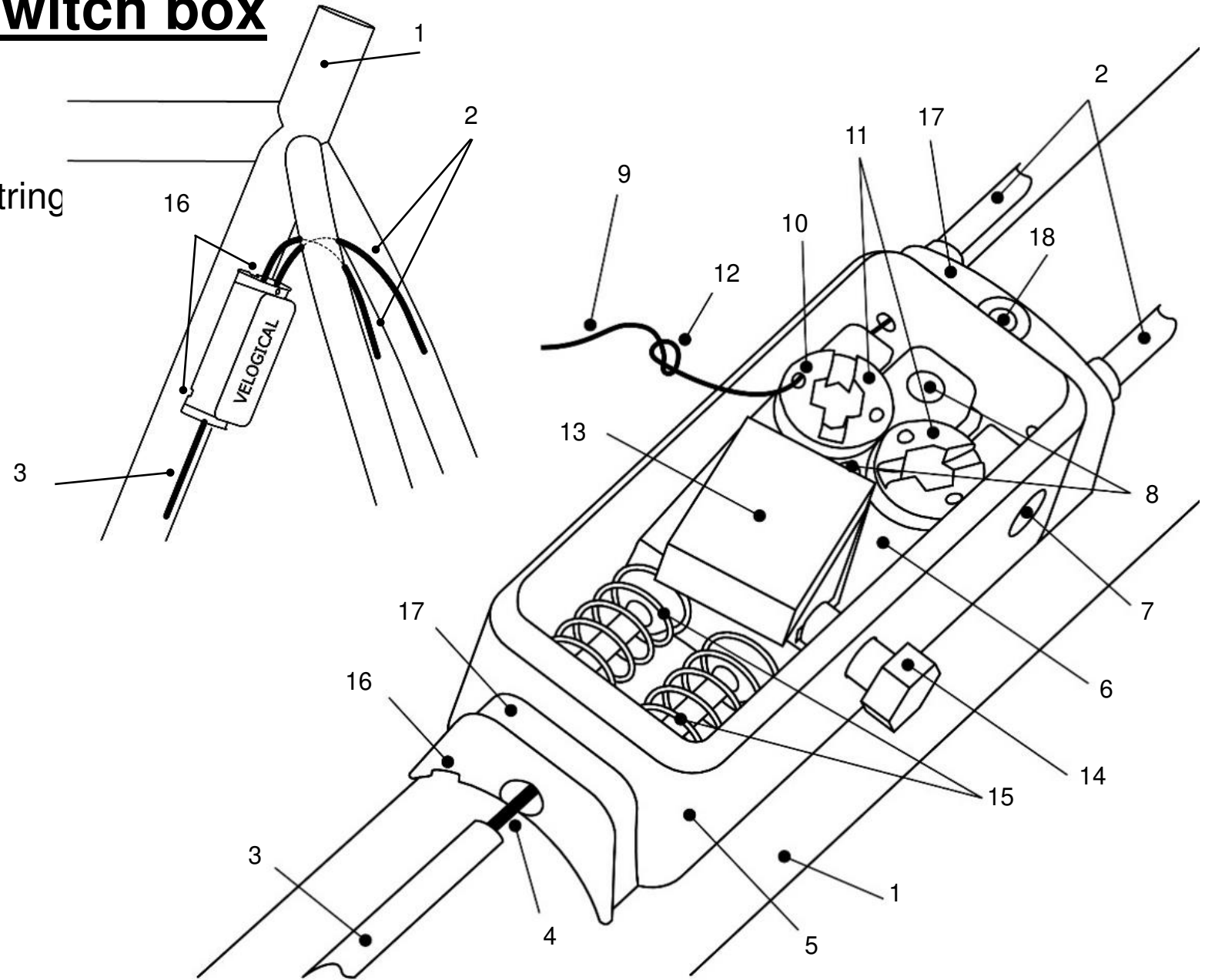


EM2c Assembly of the switch box

- 1 Seat tube
- 2 Shift cable housing (for the nylon string)
- 3 Front shift cable housing
- 4 Shift cable
- 5 Switch box housing
- 6 Switch block
- 7 Clamping screw
- 8 Grub screw
- 9 Nylon string
- 10 Bore
- 11 Swivel
- 12 Knot
- 13 Microswitch
- 14 Adjusting screw
- 15 Compression springs
- 16 Gap for the microswitch wire
- 17 Zip tie support
- 18 Fastening option with M3 screw



- First select a suitable location (preferably on the seat tube 1) for the switch box, but only fasten it loosely. Remove all the nylon strings. The shift cable housing 2 coming from both motor brackets should be routed to the switch box with a sufficiently large bending radius. In the case of a rear suspension, ensure that the shift cable housing follow the movements of the rear swing arm without collision or chafing. Shorten both shift cable housing to optimum length: as long as necessary (max 320mm), as short as possible. (Tip: After cutting, the inner plastic tube must be widened/pushed open again).



