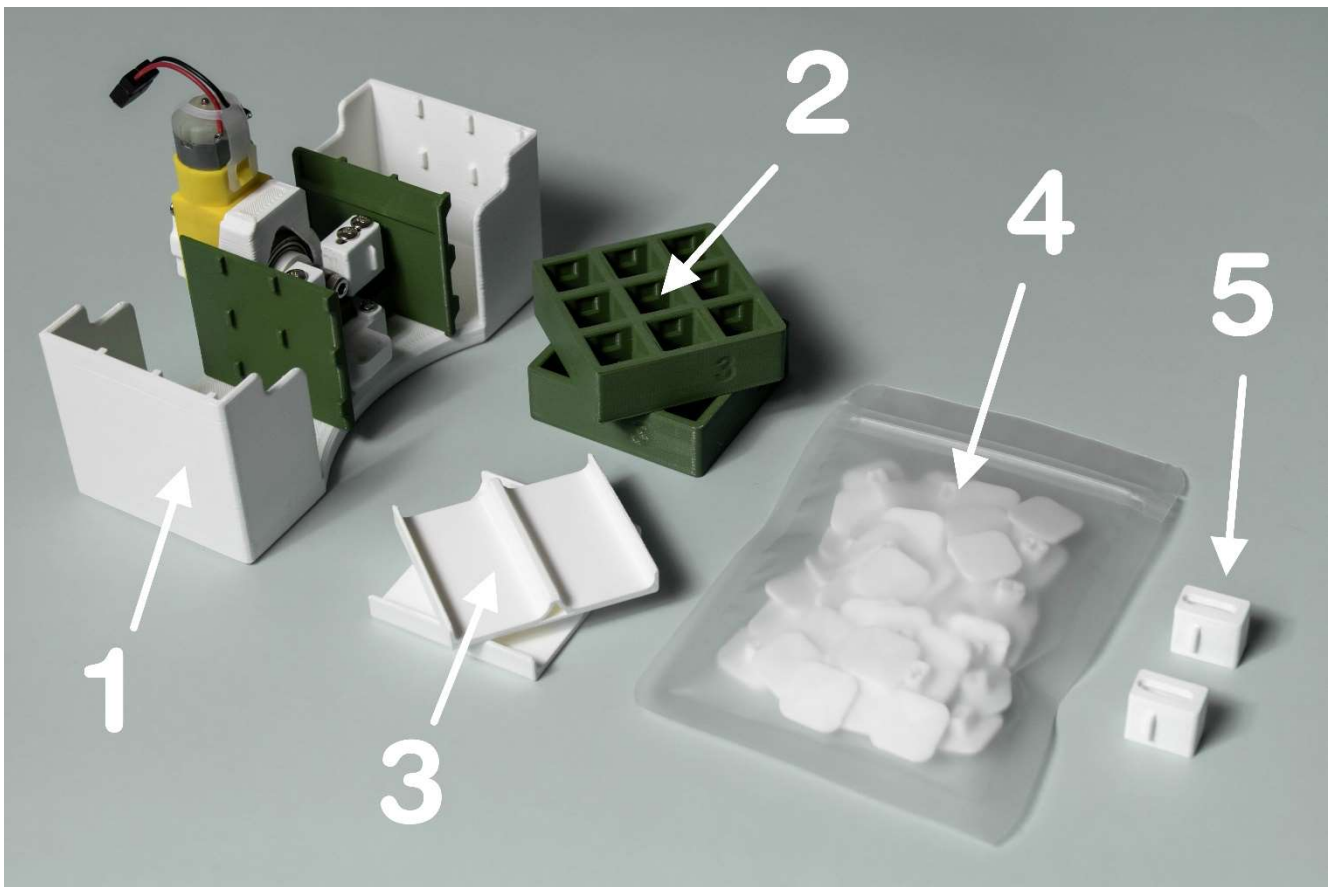# User Instructions

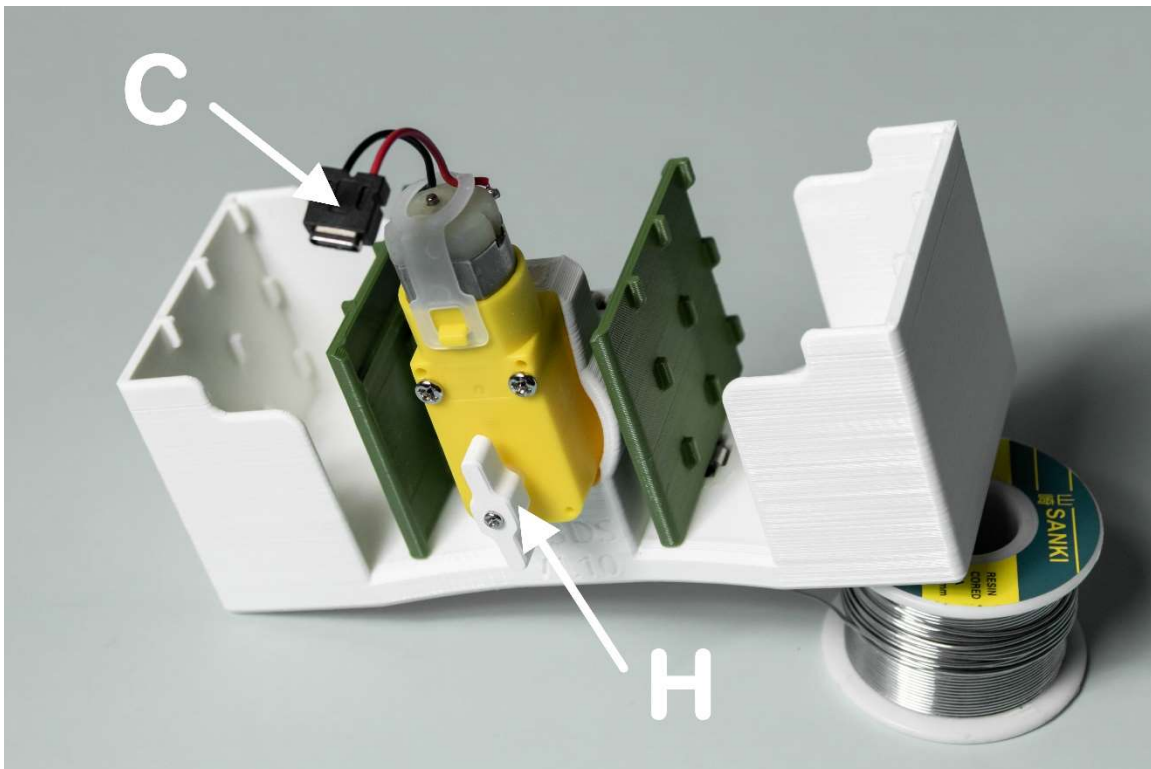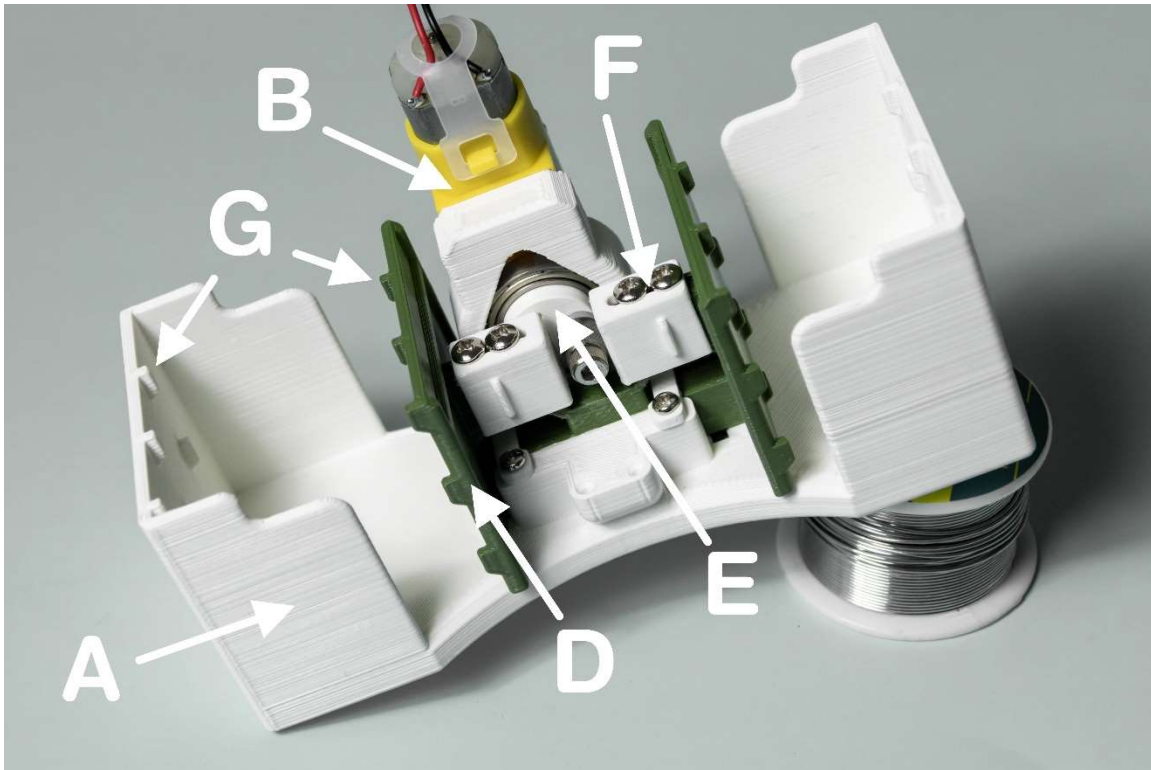## Switch Break-in Machine 3×3 DS v1.0

