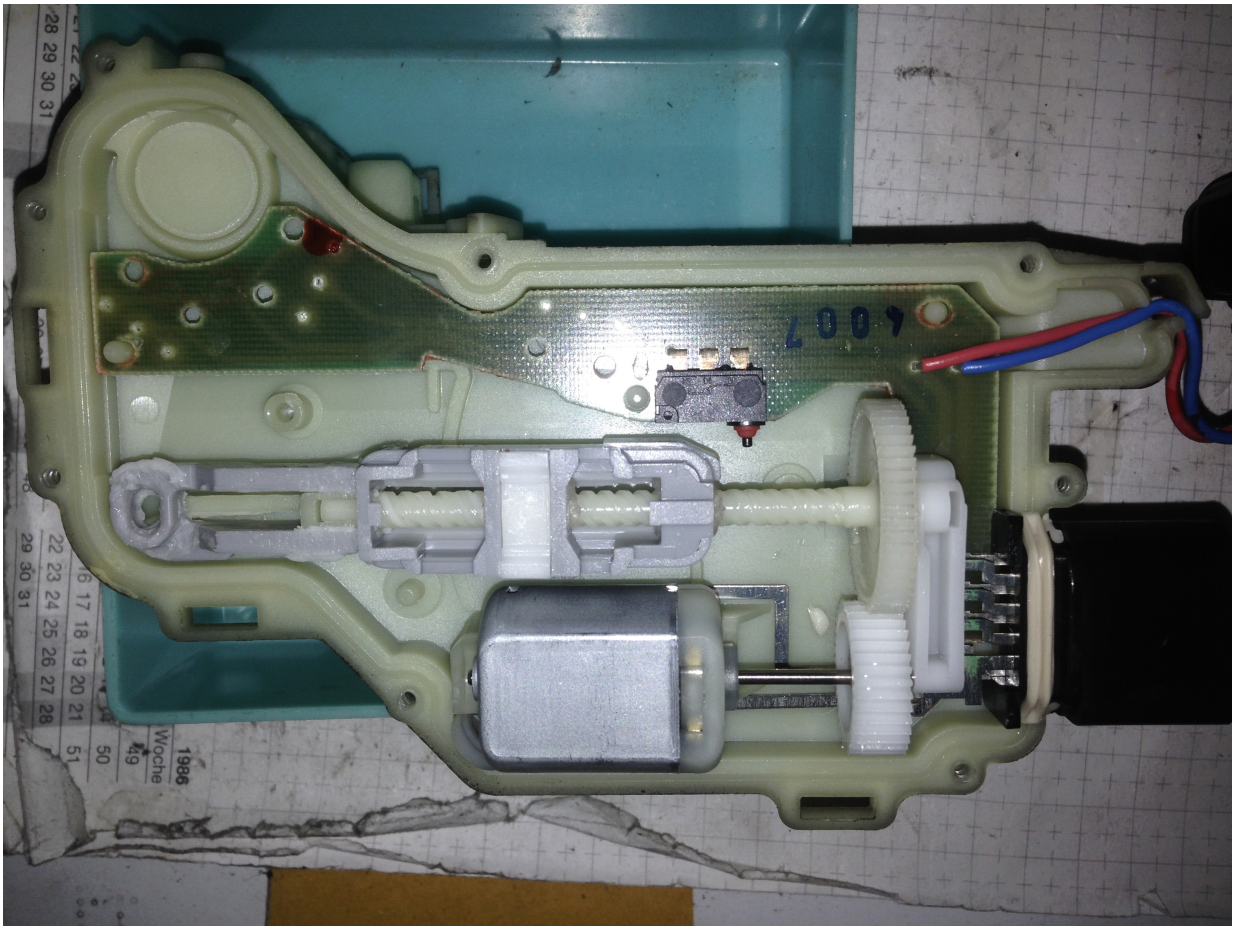
Central-Locking Motor Repair

One of the car's doors caused an intermittent failure of the central-locking system.

