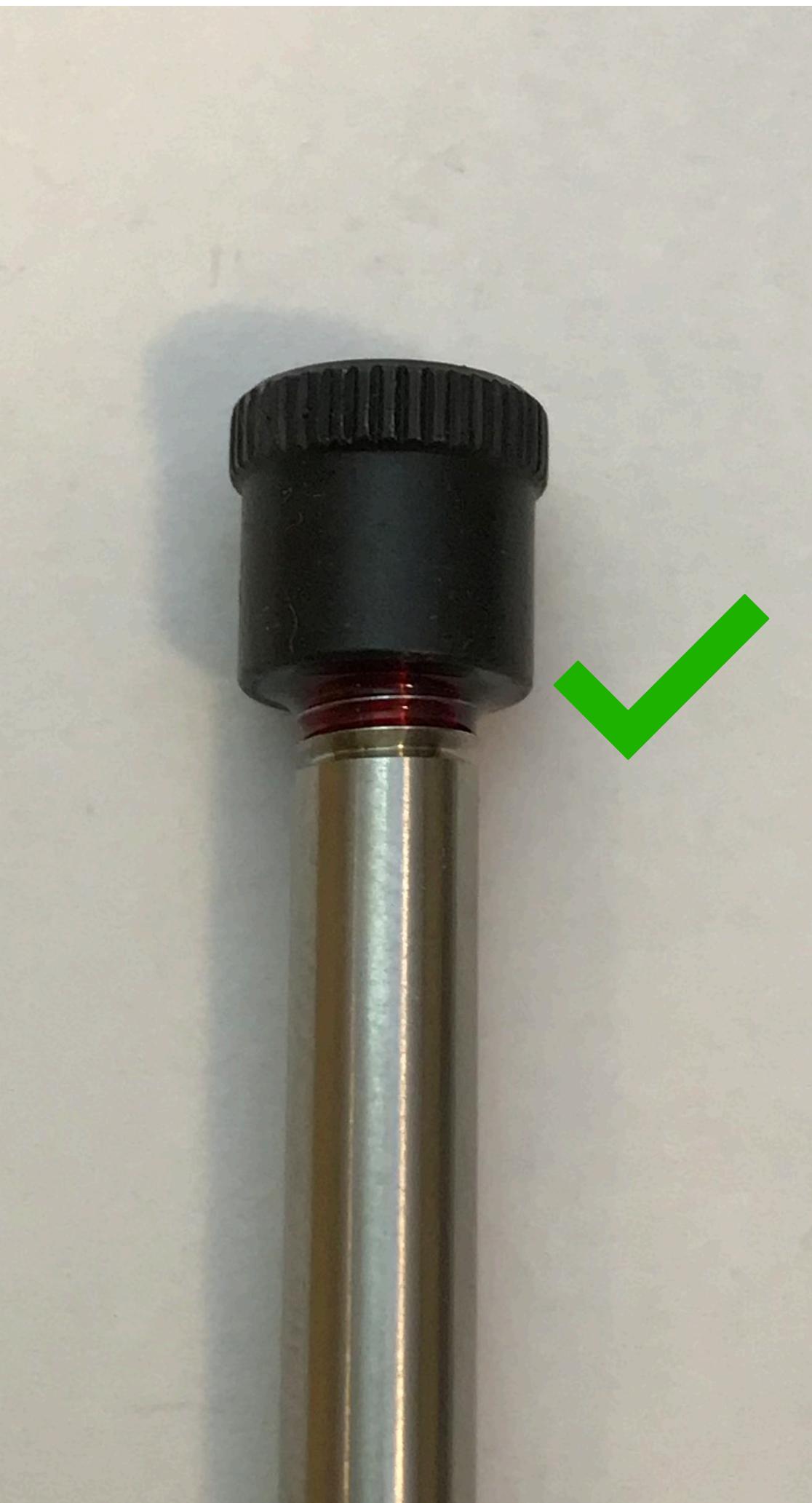
- Select the 1/8" Diameter shaft
- **Select the end of the rod with a 1/4" depth of thread**
- Add a small amount of permanent threadlocker and thread the 5/16" nut onto the end
- Tighten securely until the nut is fully engaged with all of the threading
- Do not use until the threadlocker has cured



# Step 1.2

## Guide Rods - slide rods

- Select the 3/16" diameter shafts
- Each shaft will have a single allenut placed on it
- Add a small amount of permanent grade threadlocker
- Thread each allenut on until the internal threads are fully engaged. Not all of the threading on the shafts will be engaged.
- **Do not thread the allenuts on all the way, ensure there is full engagement of an allen key in the socket.**



All rods finished

# Step 2.0

## Frame - required parts

- *The following parts and tools are required:*
- A high-quality super glue. I've used StarBond thin CA glue and never had a frame fail.
- If you are unsure about the glue you have I recommended printing some test pieces and verifying the bonding strength.



# Step 2.1

## Frame - deburring

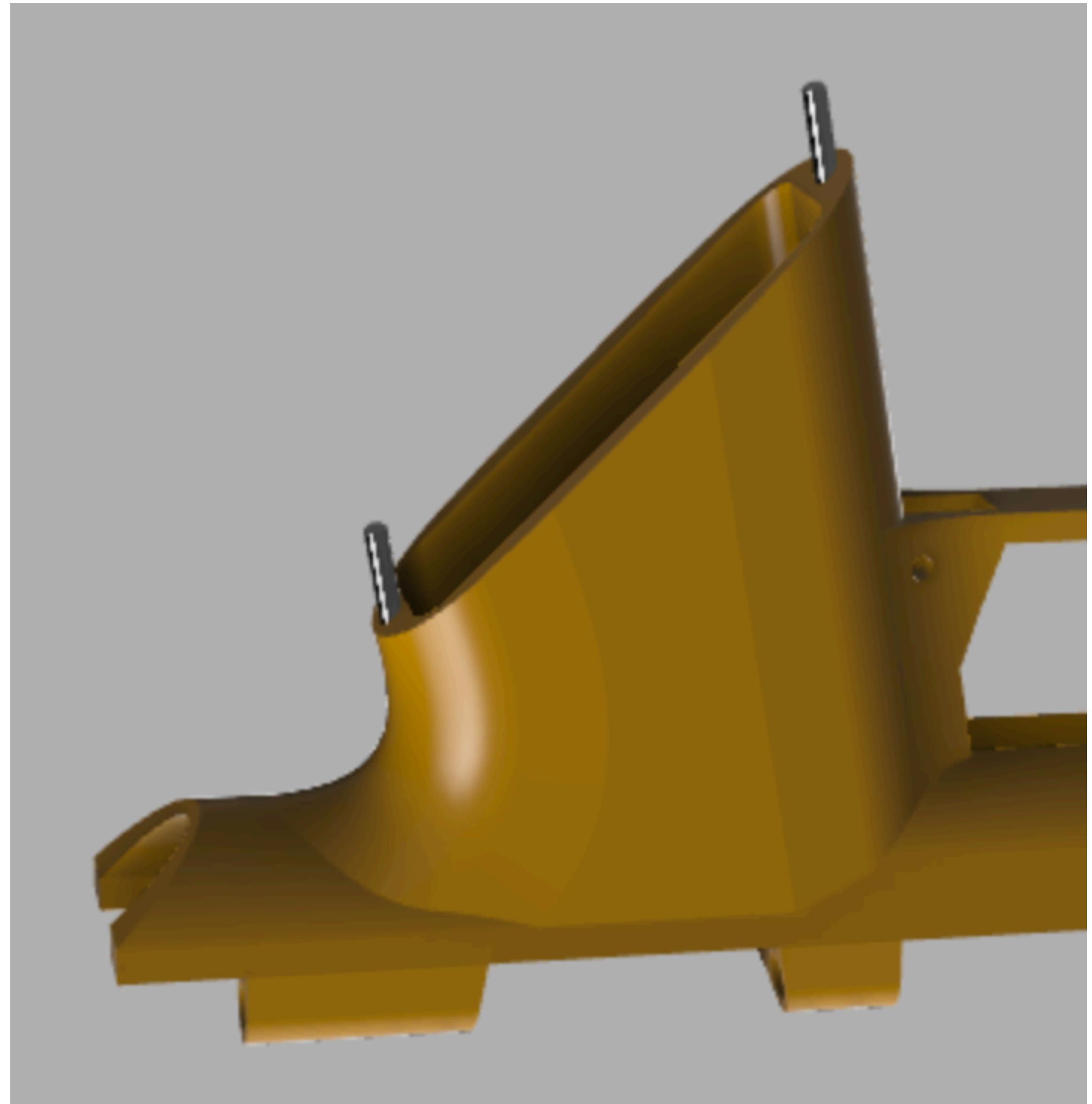
- Carefully deburr the internal edges of the magazine well using a knife or a file
- Repeat this process for the frame
- You may need to deburr or drill out the alignment pin holes depending on your print quality



# Step 2.2

## Frame - deburring

- Insert the 3/4" pins into the frame. You may need to debur or ream out the hole depending on your setting.
- **DO A DRY FIT BEFORE GLUING. ENSURE THAT THE PINS FULLY SEAT IN BOTH HALVES OF THE FRAME**