Feng Studio

Below are the user instructions for assembling and operating this product. Some variations are to be expected between the provided images and the product on hand.
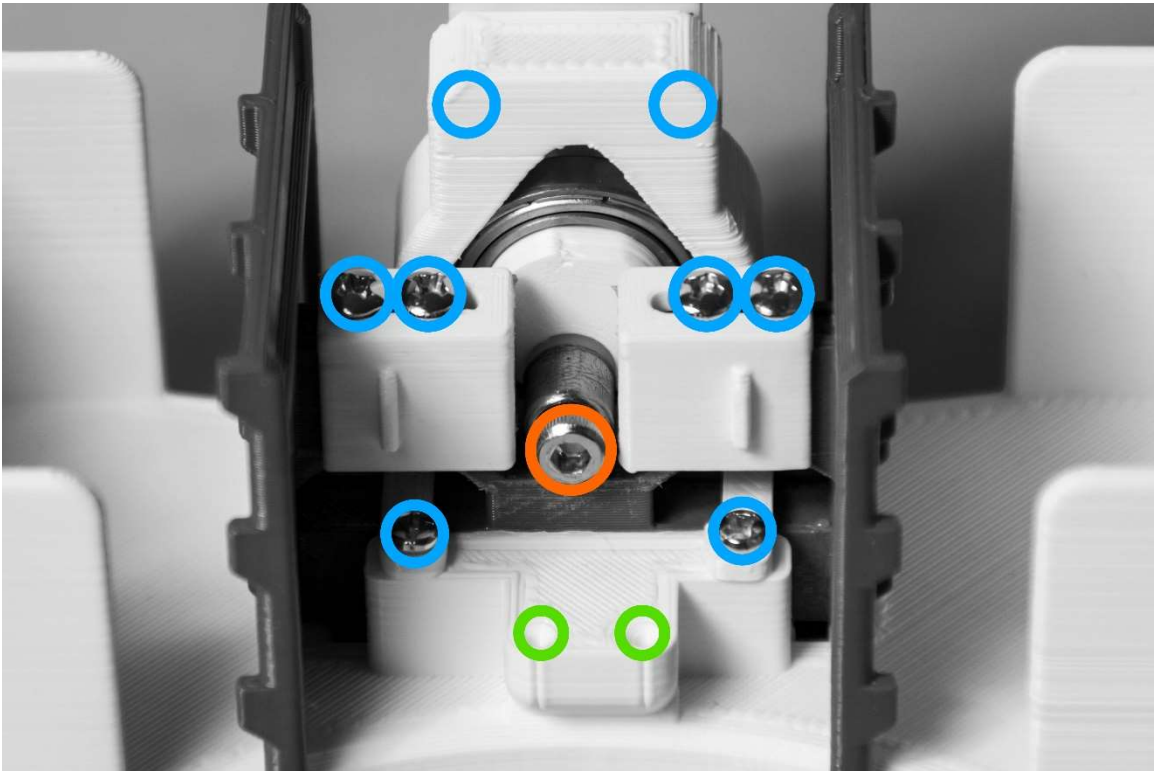
Section 1: Parts List

1 - Pre-assembled main body	2 – Plates * 2
3 – Centered-mode spacers	4 – Keycaps * ~40
5 - Spare buffer pieces * 2	

Section 2: Parts Diagram

A: Main body	B: Gear box
C: Female USB type-c port	D: Pusher
E: Wheel	F: Buffer piece
G: Off-center nibs	H : Handle

Blue: PH2

Green & handle screw & gear box screw (small): PH1

Orange: H3.0

In addition to using the correct sized screwdriver, please also avoid overtightening the screws. They only need to be tight enough to hold down the components securely. Overtightening will cause issues or permanent damage to the device. I will not be responsible for damages caused by overtightened screws.

# Read through the entire document before using the device

# Section 3: General Operation (applies for both mode A and B)

The switch plate is inserted through the top of the machine. The product will function with 1 or 2 plates.
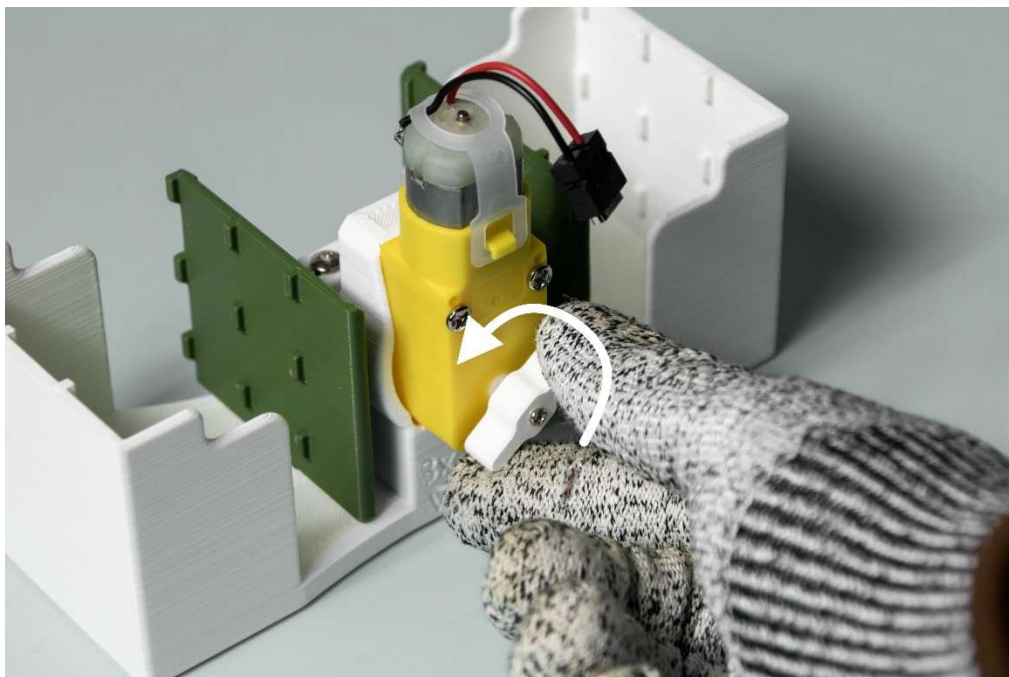
The handle can be rotated to spin the wheel. Rotate the wheel SLOWLY and ONLY WHEN NEEDED to avoid breaking the gears. If the wheel can't be rotated in one direction, try the other. If both directions don't work, turn the machine on/off briefly and try again.
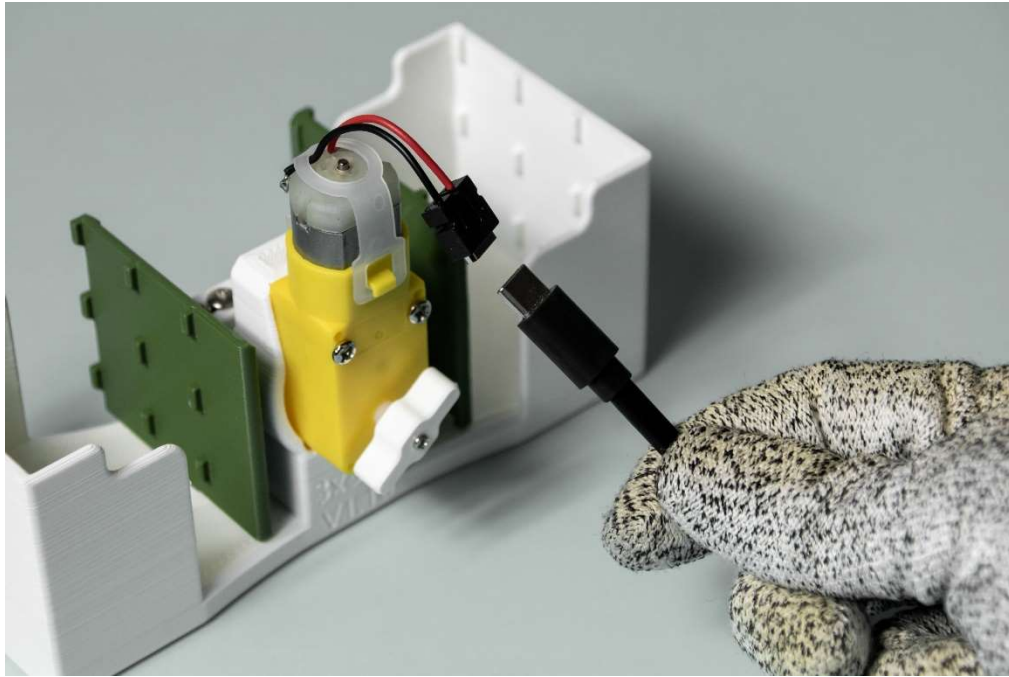
A standard 5V USB wall plug is recommended, along with any USB type-c cable. Simply plug or unplug the cable into the connector to turn the machine on or off. The user can also choose to use power banks or computer USB ports to provide power. Type-c to type-c cables will not work. The machine does not need to be shut down periodically to prevent overheating.
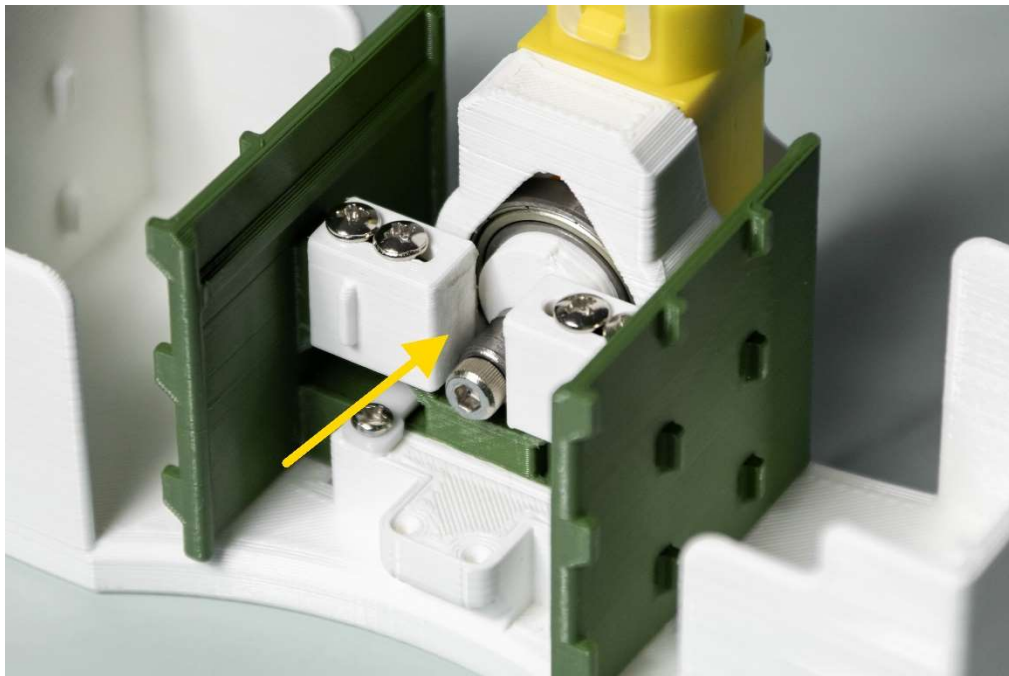