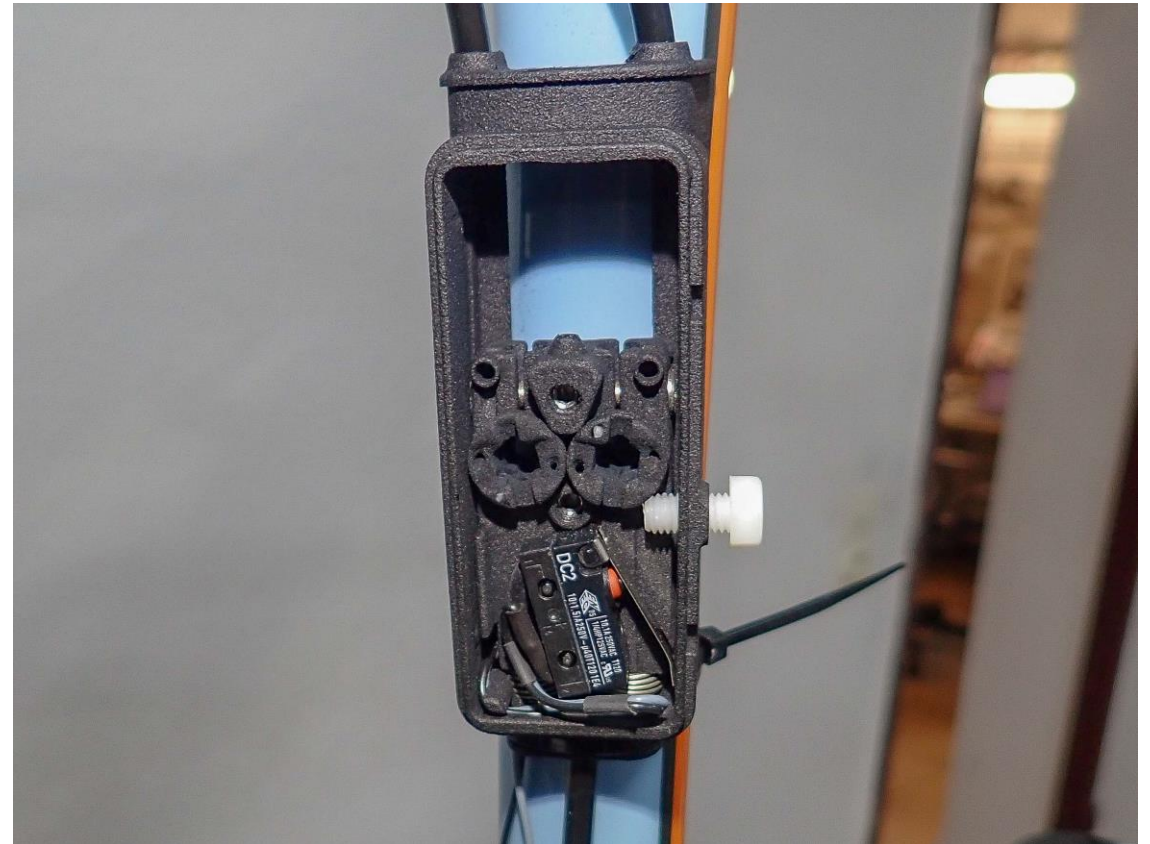
- Then determine the length of the front shift cable housing 3: Usually it runs from the shift lever along the down tube, bends up at the bottom bracket and ends in the switch box. Roughly fix the shift cable housing, take into account handlebar rotation and then cut to the appropriate length. (Tip: Do not attach the switch box to the seat tube yet, but only once the shift cables and the strings of the motors are pre-assembled.)