# Step 2.3

## Frame - gluing

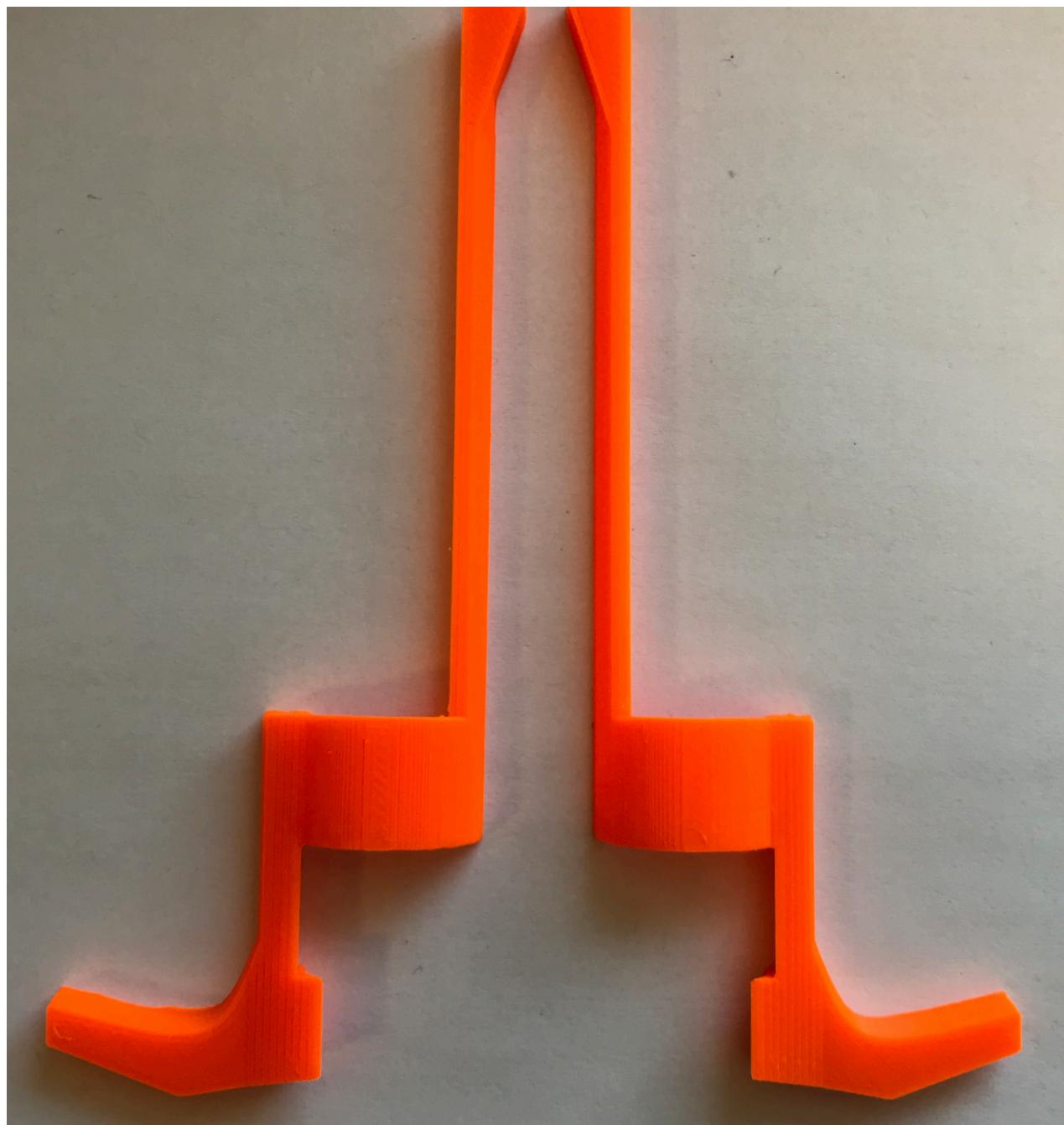
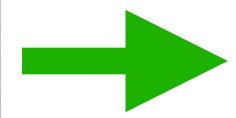
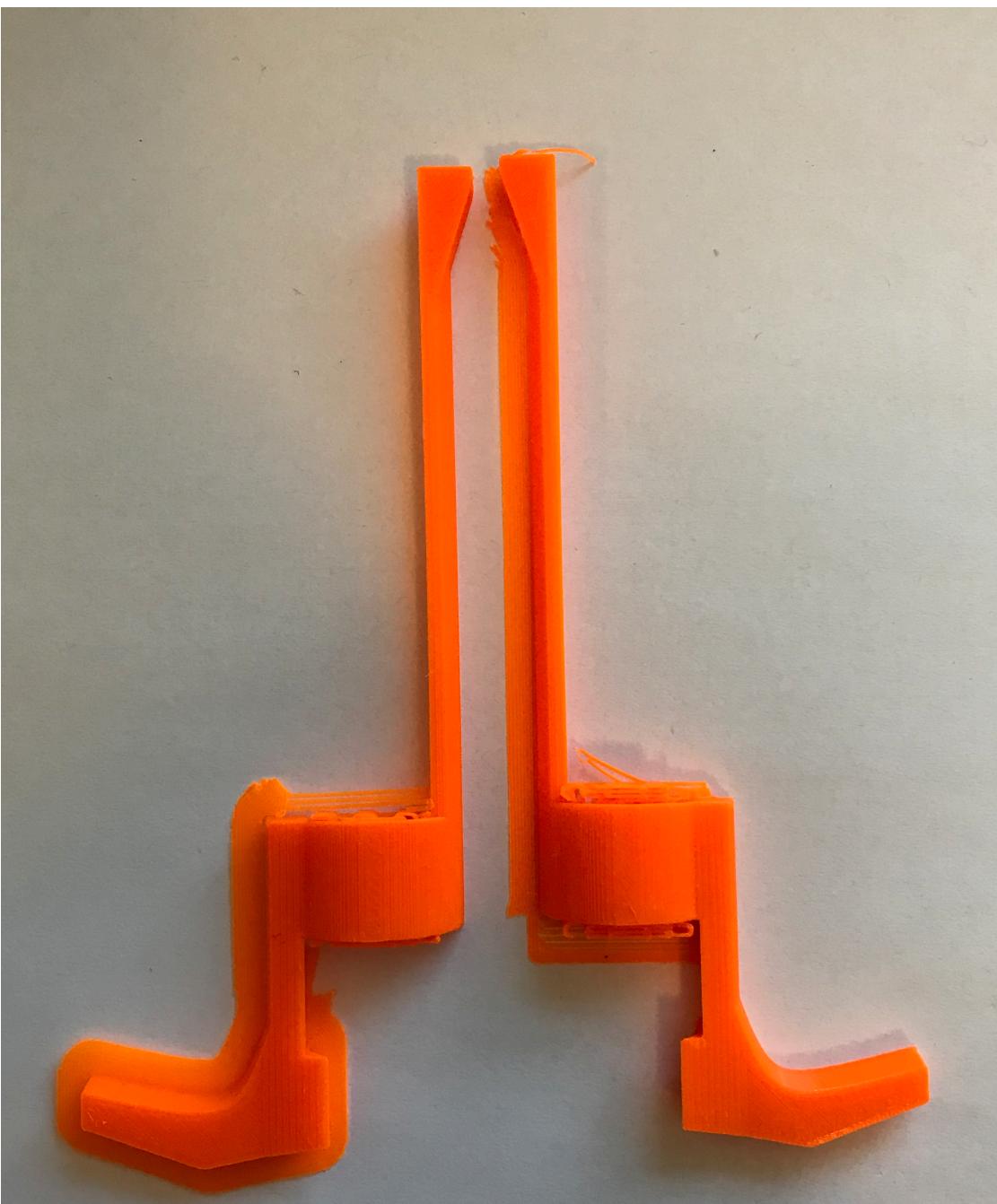
- Using a high quality CA glue, or the relevant solvent for your plastic, glue the frame together
- You should sand/file the handle seam for increased comfort
- If there are gaps or you were unable to apply appropriate pressure during gluing then DO NOT USE THE FRAME



# Step 3.0

## Trigger - preparation

- The trigger halves should be printed with a brim to ensure they do not peel from the print bed
- Likewise they will need support printed underneath each arch
- Clean up the edges and remove all support material.



# Step 3.1

## Trigger - gluing

- Glue the trigger halves together paying careful attention to align everything
- Sand or file the trigger until it slides smoothly over the barrel. It is best to wrap sandpaper around a dowel to maintain concentricity.
- Place the trigger in the frame and slide the barrel in. Check that the trigger can move it's entire range of motion without binding. Sand or file where needed.
- Yes, this step is a PITA.



# Step 4.0

## Threaded Inserts - required parts

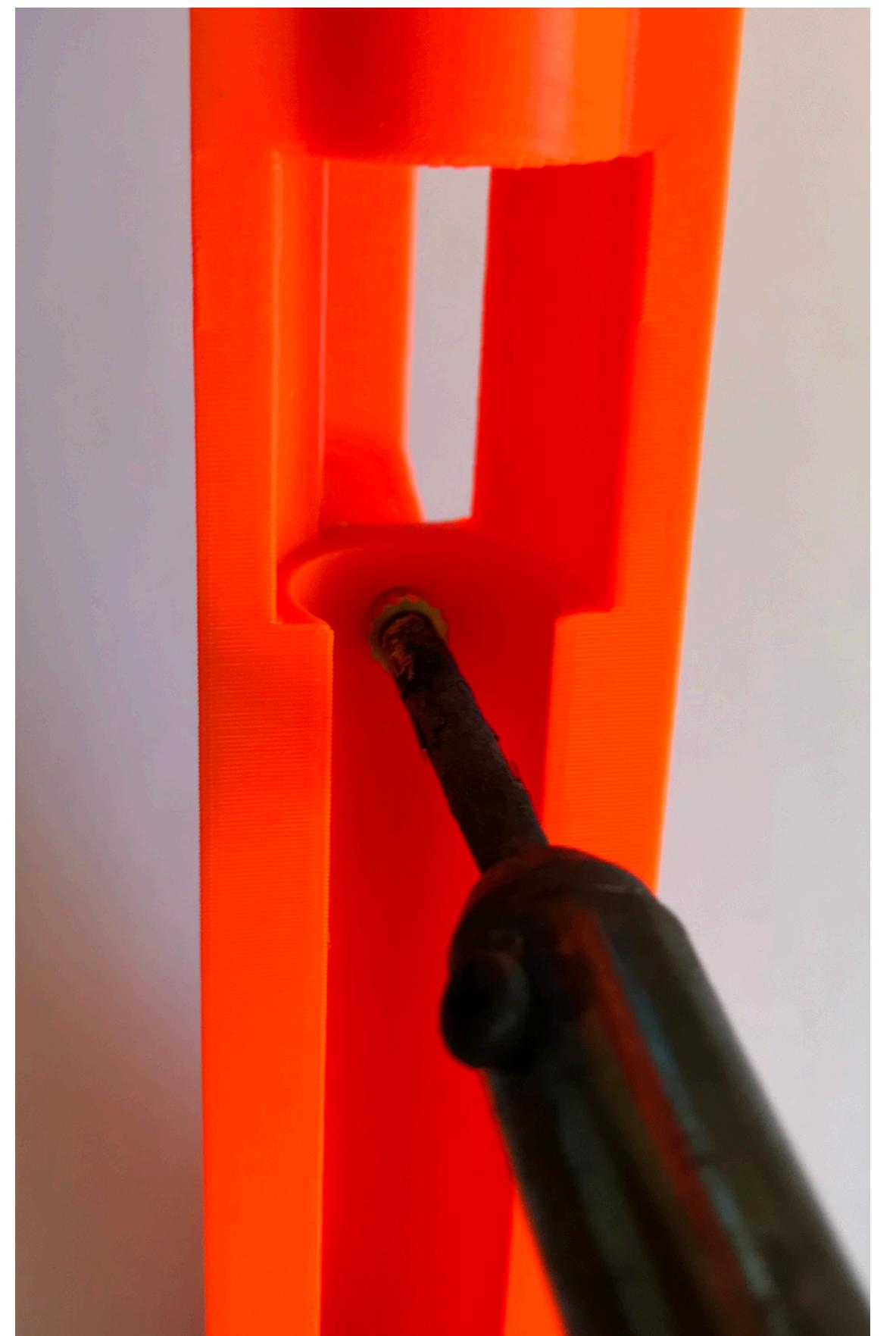
- *The following parts and tools are required:*
- 1x #5-40 Thumb nut
- 1x #6-32 Set screw
- 1x #6-32 Brass threaded insert
- Soldering iron
- 1/16" Allen key



# Step 4.1

## Threaded Inserts - barrel screw

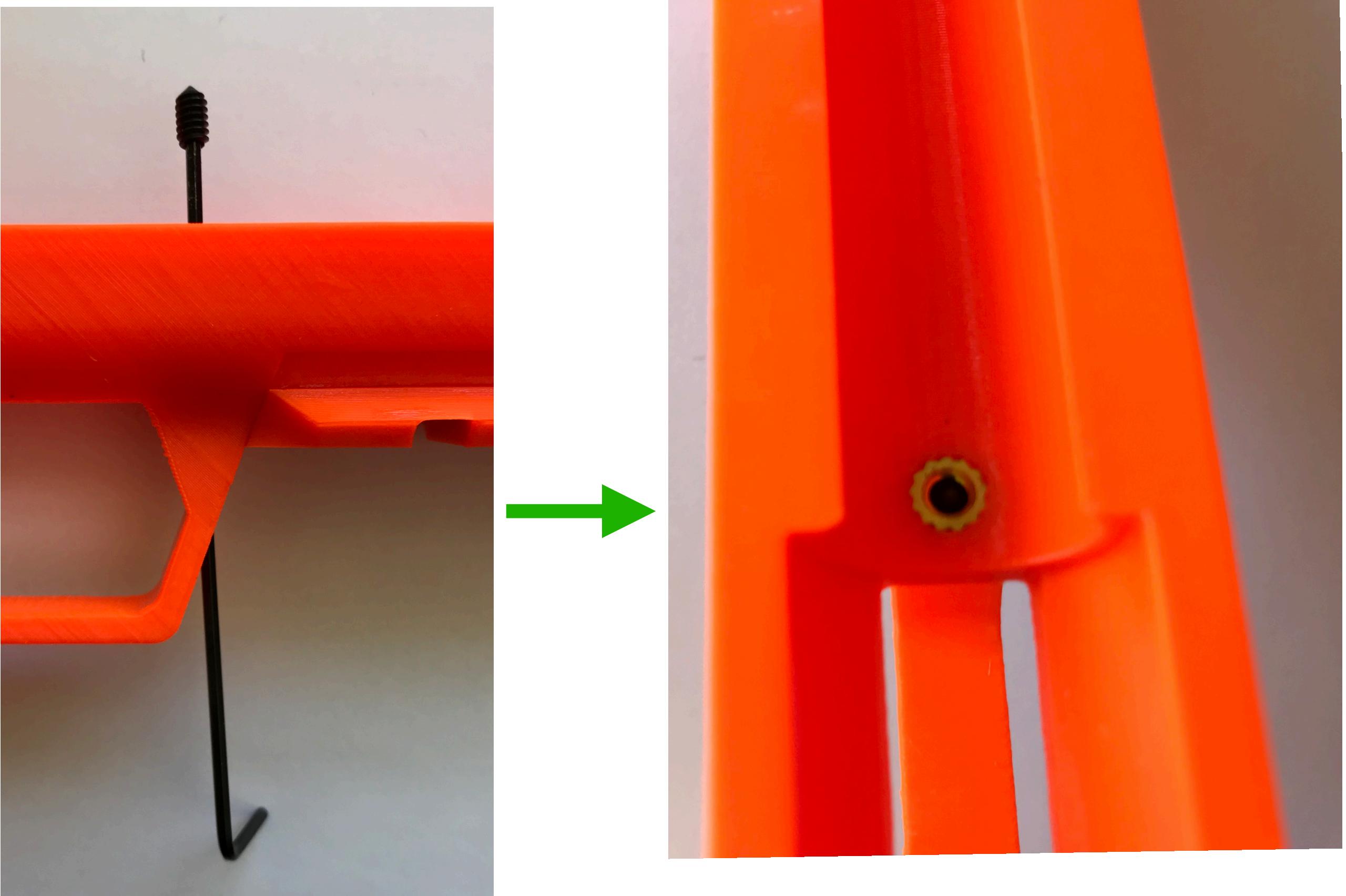
- Select the #6-32 Brass threaded insert
- Position it within the hole forward of the trigger guard
- Using the tip of the soldering iron, gently press the insert into the plastic until it is **just below the surface**
- If you don't have a soldering iron you can heat the insert separately and carefully press it in.
- Do not press the insert in too deep