Check for wear on the bearing-pusher buffer piece periodically. Any wear on the plastic will be very obvious (see section 7). Black residue from the lubricant on the wheel or buffer piece is normal. If the buffers and bearing are very dirty, wipe with paper towel and reapply grease.
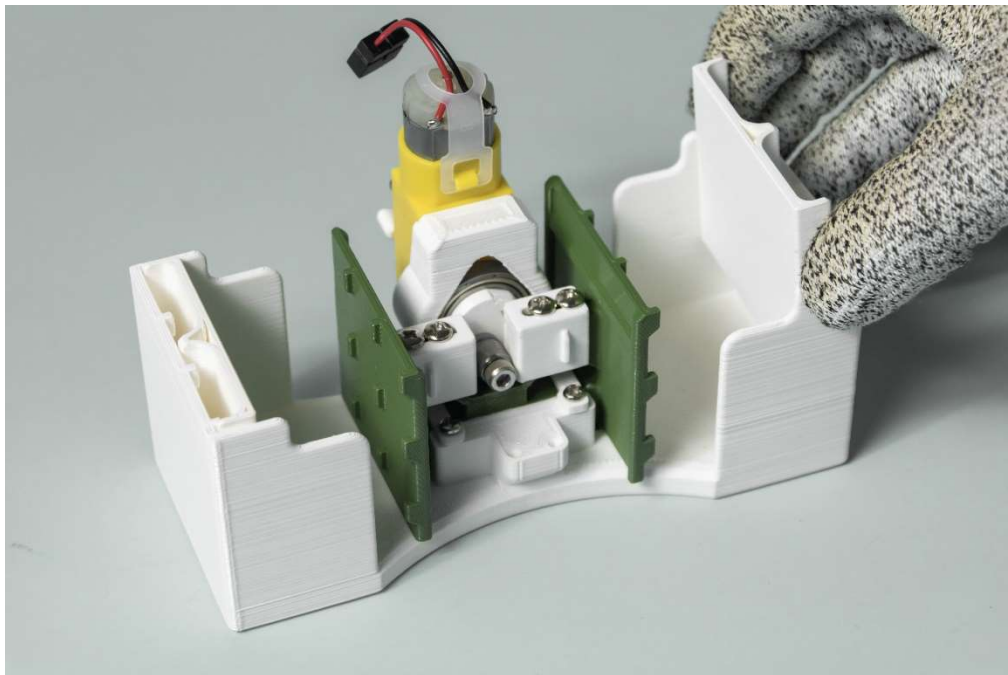
Make sure to space out the switches evenly if you are not planning on filling the entire plate. If you are filling the entire plates with switches, =<80g bottom out weight switches is recommended.
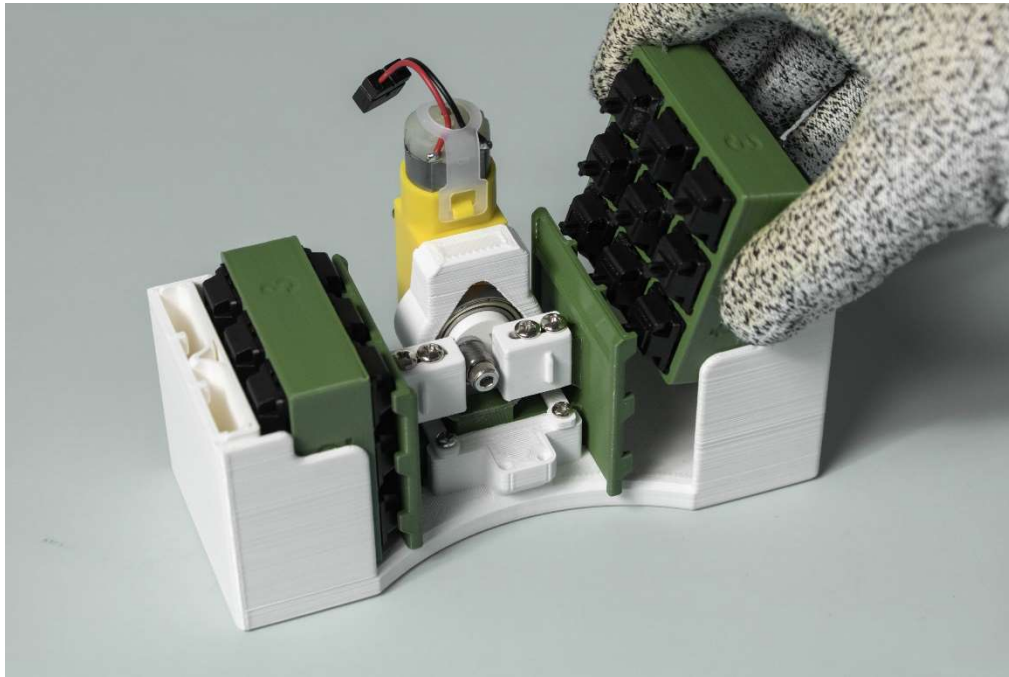
Section 4: Mode A – Centered Actuations
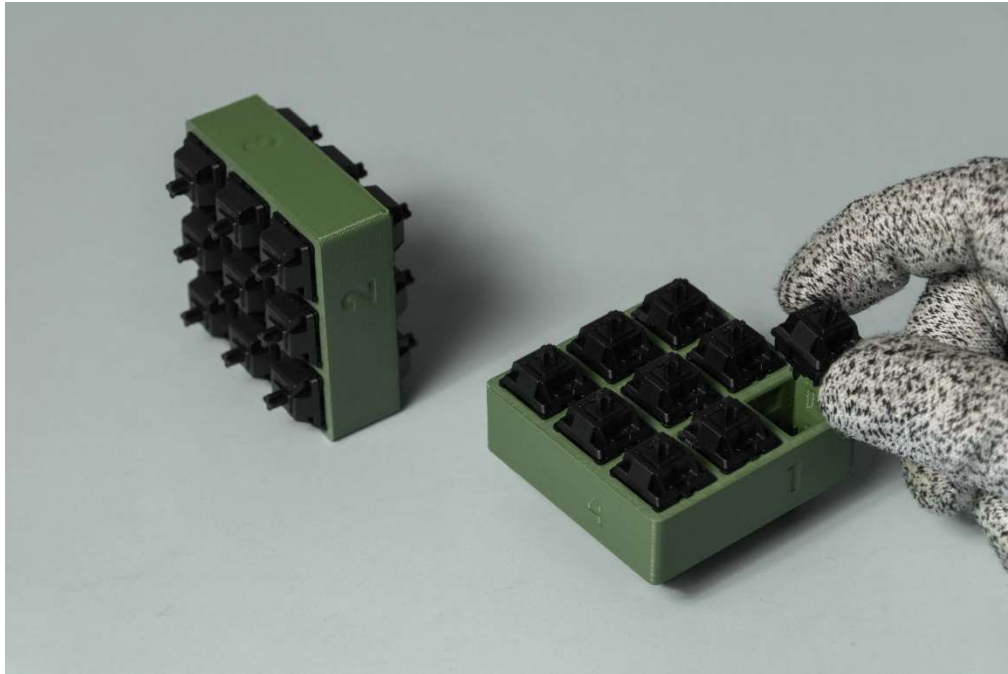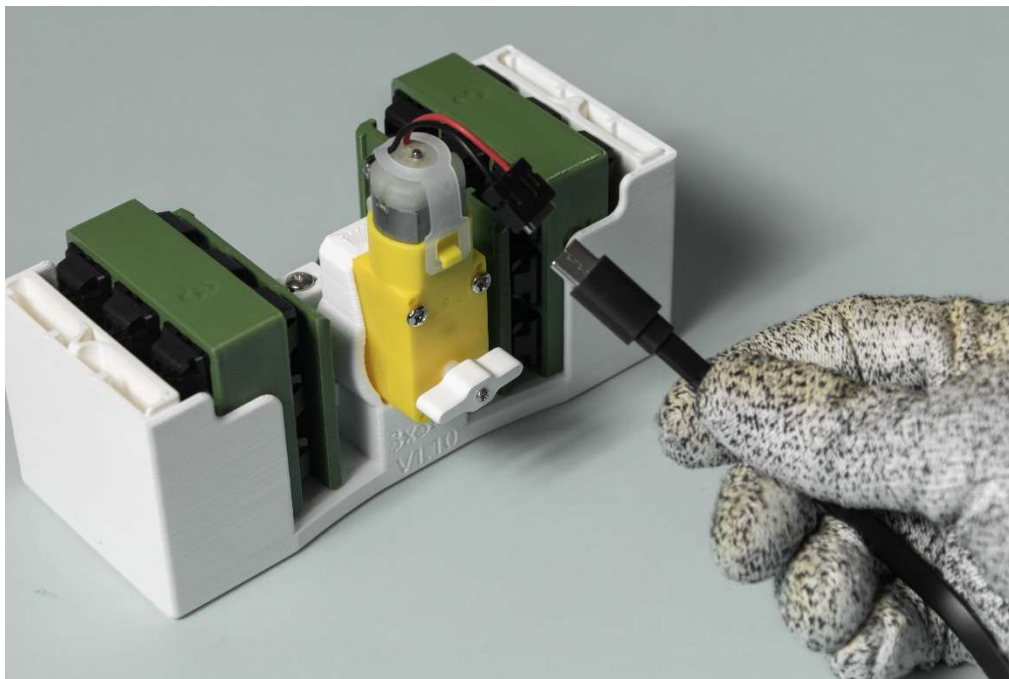

Step 1: Install switches into <u>both sides</u> of the switch plates (18 max on each plate).