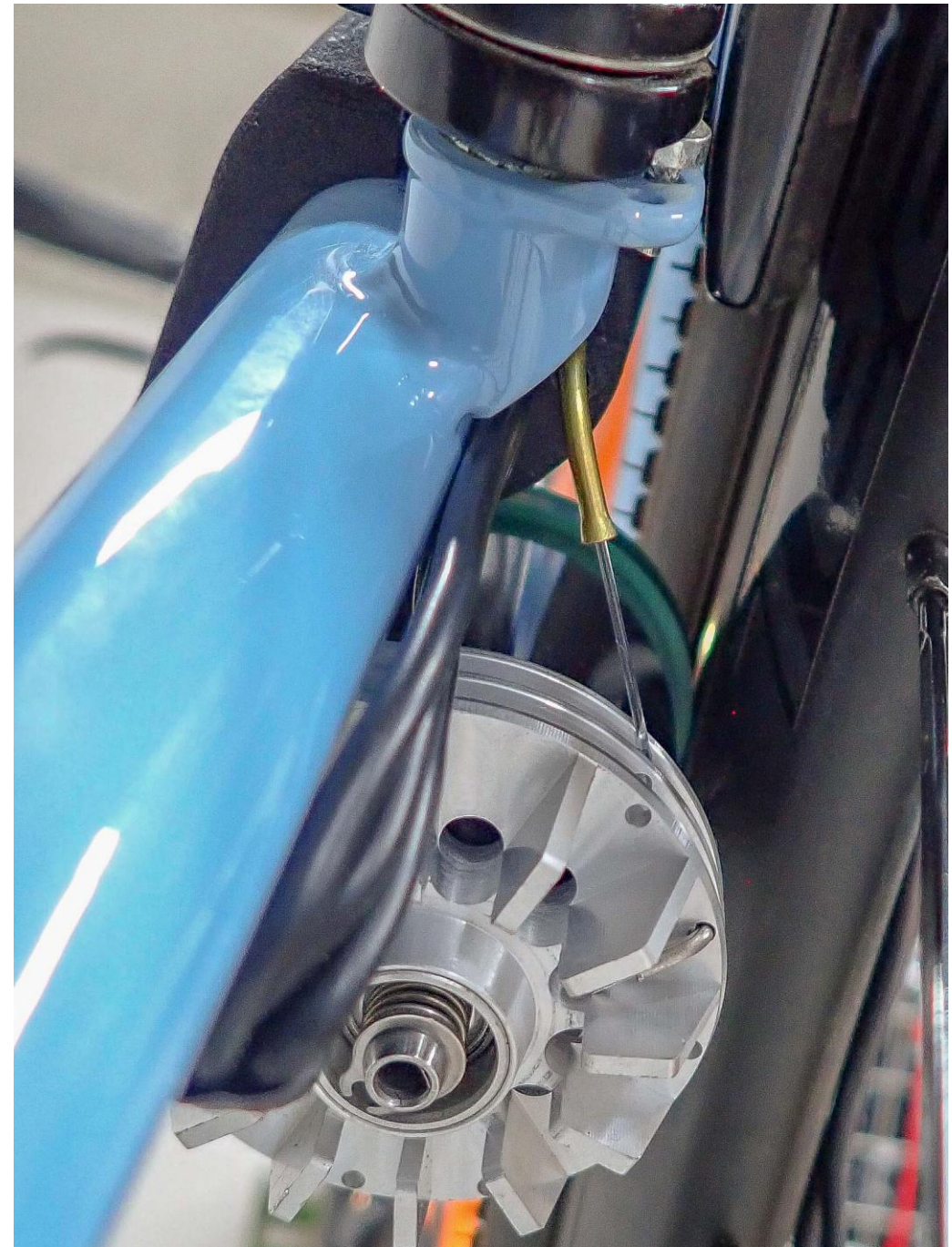
- Insert the shift cable 4 first into the shift lever, then into the shift cable housing 3, insert the free cable end through the center hole of the housing 5 and the switch block 6.