# Step 4.2

## Threaded Inserts - add set screw

- Insert a 1/16" allen key through the hole in the trigger guard and use it to thread the set screw into the insert
- The point of the set screw should face the barrel slot
- Ensure the point of the set screw is below the surface of the insert and that both are below the surface of the plastic



# Step 4.3

## Threaded Inserts - setup

- Select the #5-40 thumb nut
- The adjacent setup is not required but helps to ensure proper alignment of the insert
- Place the SLIDE\_FRONT onto the frame using the guide rods
- Slide the plunger rod through the frame and thread the thumb nut partially onto it



# Step 4.4

## Threaded Inserts - add thumb nut

- Press the soldering iron firmly into the front of the thumb nut and ensure there is sufficient contact for heat transfer
- If you don't have a soldering iron you can heat the insert separately and carefully press it in.
- Stainless steel is not as thermally conductive as brass so it will take longer for the part to reach temperature. Be patient.
- Firmly press the thumbnut into the plastic until it is flush with the frame
- Allow the insert to cool to room temperature before removing all of the guide rods.



# Step 5.0

## Magnets - required parts

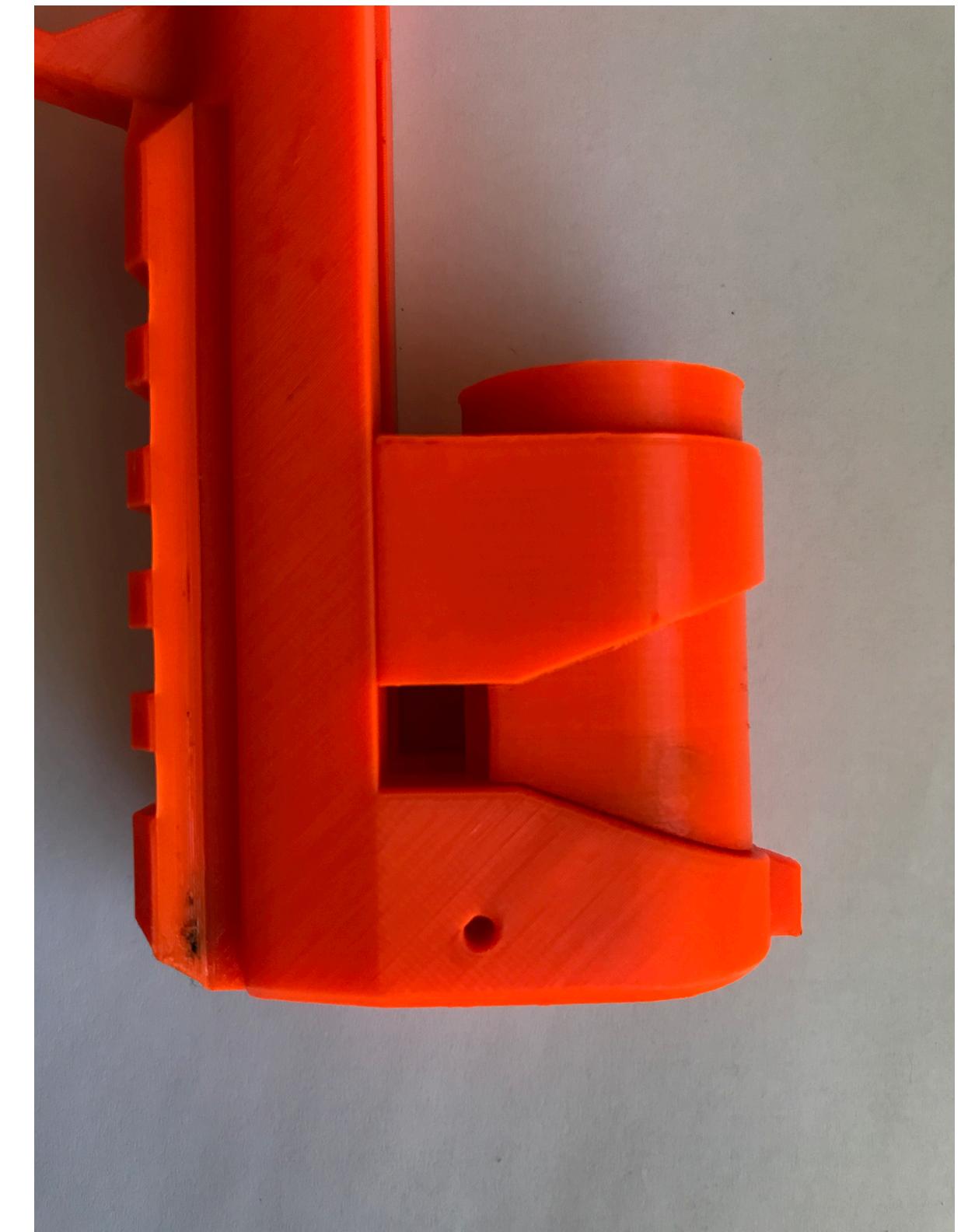
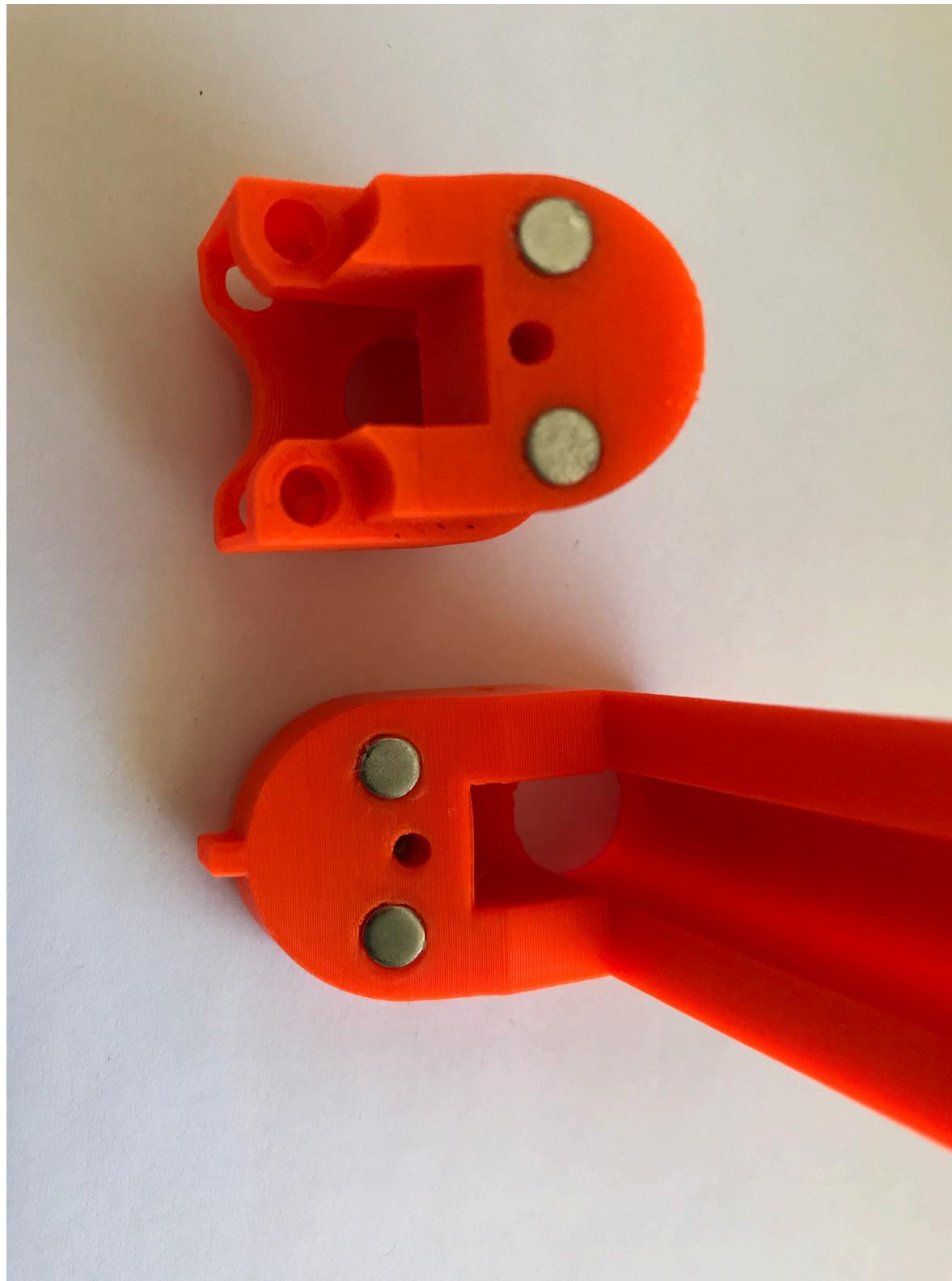
- *The following parts and tools are required:*
- 4x 0.25" OD N52 magnets
- High quality CA glue
- FRAME\_TOP
- SLIDE\_FRONT



# Step 5.1

## Magnets - glue magnets

- The magnets between the frame must ATTRACT to each other
- The magnets should sit flush with the plastic surface. Do not push them too deep or not deep enough.



# Step 6.0

## Sear - required parts

- *The following parts and tools are required:*
- 1 1/8" long dowel pin
- 3/8" long dowel pin
- Sear spring (See the torsion spring guide to make sure you have the correct one)



# Step 6.1

## Sear - spring install

- Using a 3/32 drill bit, ream out the hole in the sear until the pin can rotate easily
- Insert the spring and 3/8" pin as shown
- The 3/8" pin is just used to hold the spring in place during assembly



# Step 6.2

## Sear - final install

- Depending on print quality you may need to ream out the holes in the frame with a 3/32 drill bit
- Position the sear so that the spring is pressing against the top of the cavity, pressing the sear down
- Insert the 1 1/8" long pin fully into the frame and through the sear, pushing out the 3/8" long pin
- Save the 3/8" pin, you will need it if you ever change the sear