Step 2: Insert centered-mode spacers on both sides as shown.

Step 3: Insert switch plates in any orientation. Switch plate orientation does not affect break-in process in Mode A. Rotate the handle to move the pusher to make insertion easier.
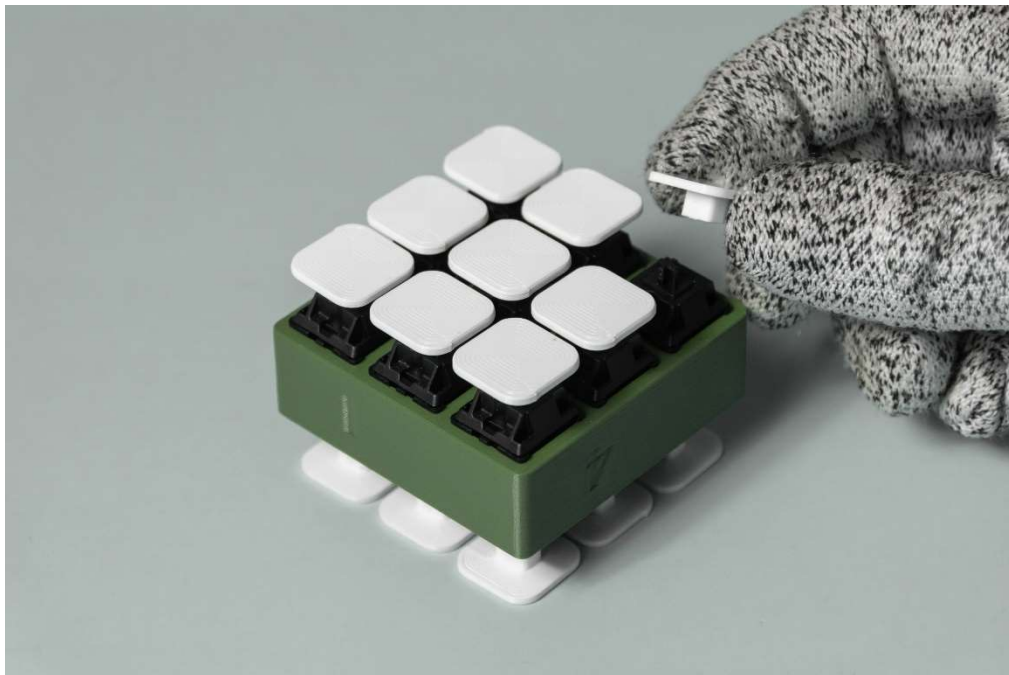

Step 4: Simply plug in the machine to start. To achieve consistency, it is recommended to break in switches by amount of time (min, hrs, etc).
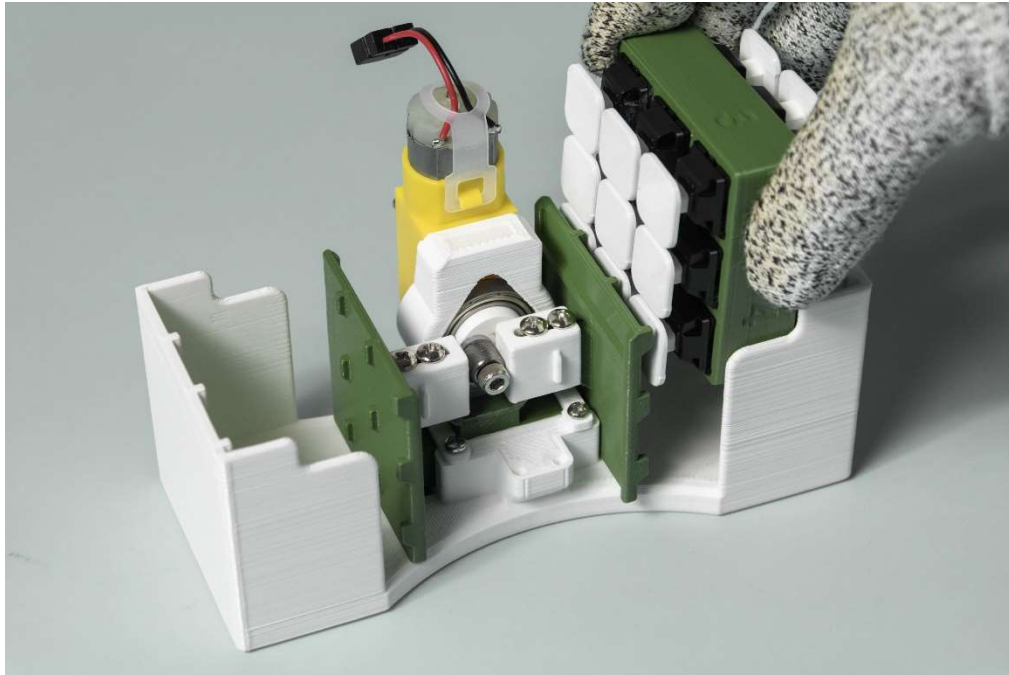
Section 5: Mode B – Off-center Actuations
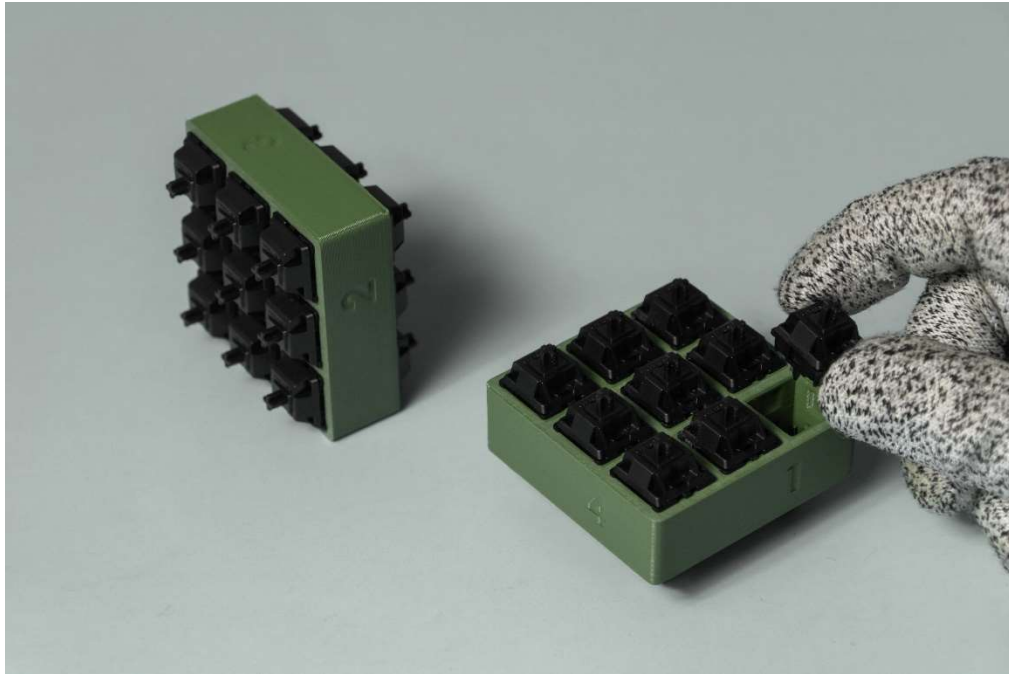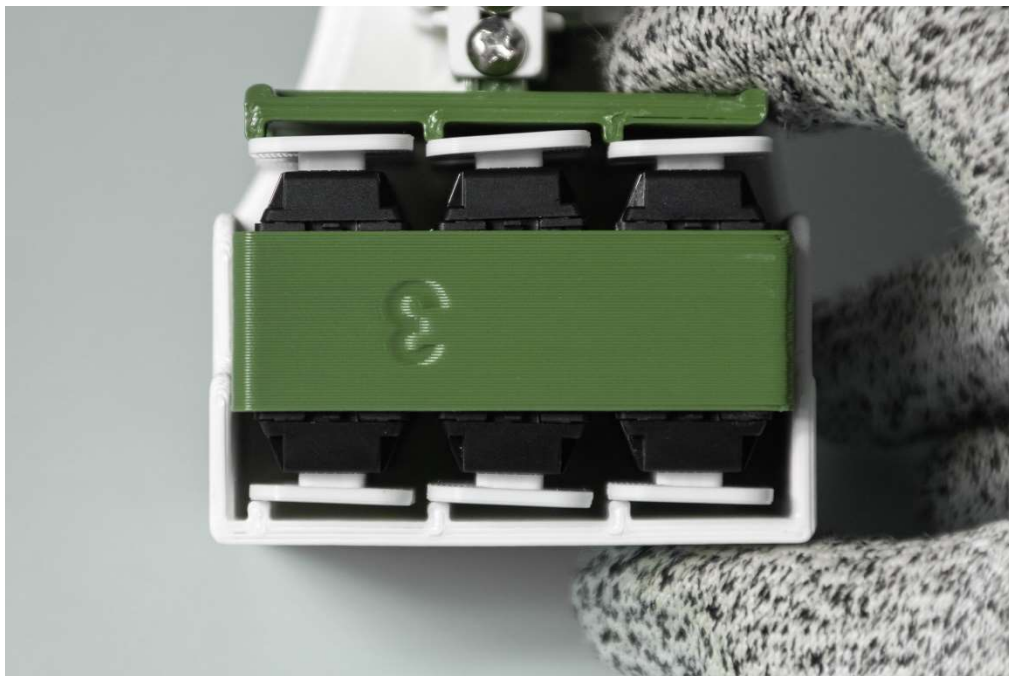

Step 1: Install switches into <u>both sides</u> of the switch plates (18 max on each plate).