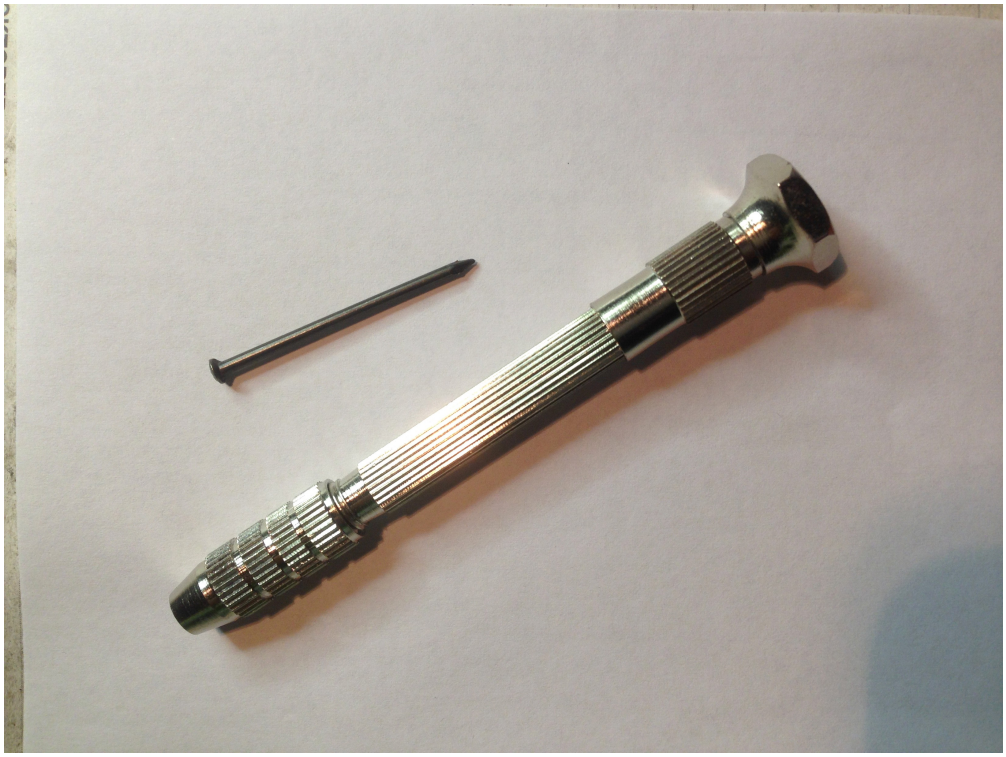
In a 2007 Volkswagen Rabbit, the passenger door's central-locking mechanism looks this way:



It's just about the motor at the bootom - a Mabuchi FC-280PD-20150. This motor is not thermistor protected. It showed very erratic DC resistances of several hundred Ohms. Once removed from the structure, I could however run it easily in both directions from 12 V DC.

This motor is custom-made (https://www.mabuchi-motor.com/product/knowledge/classification/designations.html), a data sheet not available. Because of the integral gearwheel, replacement is available in Brazil only (https://www.armazemautomotivo.com/busca/motor-mabuchi-fechadura-trava-eletrica-vw-golf-passat-polo/er-404 et al). I could not make them yet communicate in English, so I had to repair my motor instead.