# Step 7.0

## Magazine Release - parts

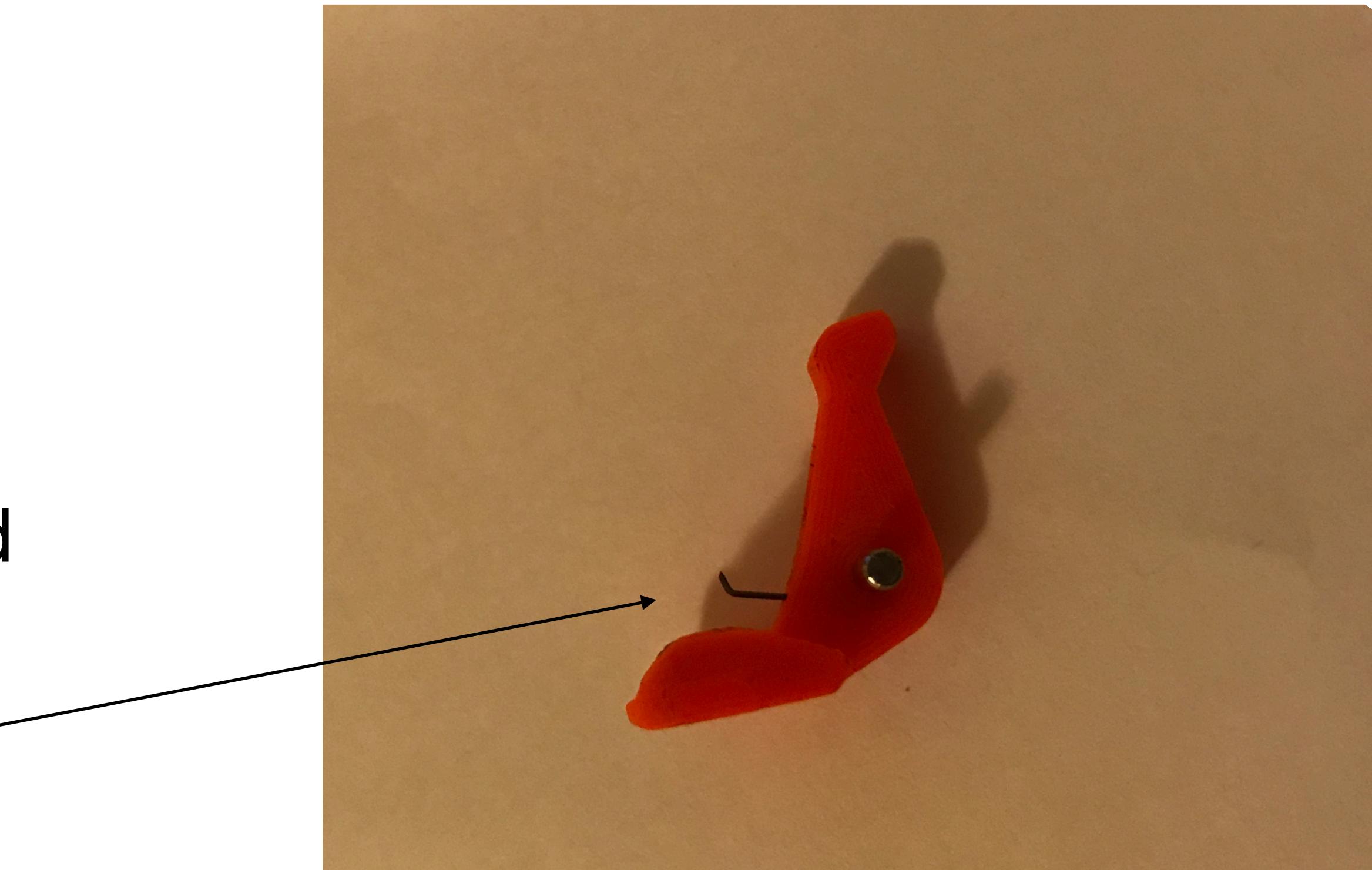
- *The following parts and tools are required:*
- Magazine Release spring (see the spring guide to verify you have the correct one)
- 1/2" dowel pin



# Step 7.1

## Magazine Release - Assembly

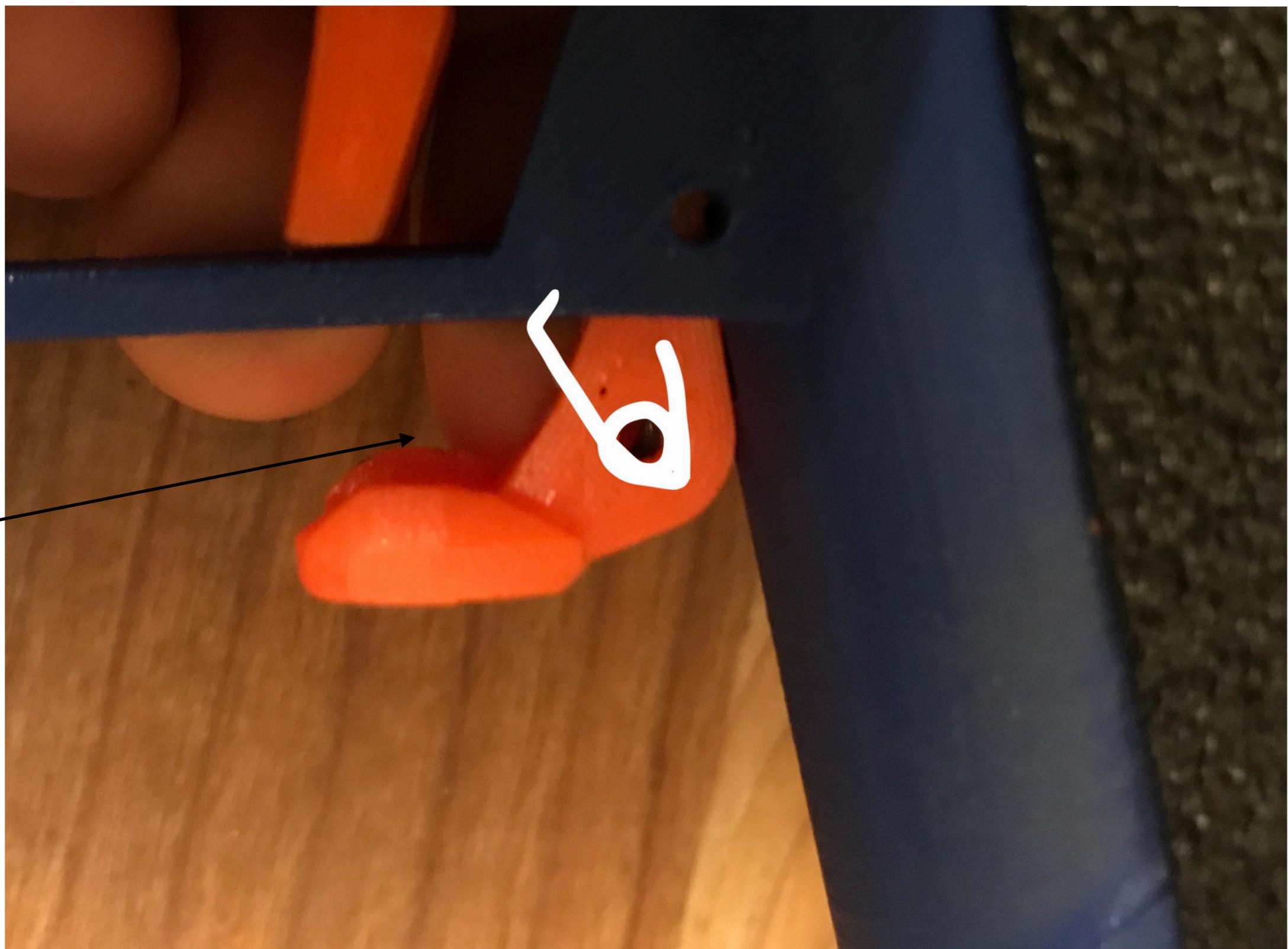
- Place the magazine release spring into the channel in the magazine release
- The bent arm of the spring should face outwards. The bend prevents the spring from catching on the frame during assembly



# Step 7.2

## Magazine Release - Assembly

- Verify the spring is placed as shown and push the release into place.
- The overlay shows the correct position of the spring



# Step 8.0

## Barrel - required parts

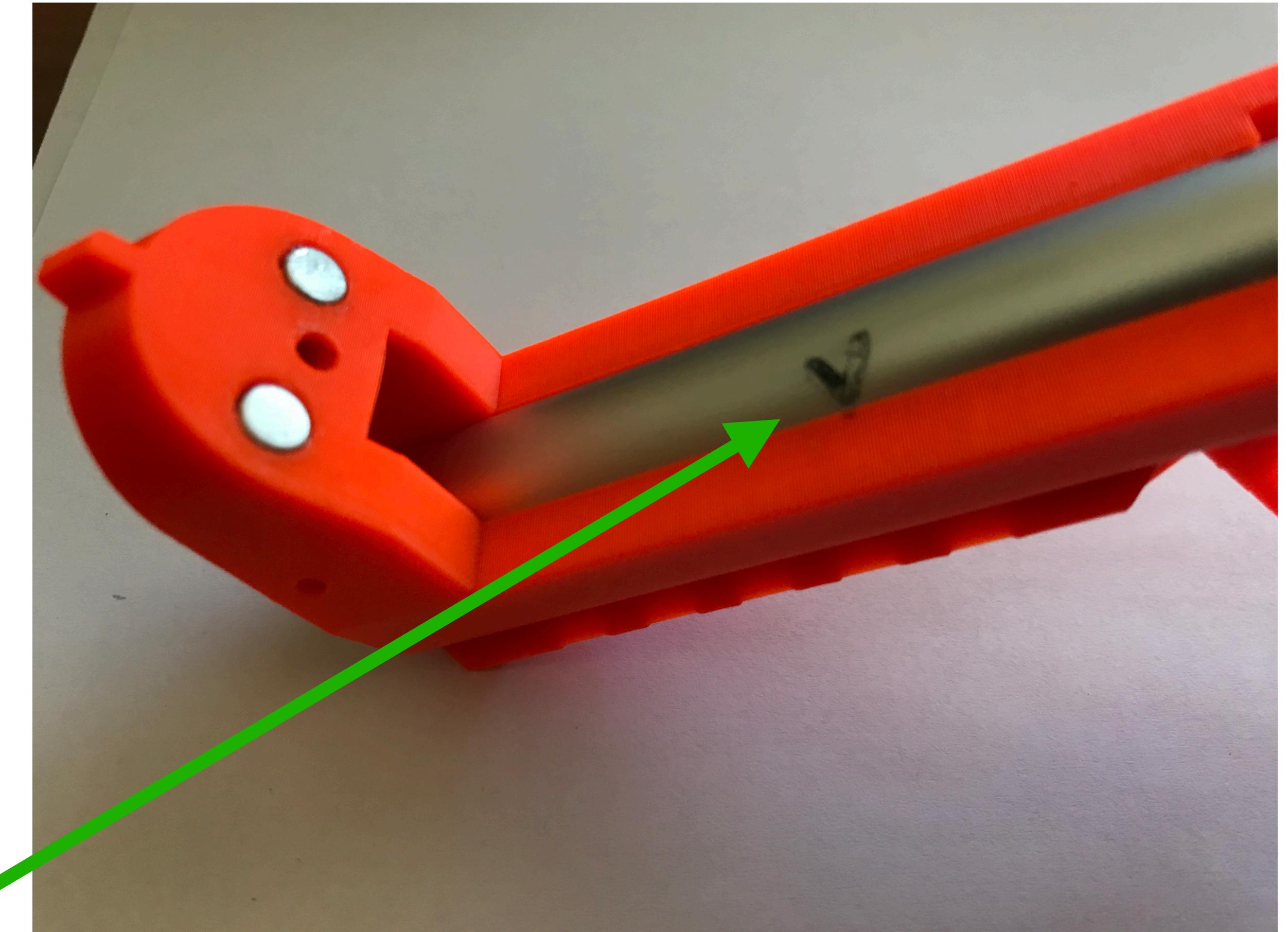
- *The following parts and tools are required:*
- Compact or extended barrel
- Square file



