Volkswagen Golf MK7 Facelift Blind Spot Assist Retrofit

PREREQUISITE: The blind spot assist uses the extended CAN bus, meaning that you must have the HIGH variant of the gateway. If not, you must upgrade it before retrofitting, otherwise it won't work.

IMPORTANT: You must disconnect both terminals of the battery, negative first and then the positive before starting this retrofit!

Note: this retrofit is much more complicated and longer than lane assist retrofit, so plan your time accordingly, you can split the work in multiple times because some tasks are not easy to do, but for sure with this guide they will be much easier for you than they were for me. In fact, I was unable to find a retrofit guide anywhere on internet on blind spot assist (only some hints/uncomplete videos) and all which is written here is the result of my research and my work.

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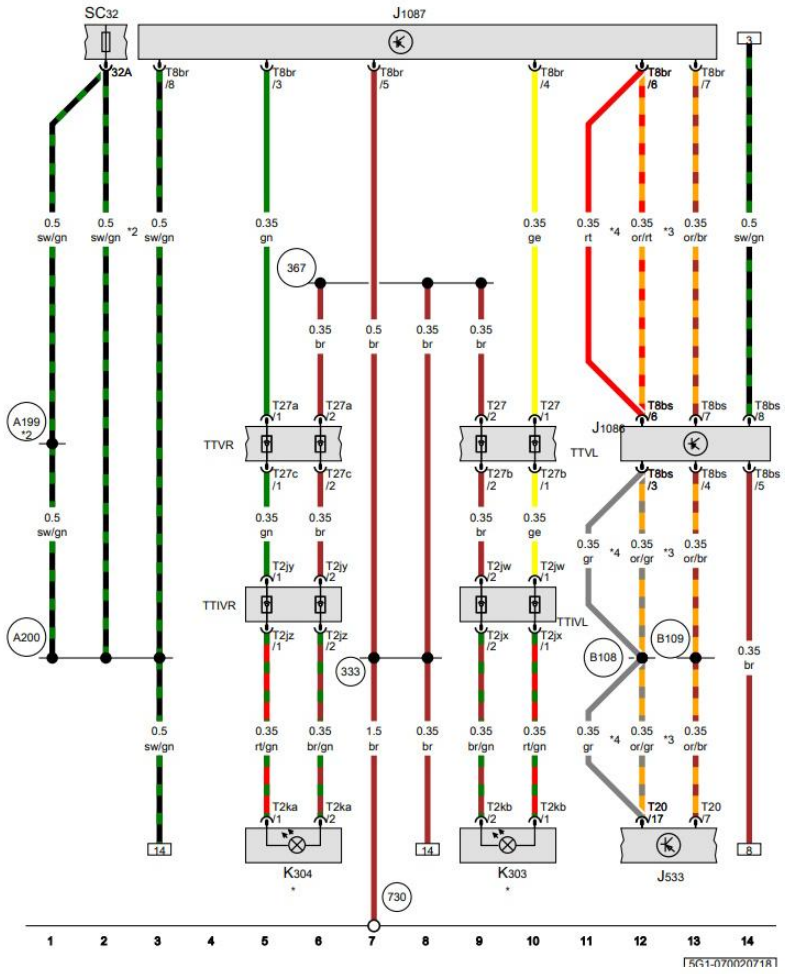
Circuit Diagram

Golf — Current Flow Diagram — No. 70 / 2



ws = white
sw = black
ro = red
rt = red
br = brown
gn = green
bl = blue
gr = grey
li = purple
vi = purple
ge = yellow
or = orange
rs = pink

Data bus diagnostic interface, Blind Spot Monitor control unit, Blind Spot Monitor control unit 2, Blind Spot Monitor warning lamp in left exterior mirror, Blind Spot Monitor warning lamp in right exterior mirror, Fuse 32 on fuse holder C

J533	Data bus diagnostic interface
J1086	Blind Spot Monitor control unit
J1087	Blind Spot Monitor control unit 2
K303	Blind Spot Monitor warning lamp in left exterior mirror
K304	Blind Spot Monitor warning lamp in right exterior mirror
SC32	Fuse 32 on fuse holder C
T2jw	2-pin connector, black
T2jx	2-pin connector, black
T2jy	2-pin connector, black
T2jz	2-pin connector, black
T2ka	2-pin connector, black
T2kb	2-pin connector, black
T8br	8-pin connector, black
T8bs	8-pin connector, black
T20	20-pin connector
T27	27-pin connector, black
T27a	27-pin connector, black
T27b	27-pin connector, black
T27c	27-pin connector, black
TTIVL	Coupling point in front left door
TTIVR	Coupling point in front right door
TTVL	Coupling point for front left door
TTVR	Coupling point for front right door
333	Earth connection 5, in rear wiring harness
367	Earth connection 2, in main wiring harness
730	Earth point 1, on right rear wheel housing
A199	Positive connection 4 (15a) in dash panel wiring harness
A200	Positive connection 5 (15a) in dash panel wiring harness
B108	Connection 1 (CAN bus extended high), in main wiring harness
B109	Connection 1 (CAN bus extended low), in main wiring harness
*	Pre-wired component
*2	According to equipment
*3	Up to July 2018
*4	From July 2018

07.2018

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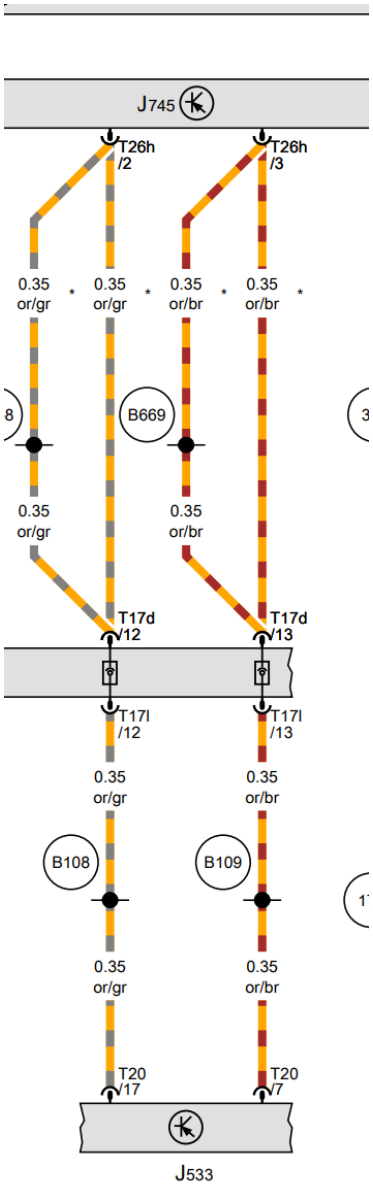
12 wires to be connected:

- **1 brown wire** for the ground (near the front right passenger side)
- **1 black/green** wire for the 12V power (in the fuse box on the left side of driver seat)
- **2 wires** from new side mirrors to external door connector (x2 for the two mirrors)
- **2 wires** to the internal door connector (x2 for the two mirrors)
- **1 connector** with 6 wires to the blind spot control units (x2 for the two control units)
- The **orange/gray and orange/brown wires** (extended CAN bus) have to be connected to the gateway unit (or the T17d/l black connector). Pin T20/17 and T20/7 of the gateway unit (J533) are also connected respectively to T17d-l/12 and T17d-l/13, you can connect the front camera wiring harness also here (easier)



Moreover, there are 10 junction pins:

- **6 pins** to join the two parts of the wiring harness
- **2 pins** to join the two parts of the door wiring harness (x2 for the two doors)

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What you need to buy:

- **Blind Spot Assist kit (2 Control Units, 2 mounting plates, 2 mirrors, wiring harness) from AliExpress:**
- **A drill for drilling the original rivets of the two door speakers**
- **A riveter with 2x4 rivets for re-installing the two door speakers**
- **2 M6 Hex collar nuts for mounting plates (they weren't provided in my kit)**
- **Optional:** if you want you can mount also the improved control units
    - **Buy 2Q0907686B/2Q0907685B (or letter A which can be upgraded to B, do not but any control units with letter >= C since they are not supported on Golf Mk7/Facelift),** their advantages are:
        - They detect incoming cars from further distance
        - They support emergency braking when going reverse or exiting from a parking (e.g. they do not only notify about obstacles, but they actually send a command to brake the car to avoid the collision).
        - Together with Lane assist they reverse the changing of the lane if they detect any obstacles arriving from behind (the car steers back the other way)
        - **Note: They require you to make an additional junction cable**

LEFT (J1085) 2Q0907685B

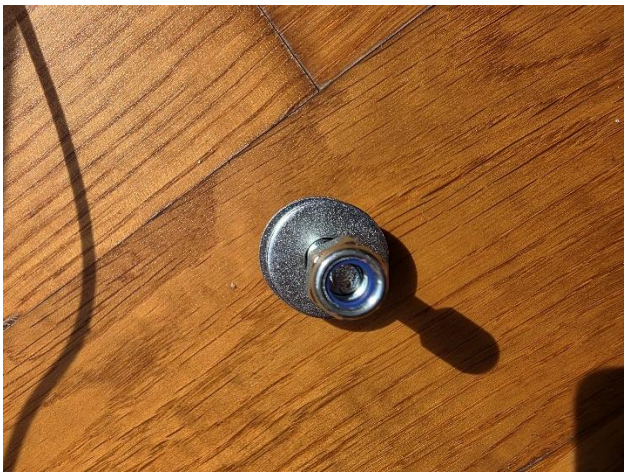
RIGHT (J1086) 2Q0907686B

- **2 female control units connectors 1J0973814 with pins and wiring**:

With about 15cm of Wires

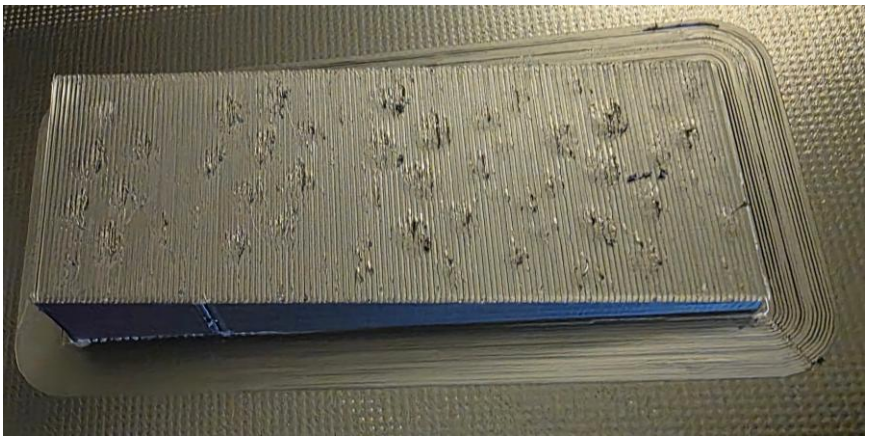
- **2 male control units connectors with rubber grommets and pins 1J0973714 (same link above)**

- **2x 1 hex M5x40 bolt, 2x washers and a 1 self-locking nut (to fix the new control units to the original brackets). You can also use hot glue gun.**

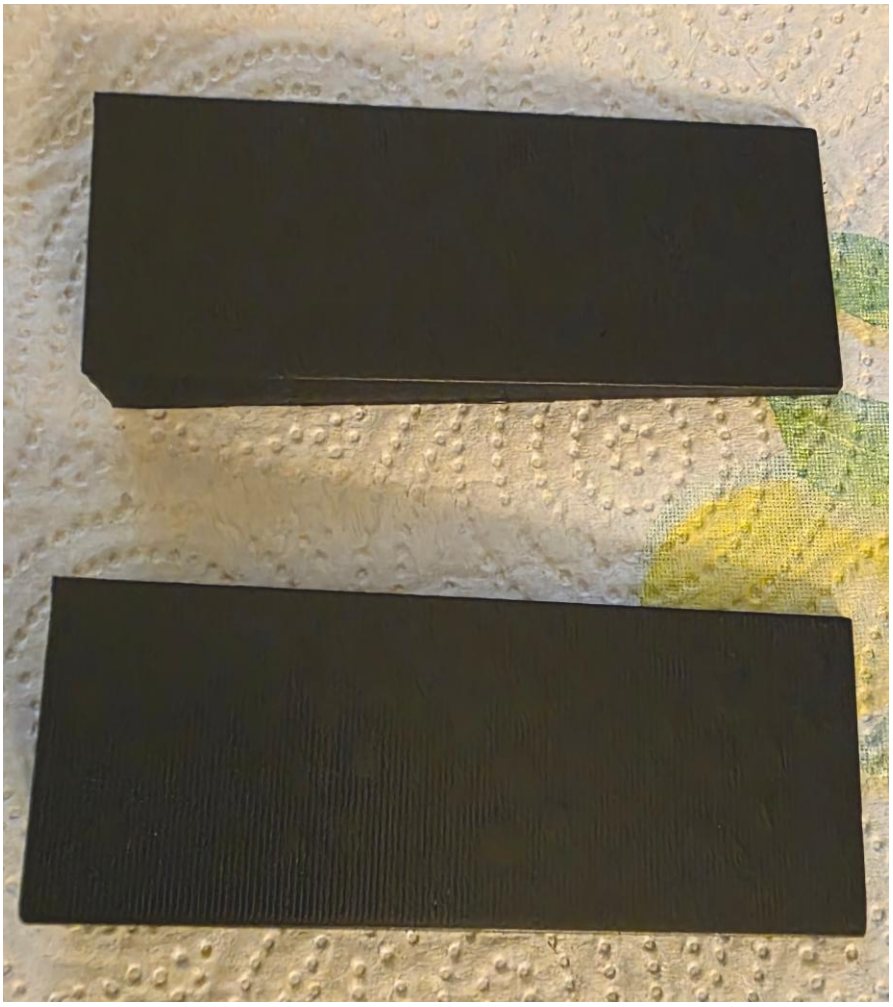


- **2 wedge spacers for Golf Mk7 to adjust the setup angle of new control units in order to avoid dynamic calibration issues after around 40 kms since the installation:**
  - **You can buy the DS57 PVC wedge sold at Leroy Merlin, its size is 95x38x13mm, it offsets with a grade of around 6 degrees, it works though it is a little bit elastic.**

- **You can print it by yourself using a 3D printer and ABS/ASA filament, here it is [the STL object on Thingiverse], its size is 90x35x16 mm (in the picture below you see the raw 3d print which you can rub with sandpaper in order to smooth the top surface), it offsets with a grade of around 7 degrees**

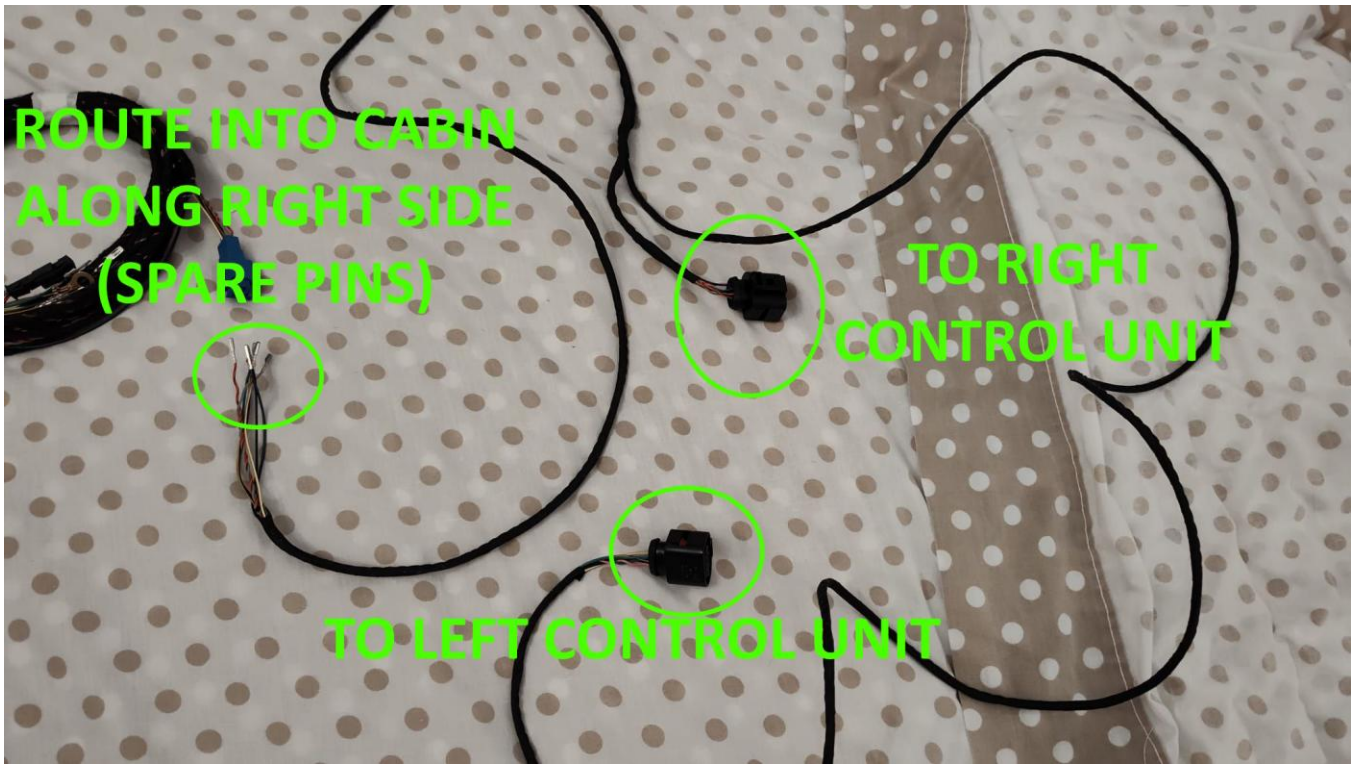


Final Result

- 
- **Two meters of 1mm^2 wire (I used yellow colour)**
- **Car wiring harness tape to waterproof cable in rear trunk**

Blind Spot Assist kit overview:

- **Rear cable**



- **Control unit connector detail**

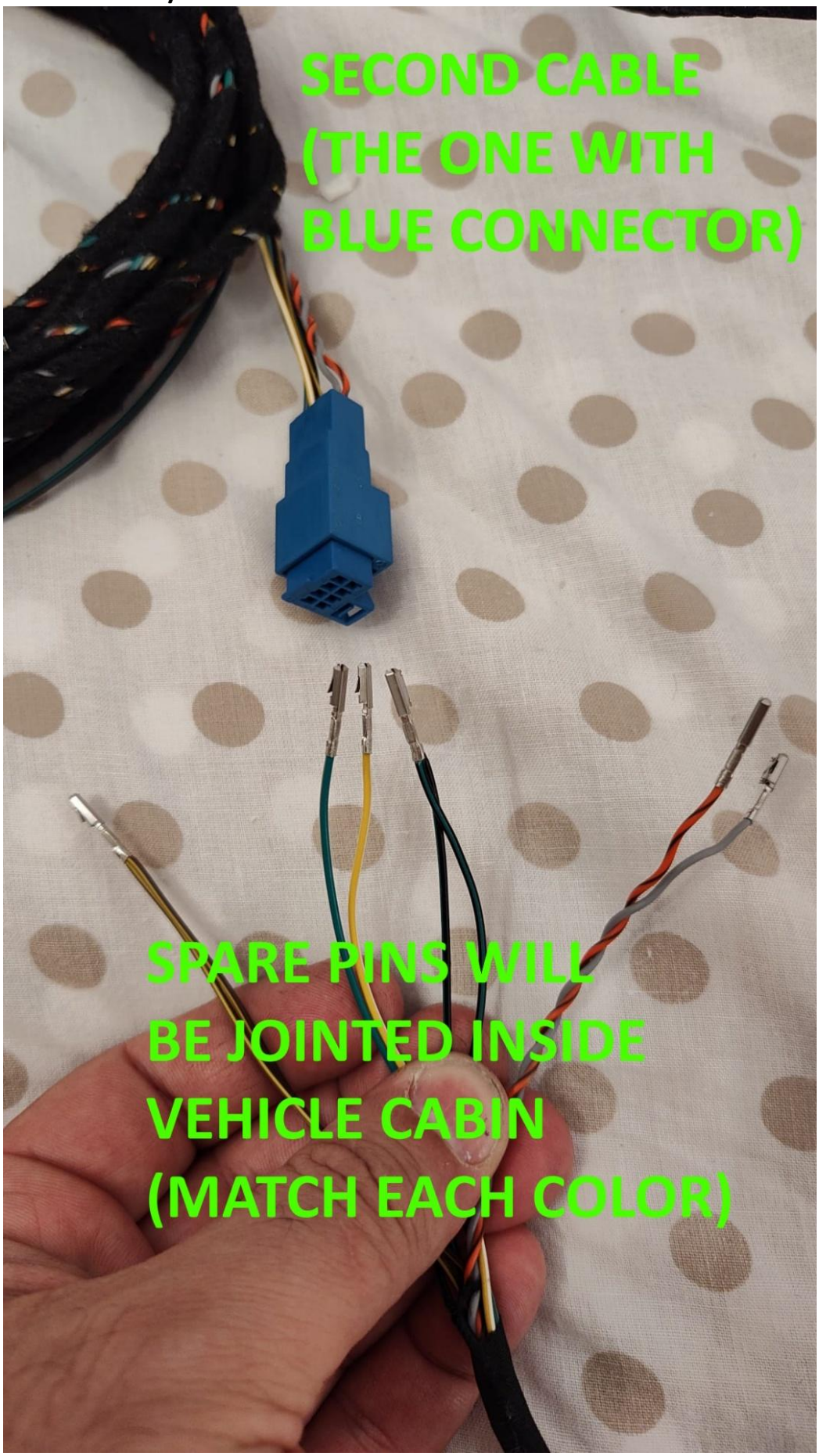
- **Control Units**

LEFT (J1085) **RIGHT (J1086)**

Master J1086 right - connector T8bs
3 - CAN high to pin 17 on GATEWAY J533
4 - CAN low to pin 17 on GATEWAY J533
5 - GND
6 - to Slave 6
7 - to Slave 7
8 - +12V, terminal 15a

