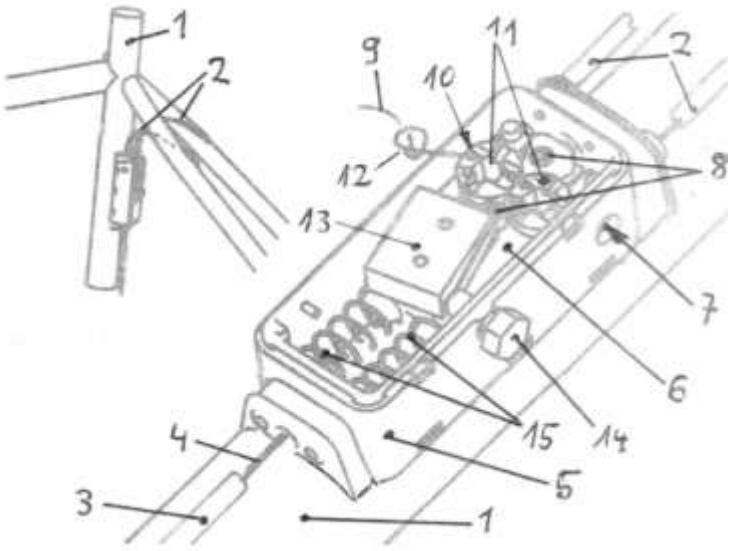
EM2c : Final assembly of switch box

File: EM2c_Schaltbox_EN_2022-08



1: Seat tube
2: Gear cable housing (Gch for nylon rope)
3: Front gear cable housing (Gch)
4: Gear cable
5: Switch box housing
6: Switch block
7: Clamping screw
8: Grub screw
9: Nylon rope
10: Bore
11: Swivel
12: Knot
13: Microswitch
14: Adjusting screw
15: Compression springs

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

- Then determine the length of the front Gch 3: Usually it runs from the handlebar switch along the down tube, bends up at the bottom bracket and ends in the switch box. Roughly fix the Gch, 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 gear cable and the ropes to the motors are pre-assembled.)

- Insert the gear cable 4 first into the handlebar switch, then into the Gch 3, insert the free wire end through the center hole of housing 5 and switch block 6.

- Move the handlebar switch to the "Off" position (i. e., with the gear cable being completely extended)**.** Hold the switch box and pull firmly on the free end of the gear cable so that the gear cable housing is pressed to the stop 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 handlebar switch 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 handlebar switch 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 gear 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 handlebar switch smoothly to the second detent, the compression springs 15 are then almost in block. When returning to the "Off" position, the switch block must spring back smoothly to its rest position.

- Cut off the excess gear cable as close to/flush with the upper end of the shift block as possible. (Tip: To do this, set the handlebar switch to "On").

- Remove both Gch 2 from motor bracket and switch box, thread the outgoing nylon ropes 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 bracket. Pull the motor with the nylon rope against the rim and check that the rope runs cleanly into the bend opening. (Tip: The rope can wear prematurely if it is pulled over the sharp edge of the brass tube mouth. Therefore, the rope 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 rope entry).

- Thread nylon rope 9 into Gch and now insert it into the motor bracket as far as it will go. Check again whether the motor can still be pulled smoothly against the rim.

- Pull back the nylon rope 9 until it no longer sticks out of the gear cable housing. Now insert the Gch into the locating hole of the switch box as far as it will go and push the nylon rope in at the brass tube bend until it emerges from the bore 10 of the swivel 11. (Tip: If the rope does not find its way through the swivel hole 10 on its own, you can pull the gear cable housing out of the switch box housing again and thread the nylon rope in separately first).

- Attach knot 12: Handlebar switch in "Off" position, keep both motors pressed against the rim (e.g. with a hair tie). Pull nylon ropes 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 rope with one hand, compress the knot towards the swivel with the thumbnail of 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).

- Stretch the ropes: Remove hair ties, handlebar switch 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 ropes 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 nylon ropes by bringing handlebar switch to first detent. Under this pretension, all gear 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 rope length: Set handlebar switch to "Off" position, wait 5 minutes until the ropes have shrunk back. Check 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 clamping screw **exactly** one and a half turn. 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 handlebar switch and make sure that both motor start to rotate at the same time.)

- Secure the switch box in its final position on the frame with two industrial cable ties. Cut off the protruding nylon rope 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.

- 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 the handlebar switch. If drive switches off uncertainly, turn in a half or a full turn clockwise. If drive switches on unsafely, turn out half or up to one full turn counterclockwise.