# Step 8.1

## Barrel - marking

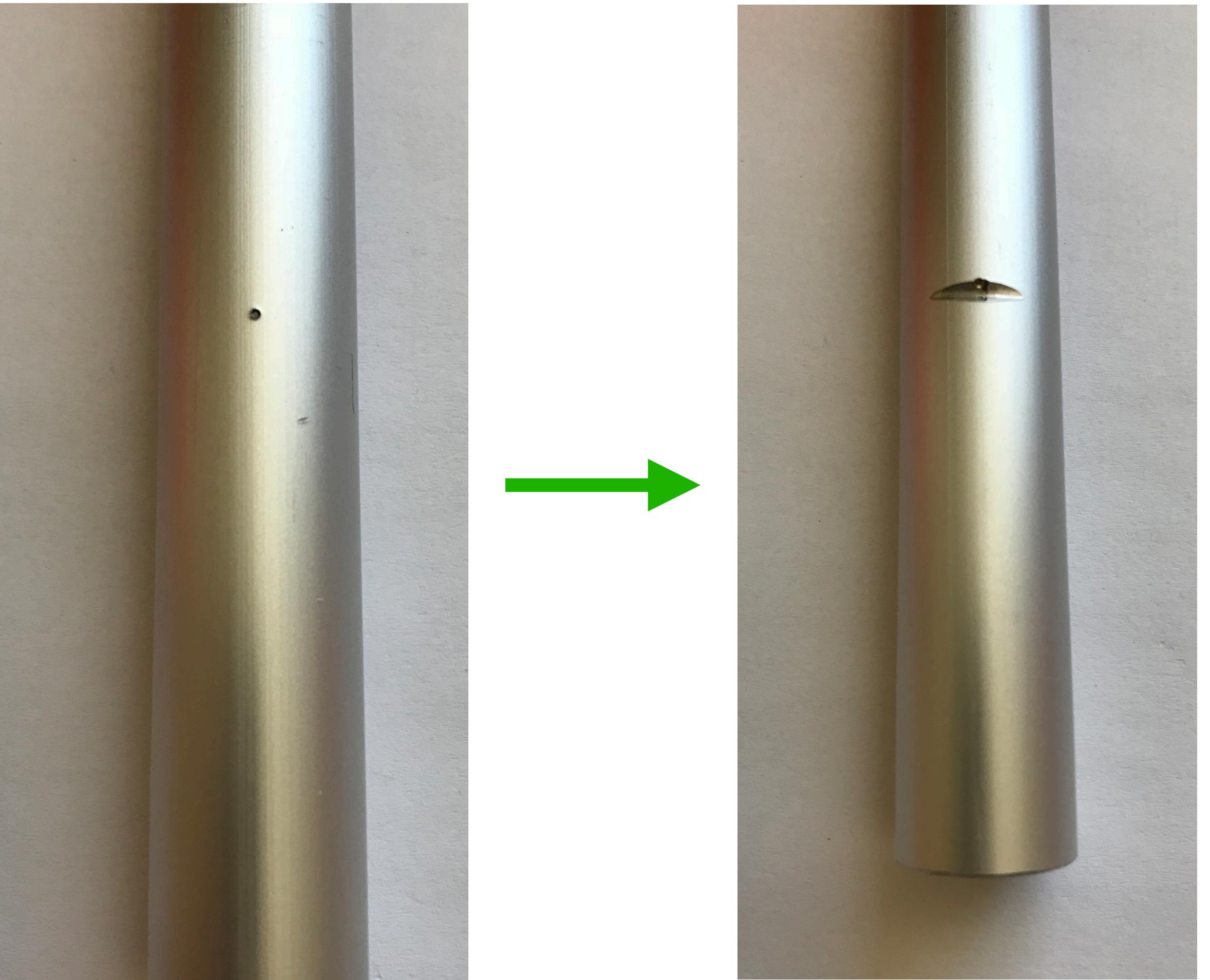
- Ensure that neither the brass insert nor the set screw are protruding into the barrel slot
- Insert the barrel fully into the frame, there will be 1/8" left sticking out of the front
- Tighten the set screw using an allen key. **DO NOT OVERTIGHTEN**- you can warp the frame.
- Mark the location of the barrel relative to the frame so you can position it in exactly the same orientation later
- Unscrew the set screw fully and remove the barrel



# Step 8.2

## Barrel - barrel notch

- There should now be a small indentation from the set screw on the barrel
- Use a file to create a notch in the location of the mark. The set screw has a 90° point so you should use the edge of a square file.
- Do not file through the entire wall of the barrel
- If your notch misses the mark you can repeat the previous steps and just rotate the barrel to a fresh area



# Step 8.3

## Barrel - assembly

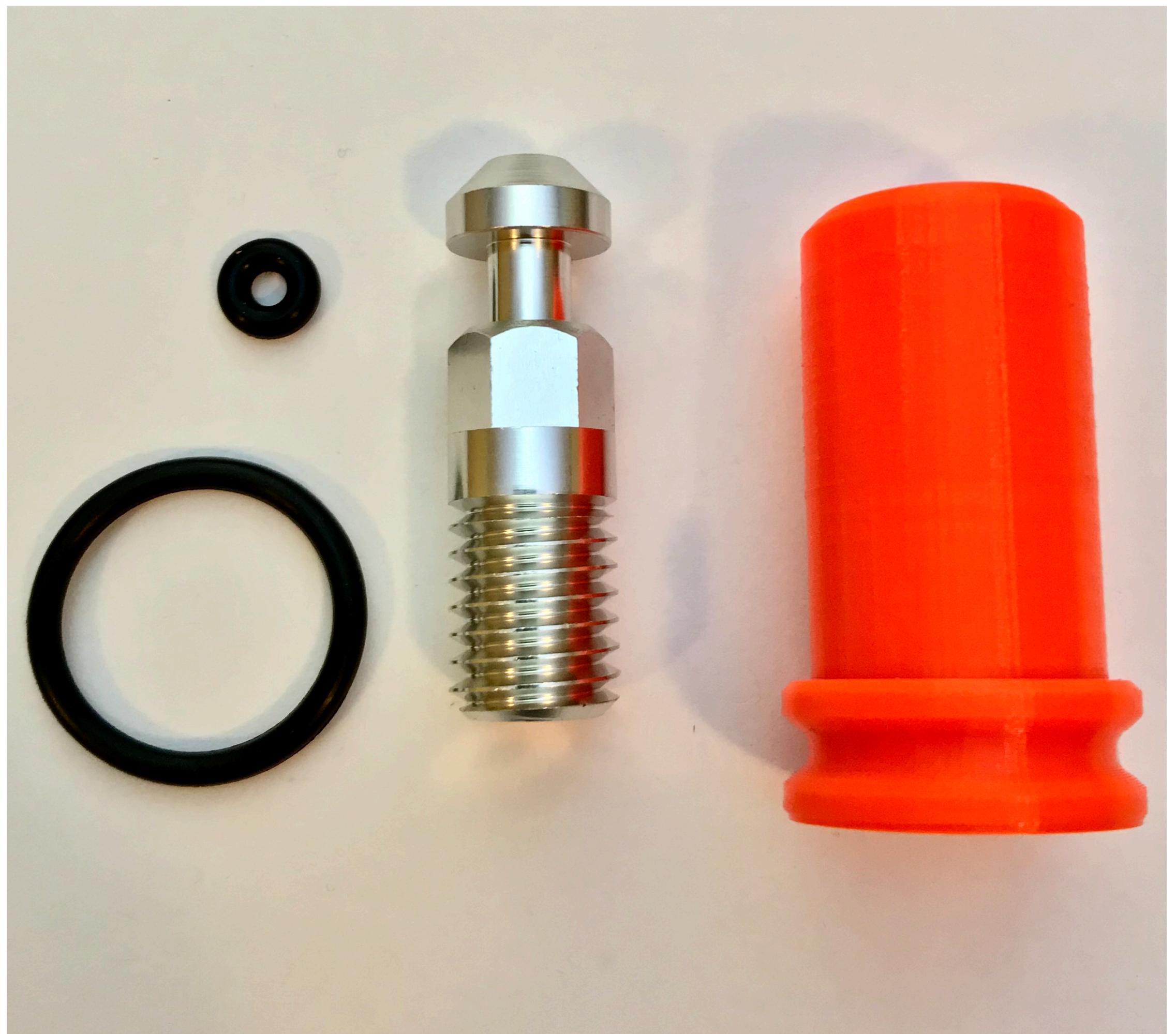
- Install the trigger and the trigger spring. You may need to lift the sear (not present in this picture) to set the trigger into place.
- Add a “blue” or semi-permanent grade threadlocker to the set screw to prevent it from loosening
- Using the mark you previously made, set the barrel into the same position and tighten the set screw.
- **DO NOT OVER-TIGHTEN** the set screw. It only need to engage fully with the notch. Over-tightening can result in a warped frame.



# Step 9.0

## Plunger - required parts

- *The following parts and tools are required:*
- #104 o-ring
- #117 o-ring
- Aluminium plunger core
- Silicone based lubricant



# Step 9.1

## Plunger - core assembly

- Insert the #104 o-ring into the recess at the bottom of the plunger
- Thread the plunger core into the plunger body until it is seated firmly, do not over tighten.



# Step 9.2

## Plunger - final assembly

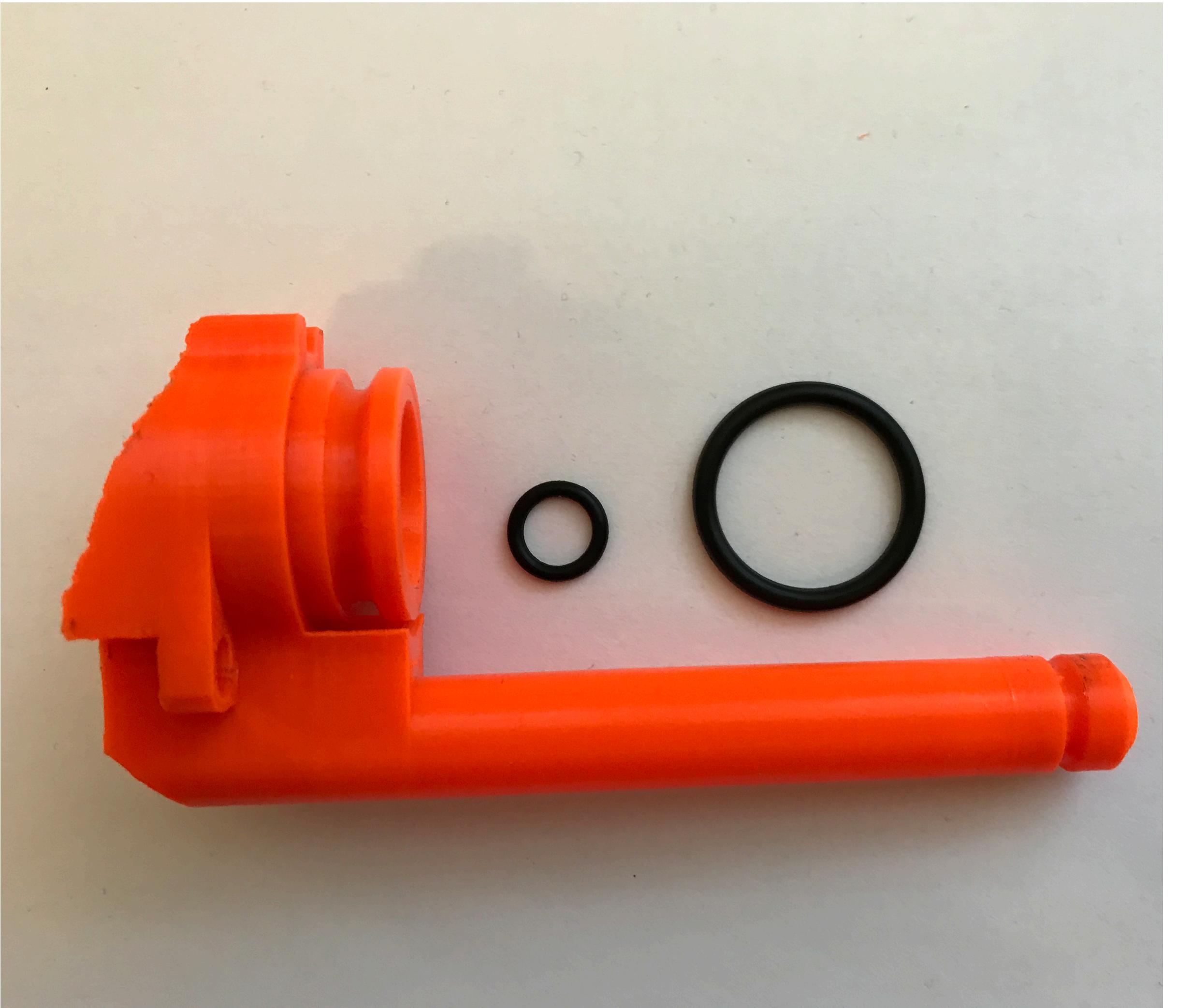
- Add the #117 o-ring to the front groove
- Add silicone lubricant to the external o-ring and some in pass-through hole.