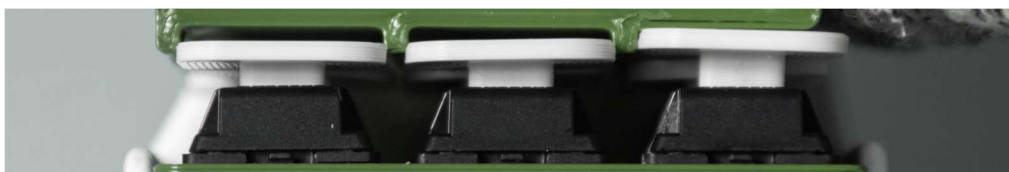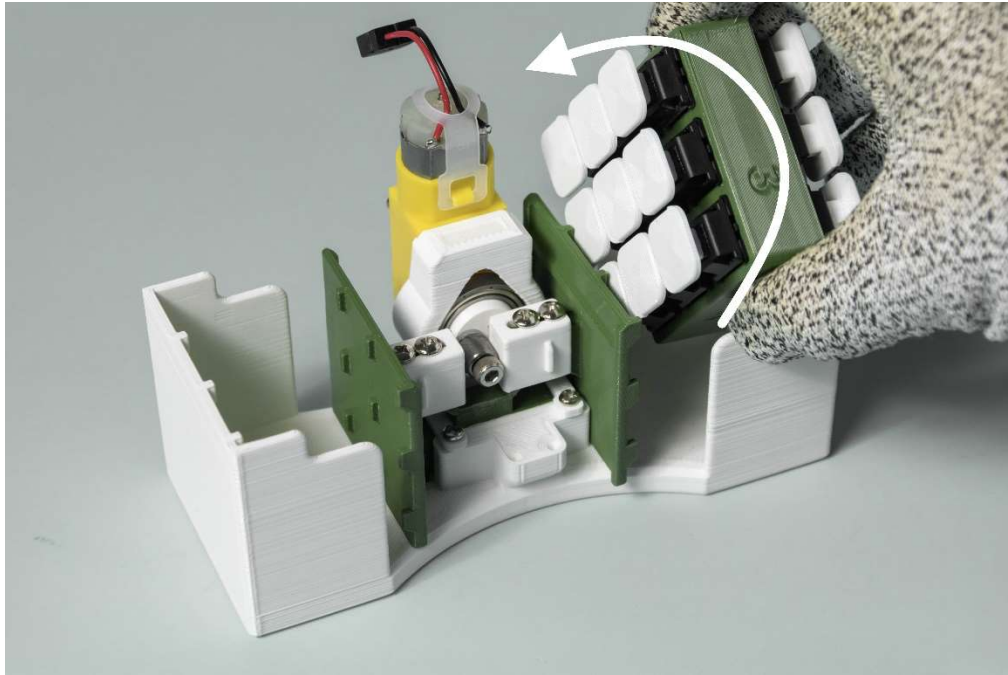Step 2: Insert keycaps onto <u>all</u> switches.

Step 3: Insert switch plates, the off-center nibs need to line up with the edge of the keycaps.

At this point, the user's machine should look like the image above. Once turned on, the nibs will apply force to the side of the keycaps, resulting in more friction towards one side.

Below: <u>Incorrect</u> alignment.

Step 4: Plug in the machine, the pusher will break in only one side of the switch. In order to break in the other three sides, rotate the switch plate 90 degrees after one side is finished. Please take notes on which side(s) has been broken in. 4 sides are labeled with numbers. For consistent results, break in each side for the same amounts of time.

Warning: Switches aren't designed to be pressed off-center repeatedly, please do not leave the switches in off-centered mode for millions of actuations unattended. Check once in a while to see if there are any damages to the switch top housing, and spin the plate periodically.

Some keycaps might scrape the north/south sides of the top housing. Test this before starting the break-in process by installing the keycaps onto the switches, then move it up and down while tilting the keycaps to each of the 4 sides. If there is scraping, you can lightly file the affected side. Usually only 1 side is affected. The keycaps are still usable without filing, however a user have reported decreased break-in effect when scraping is present. But I haven't noticed this myself.

Section 6: Adjusting the Travel Distance
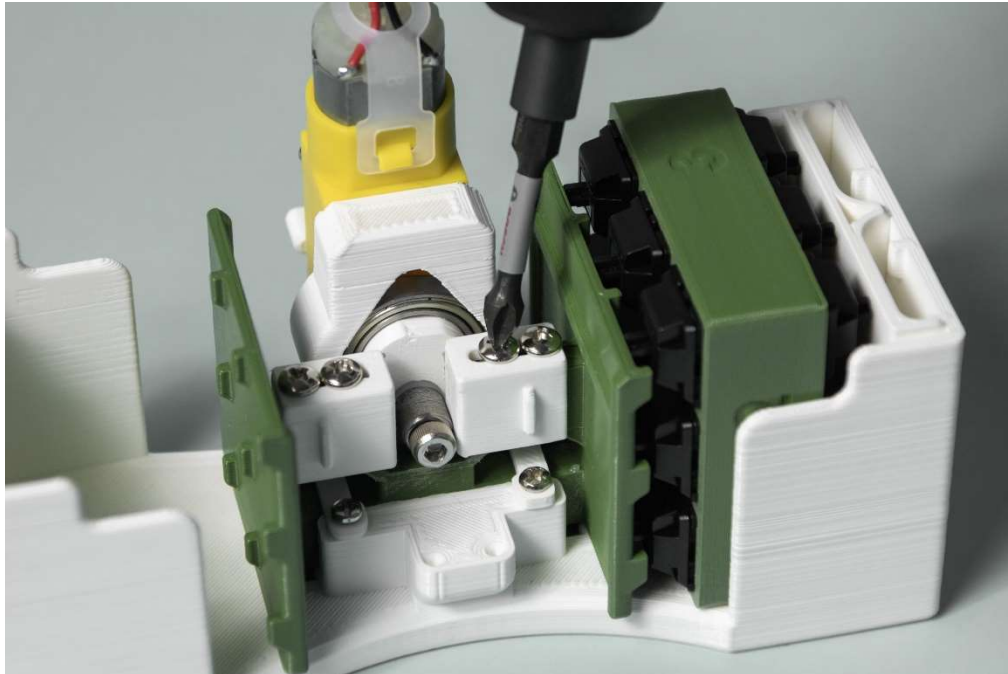
Step 1: Unscrew the 2 screws holding down the buffer. These do not need to be unscrewed completely, only loosened to allow the buffer to move. Note that the machine is adjusted for 4mm switches out of the box, unless you are using long pole switches, you do not need to adjust the travel distance. This section needs to be done in mode A, with no keycaps and the centered-mode spacers inserted.
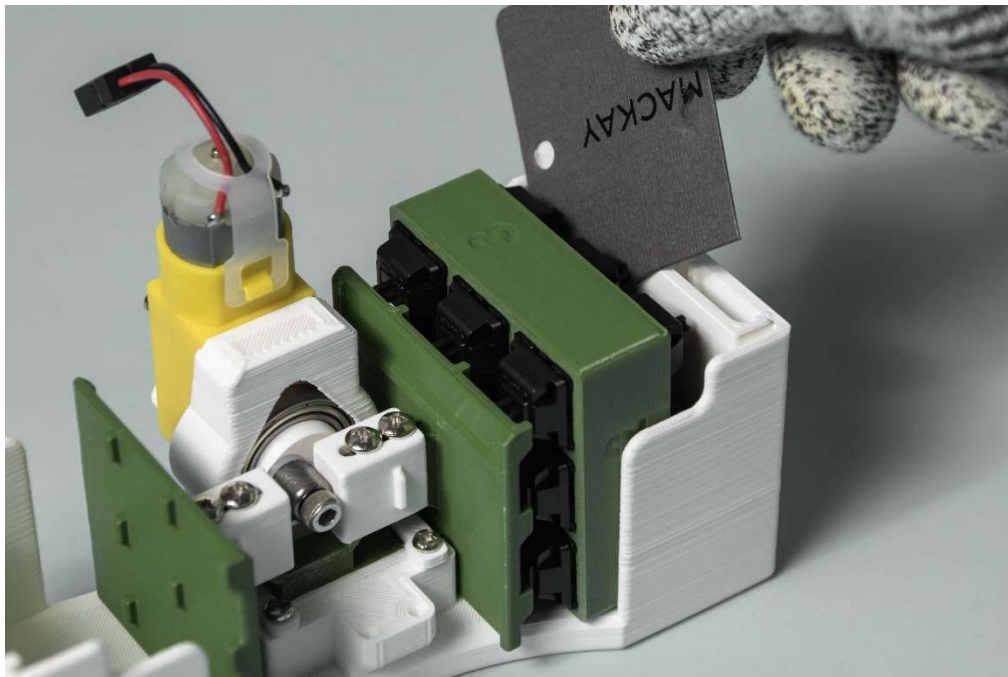