Slave J1087 left - connector T8br
3 - lamp mirror right K304
4 - lamp mirror left K303
5 - GND
6 - from Master 6
7 - from Master 7
8 - +12V, terminal 15a

- **Junction rear / front cable**



- **Right door connection (vehicle cabin)**

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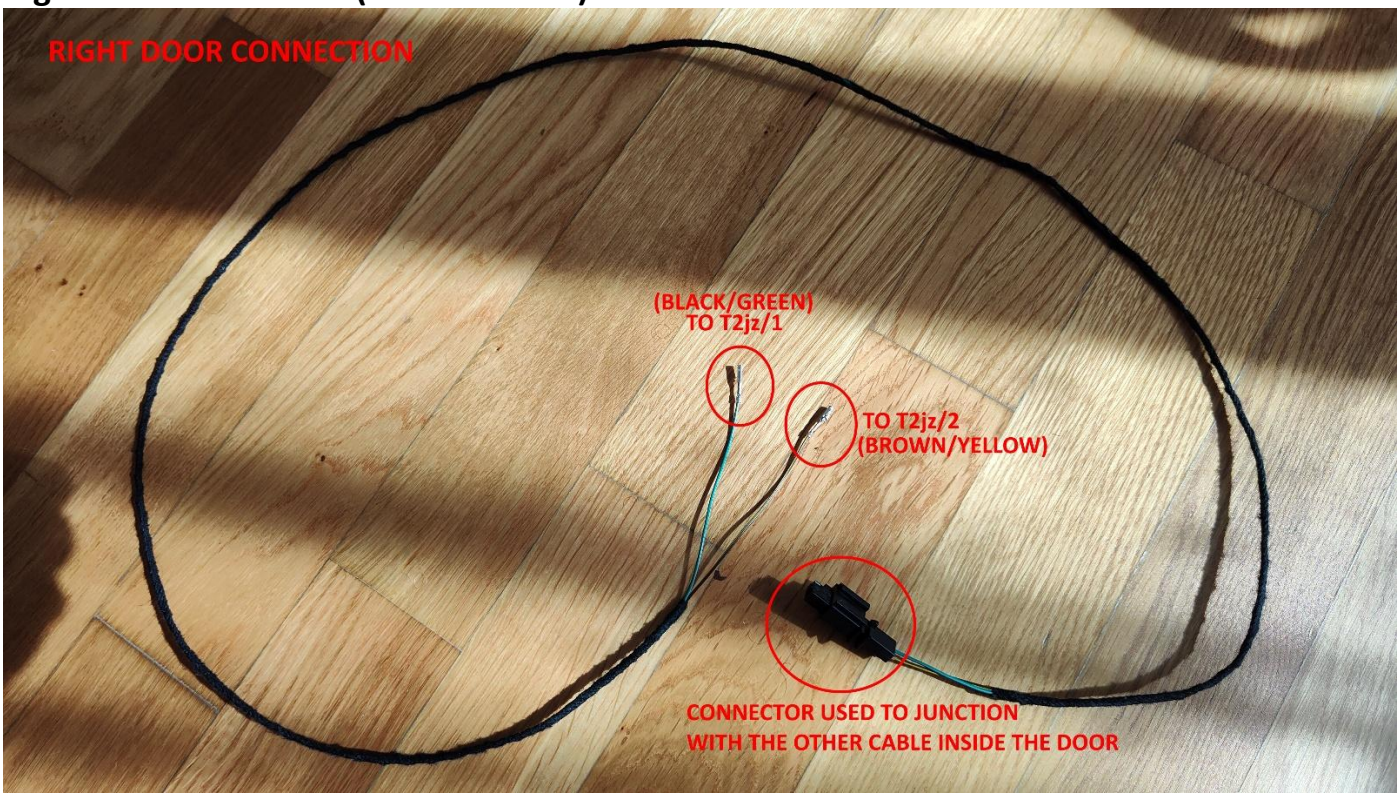
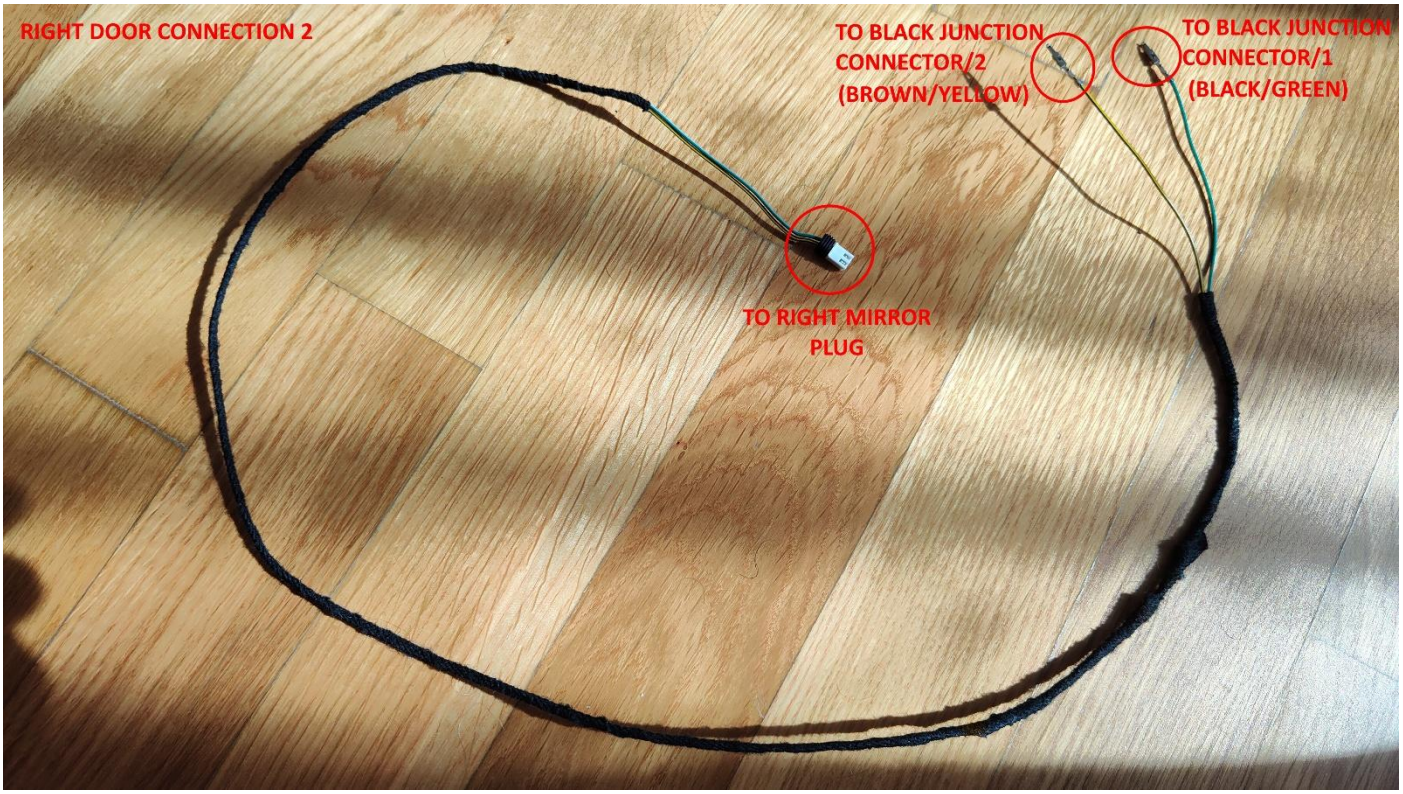
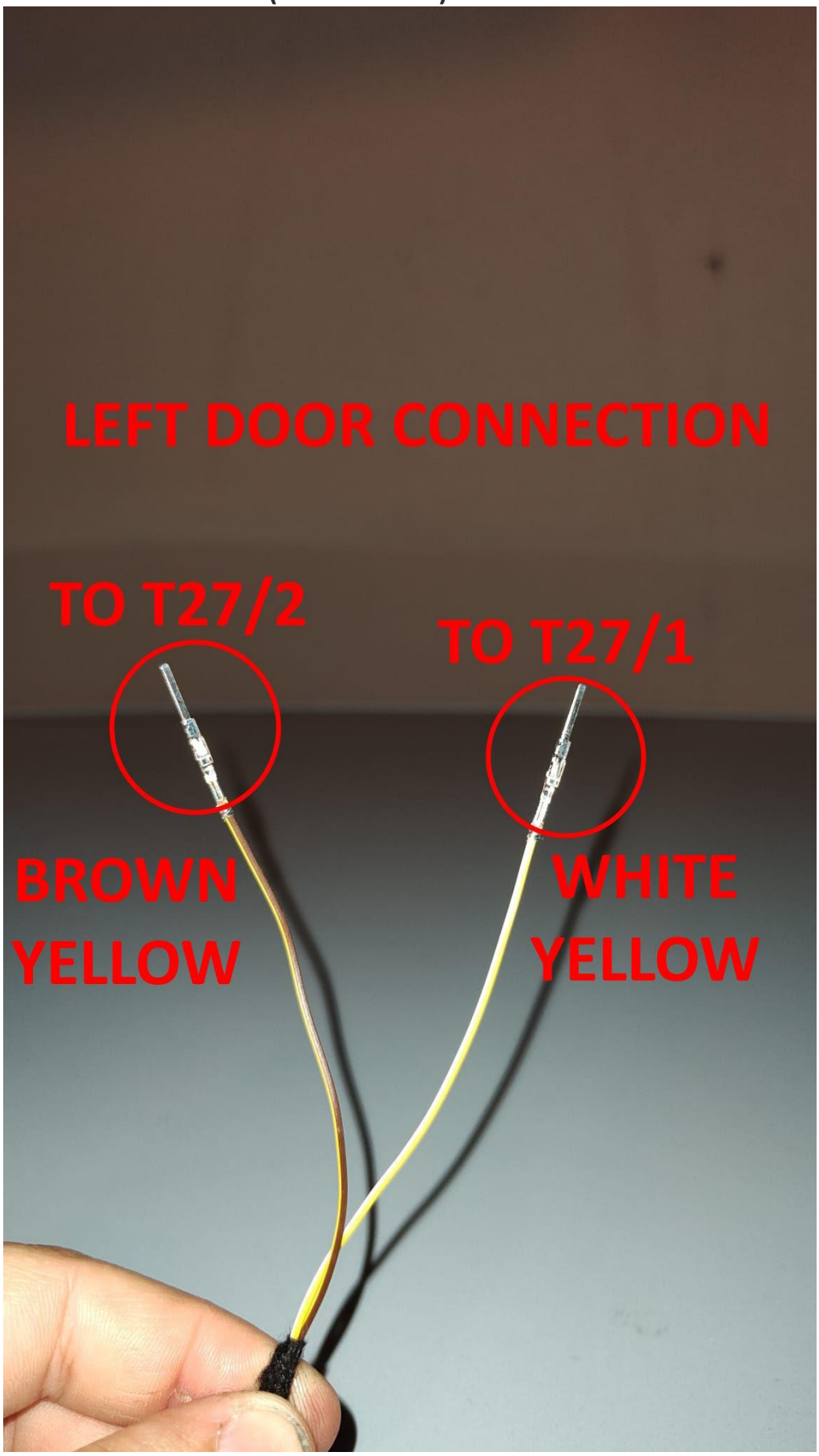
- **Right door connection (external door)**

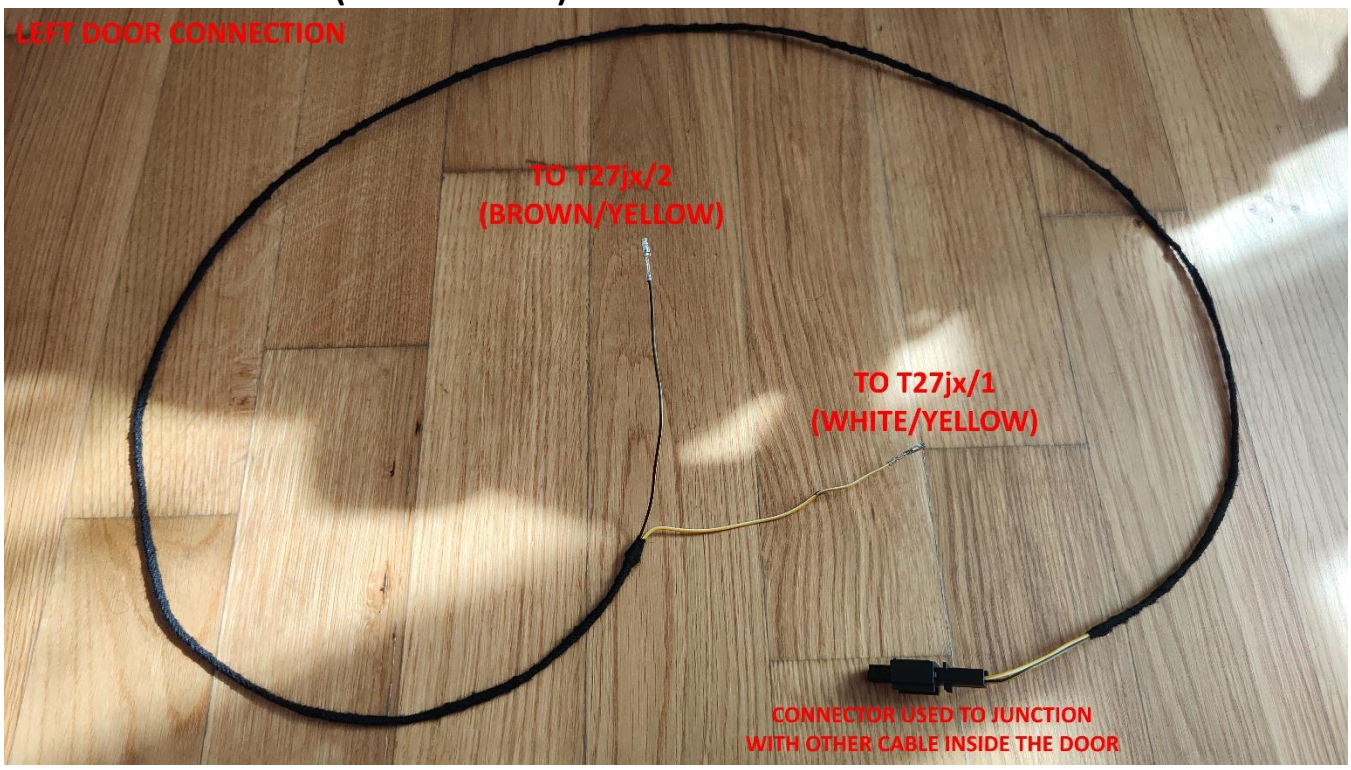


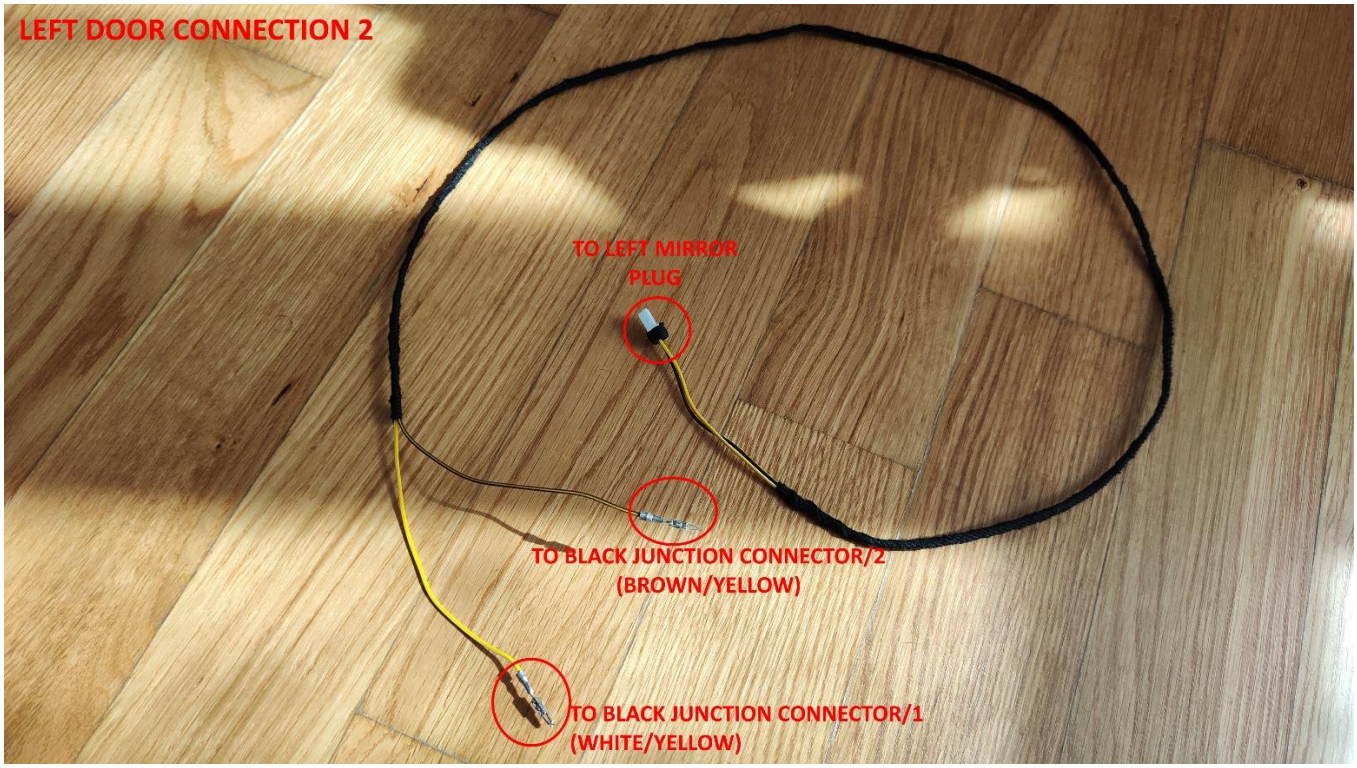


- **Left door connection (vehicle cabin)**



- **Left door connection (external door)**





- **+12V power to Fuse box C**

- **Ground**

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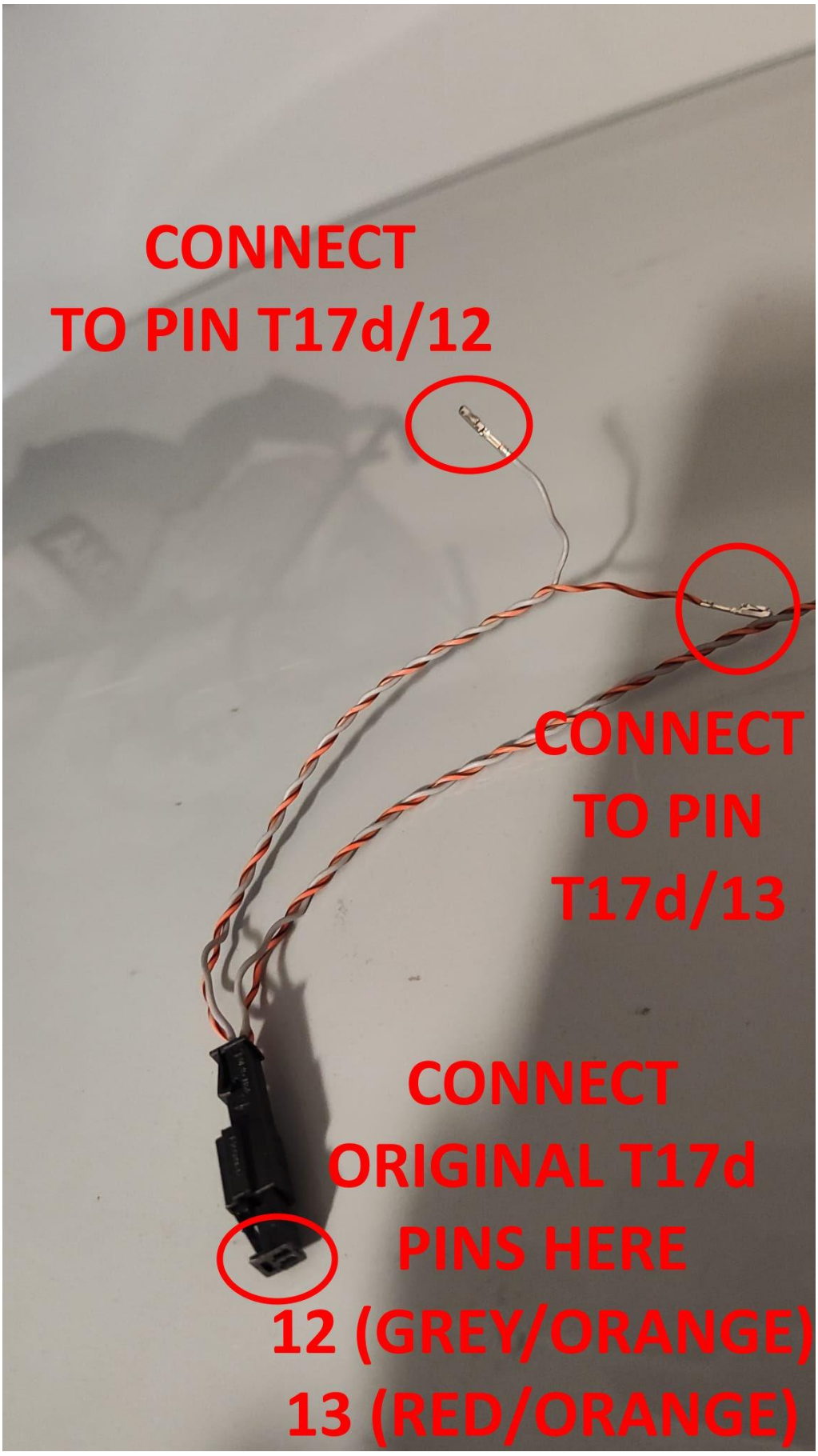
- **Extended CAN BUS wiring**

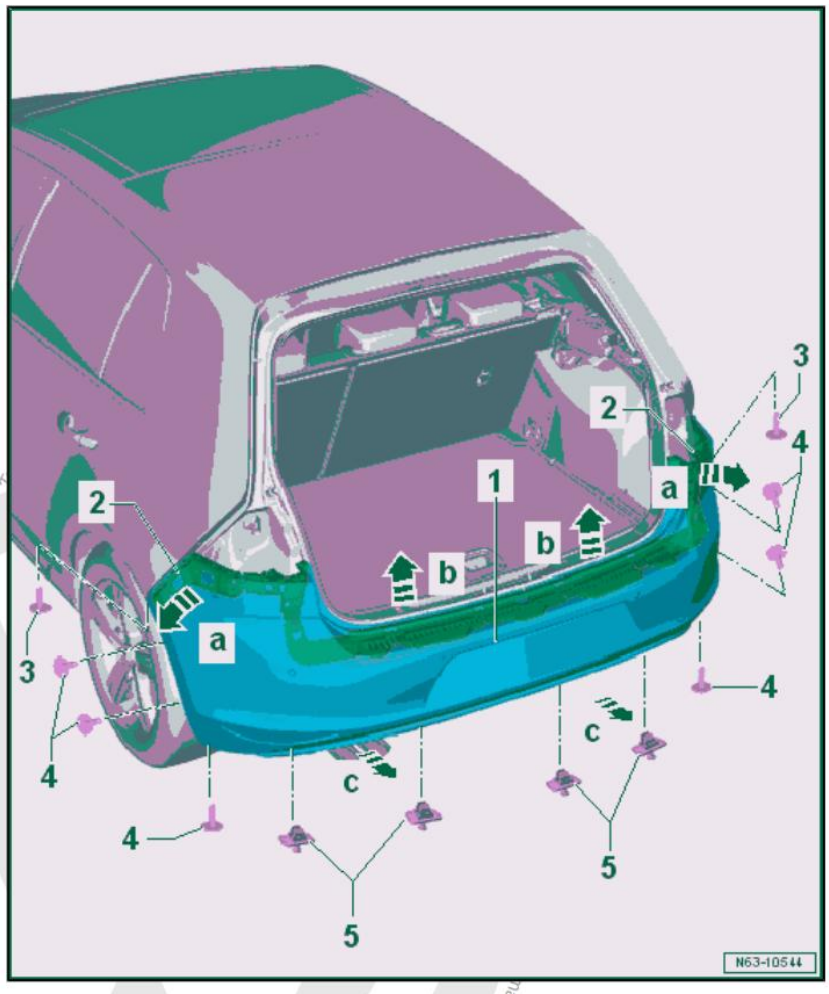


- **Two new mirrors with the blind spot light**

Instructions:

- **Disconnect and remove the battery (video: [Replacing the Battery - VW Golf MK7](#))**
- **Remove tail lights (https://www.youtube.com/watch?v=_2K5eMGxkkM)**

- **Remove the rear bumper (video: https://youtu.be/5rmso5hmLQk)**



– Remove the side panel tail lamps. Refer to ⇒ Electrical Equipment; Rep. Gr. 94 ; Tail Lamps; Tail Lamp, Removing and Installing .