# Step 10.0

## Slide Assembly - parts required

- *The following parts and tools are required:*
- #117 o-ring
- #011 o-ring
- SLIDE\_REAR



# Step 10.1

## Slide Assembly - o-rings

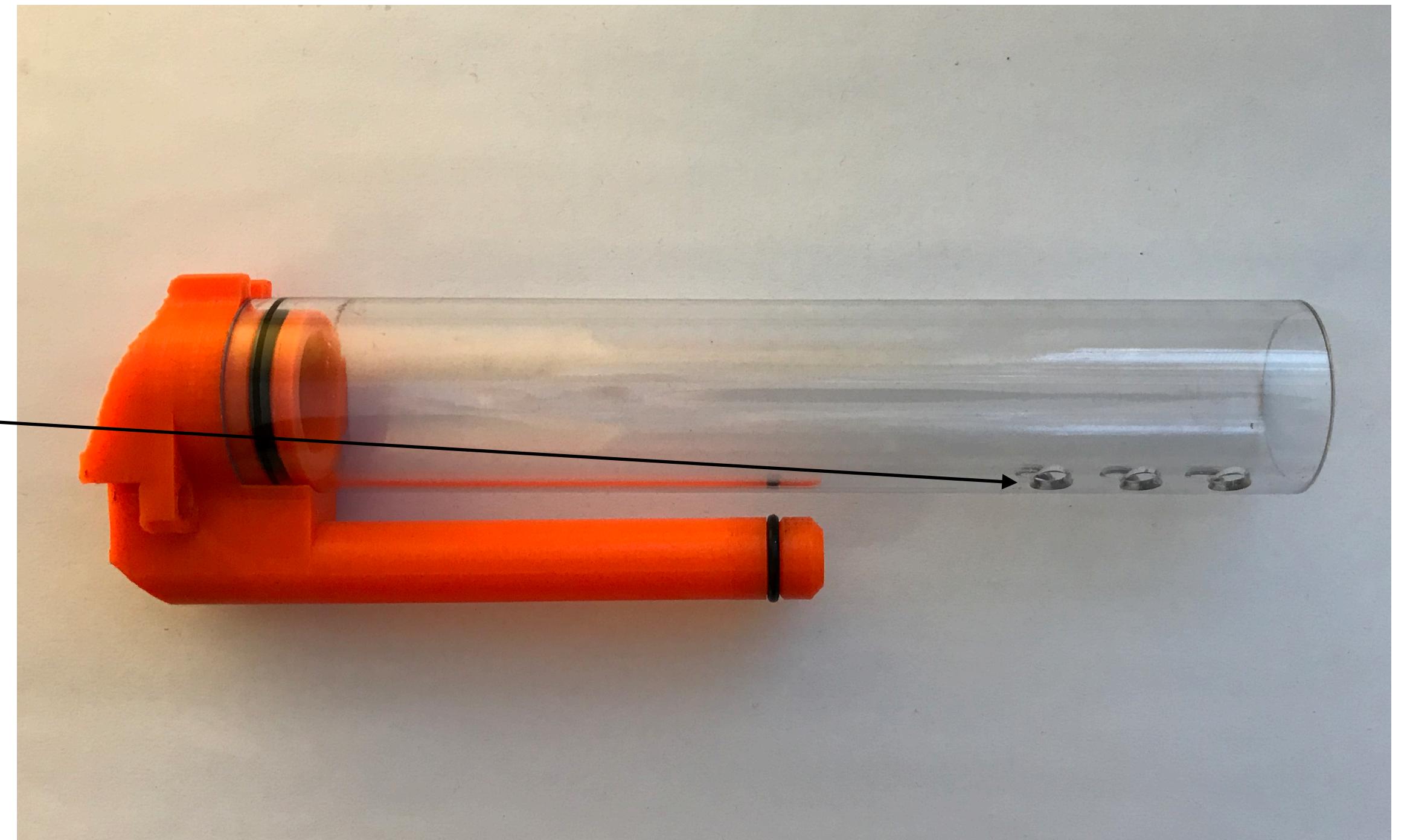
- Add o-rings to their respective grooves
- Lubricate the pusher o-ring with a silicon based lubricant



# Step 10.2

## Slide Assembly - plunger tube

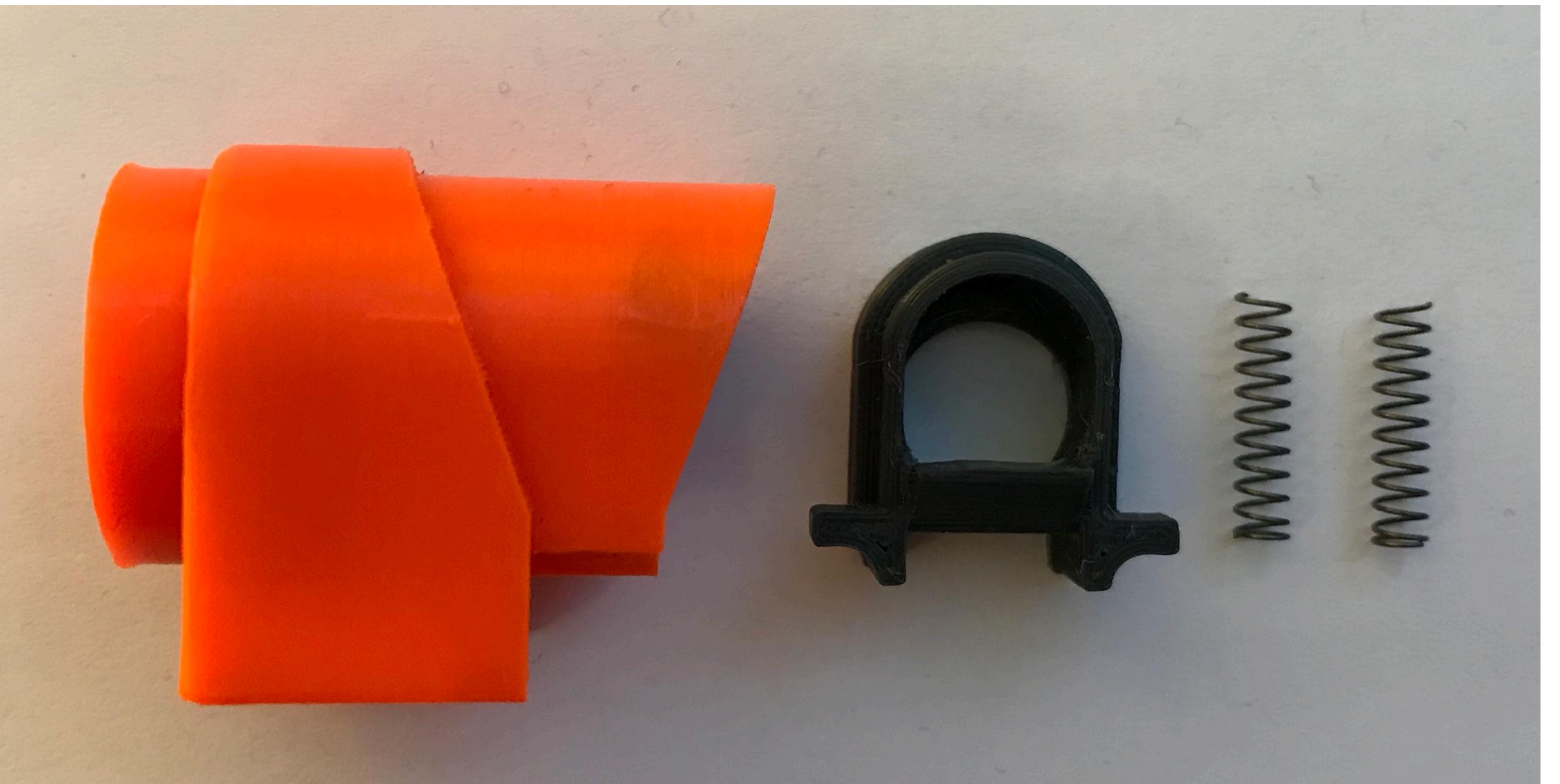
- Add the plunger tube to the rear of the slide.
- Make sure the speed holes are towards the front and facing down



# Step 11.0

## Catch - parts required

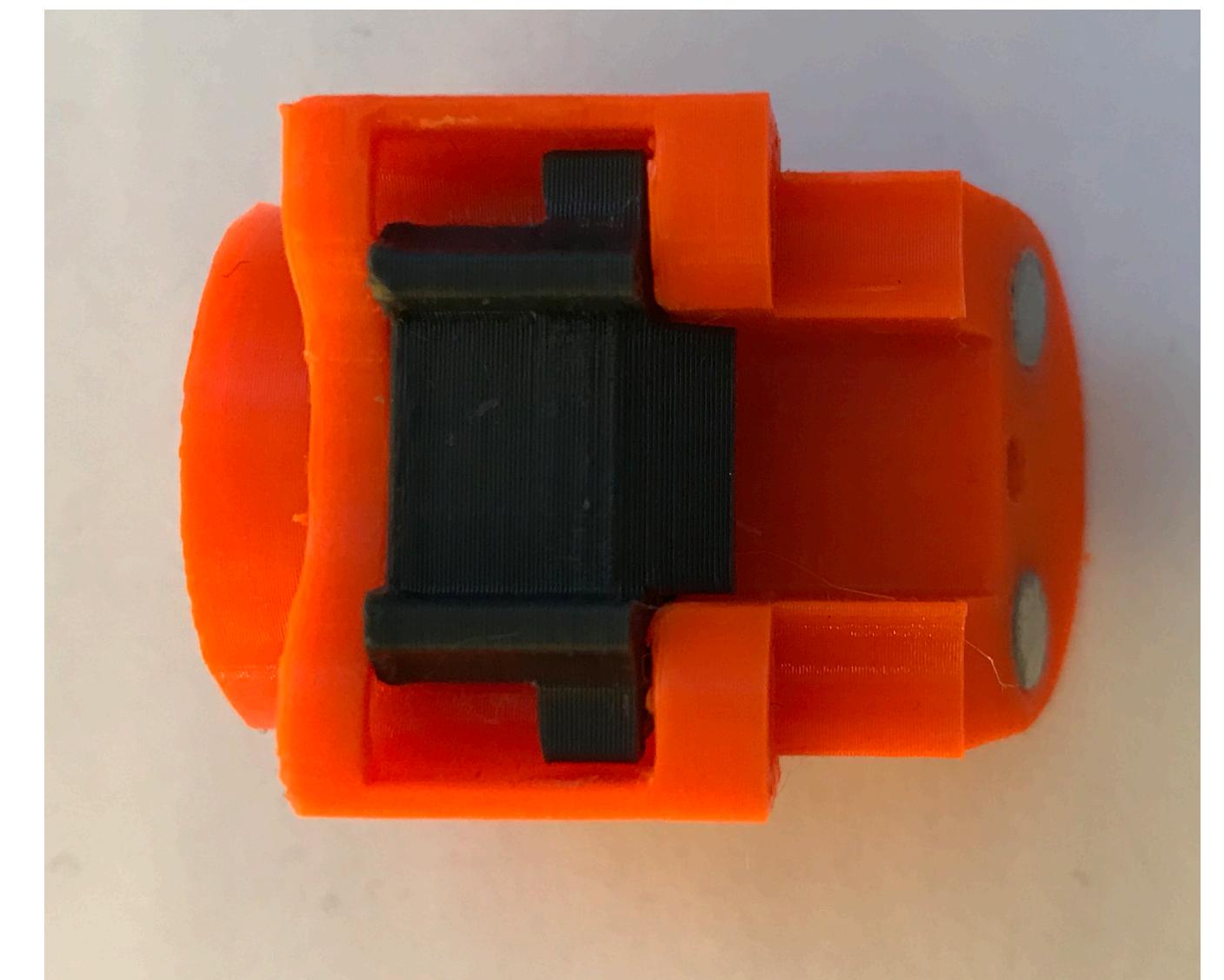
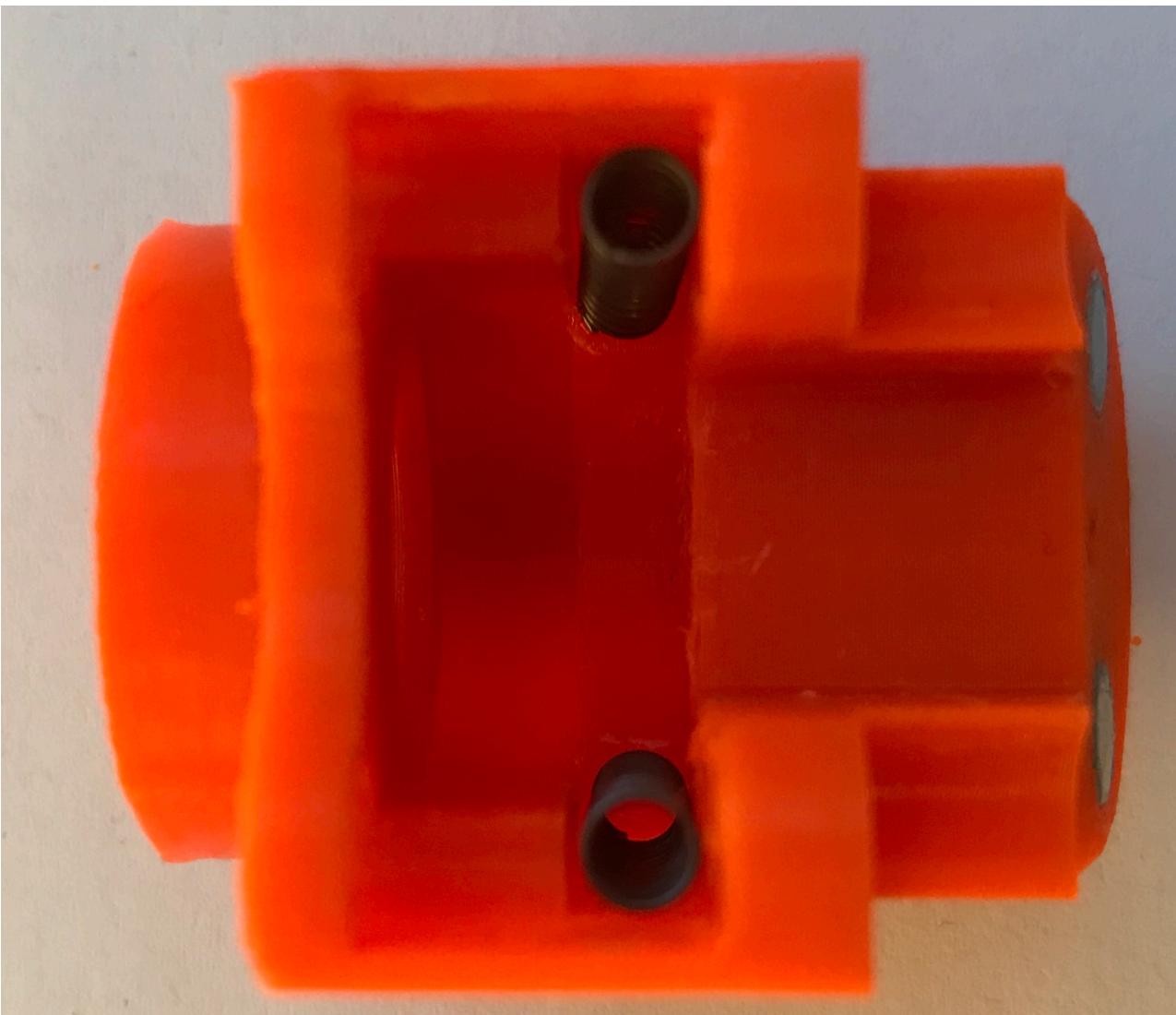
- *The following parts and tools are required:*
- SLIDE\_FRONT
- CATCH
- 2x catch spring