Step 2: Stick a piece of card (poker card or similar) in between the centered-mode spacer and the switches. The goal is to get a card stuck while the switches are bottomed out in the next step.
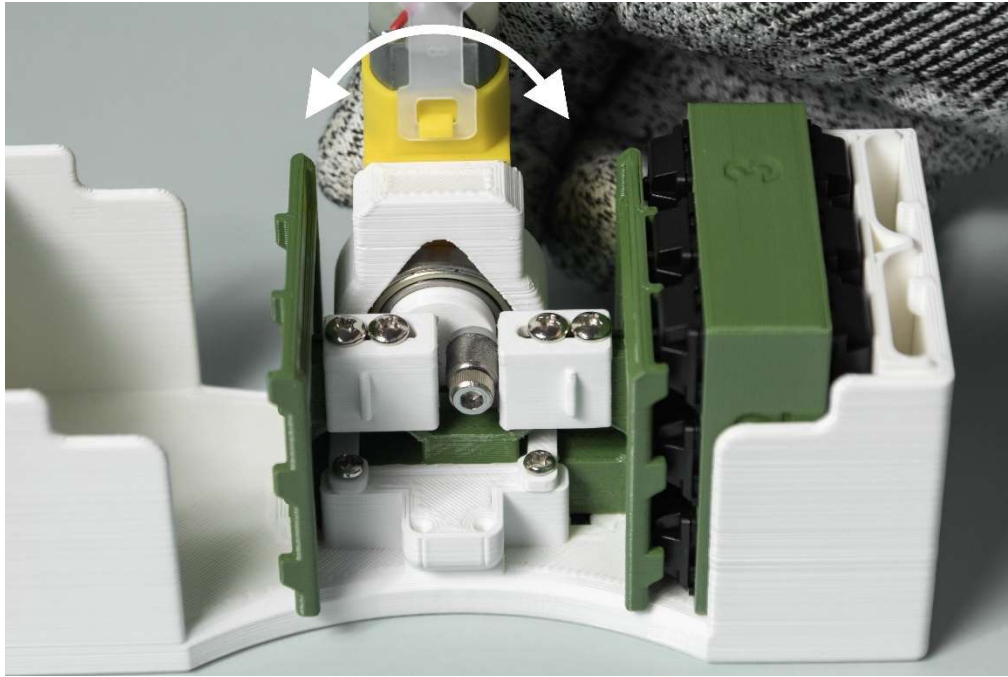
Step 3: Rotate the wheel as shown so that the switches are in the bottomed-out position. If you cannot move the wheel to the bottom out position, that means you need to lower the travel distance. (Note: the card is not shown in this picture, but it still needs to be inserted at this point)
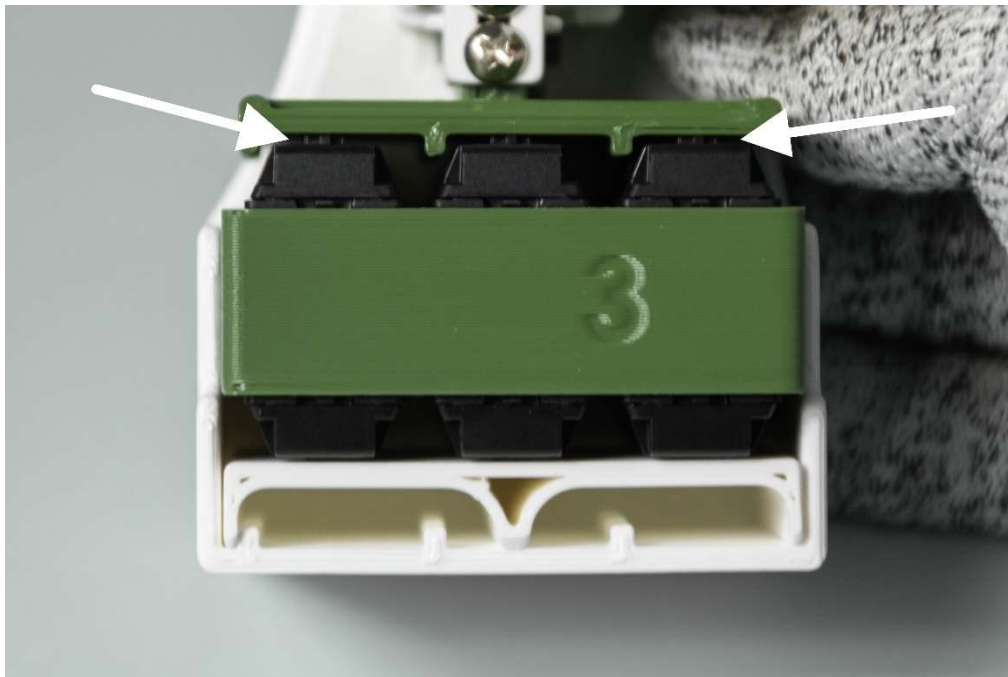
Step 3 continued: The previous step is necessary since it leaves a small gap and prevent complete bottom out. This is what the end result will look like and it does not impact break-in performance.
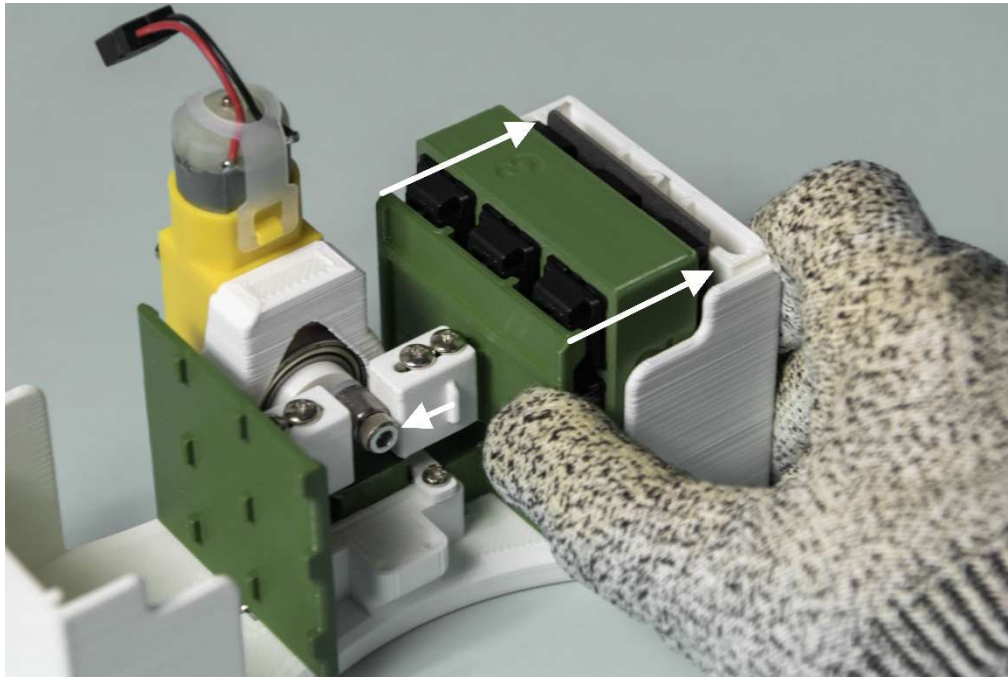
Step 4: With 1 hand, push the pusher as shown to bottom out the switches. With another hand, move the buffer piece until it touches the bearing in the middle.
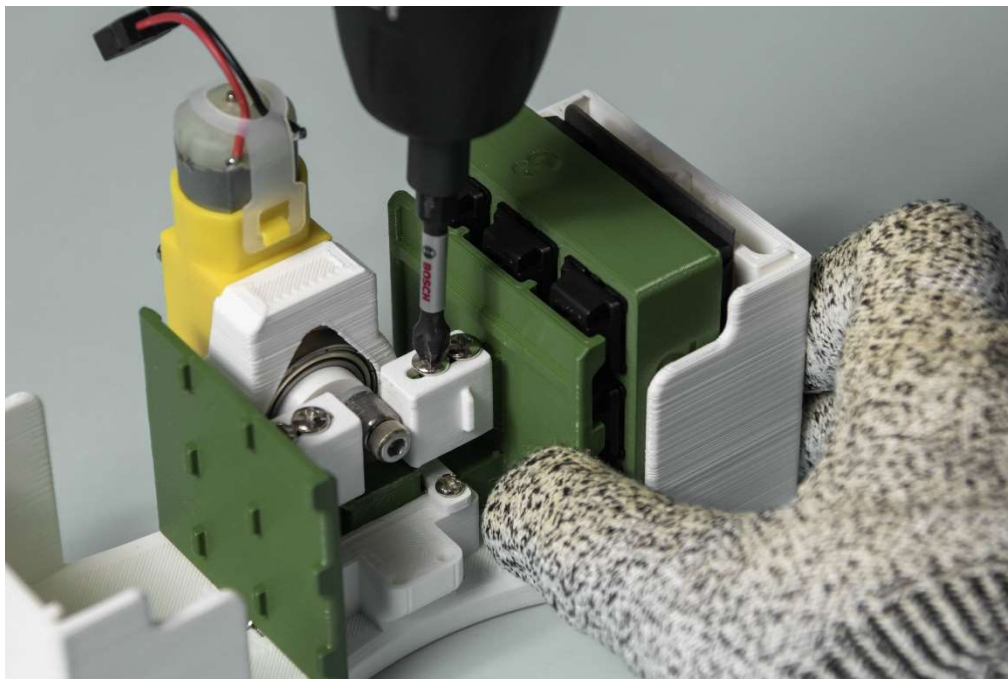