– Remove the screws -3- in the wheel housing (pointing upward) on the left and right sides.

– Remove the screws -4- near the wheel housing liner on the left and right sides.

– Remove the expanding rivets -5- from underneath.

A second technician is required for the rest of the removal procedure.

– Pull the bumper cover -1- out of the left and right guide retainers -2- on the side panel in direction of -a arrows-.

– Loosen the bumper cover -1- upward from the retainers in direction of -b arrows-.

– Remove the bumper cover -1- parallel from the vehicle in direction of -c arrows-.

– If equipped, disconnect the electrical component connections.

For notes and procedures regarding the parking aid. Refer to ⇒ Electrical Equipment; Rep. Gr. 94 ; Parking Aid .

- **Install left and right mounting plate:** unscrew the two bolts, install the mounting plates, screw again the two bolts and the new M6 hex collar nut.

Left mounting plate

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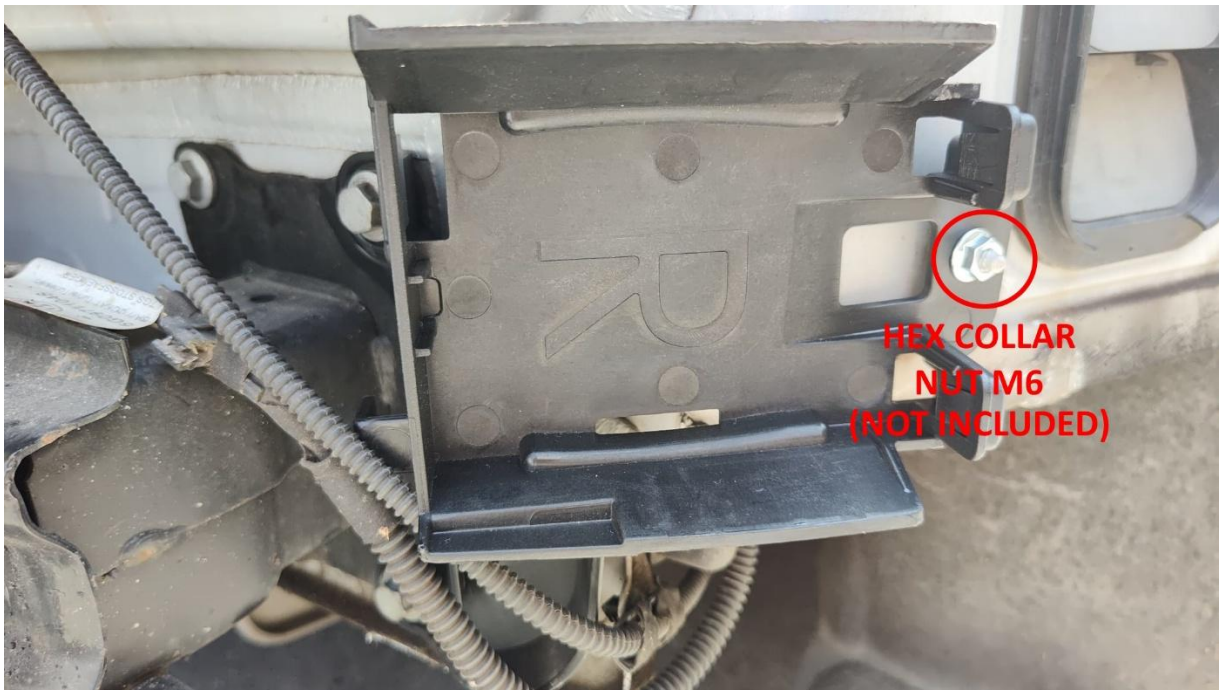
Right mounting plate



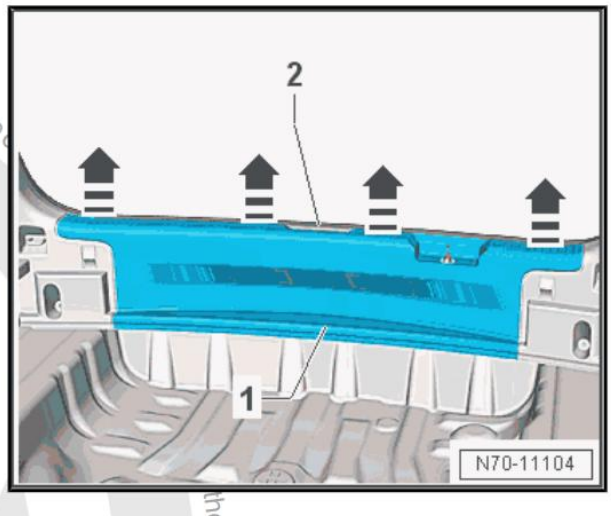
- **Start from left: insert left control unit, plug its connector from the wiring harness and run the cable along the rear crossbeam zip tying it to existing cables up to the right control unit, insert and connect it also to its plug.**

Left control unit mounted

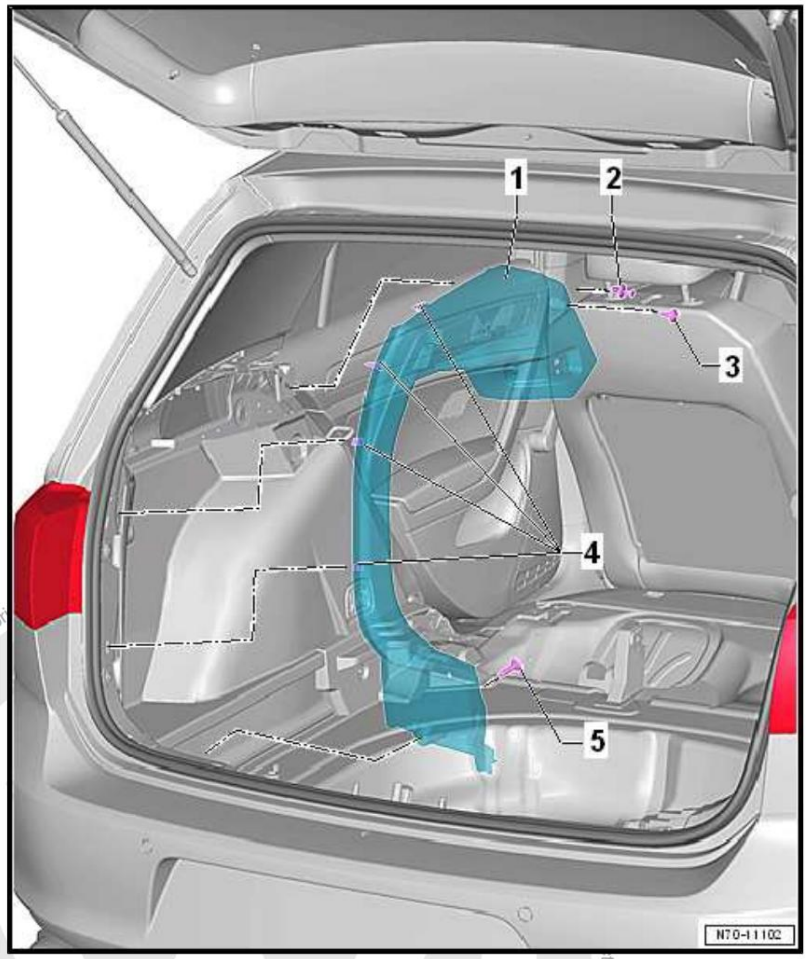
Right control unit mounted

Sorry I forgot to take a whole picture the first time, this one is from another day but it gives however the idea of the route

- **Remove the internal lining on the right side of car inside the trunk**
  - **Remove rear luggage lock trim (https://youtu.be/7KPS8Mr0jgU)**



  - **Remove the right trim (instructions are for left side, for right side it is the same)**

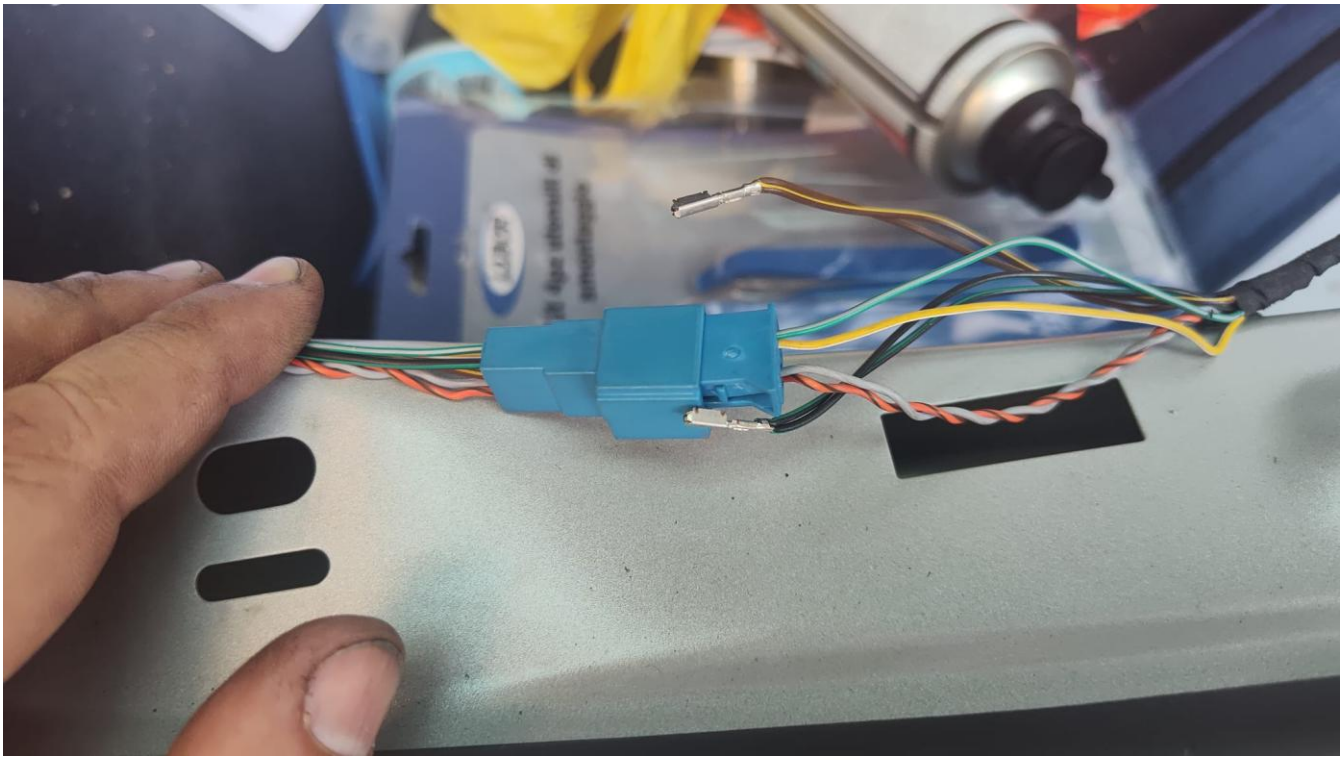


- Remove the bolts -3 and 5-.
- Remove the spreader plug -2-.
- Loosen the rear shelf compartment -1- near the clips -4- from the body mounts using the Pry Lever - 80-200- .
- If equipped, disconnect the connectors and remove the rear shelf compartment -1-.

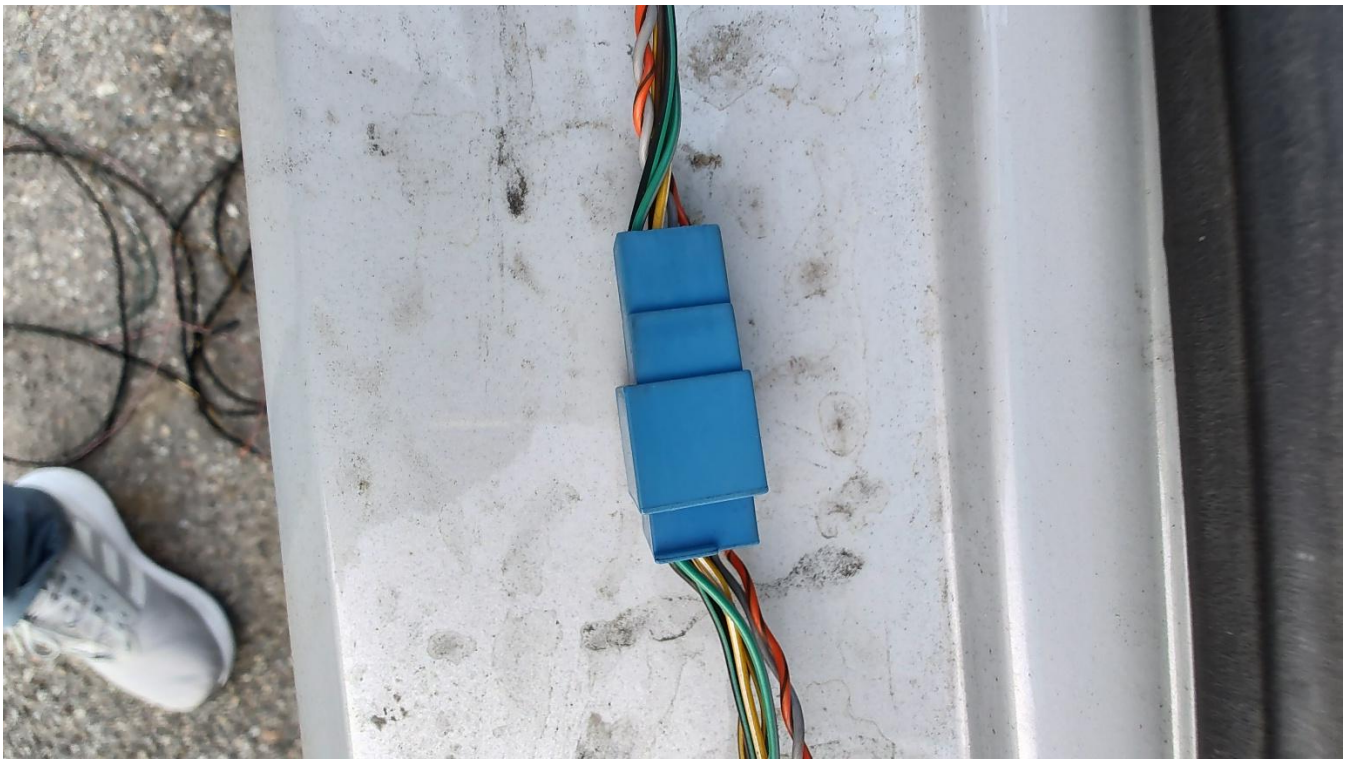
- **Run wiring harness into vehicle cabin using the rubber grommet (sorry I forgot to take a picture)**

Cable comes out into vehicle cabin on right side of the trunk (IMPORTANT: <u>if you need to punch the rubber grommet to enter the cable with spare pins remember to apply at the automotive silicone sealant to make it again waterproof</u>)

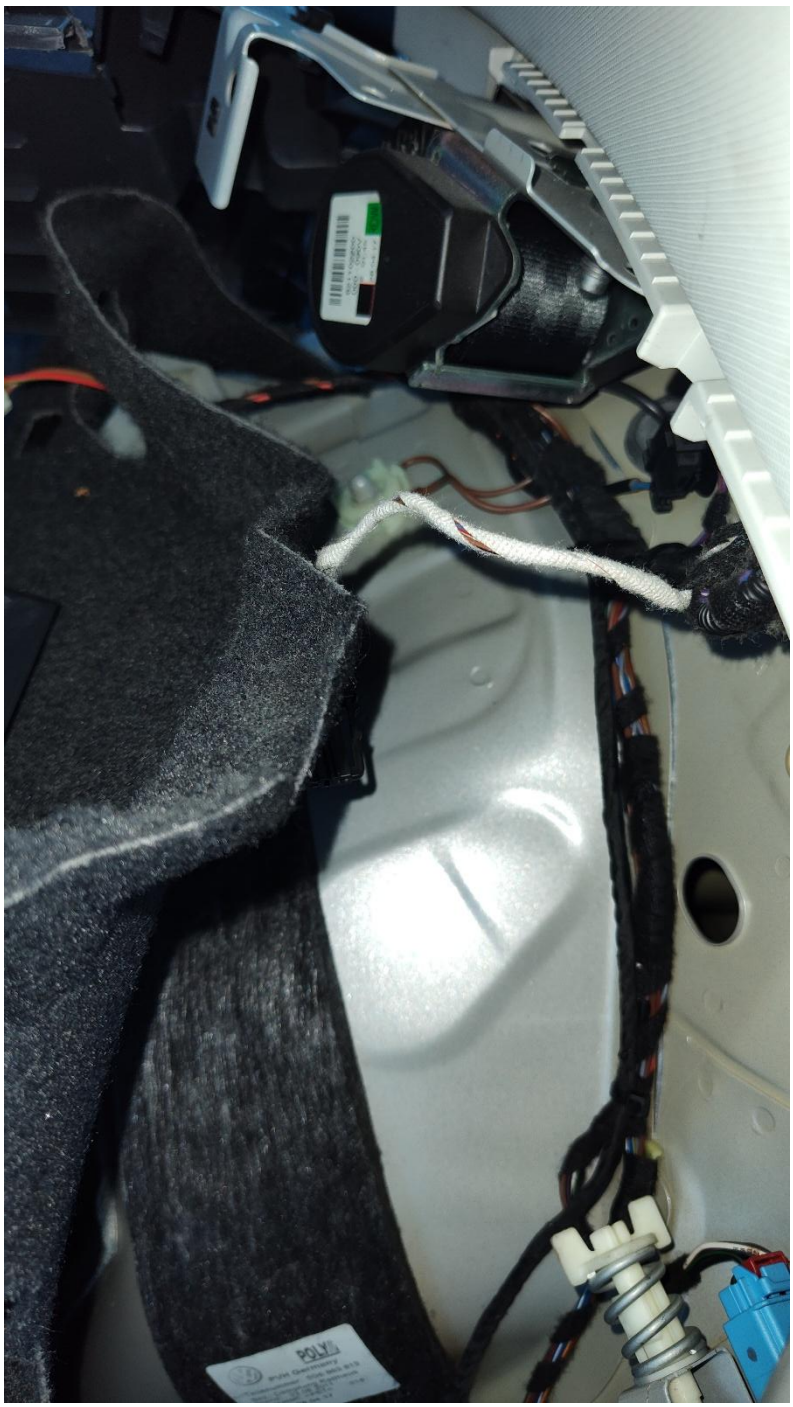
- **Plug the spare pins inside the spare blue connector matching the wire colours**



All pins plugged



- **Run cable forward up to the right side and zip tie it (the tail light here is mounted, again I took this picture in another day)**