- Move the shift lever to the "Off" position (i.e., with the shift cable being completely extended). Hold the switch box and pull firmly on the free end of the shift cable so that the shift cable housing is pressed in the locating holes at both ends. The switch block 6 is now in the rest position (clamping screw 7 aligns with the housing bore).
- Tighten both grub screws 8 temporarily until there is noticeable resistance, then bring the shift lever all the way down (second detent) and then back to the "Off" position. Only if no dead travel is now detected (i.e. the smallest movement of the shift lever is transmitted 1:1 to the switch block) can both grub screws be tightened by a maximum of one further turn. If dead travel is detected, the shift cable 4 must be retightened. (Tip: The threaded hole is made of plastic and may be destroyed by overtightening. Therefore, hold the Allen key at the short end so that you have more feeling).



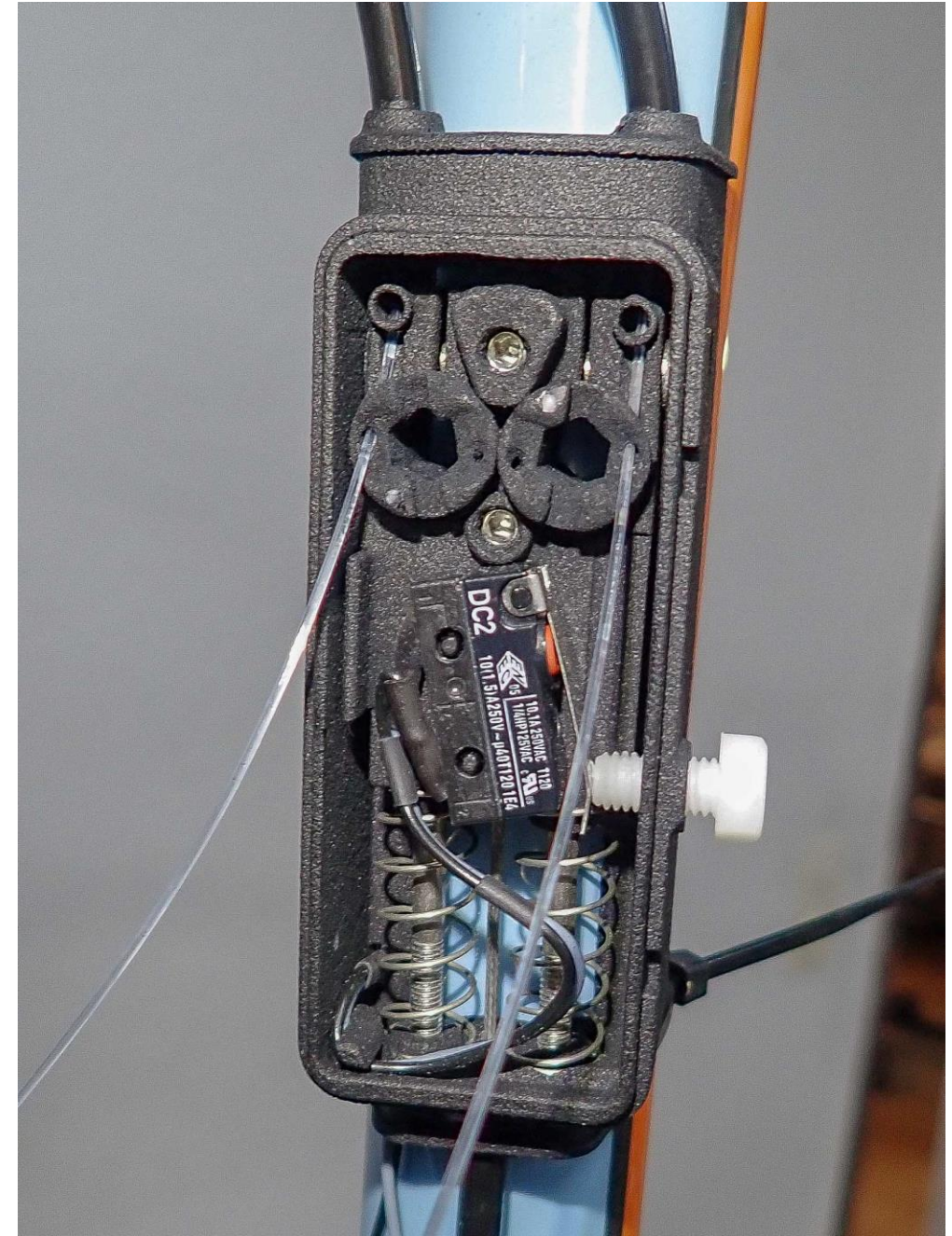
- Test: It must now be possible to move the shift lever smoothly to the second detent, the compression springs 15 are then almost fully compressed. When returning to the "Off" position, the switch block must spring back smoothly to its rest position.