Step 5: Without moving, tighten the screws on the buffer pieces while it is still in contact with the bearing in the middle. Remember not to overtighten. Remove card and repeat on the other side.
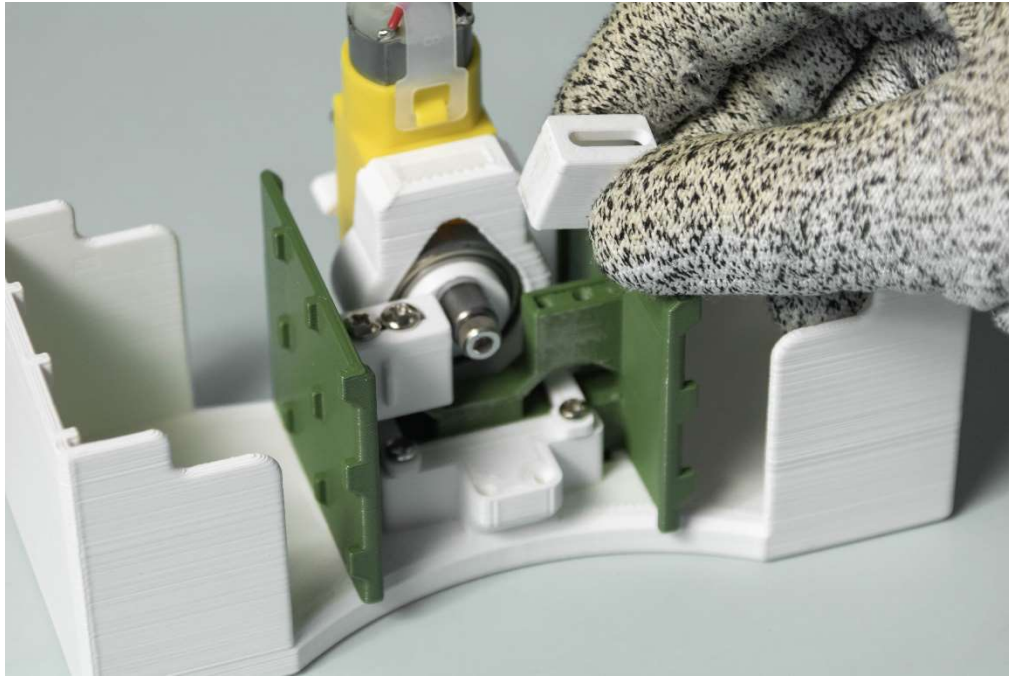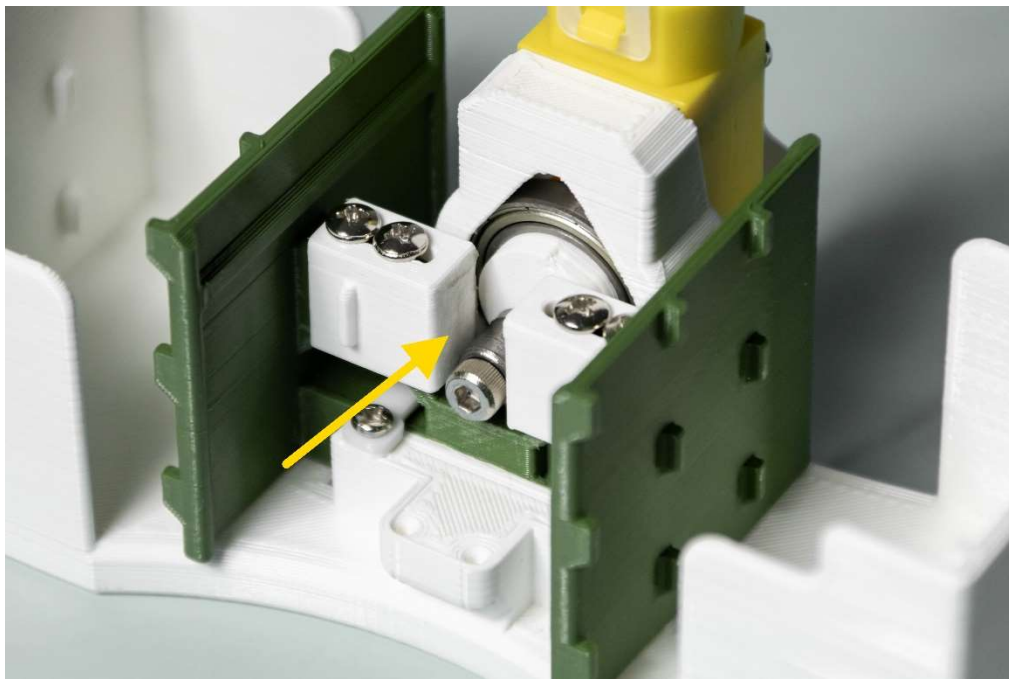
Section 7: Replacing the buffer piece

When to replace the buffer? Wear on the buffer will decrease the travel distance of the pushers, when this happens, sometimes one can compensate by adjusting the travel distance following section 6. Use your judgement, the pictured piece was used for ~400 hours and is still usable (picture from 4x4).
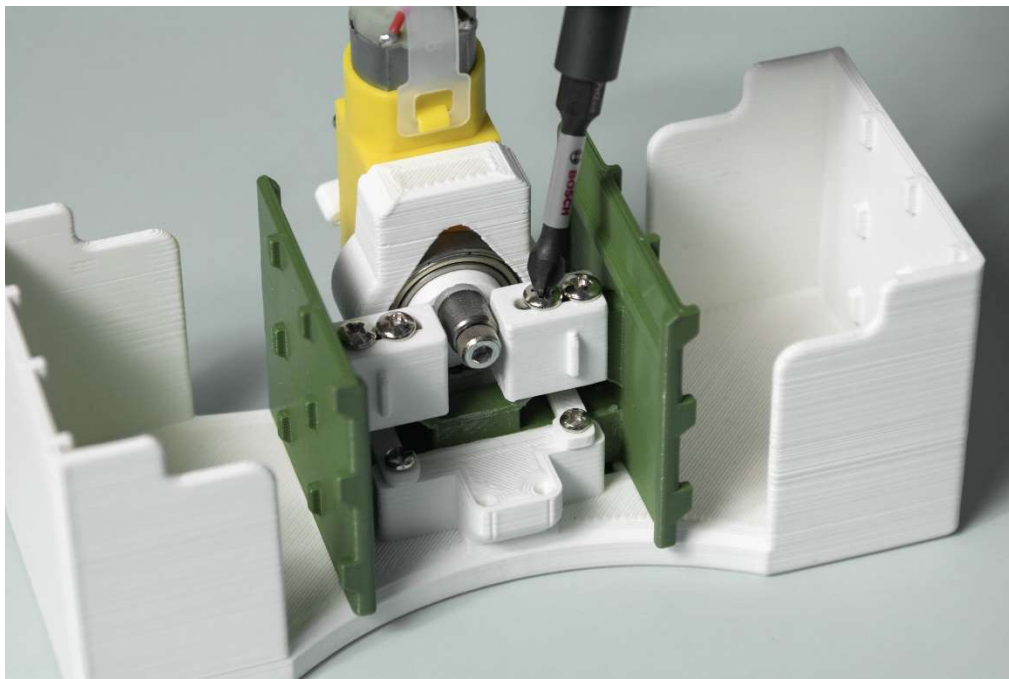
Step 1: Completely remove the 2 screws holding in the buffer pieces.

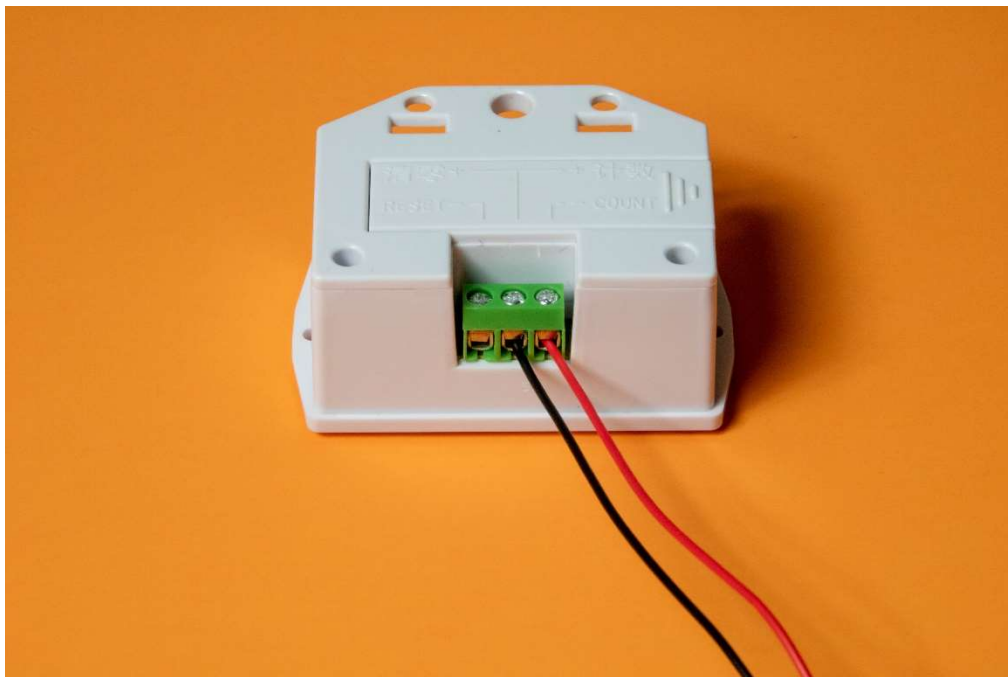Step 2: Simply remove the buffer and replace with new ones.