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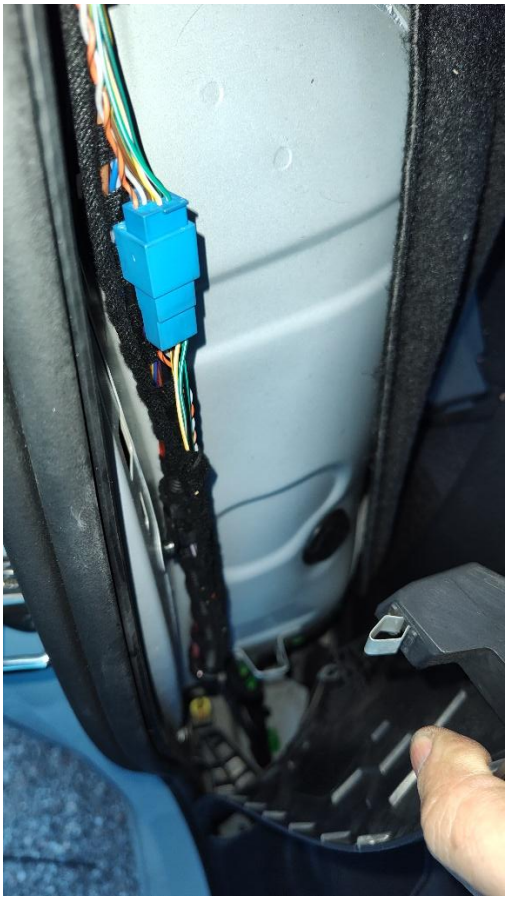
- **Run cable forward down the right side of the rear seat and zip tie it**

Coming down from the rear seat (zip tie it)



- **Remove foot trims and run cable forward along the right passenger side zip tying it**

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Running and zip tying cable till front passenger seat

- **Screw ground terminal to ground point**

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Ground point detail

- **Leave the 2 male pins for right door connection (black/green and white/yellow) and route the remaining part of the cable to the driver seat after having removed the two central console side trim panels(https://www.youtube.com/watch?v=orm7JaHVmmU)**

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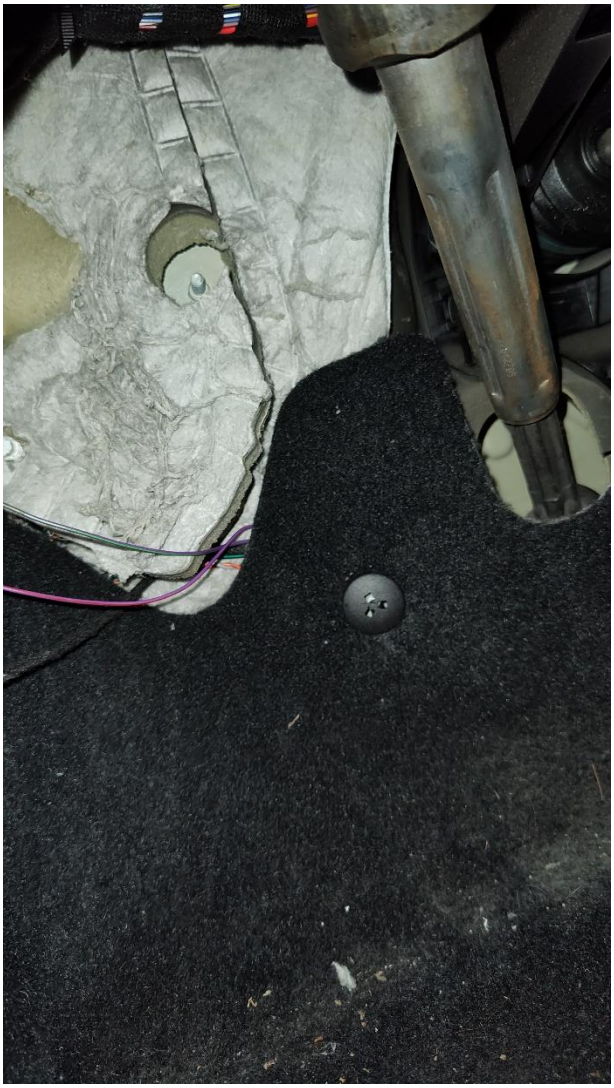
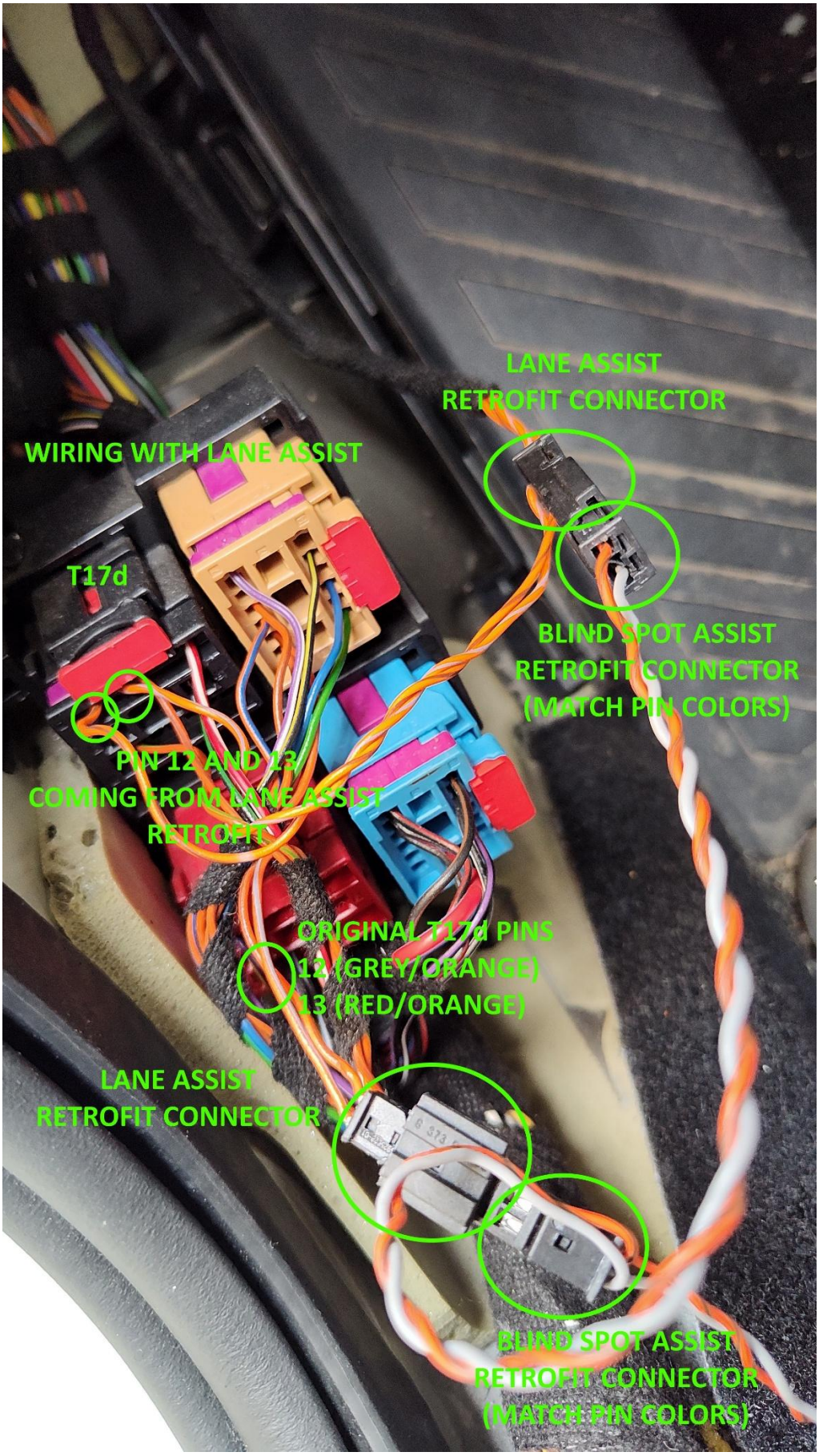


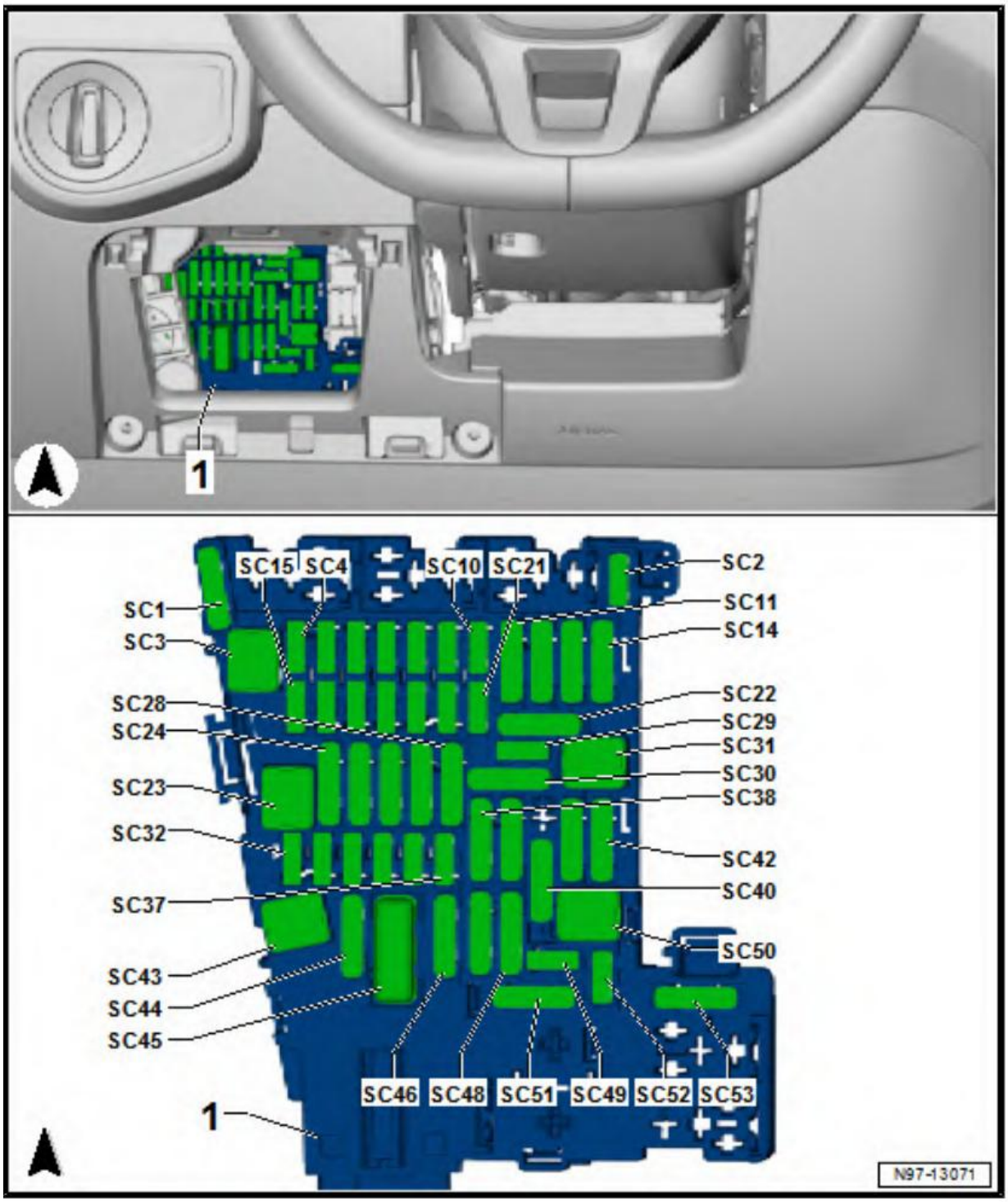
- **Remove the driver seat item compartment** (https://www.youtube.com/watch?v=mw4wC7yznSI)

- **Remove lower A-Pillar trim near driver seat** (https://www.youtube.com/watch?v=dU00cH-WoZg)

- **Extended CAN BUS connection (here including the lane assist retrofit, if you do not have retrofitted lane assist, please see my lane assist retrofit guide for wiring)**

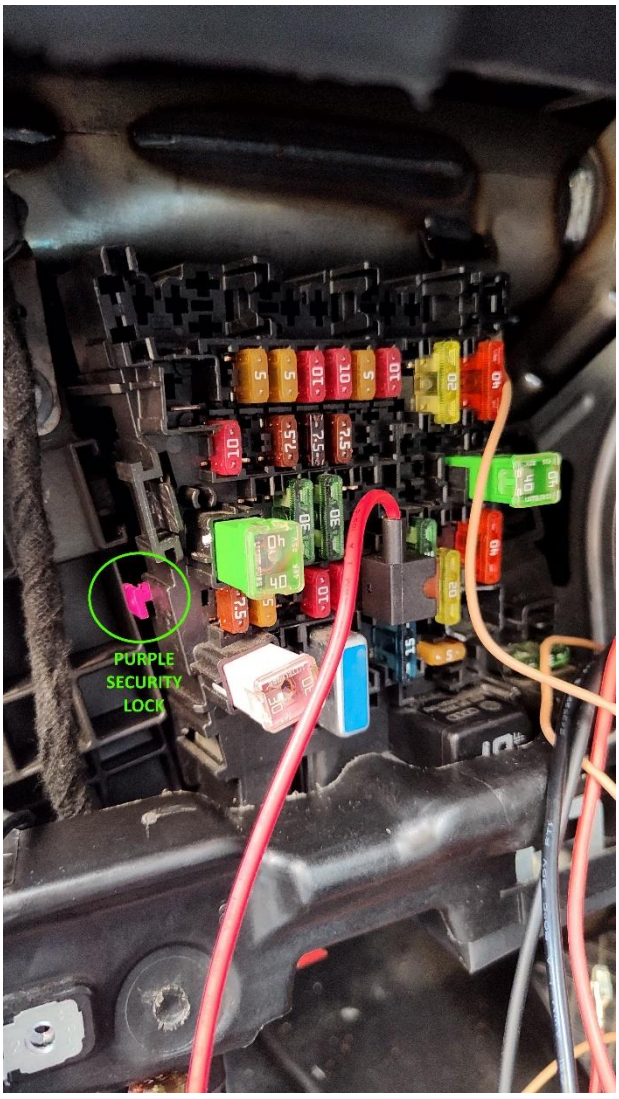


- **12V power wiring: 2 possibilities**
  - **Fuse TAP (easier and faster, used initially this for lane assist retrofit):** Connect the black green wire using a mini fuse tap to SC32 fuse or if unable due to space to another SWITCHED fuse (e.g. providing power only if the dashboard is turned on) in the same row (https://www.youtube.com/watch?v=59uL9jNEI1k).



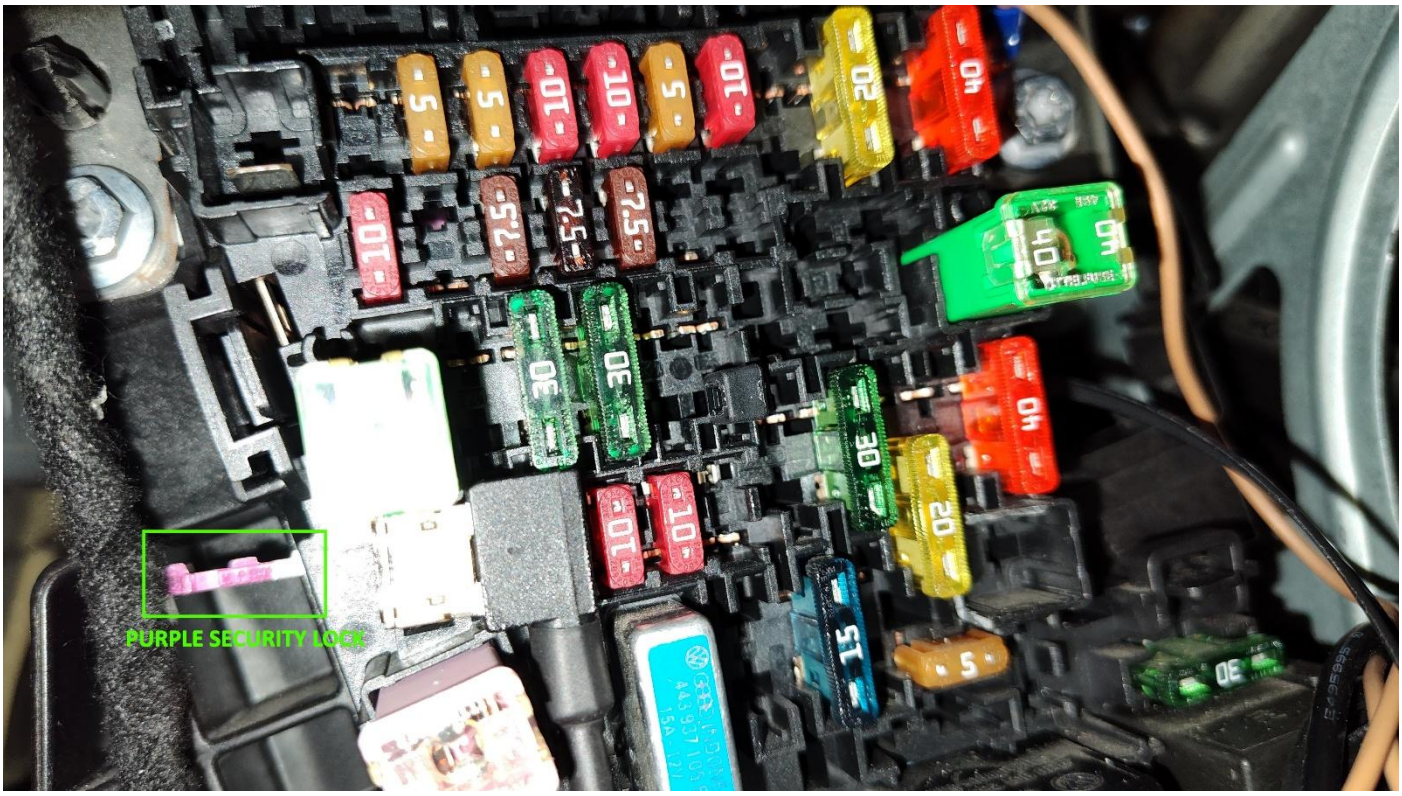
  - **Wire a new empty fuse using a zip tie (strongly discouraged):** it is a real pain in the ass, I did this for blind spot assist but it is very difficult and requires a lot of attempts and patience **(https://www.youtube.com/watch?v=oYKR06io0nM).**
    Some pictures:

All trims removed

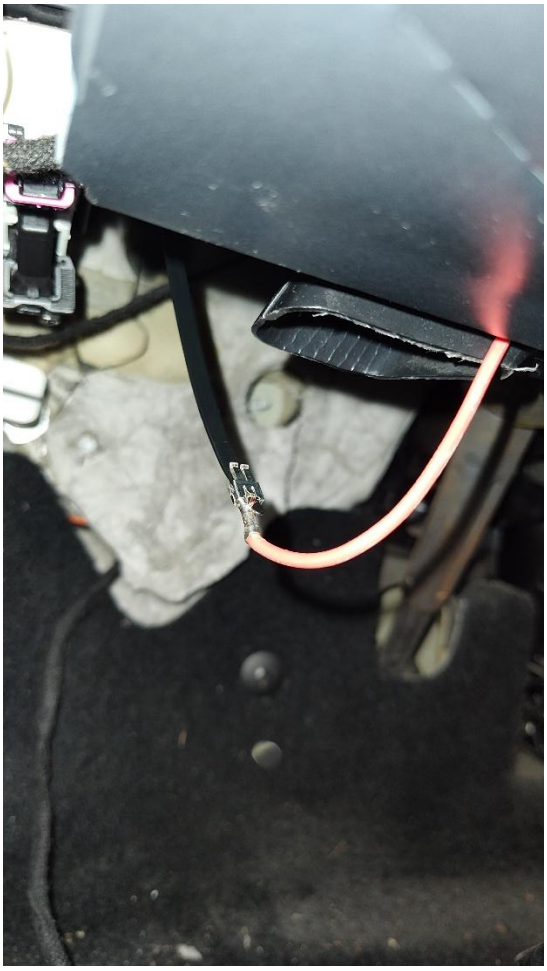


Fuse box holder pulled a little bit forward just to unlock its purple security lock (Note the existing wire tap for lane assist)

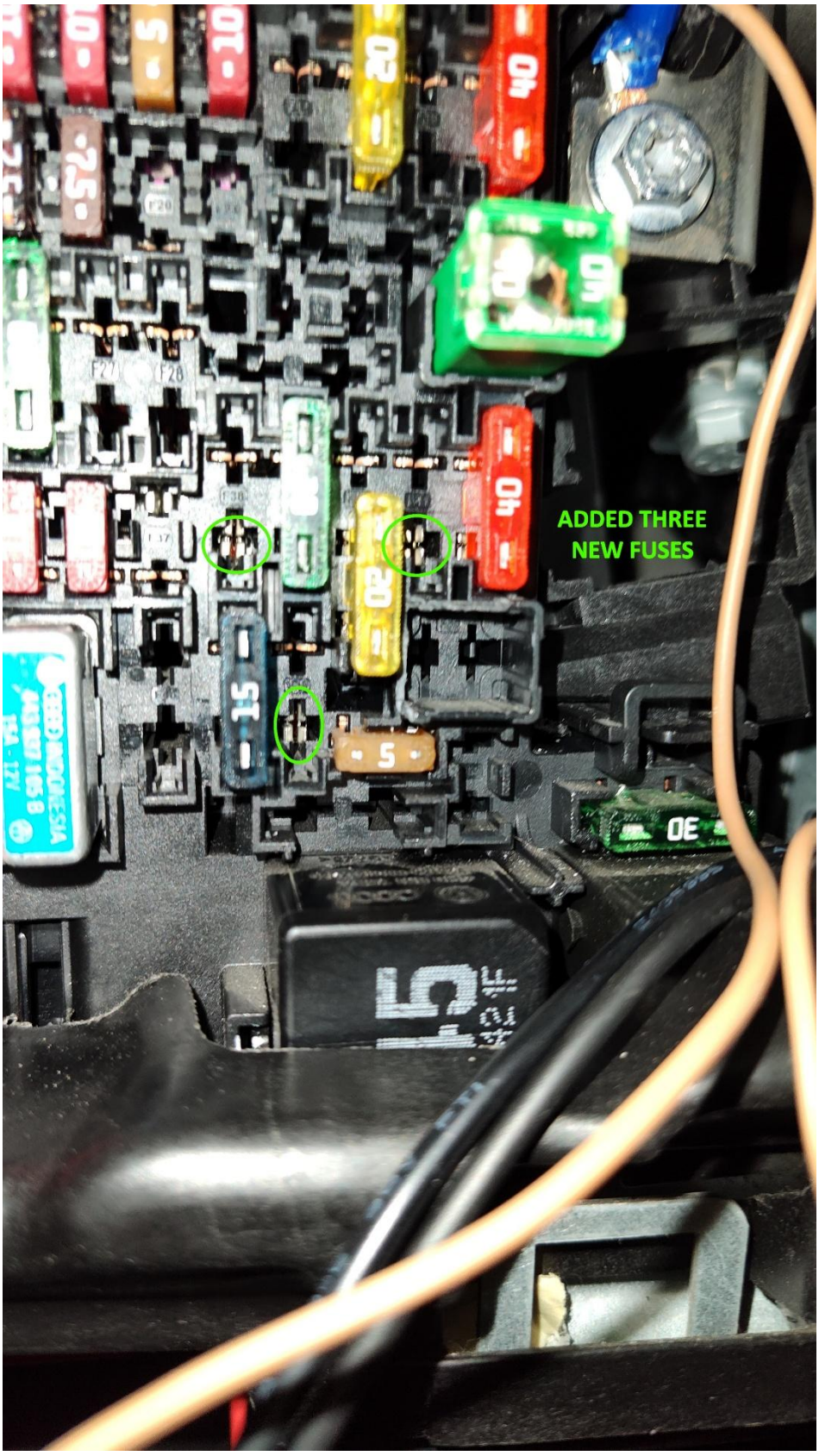
Purple security lock completely unlocked