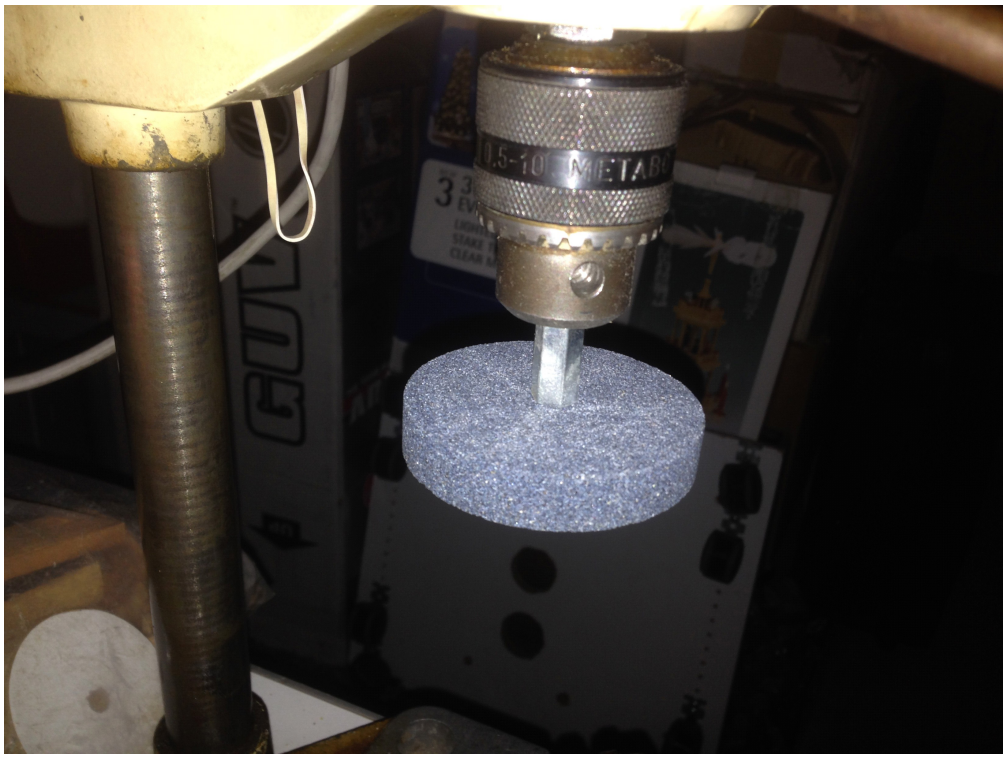
Several predecessors reported trouble while making the two tabs release the motor's body. So I prepared a special hook to pry them out, taking a hardened-steel nail and a pin vise.



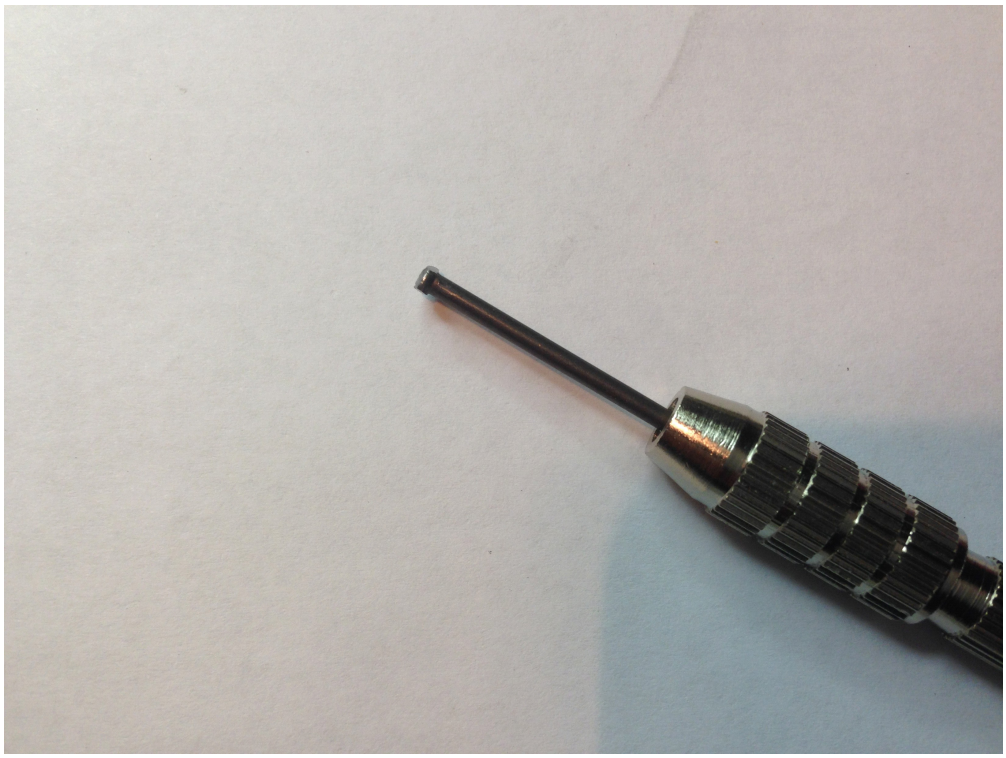
To rehearse that, easily available FC-280 motors were https://www.ebay.com/itm/Mabuchi-FC-280PT-20150-Door-Lock-Motor-Actuator/264326850853?_trkparms=aid%3D111001%26algo%3DREC.SEED%26ao%3D1%26asc%3D20160908105057%26meid%3Dc3b4053996074f479a57fe1da957088c%26pid%3D100675%26rk%3D3%26rkt%3D15%26sd%3D283506703219%26itm%3D264326850853&_trksid=p2481888.c100675.m4236&_trkparms=pageci%3A42f7781e-8ff3-11e9-bd4a-74dbd18017d5%7Cparentrq%3A5ea5df2b16b0ad31c3e1b12dffd51a8e%7Ciid%3A1.