Step 3: Apply any type of grease to the new buffer piece, where the bearing comes in contact with the buffer. If the bearing is dirty, wipe it clean and apply grease as well.
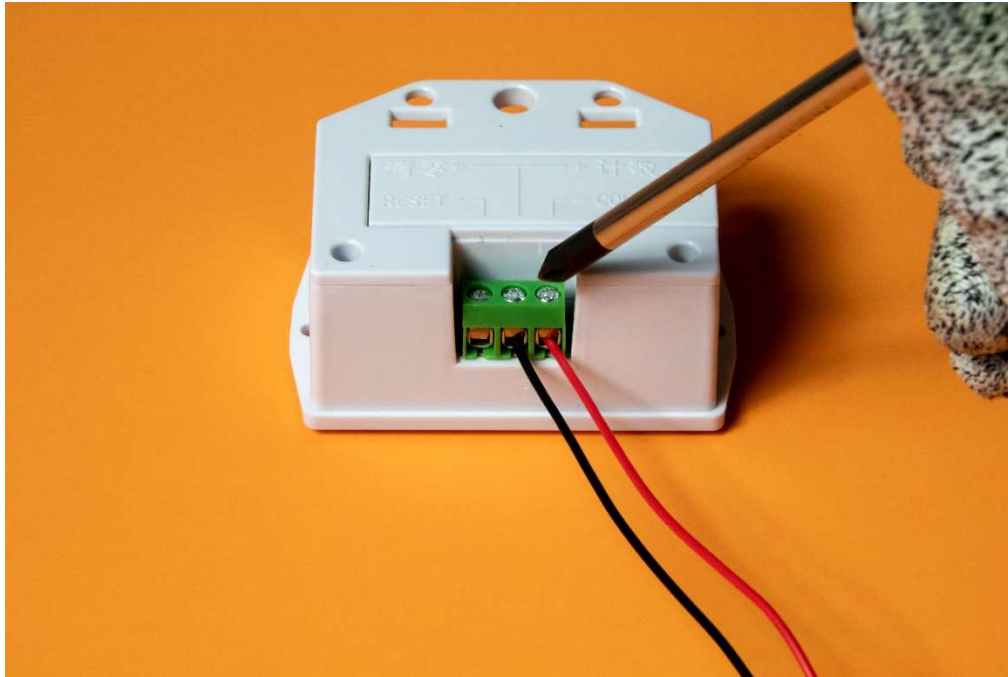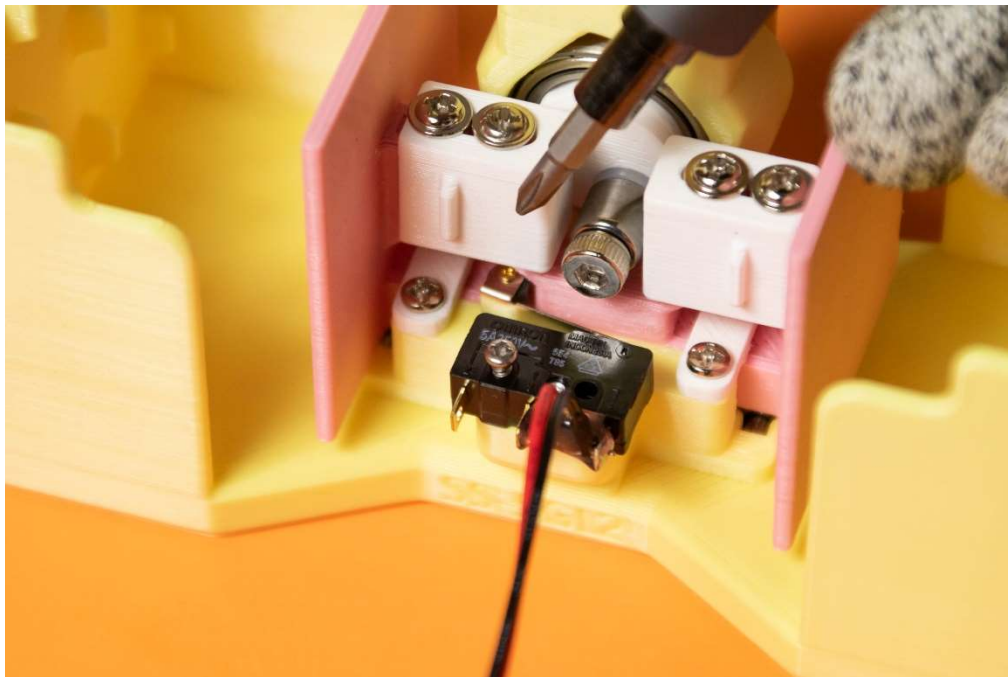
Section 8: Actuation Counter

Step 1: Flip the counter so the back side is facing up.

Step 2: Insert the 2 wires into the <u>right and middle</u> slots, the order of the wires does not matter. Make sure the screws are loose if you are unable to insert the wires.

Step 3: Tighten the two screws and make sure the wires are secure.

Step 4: Hold the switch onto the main body of the machine so that the holes line up and that the wheel of the switch is inside the hole of the pusher. Screw in the two screws.
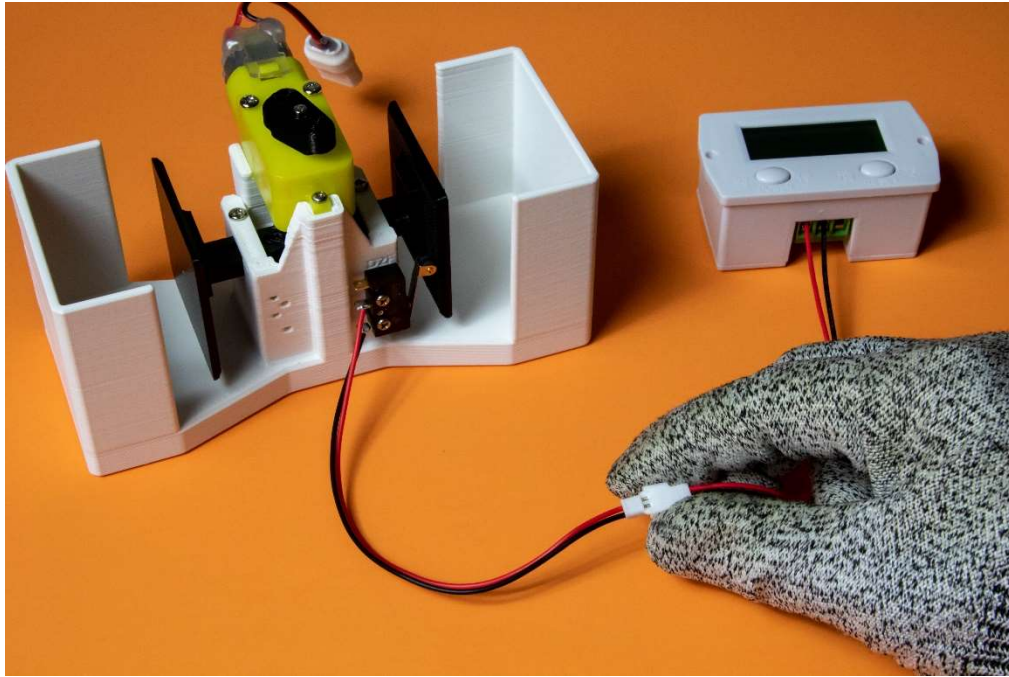
Step 5: Connect the two wires with the white connector, the pins only go in one way.

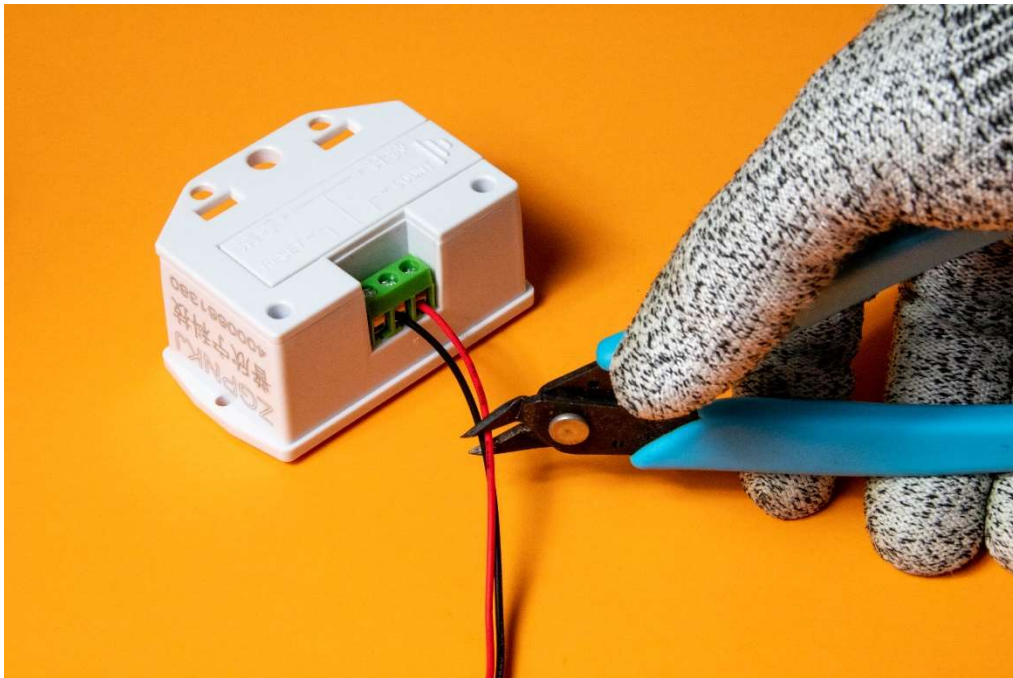Step 6: Remove the battery compartment cover.

Step 7: Insert a AA battery (1.5v) and put the cover back in place.

Step 8: Long press the POWER button (left) to turn on/off the counter. The current count will be saved when the counter is shut off.

Step 9: Long press the RESET button to reset the counter, the counter resets itself after the count reaches 1,000,000.

Step 10 (OPTIONAL): Cut the wire if you feel the wire is too long, please note this process is not reversible unless you choose to solder on another section.

Changelog