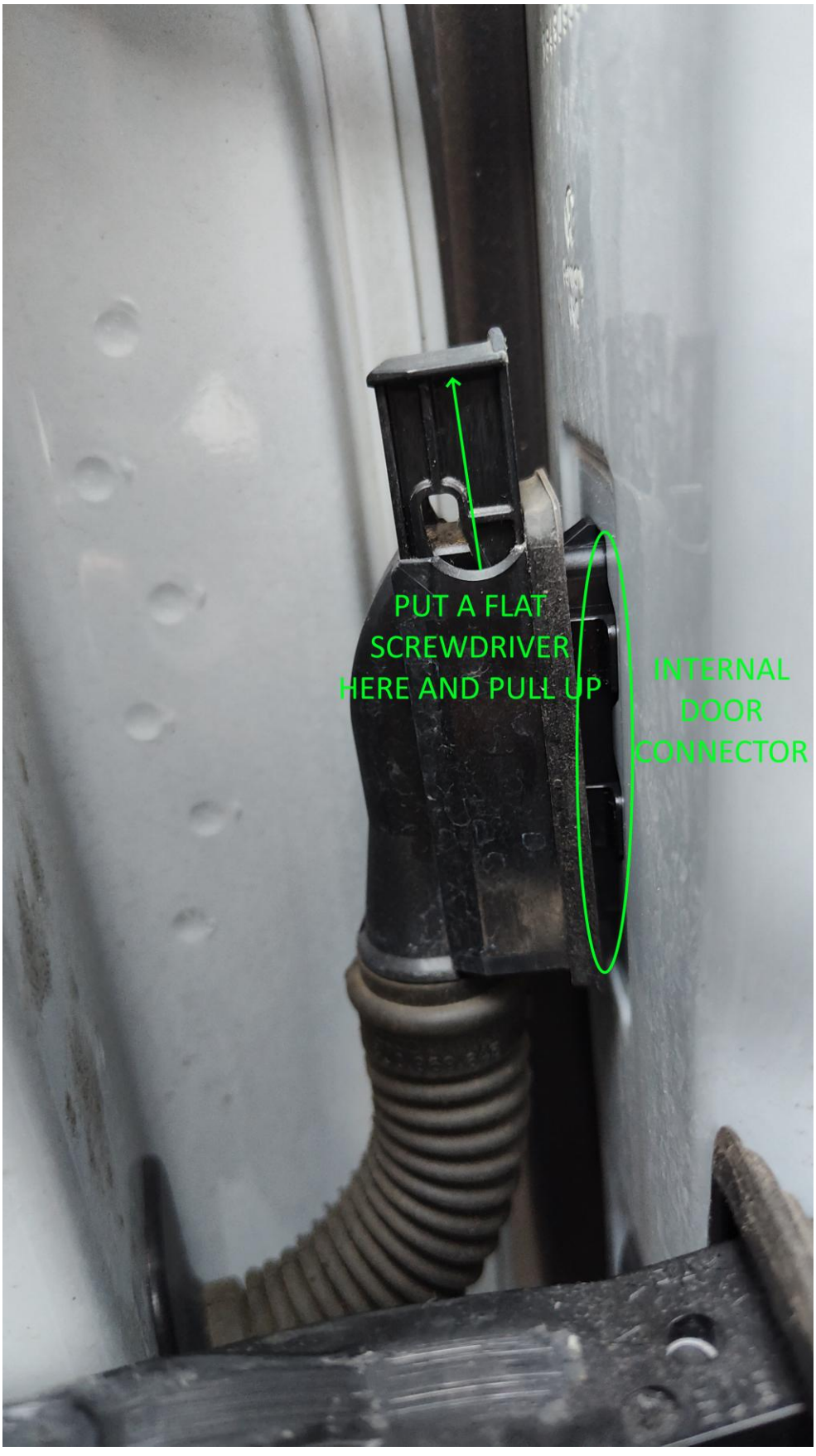
Wiring a new fuse with a zip tie



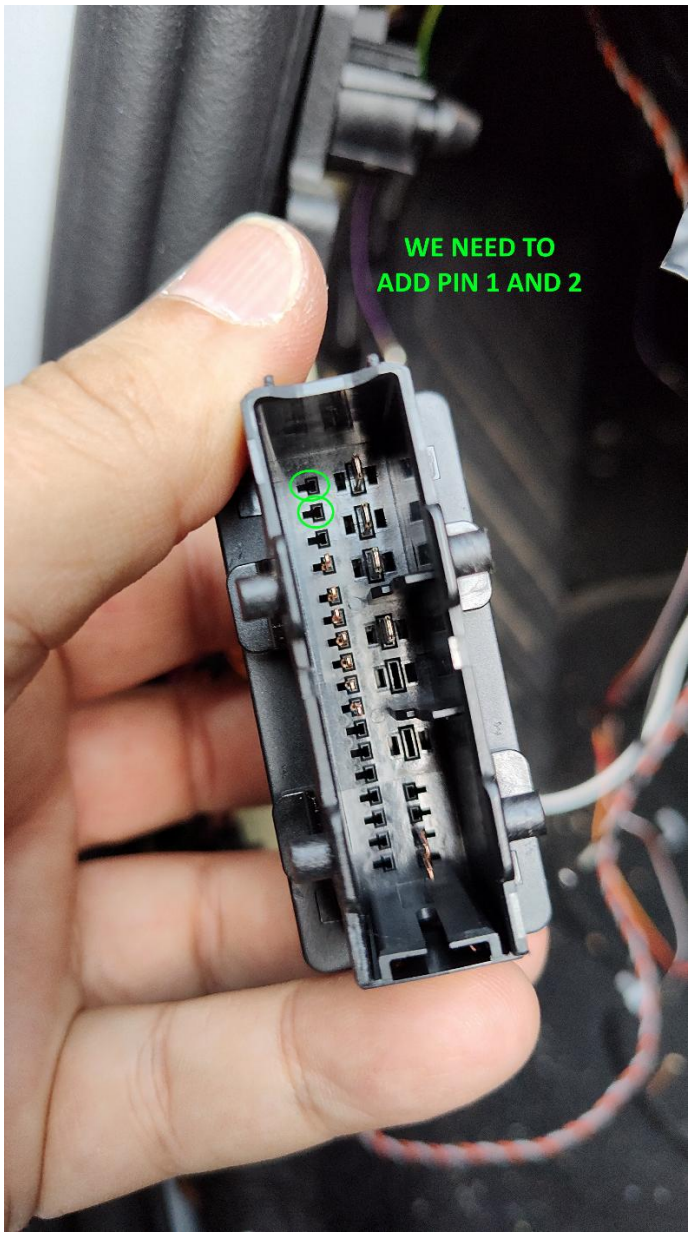
3 fuses wired here, actually I did 4 in order to have plenty spare power for any future retrofit



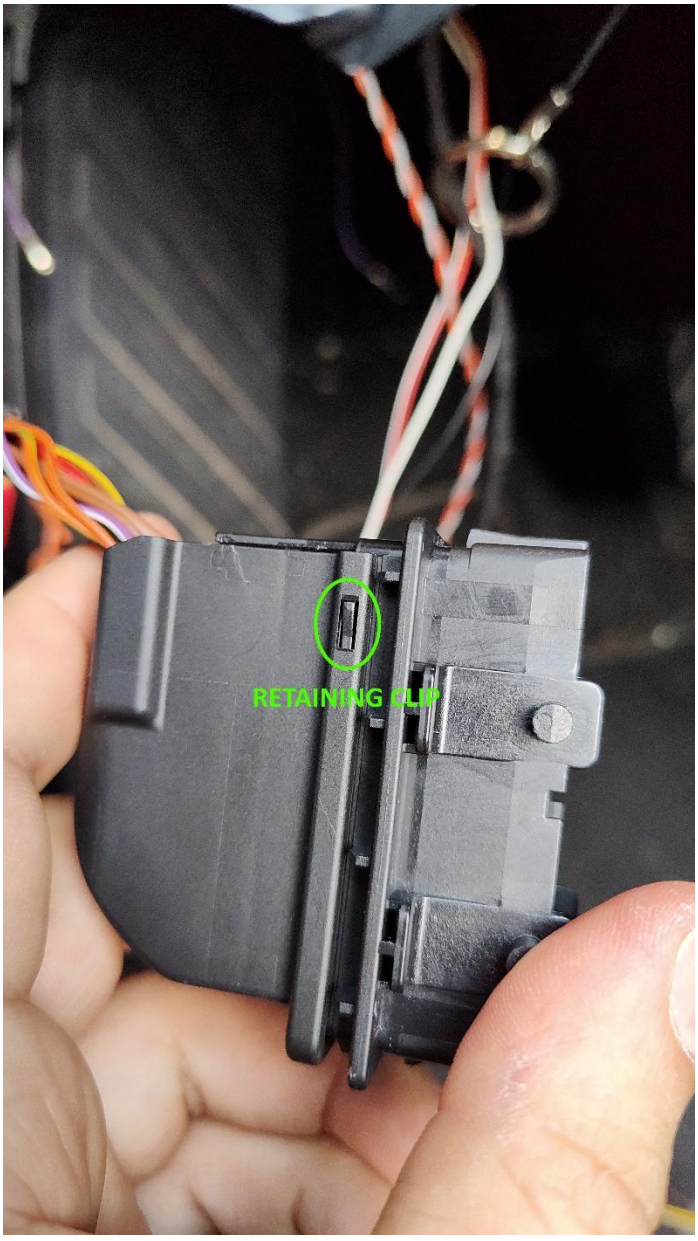
- **Now you have to start working on the doors and it is the hardest part (yet easier than wiring a new fuse with the zip tie). Do all that follows for both doors.**
- **Unlock the door connector**

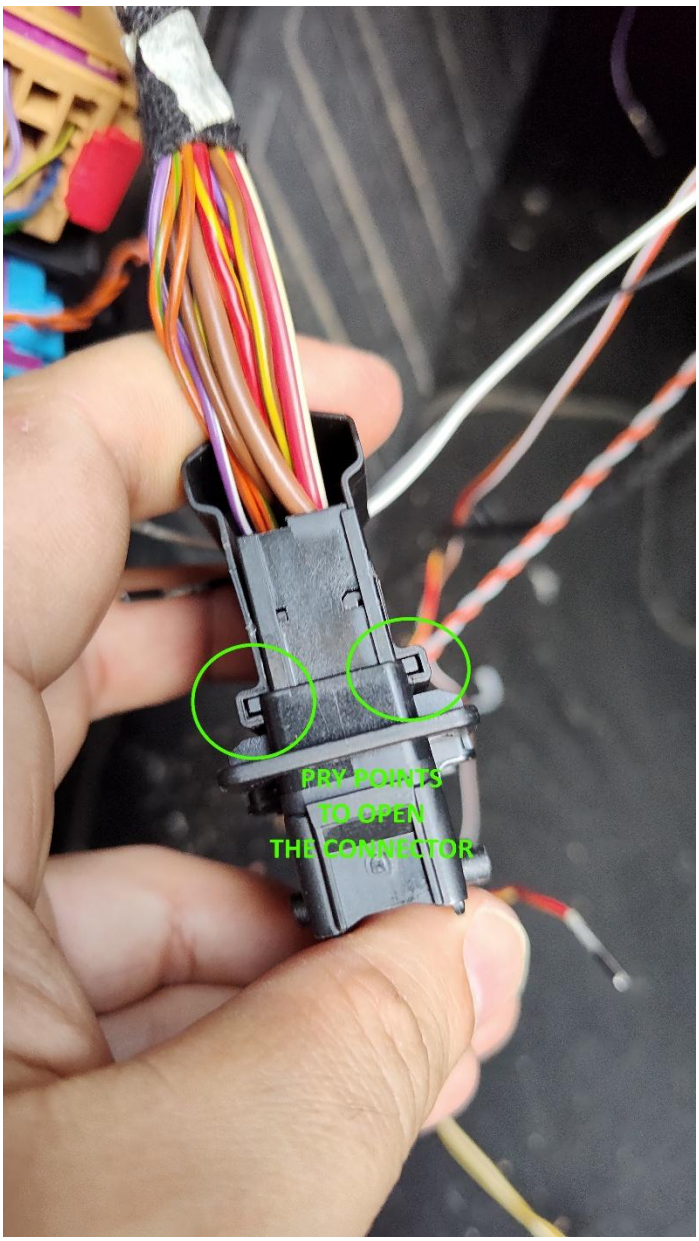


- **Disengage internal door connector**



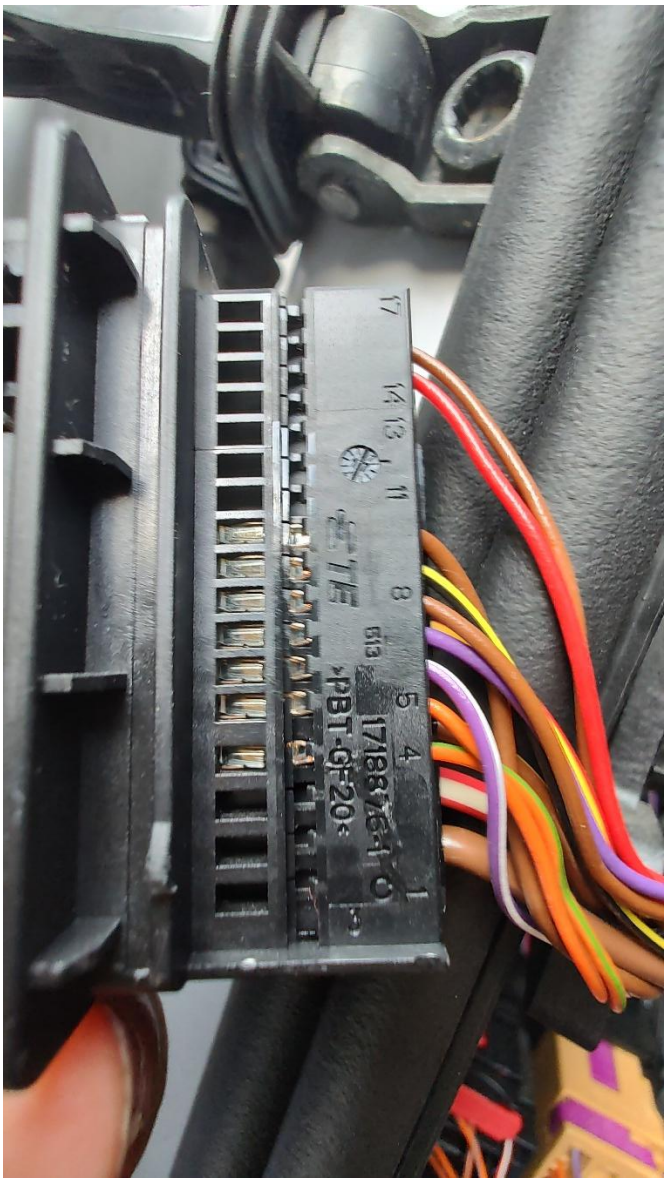
- **Remove connector housing using a flat screwdriver on pry points**

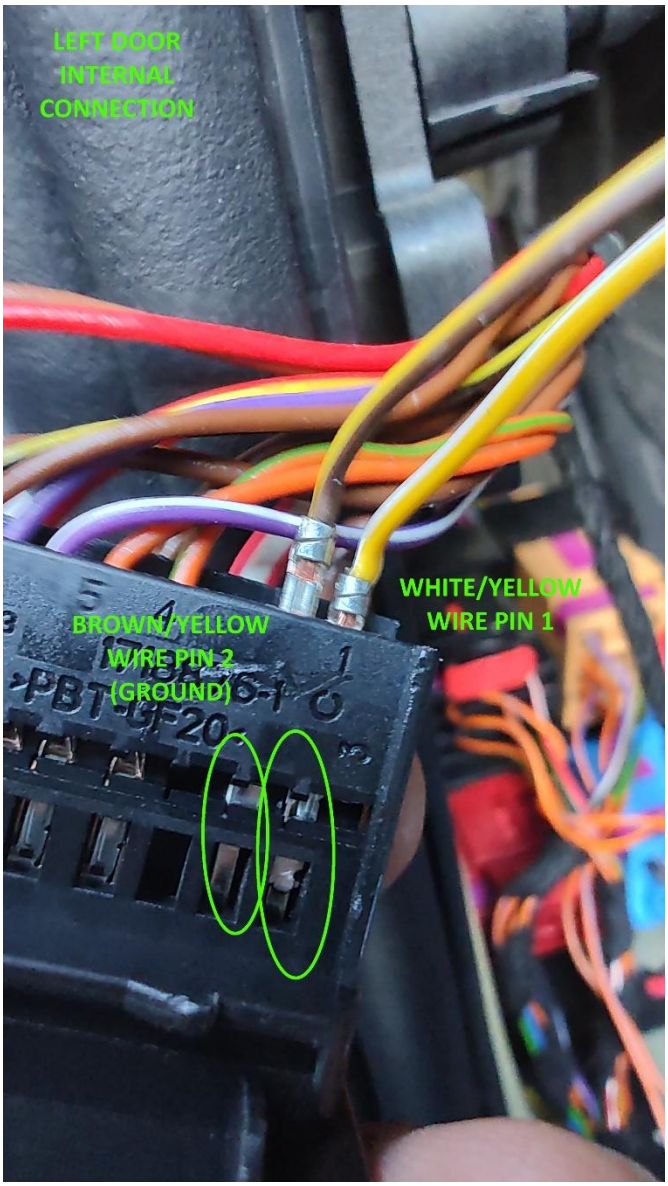




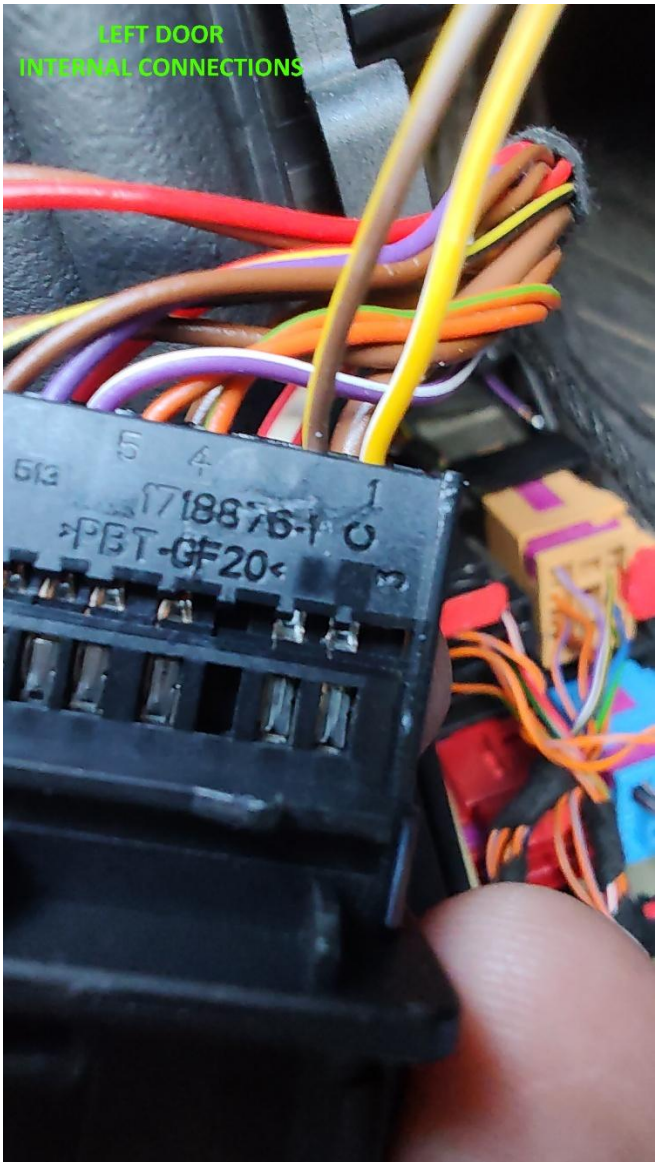
- **Insert WHITE/YELLOW terminal into PIN1, BROWN/YELLOW terminal into PIN2 (left door)**