I bought 3 guinea pigs of them:

Then I installed a grinding disk



and just narrowed the nail's head to fit into the notches where the tabs reside:



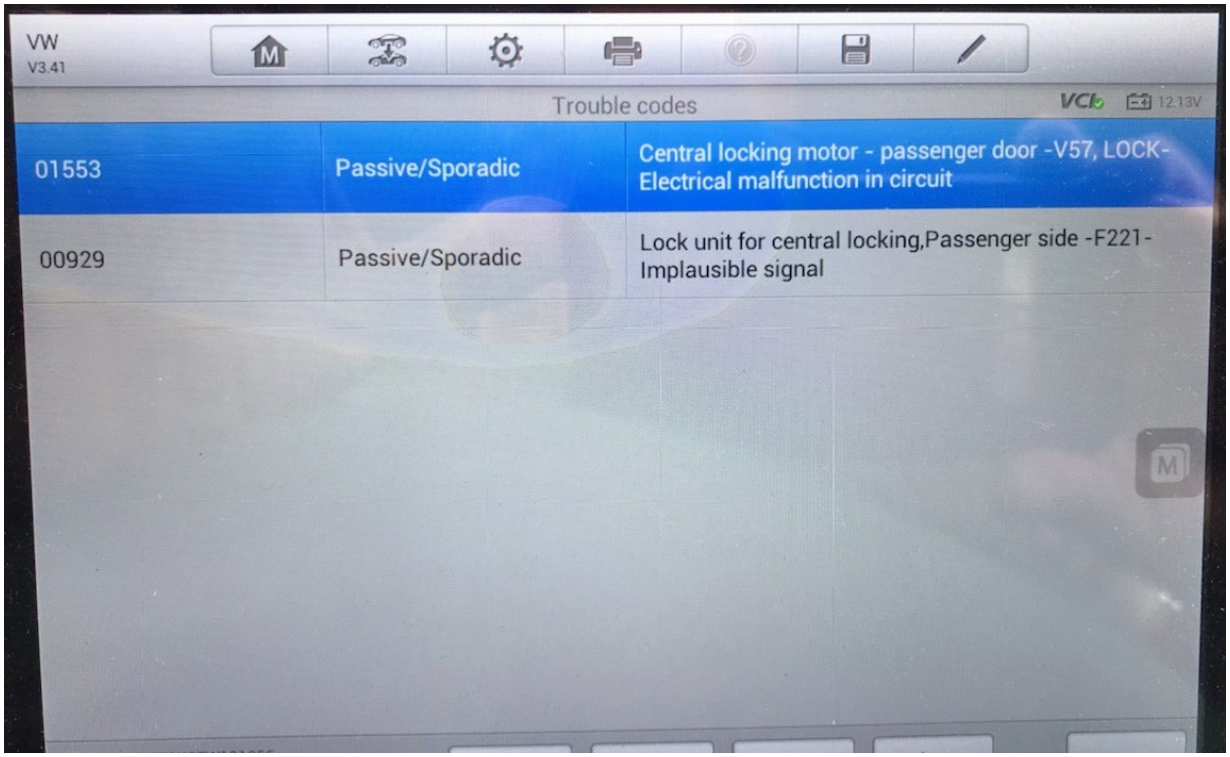
So I got pretty much the intended hook

and could pry the tabs a bit away - however assisting with kind of a wedge between the nail's head and the wall of the notch. Fortunately I needed just two hands for that, but a further pair of hands for a photo was not available.

Once open, the commutator room revealed its malaise:

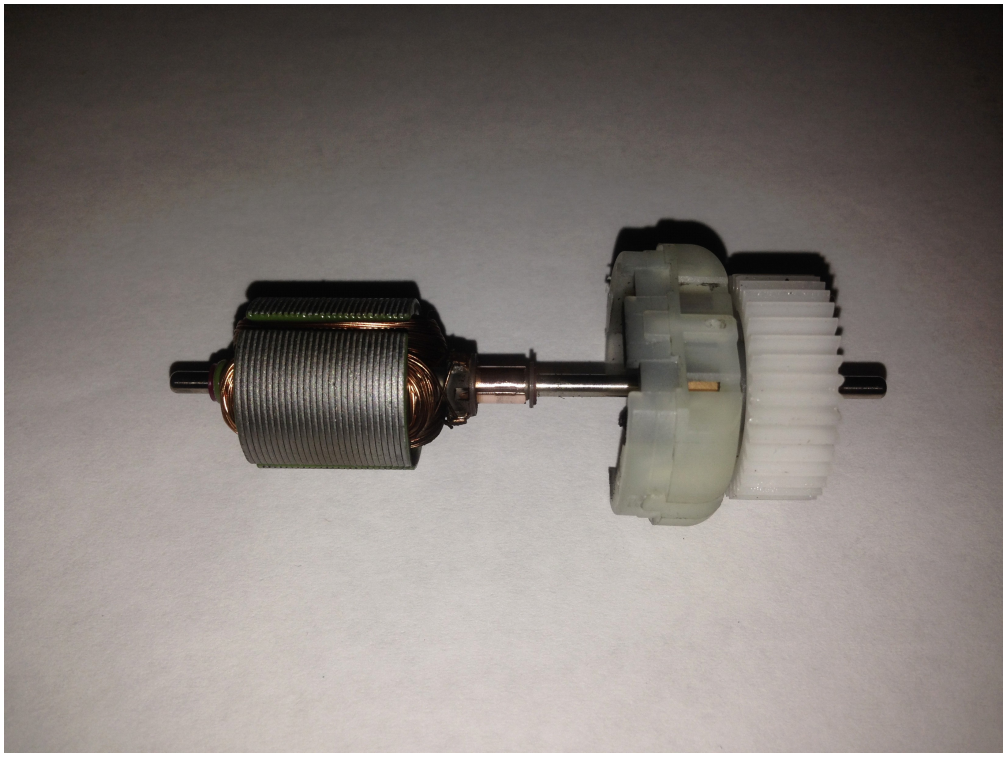
Obviously it's not easy to photograph an all-black object.

OBDII reports the damage as 01553 and 00929 DTCs:



So I clamped the rotor carefully (not knowing how soft the shaft is) into a slowly rotatable chuck and applied a glass-fiber eraser (the one partly visible beneath the chuck) to the revolving commutator

until it sparkled pristine:



If you do this yourself, you better had collect and discard the glass-fiber drop-off before you accidentally touch it. So you spare yourself a day-long skin irritation.

A tiny machine vise helps a lot while knocking the tabs a bit back, so the motor doesn't fall apart later. A single hit with an automatic center punch did it perfectly.

The reassembled motor had 0.6 kΩ DC resistance and took idle-running 0.11 A from 12 V DC.