# Step 11.1

## Catch - assembly

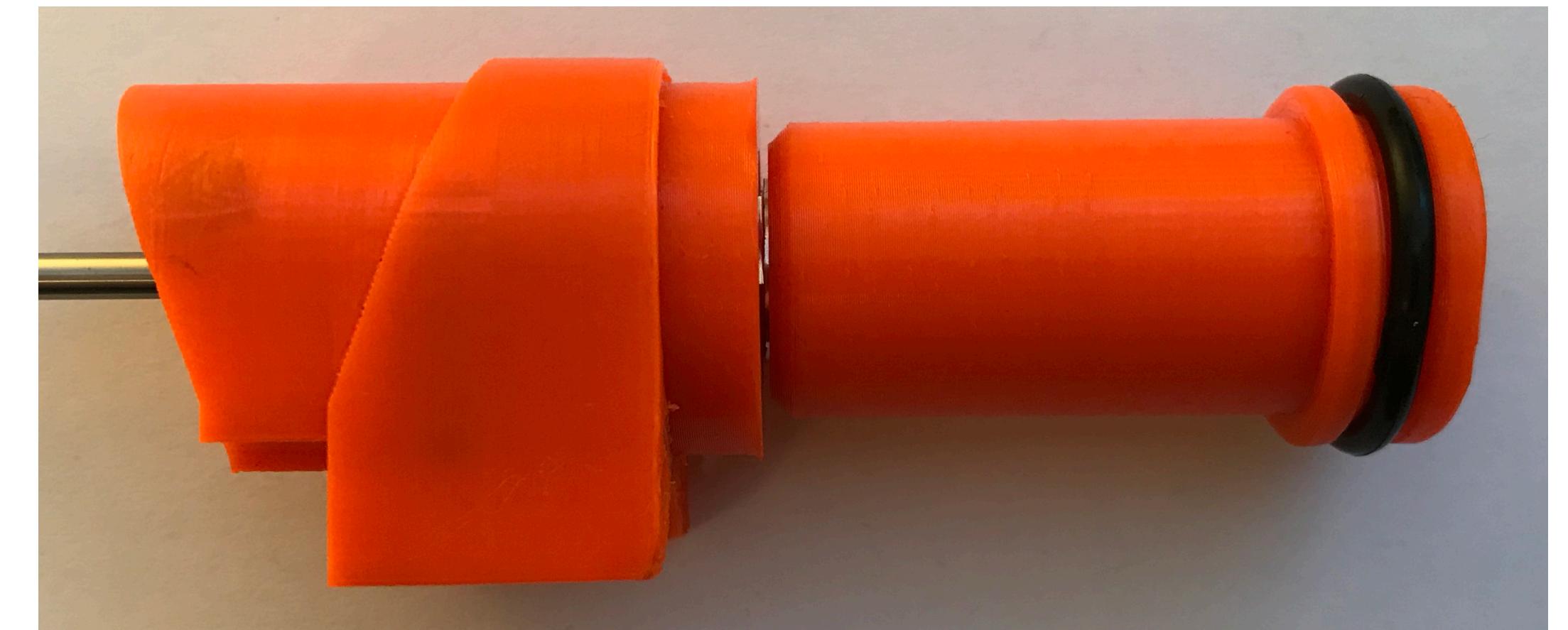
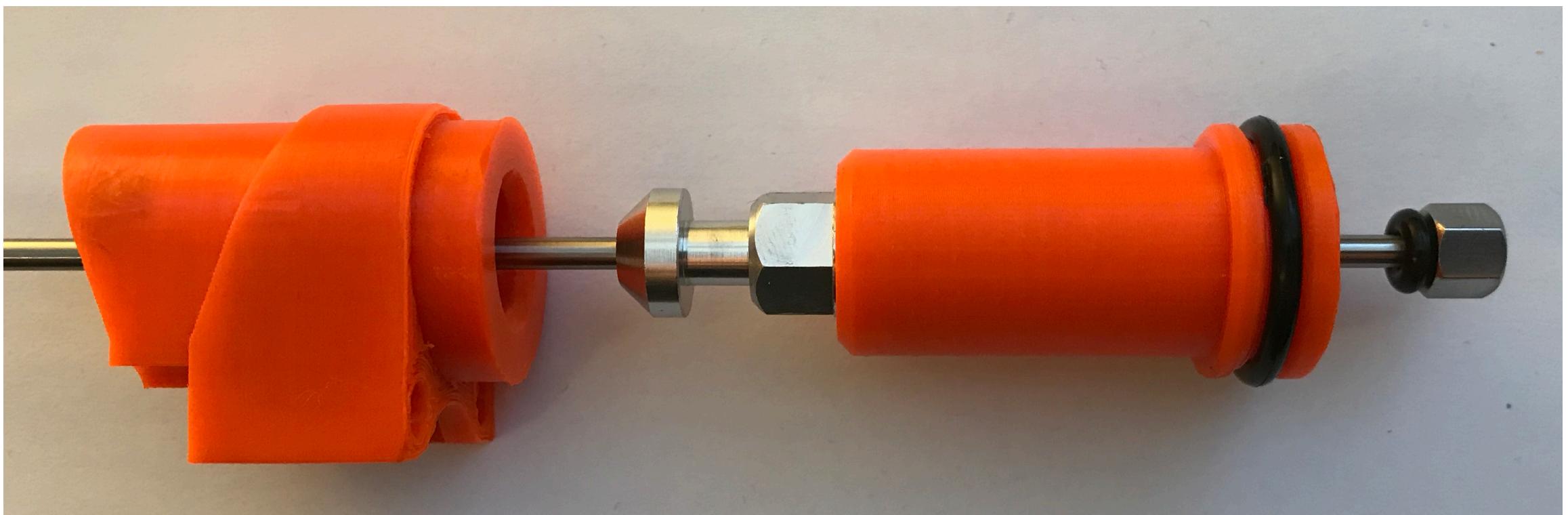
- Insert the catch springs into their grooves
- Add the catch
- Ensure the catch slides smoothly and has a full range of motion
- Sand or file the parts as needed to achieve a proper fit



# Step 11.2

## Catch - testing

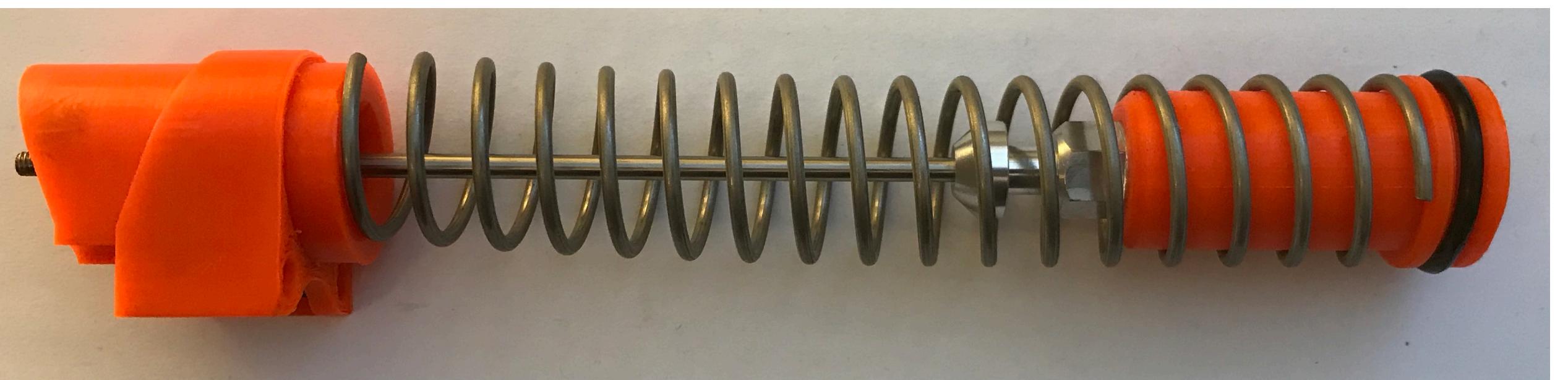
- **It is important to test the catch before the final assembly!**
- Insert the plunger rod through the plunger and the catch
- Ensure the catch can fully **engage** and then **disengage** the plunger
- If the plunger does not exit the catch easily when it is pressed then **check the fit and file/sand where needed**