- Cut off the excess shift cable as close to/flush with the upper end of the shift block as possible. (Tip: To do this, set the shift lever to "On").



- Remove both shift cable housing 2 from the motor brackets and the switch box, thread the outgoing nylon strings 9 from the motor into the bends of the lower brass tubes and push them through until they emerge at the upper end of the motor brackets. Pull each motor with the nylon string against the rim and check that the string runs cleanly into the bend opening. (Tip: The string can wear prematurely if it is pulled over the sharp edge of the brass tube mouth. Therefore, the string attachment is between the two lower cooling fins on the short 3125 motors, and between the upper fins on the long 3135 motors. The tube can be rotated in the motor bracket and the bend can be slightly adjusted by hand to allow perfect string entry).



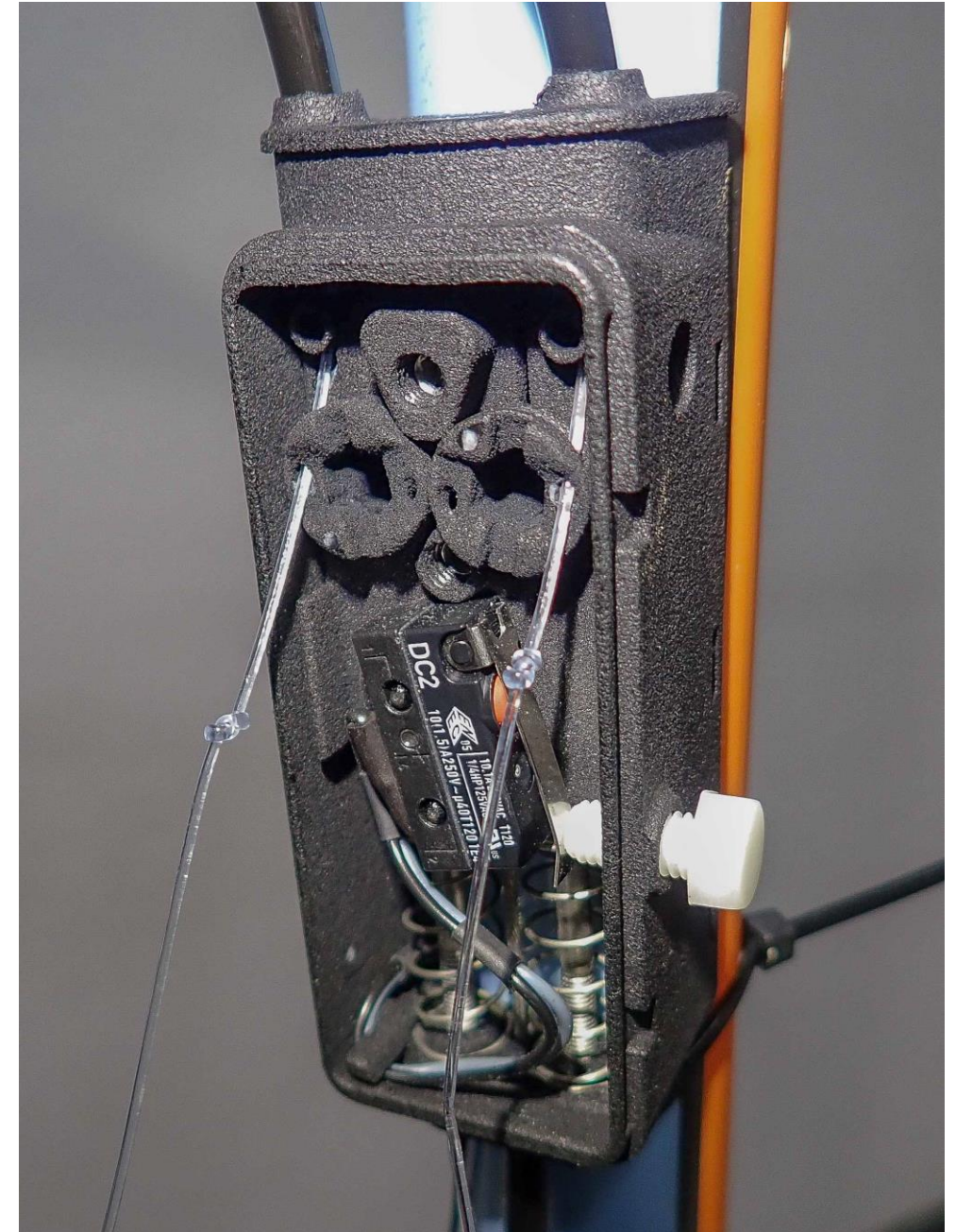
- Thread the nylon string 9 into the shift cable housing and now insert it into the motor bracket as far as it will go. Check again whether the motors can still be pulled smoothly against the rim.
- Pull back the nylon string 9 until it no longer sticks out of the shift cable housing. Now insert the shift cable housing into the locating hole of the switch box as far as it will go and push the nylon string in at the brass tube bend until it emerges from the bore 10 of the swivel 11. (Tip: If the string does not find its way through the swivel hole 10 on its own, you can pull the shift cable housing out of the switch box housing again and thread in the nylon string first).