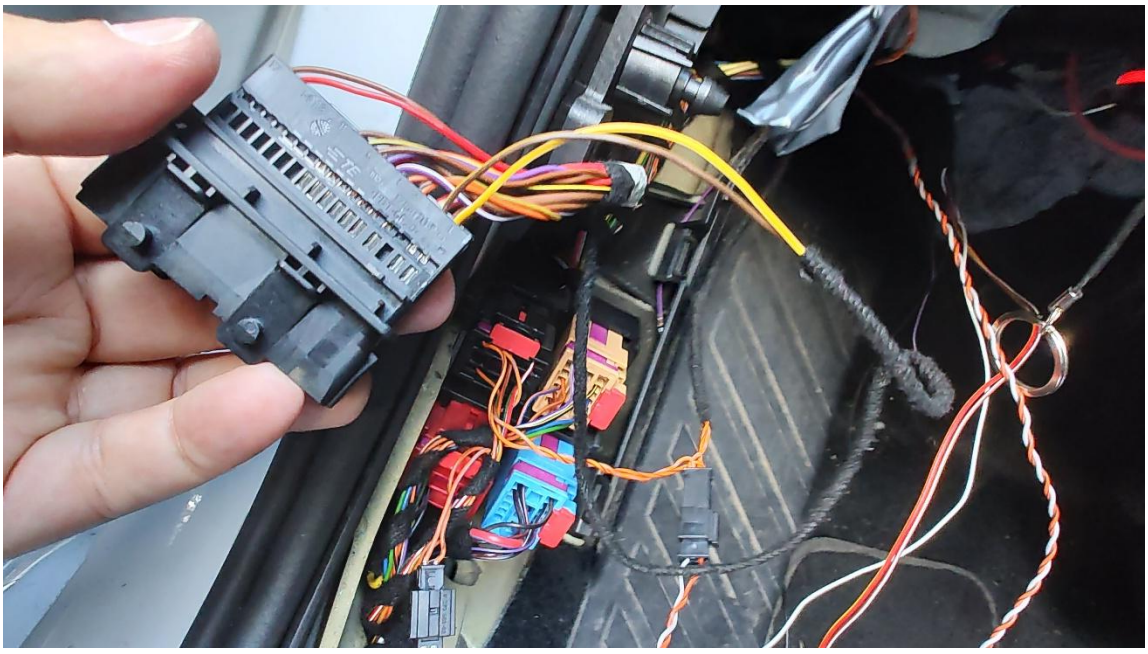
  Original connector





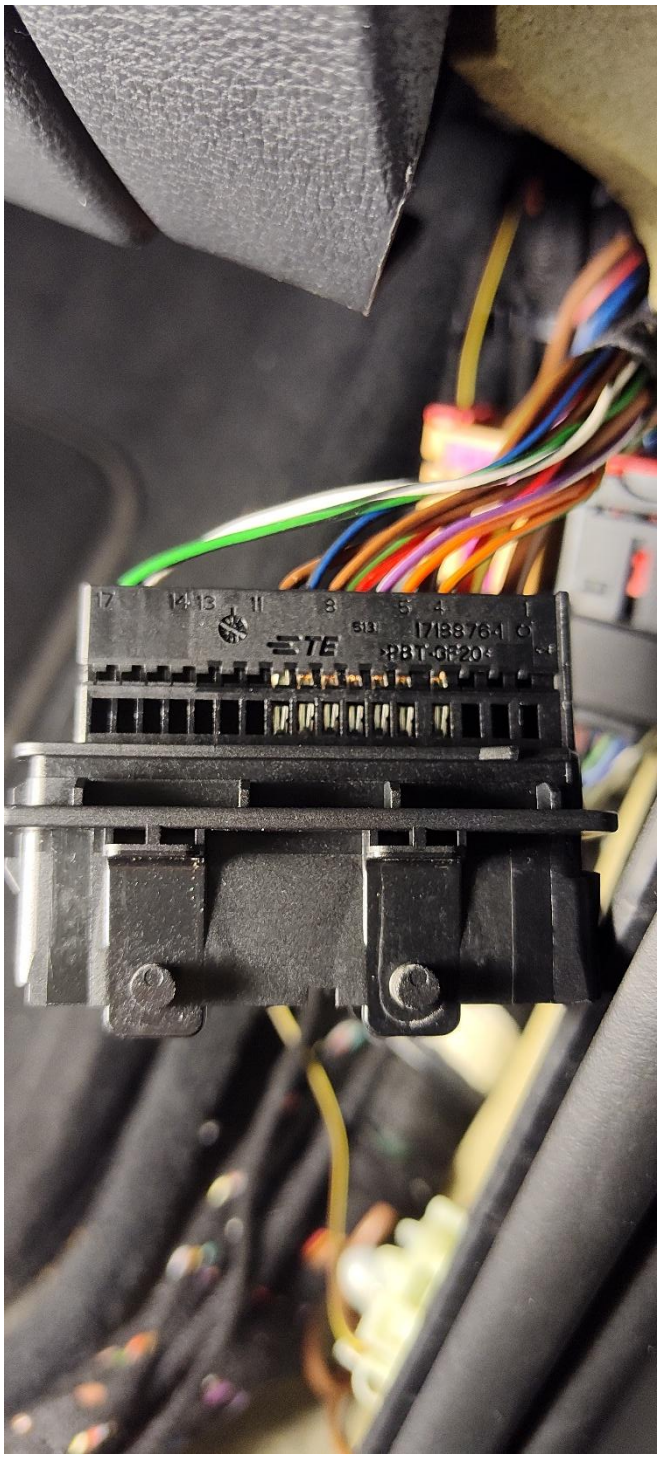
- **2 new pins inserted**

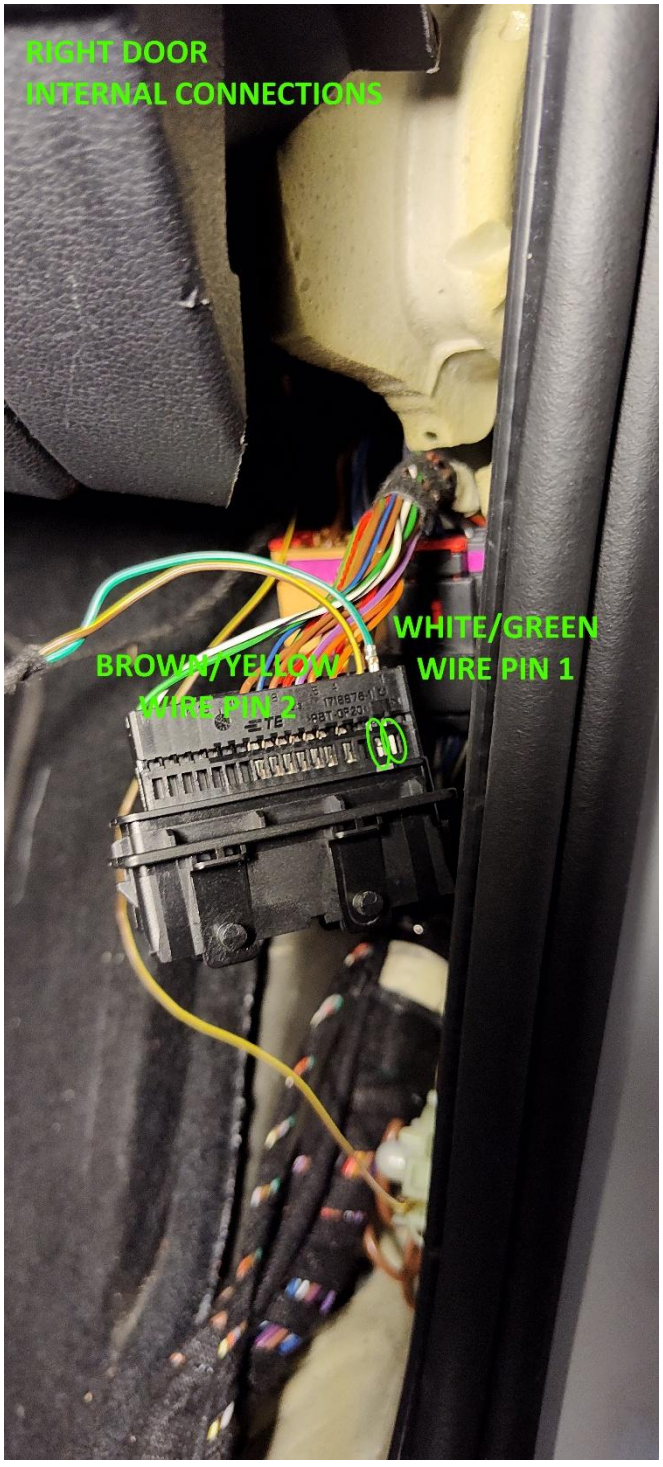




- **Close again the connector and reinsert it into the external opening (the connector will wobble a little, it is normal it will become solid once it is connected back the its female part which pulls it outside with its locking mechanism)**

- **Do the same operation for the right door internal connector.**
  Insert WHITE/GREEN terminal into PIN1, BROWN/YELLOW terminal into PIN2 (right door)





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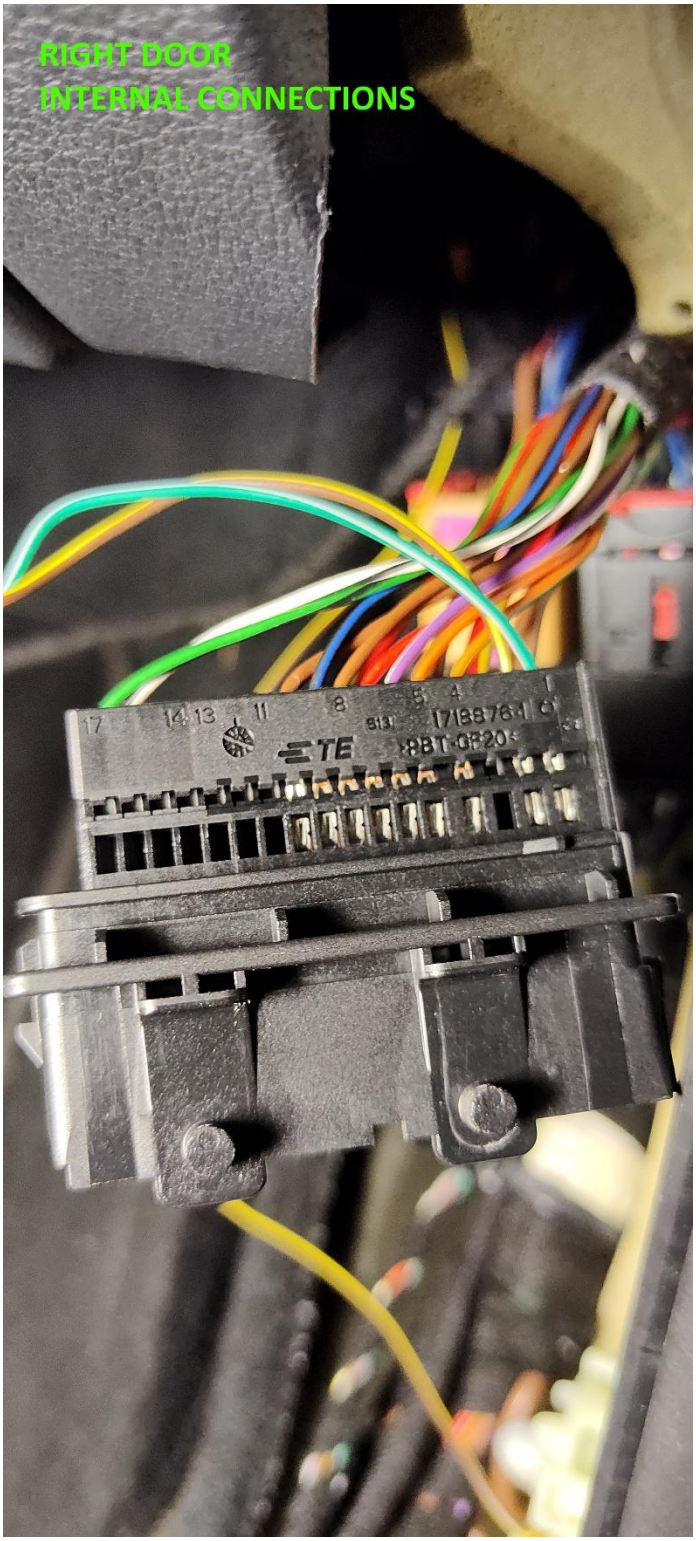
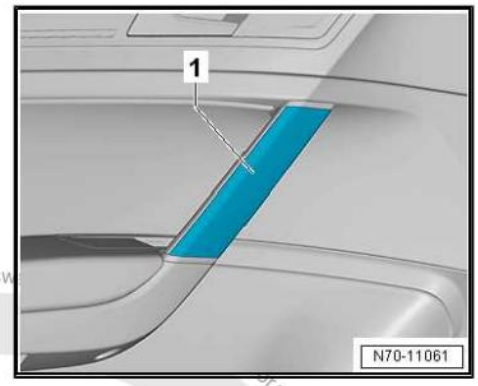
- **2 new pins inserted in the right door internal connector.**

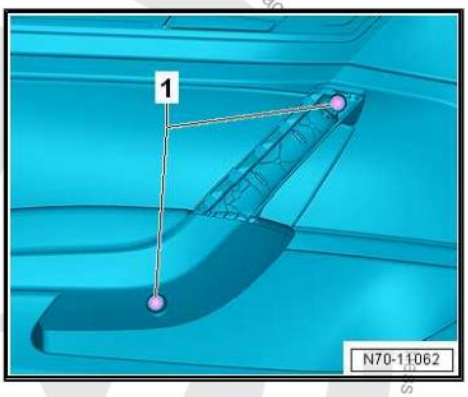


- **Work in car has finished, now you have to start working on doors. Remove the door trim:**

  – Remove the handle molding upper section -1- with the Trim Removal Wedge - 3409- from the mounts in the door trim panel.

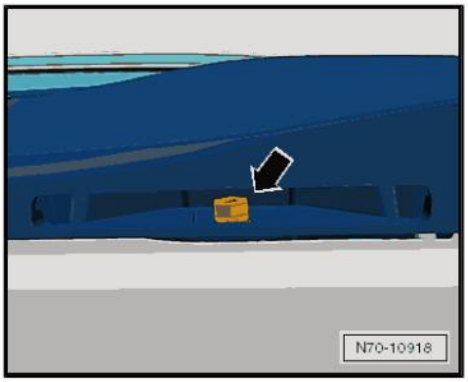


  – Remove the bolts -1-.

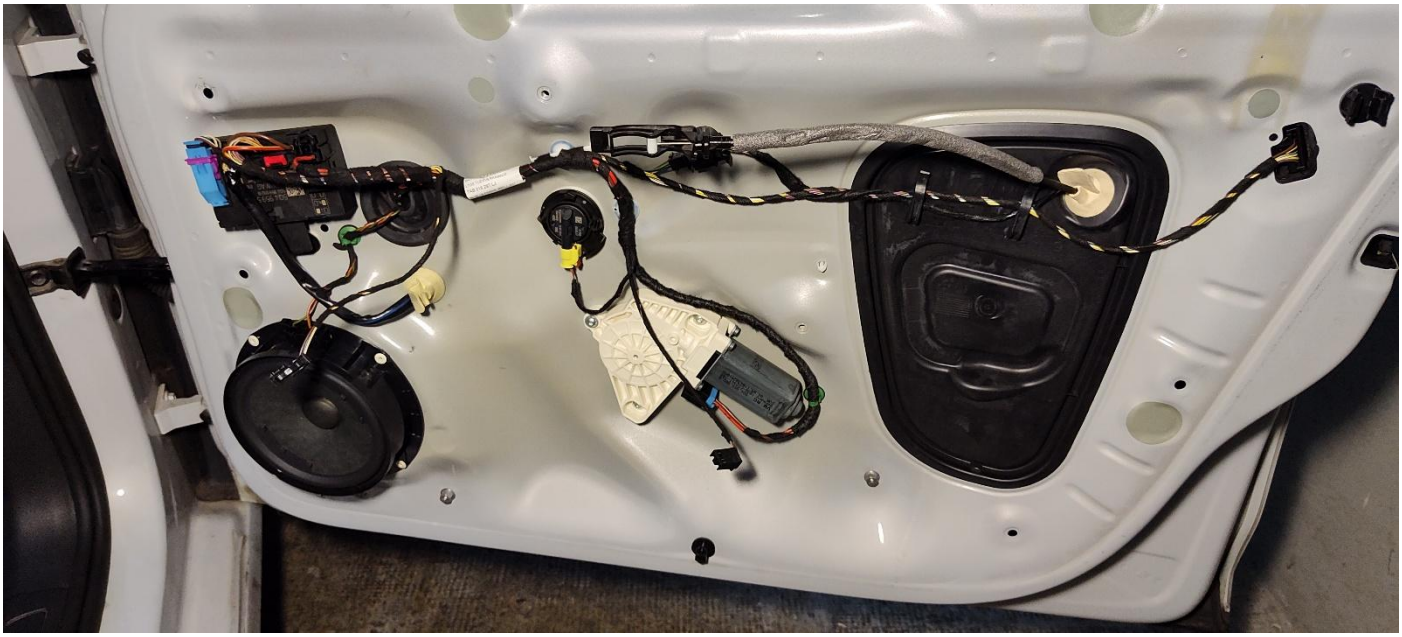


  – Turn/release the clip -1- 90° in direction of the -arrow- ($^1/_4$ of a turn) using the open-end wrench (10 mm).

  - Clip -arrow- is loosened.