# Step 12.0

## Final Assembly

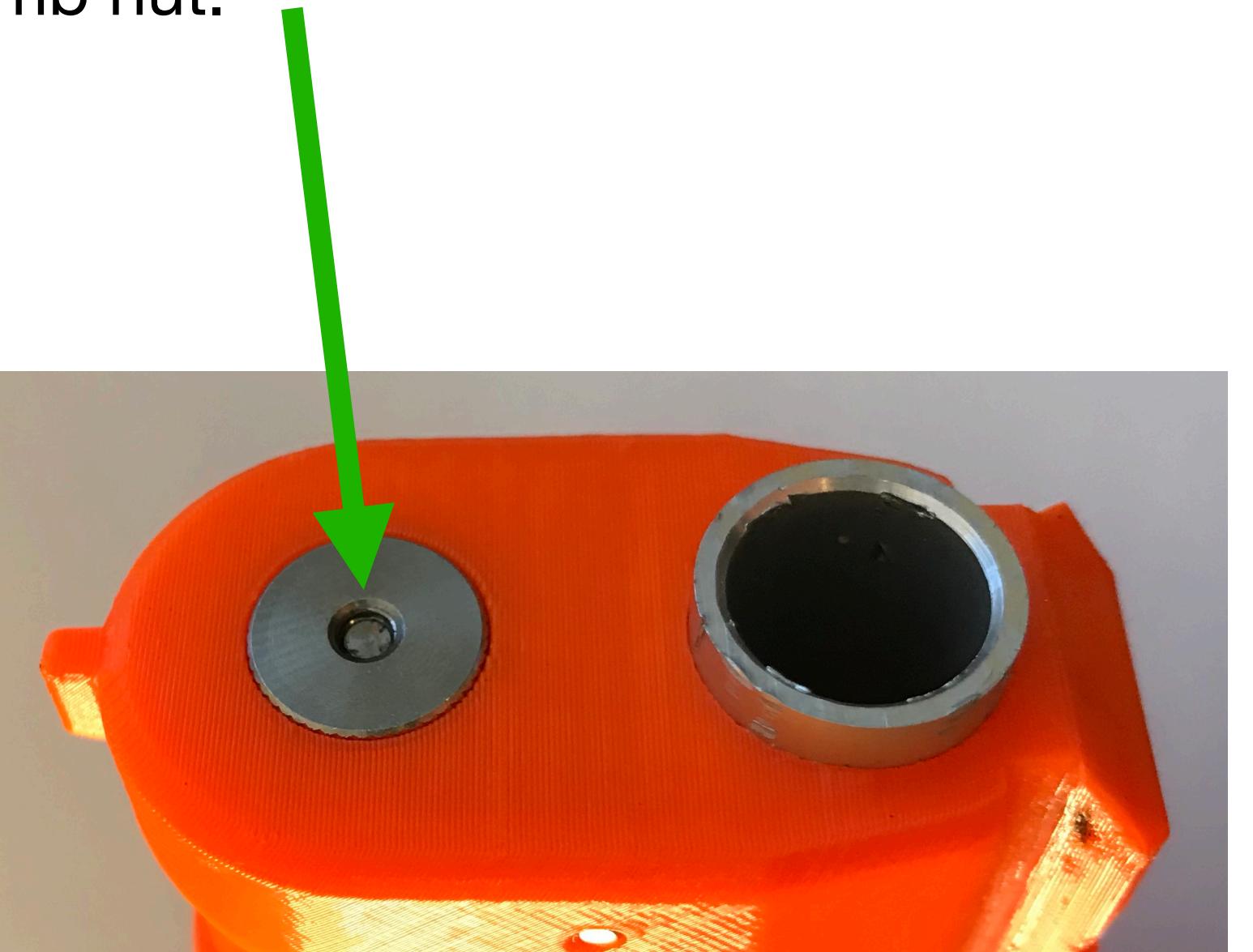
- Begin by adding a #104 o-ring to the end of the plunger rod to cushion the plunger impact
- Install the plunger rod through the plunger, spring, and catch. **Use a 788 spring if this is your first build!** Become familiar with operation before moving to a k25.
- Lubricate all moving parts with a silicone based lubricant
- Verify that the ends of the main spring are filed and no burs exist that could scratch the inside of the plunger tube. Scratches will ruin the seal and decrease performance.



# Step 12.1

## Final Assembly -

- Set the plunger assembly onto the Frame and tighten the plunger rod into the thumb nut
- The plunger rod should not be tightened all the way, leave aprx. 1/16" gap to the front of the thumb nut.



# Step 12.2

## Final Assembly

- Add the slide assembly by pushing the plunger tube firmly onto the catch block
- Verify that the plunger will not impact the rear of the slide when fired. Adjust the depth of the plunger rod accordingly.



# Step 12.3

## Final Assembly

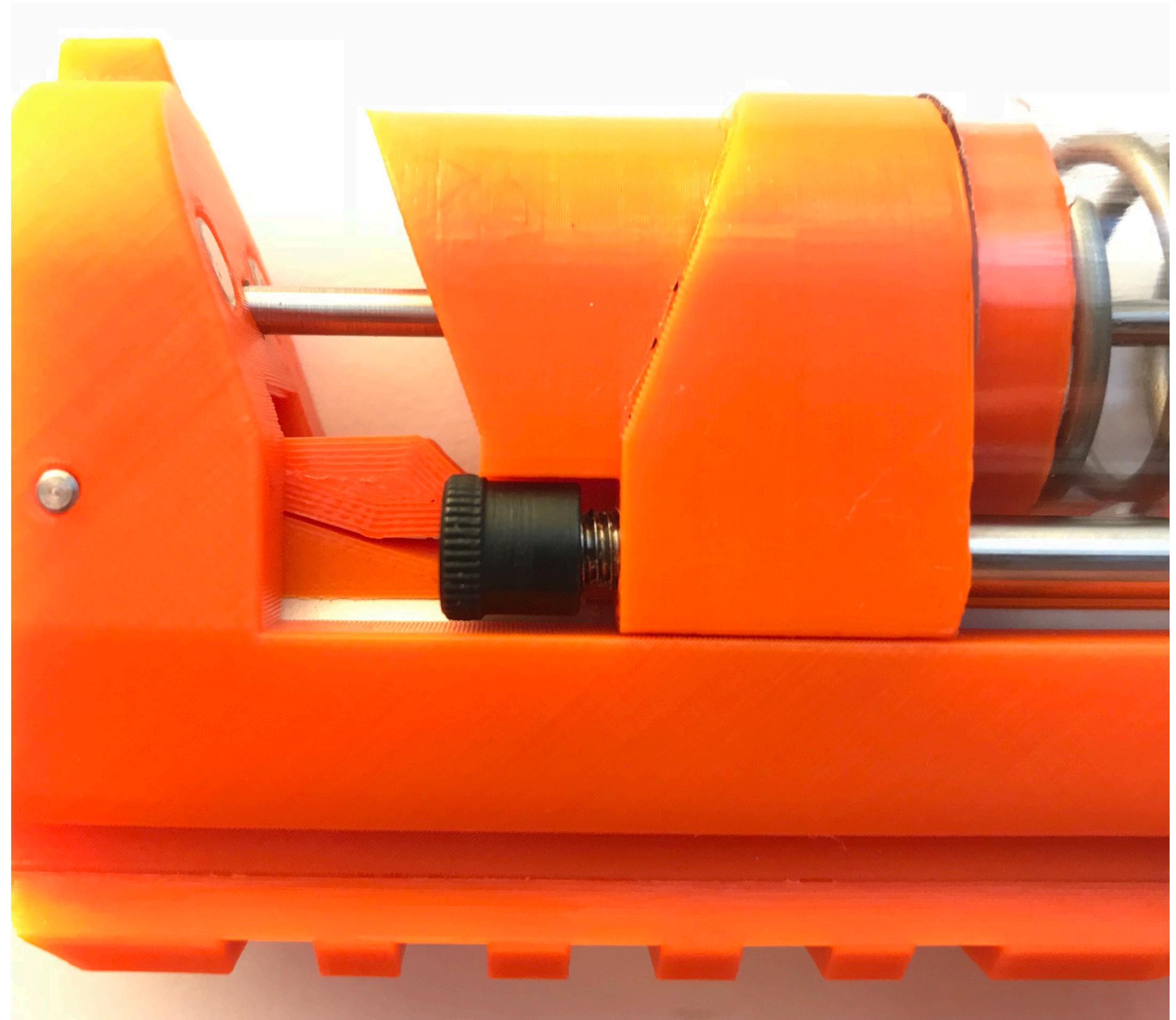
- Slide the guide rods through the slide and catch assembly from the rear of the blaster
- Lubricate the rods and their channels on the frame



# Step 12.4

## Final Assembly

- Add Allenuts to the front ends of the guide rods
- The nuts do not need to be very tight and over-tightening them can warp the slide
- Tighten them and then test fire the blaster, being sure to cover the barrel as to not dry fire.
- Once you have verified the blaster is operational, add a small amount of “blue” or semi-permanent grade threadlocker.



# Step 12.5

## Final Assembly

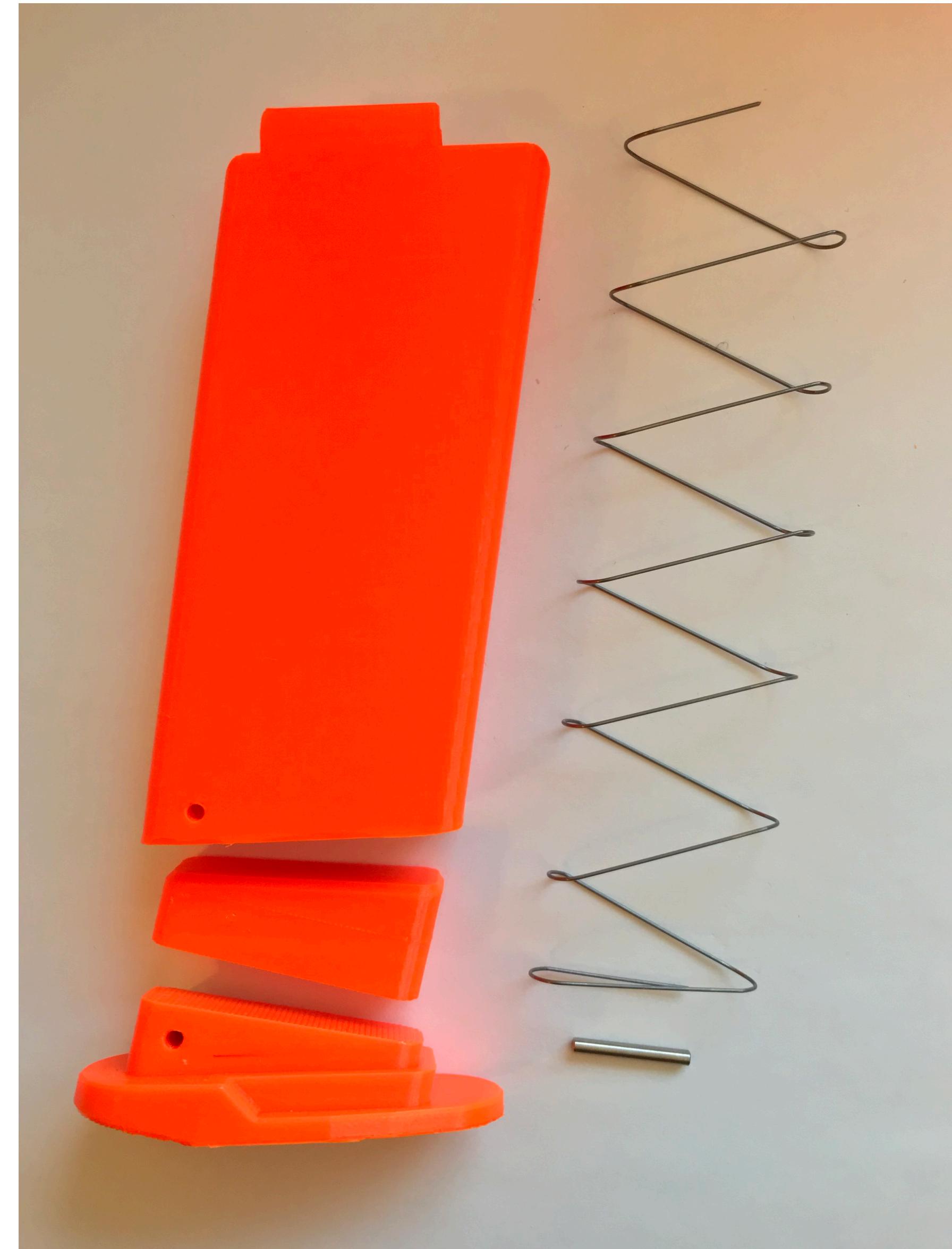
- Add grip tape, templates are available in the project repository
- Add the bright orange muzzle to the front of the blaster



# Step 13.0

## Magazine - parts required

- MAGAZINE\_BODY
- MAGAZINE\_FOLLOWER
- MAGAZINE\_BASE
- Magazine spring (1/2 spring for compact, full spring for extended)
- 3/4" dowel pin



# Step 13.1

## Magazine - assembly

- Sand the follower and inside of the magazine to remove any burrs or defects
- Ensure the follower and the baseplate are aligned so the spring is between 2 parallel surfaces
- Insert the follower and spring, then secure the baseplate with the 3/4" pin