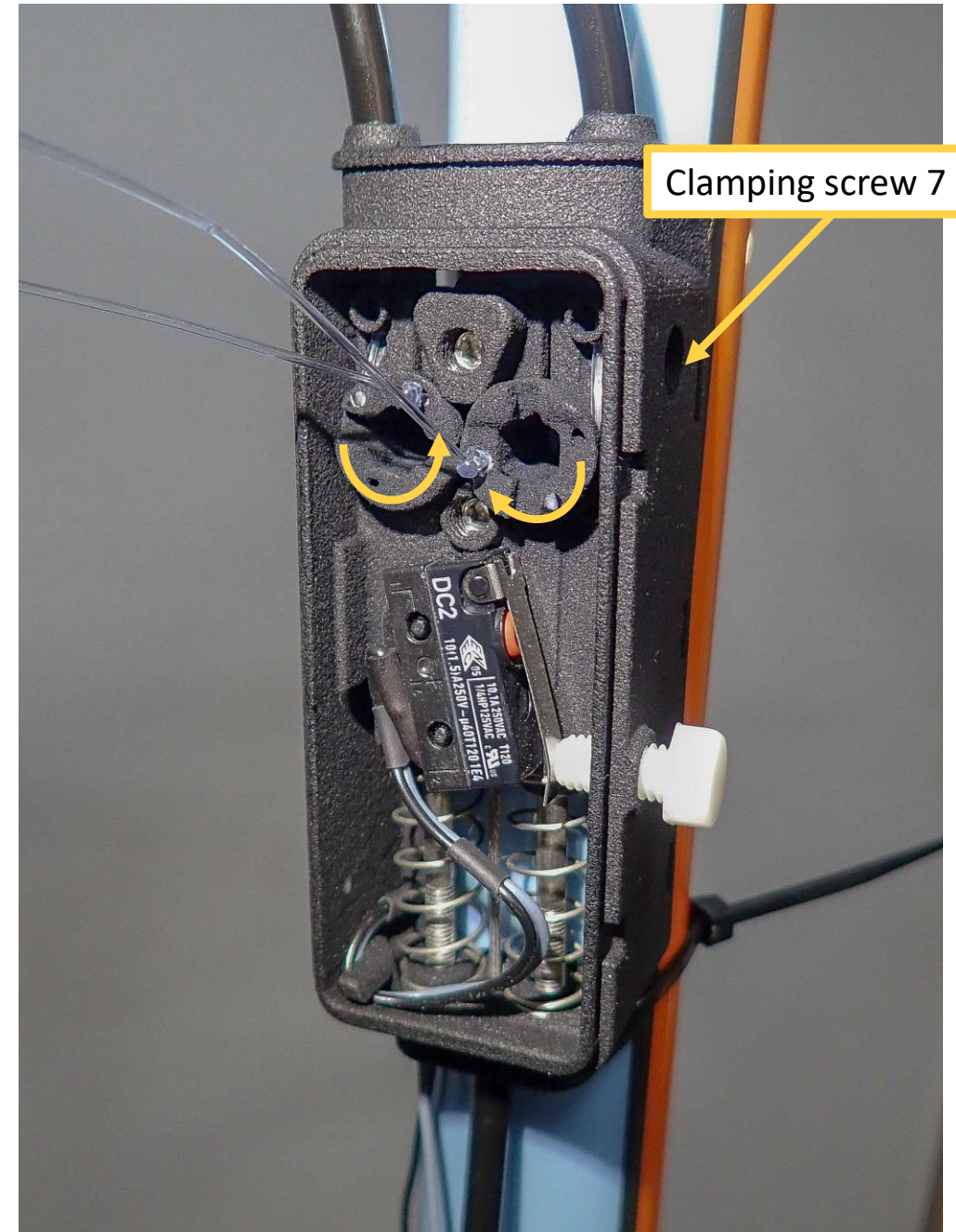
- Attach knot 12: Shift lever in "Off" position, keep both motors pressed against the rim (e.g. with a hair tie). Pull the nylon string tight and attach a simple knot (loop) so that it is 10 to 15mm away from the hole 10 in the swivel. When this distance is correct, the knot must be pulled extremely tight. (Tip: hold the free end of the string with one hand, compress the knot towards the swivel with your thumbnail from the other hand. Caution: do not put any load on the thin wall at the swivel, otherwise the bore can be torn out. Second hole serves as a reserve).



Hair tie



- Stretch the strings: Remove the hair ties, shift lever in "Off" position. By turning both swivels in opposite directions with a coin in the slot or a 5 mm Allen key in the hexagon, the strings are wound up until the motors with the friction rings just touch the rim.
- Tighten clamping screw 7: CAUTION, this screw has a defined stop due to its thread length. It is therefore tightened sensitively or rather without a torque setting until the noticeable stop is reached.
- Pre-tension the nylon strings by bringing the shift lever to the first detent. Under this pretension, all shift cable housing are going to be firmly pressed into their locating holes once again. Wait 30 minutes. (Tip: In the meantime, the pedal sensor and magnets can be mounted and the motor cables neatly routed on the frame).