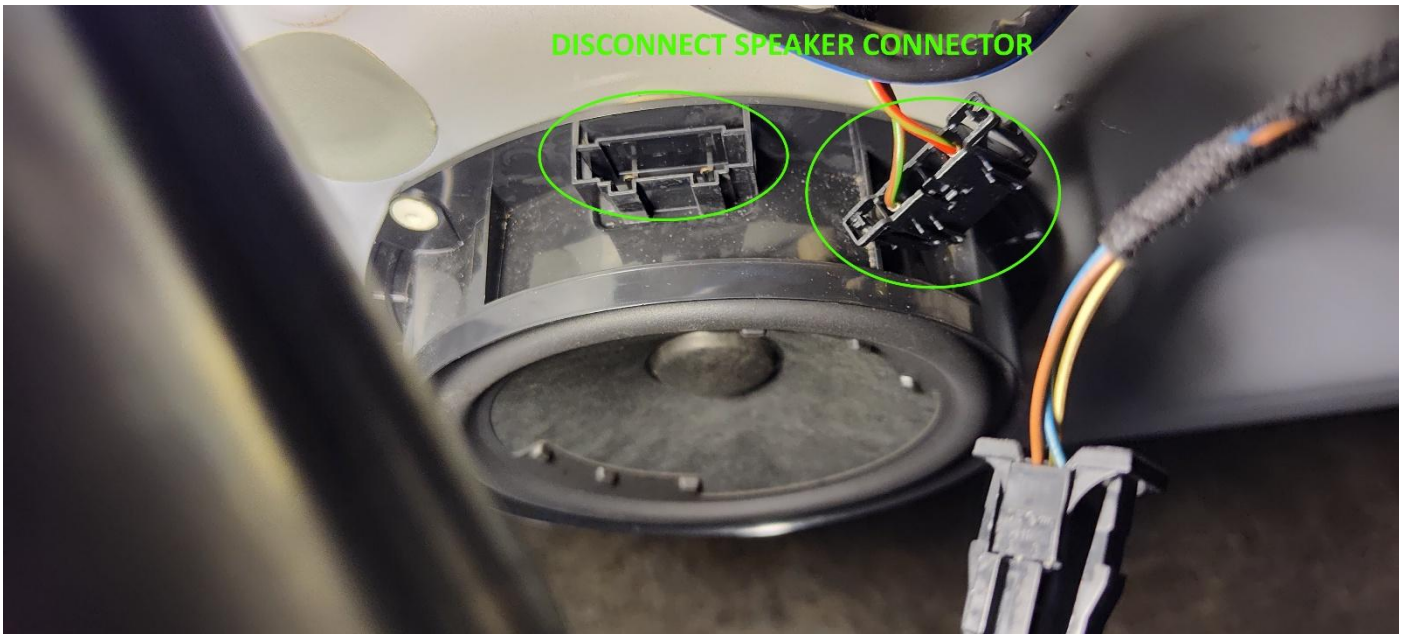


Door with panel removed

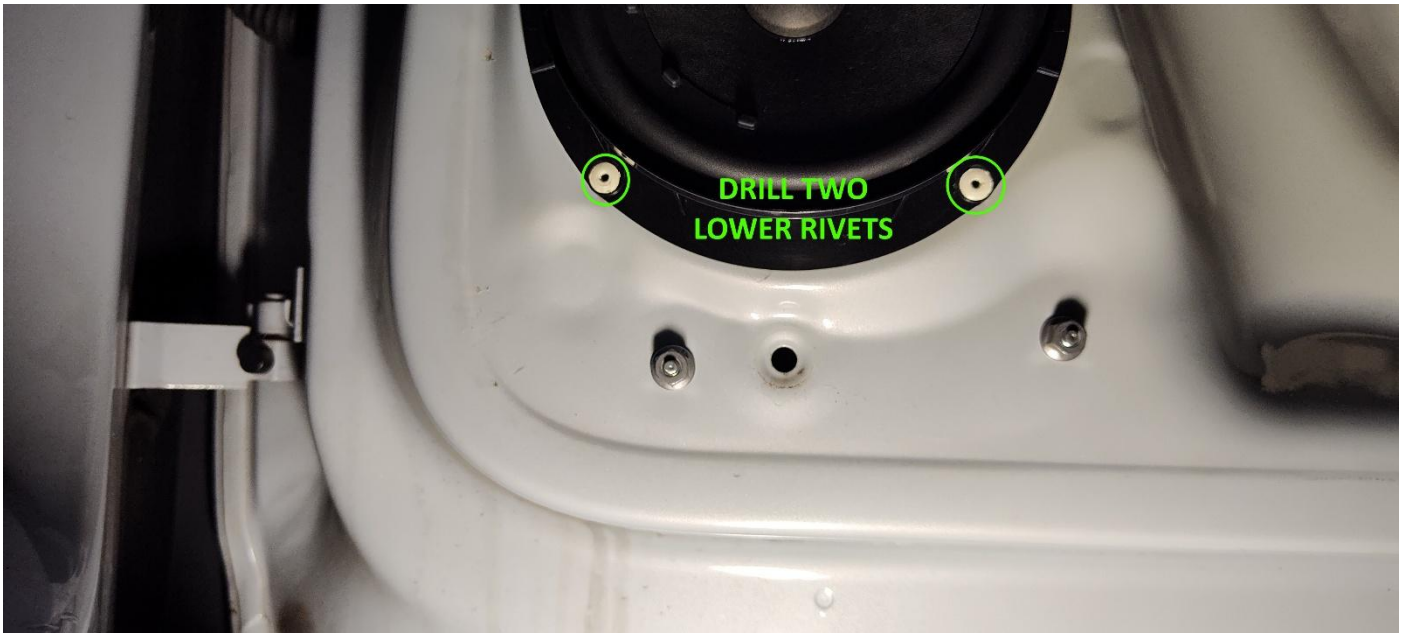


- **Speaker removal**

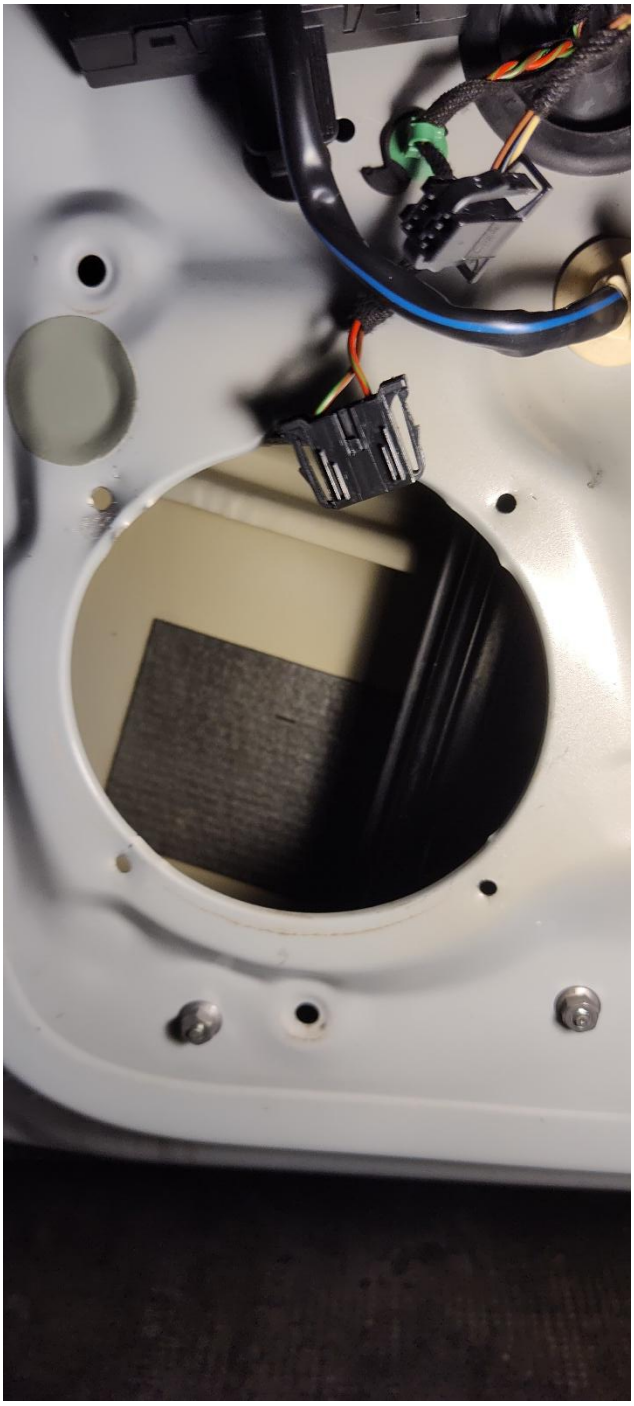
  Disconnect the speaker connector and drill 4 rivets.




DRILL TWO
UPPER RIVETS


DRILL TWO
LOWER RIVETS

Remove the speaker



- **Now it comes the hardest part running the cable from the side mirror to the door external connector. I used my own method which consists in dismounting the mirrors and disassembling them when they are out of car (in this way it is easy to run the wire), others cut the insulation sheath in the passthrough hole (see following pages) and force the cable along it, pick the one which works best for you. Here follows my own way:**

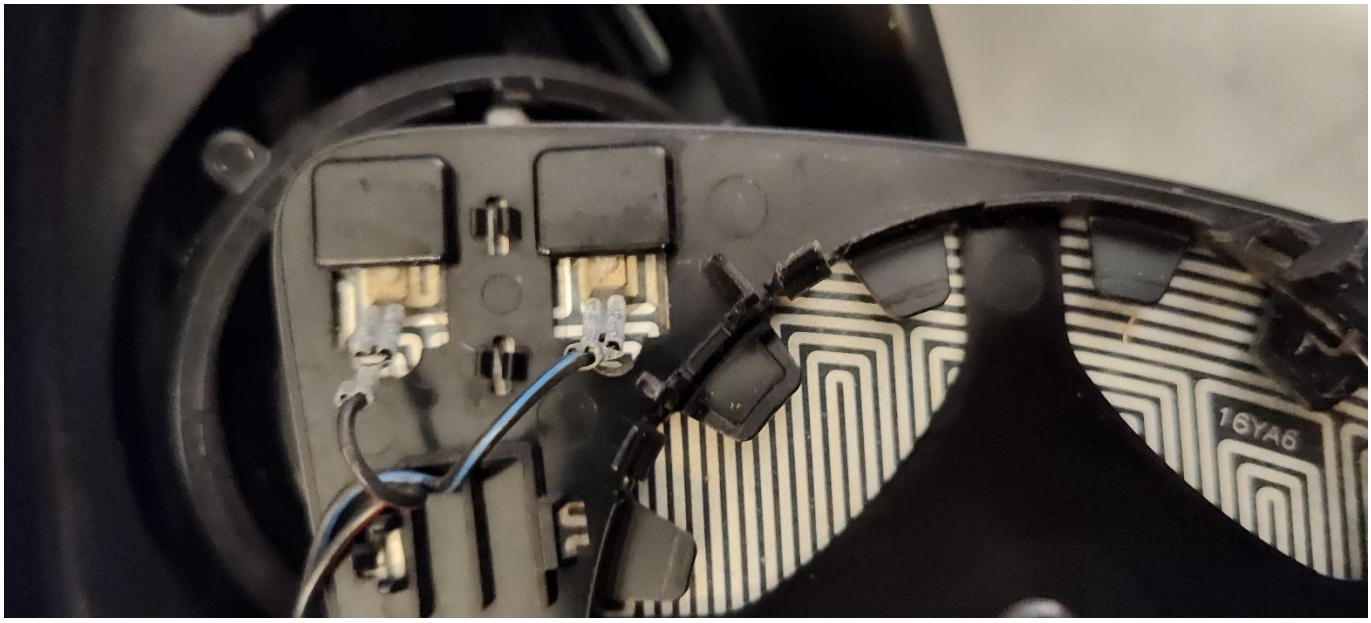
- **Remove side mirror (https://www.youtube.com/watch?v=g9XVXgCOLmY)**

Before removing disengage rubber and the little green clip under the control unit (sorry there is a mixture of pictures from right / left door)

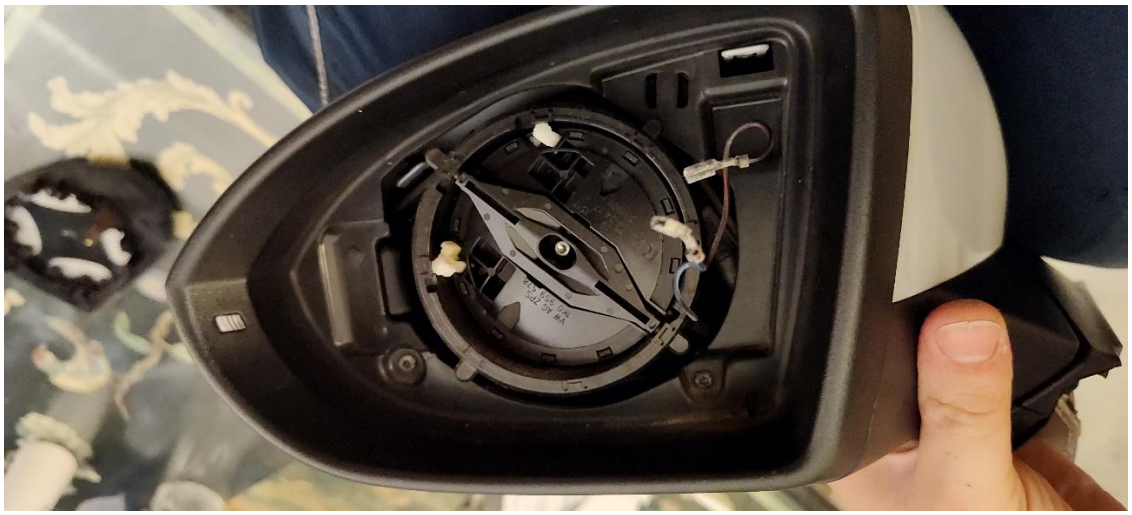
- **Disassemble side mirror**

  Push the mirror in the bottom right corner

Remove mirror by pulling gently from top left corner, unplug heating terminals



Mirror removed



Remove the top plastic cover

We need to remove 3 plastic covers.

Pry gently with a flat screwdriver the bottom plastic cover

Bottom plastic cover removed

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Remove middle plastic cover

Left side (do nothing here)

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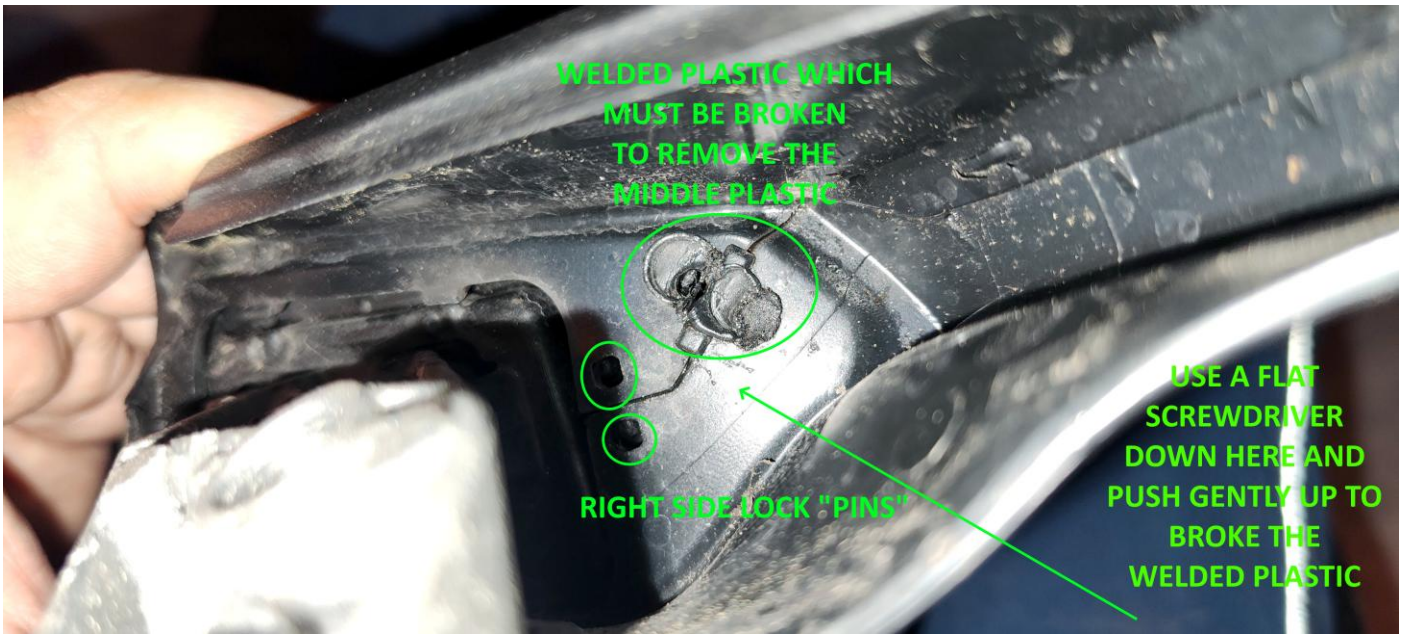
Right side



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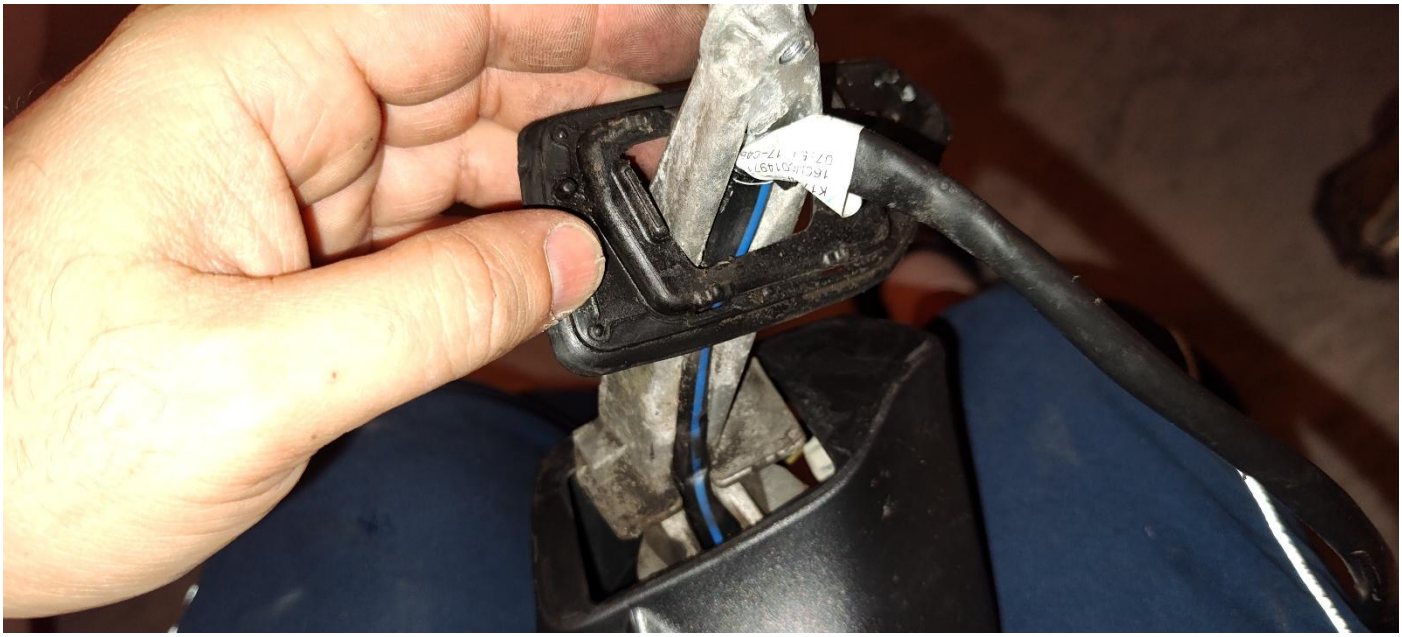
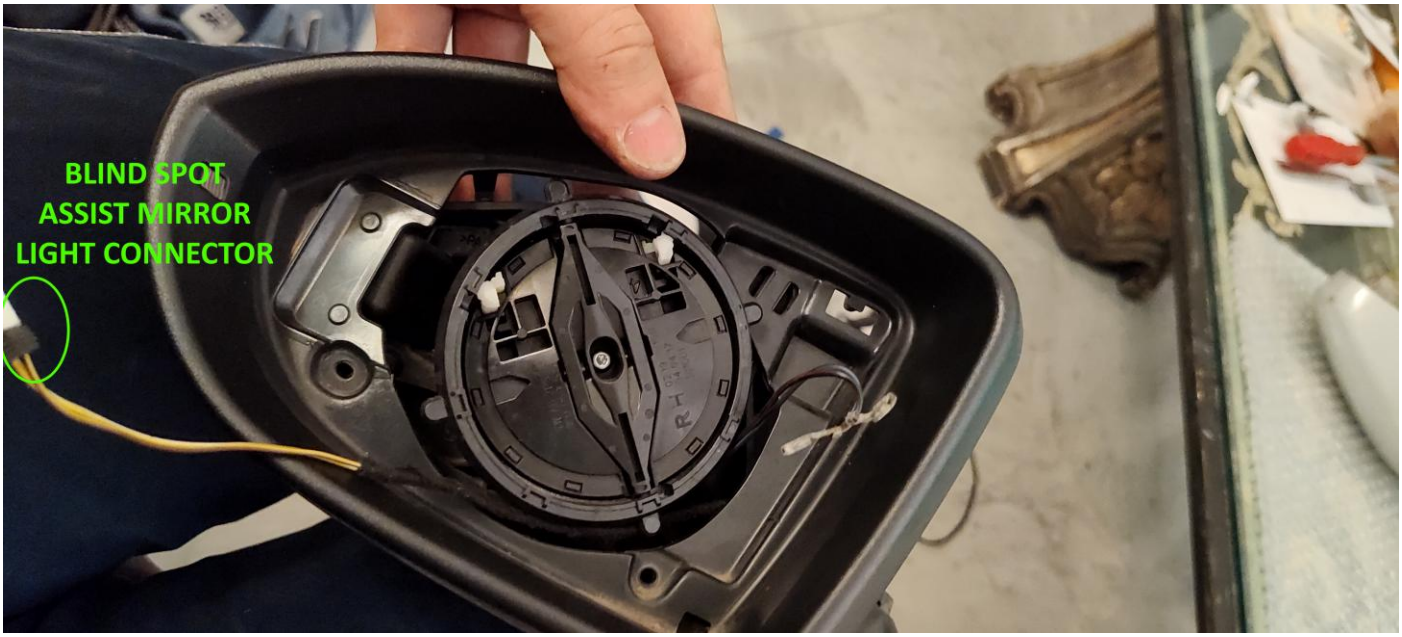
Middle plastic cover removed

Remove top plastic cover

Top plastic cover removed



Run wire into the mirror starting from white blind spot assist mirror light connector into the back of the side mirror



Run the wire inside the passthrough hole (should be very easy now)

Wire coming outside the passthrough hole

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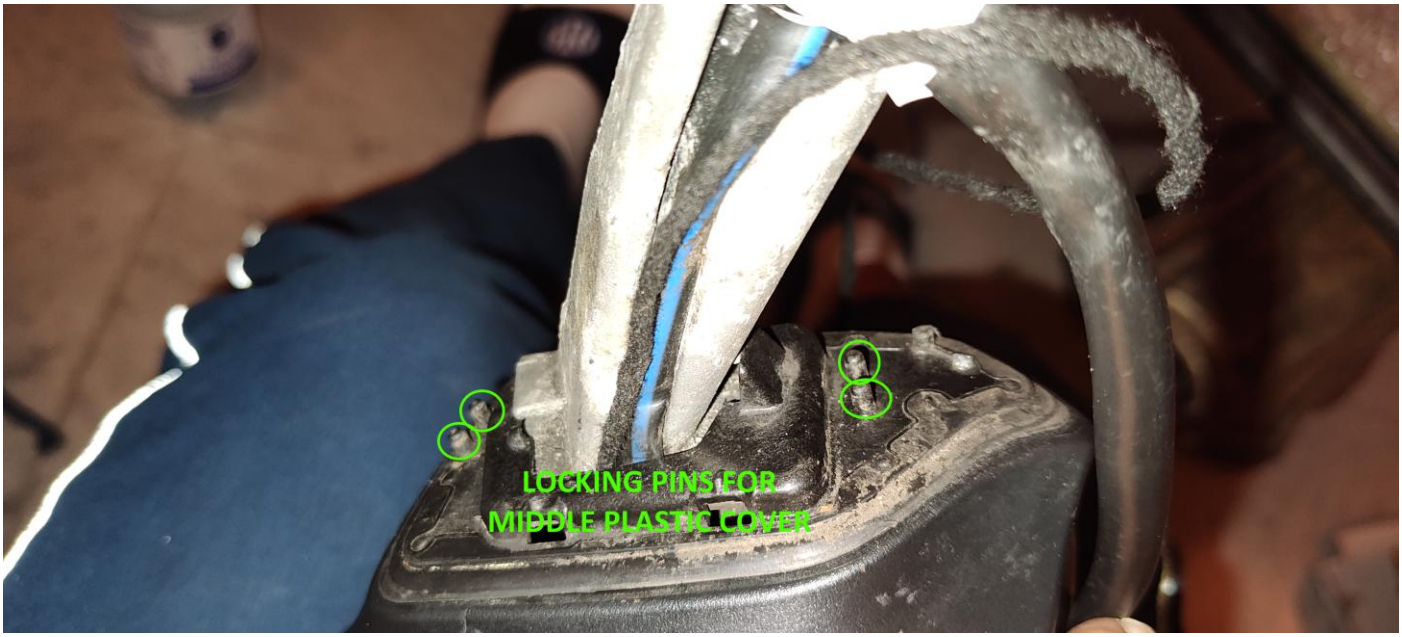
Top plastic cover inserted again



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Middle plastic cover inserted again (wedge into the 4 locking pins)

Left side

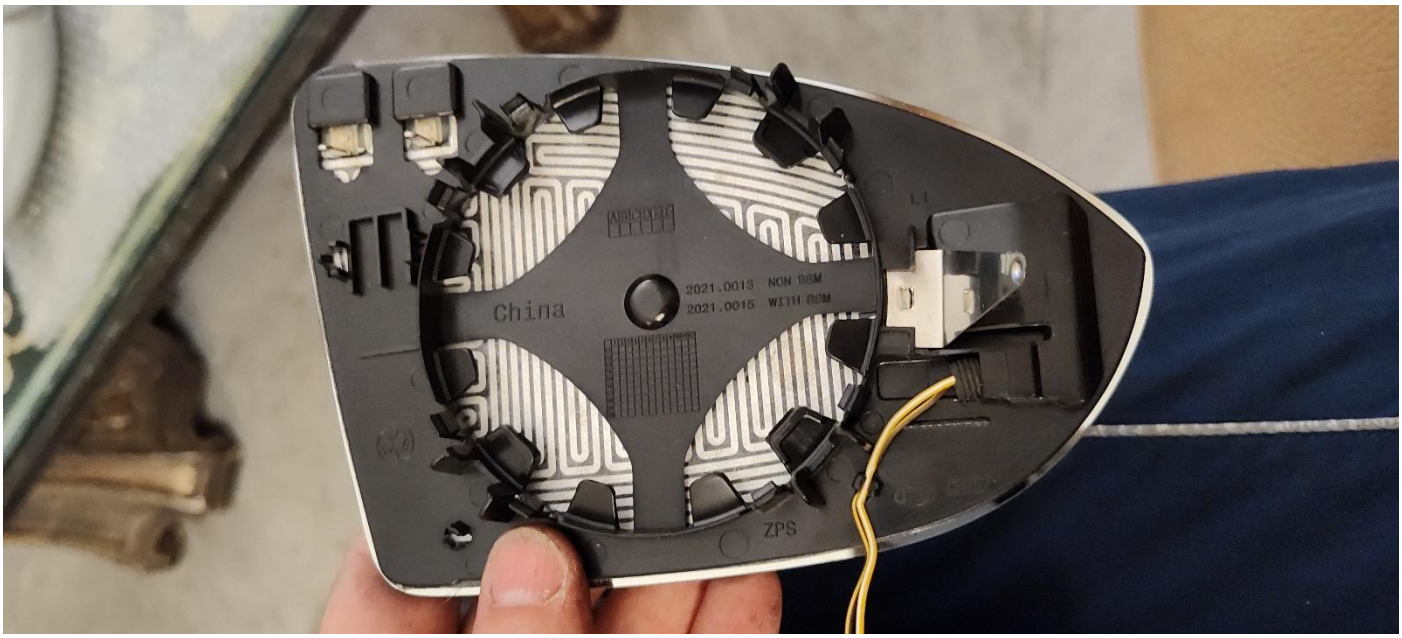
Right side (note the missing pin, if you want you can apply hot glue, but it is not needed, I manage to close everything without using it)

Bottom plastic cover inserted again (push and slot in gently).