- Adjust the string length: Set the shift lever to "Off" position, wait 5 minutes until the strings have shrunk back. Check that you have a 3mm nominal distance between rim and friction rings. Tighten clamping screw 7 with CAUTION. (Tip: 3mm nominal distance can be checked with a 3mm Allen key as feeler gauge between rim and friction rings).
- For readjustment, loosen the clamping screw 7 exactly two turns. Turn slightly the right or left swivel to increase or decrease the nominal distance. Tighten clamping screw 7 with CAUTION. (Tip: With the rear wheel turning, slowly turn on the shift lever and make sure that both motors start to rotate at the same time.)
- Secure the switch box in its final position on the frame with two industrial cable ties. Caution: Lead the grey and black wire of the microswitch through one of the gaps 16 to the outside. Cut off the protruding nylon string approx. 12 mm from the knot and insert the protruding piece into the hexagon of the swivel. Put on the cover and snap it into place. (Tip: Elegant but less robust is a fastening of the switch box thanks to a M3 Allen screw 18)
- The switching point of the microswitch 13 can be adjusted by the adjusting screw 14: The soft click should be audible halfway between the "On" and "Off" positions of shift lever. If the drive switches off uncertainly, turn in a half or a full turn clockwise. If the drive switches on unsafely, turn out half or up to one full turn counterclockwise.