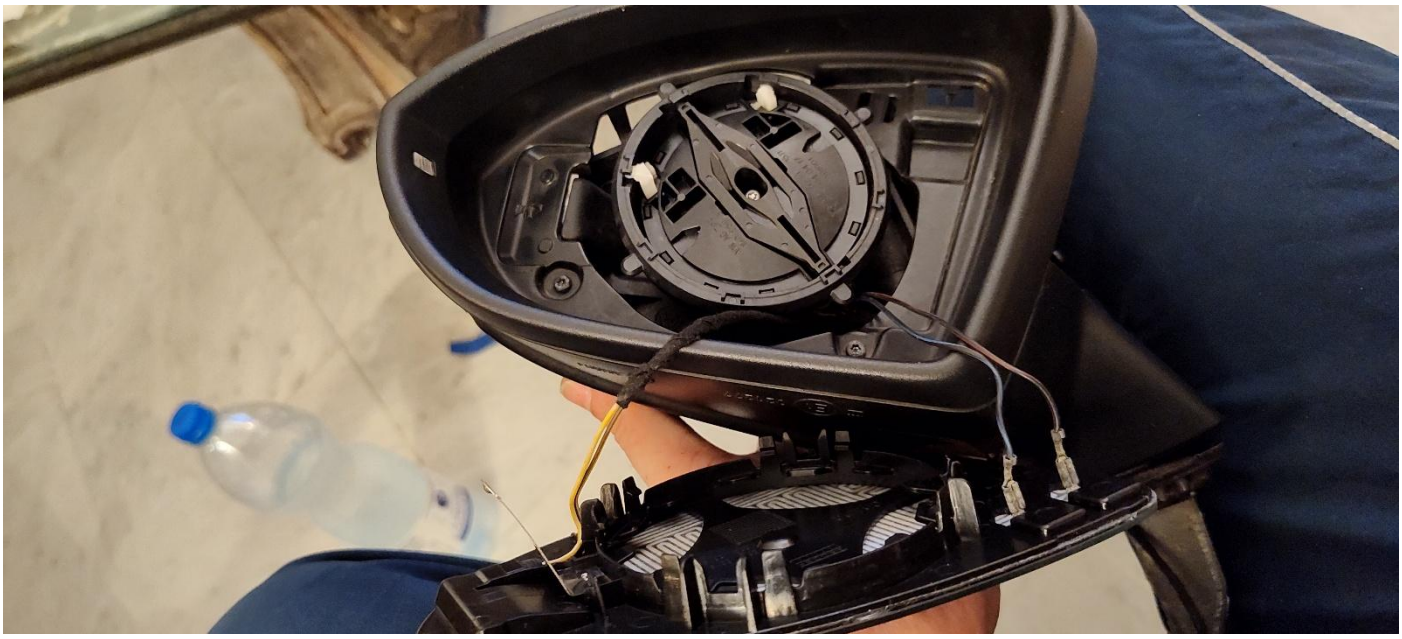
Add a new zip tie to secure both cables

Connect the new mirror provided with blind spot assist kit

Connect blind spot assist mirror light



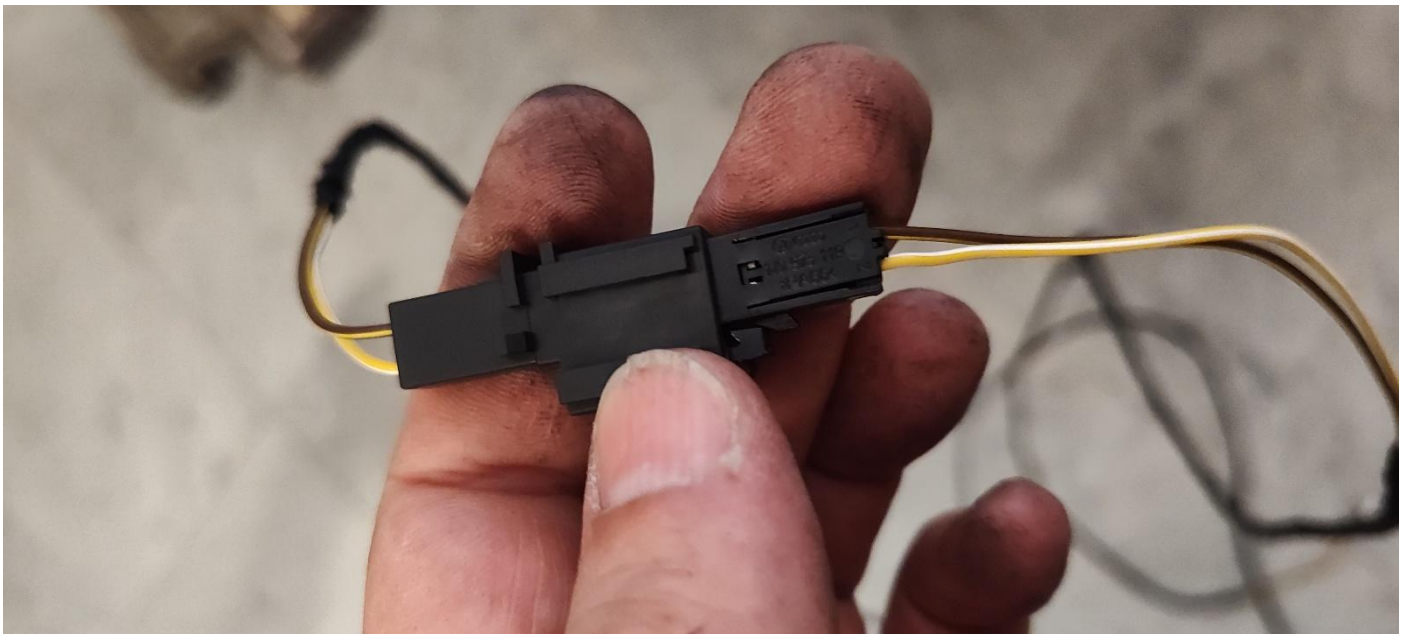
Connect heating element (check them when mounted on the car if mirror does not heat after 5 minutes remove again just the mirror and swap the connectors)



Mirror re-assembled

Join the two door cables

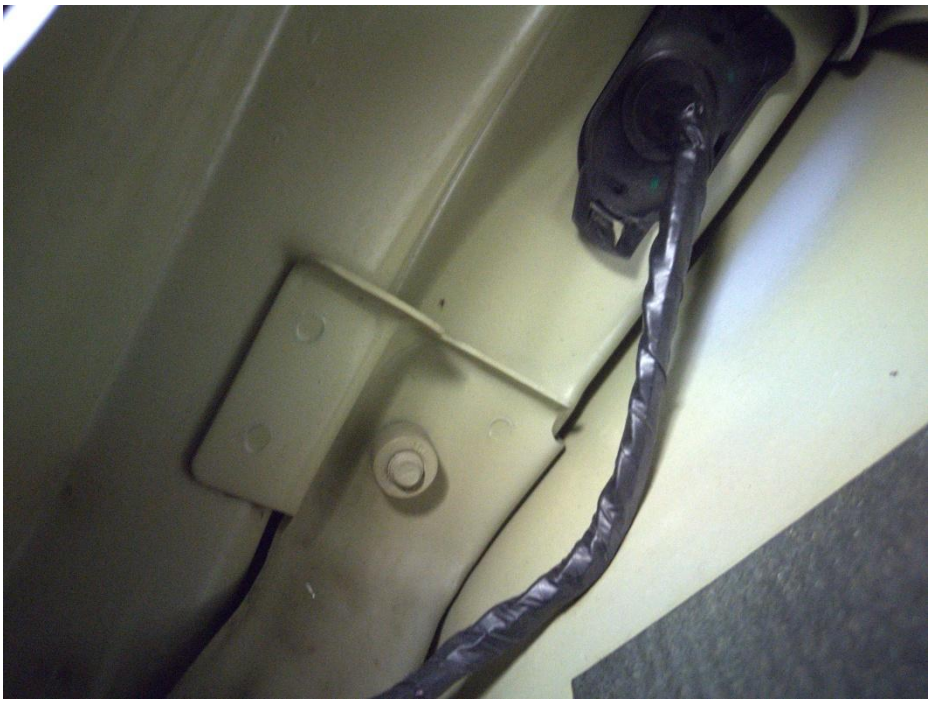
Insert pin into the connector (match colours)



- **Reassemble the side mirror on car. Note when inserting the side mirror cable inside the door there are two vertical halves, pass it through the one closer to the interior of the car, otherwise when you try to lower the windows later, they will get stuck and you have to dismount everything again (mistake learnt from experience).**

- **Remove the door plastic clip (sorry the picture here is from right side door)**

Internal view from inside the door

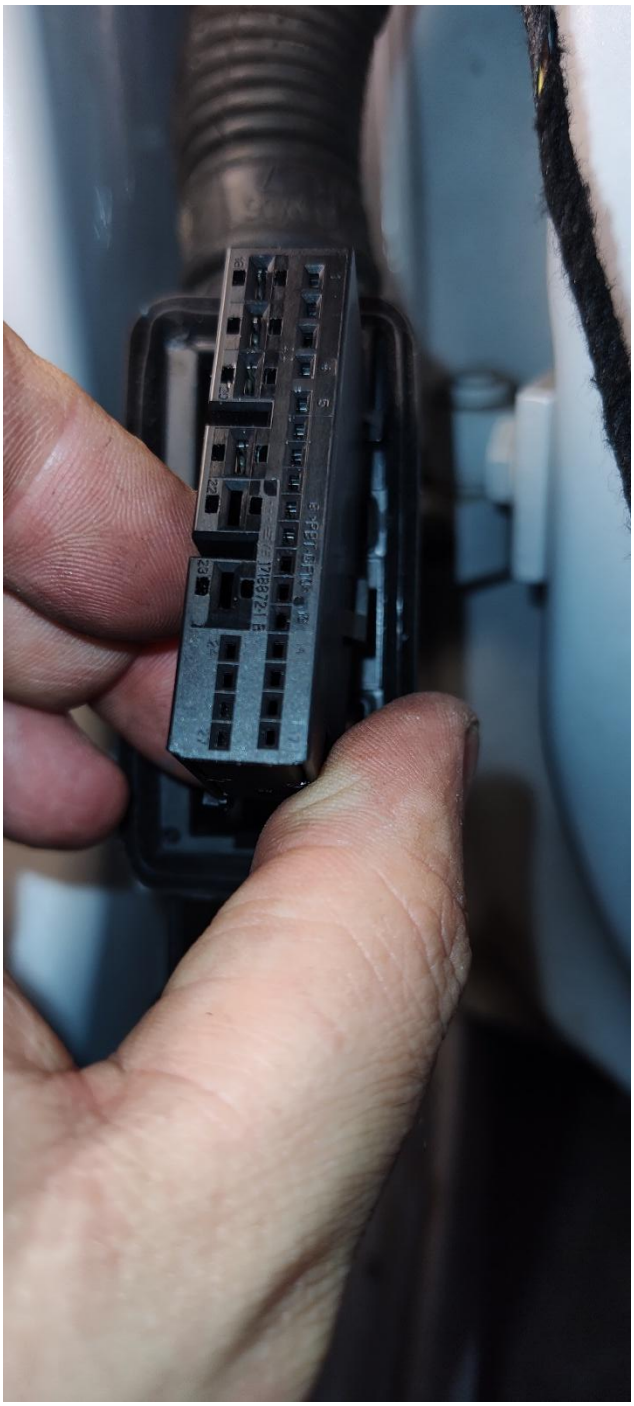


- **Run blind spot assist wire through door plastic clip**

- **Use a probe to run the wire through the rubber**

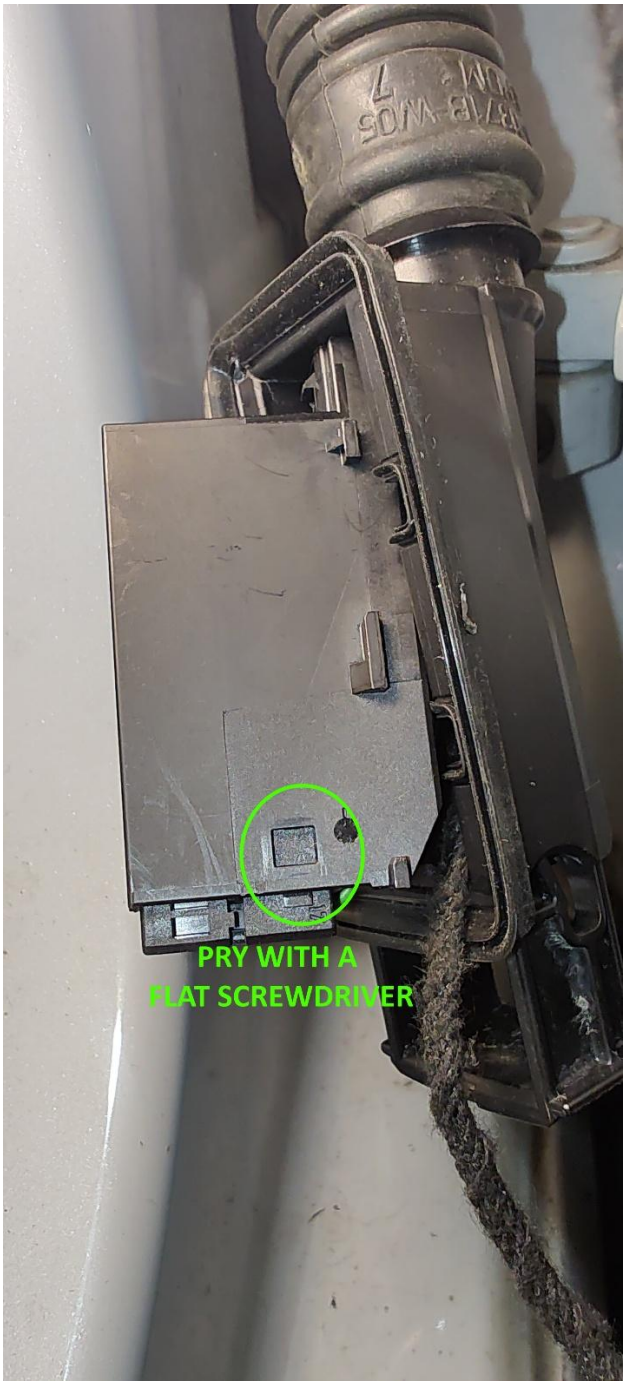
- **Unlock the door female connector, push with a flat screwdriver and pull down**

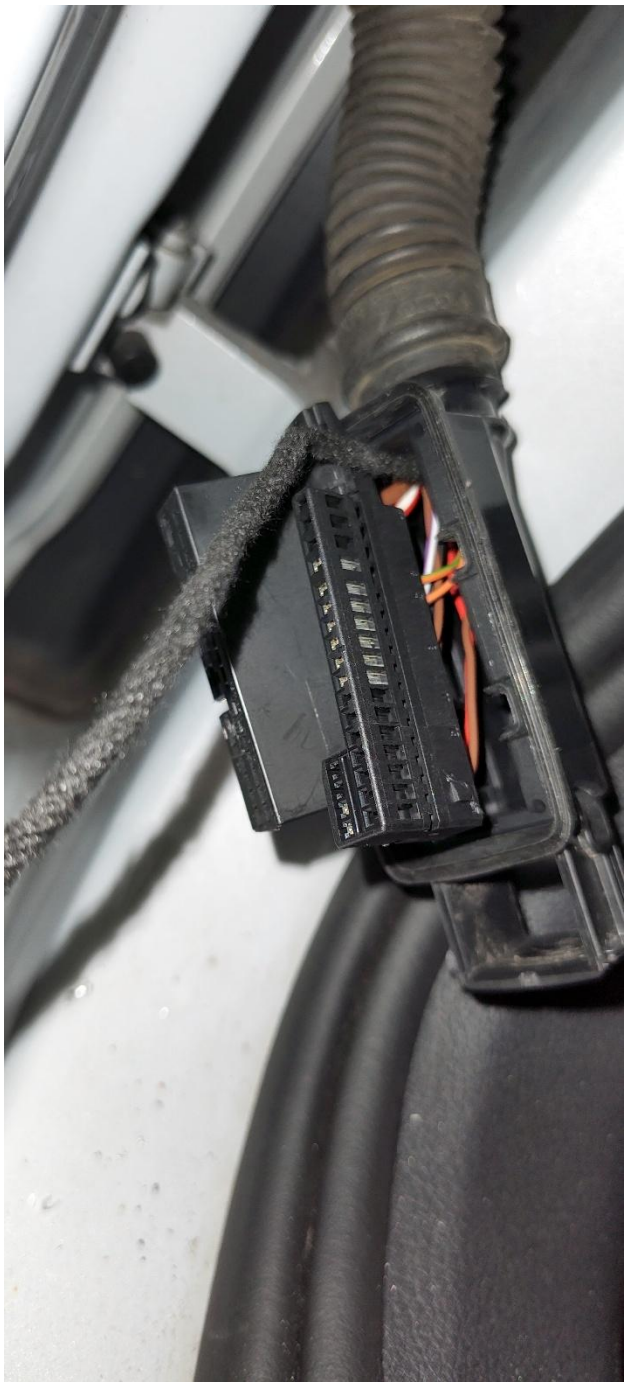
Connector unlocked



- **Remove external door connector housing**

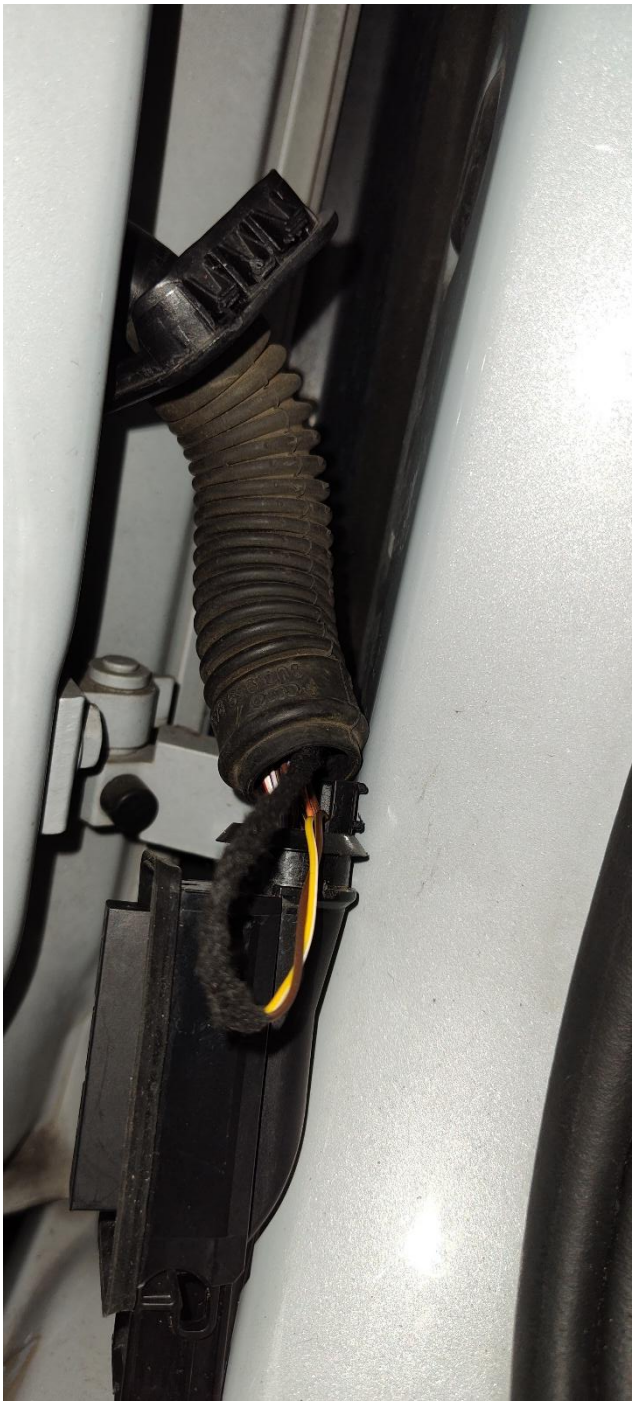
External door connector housing removed



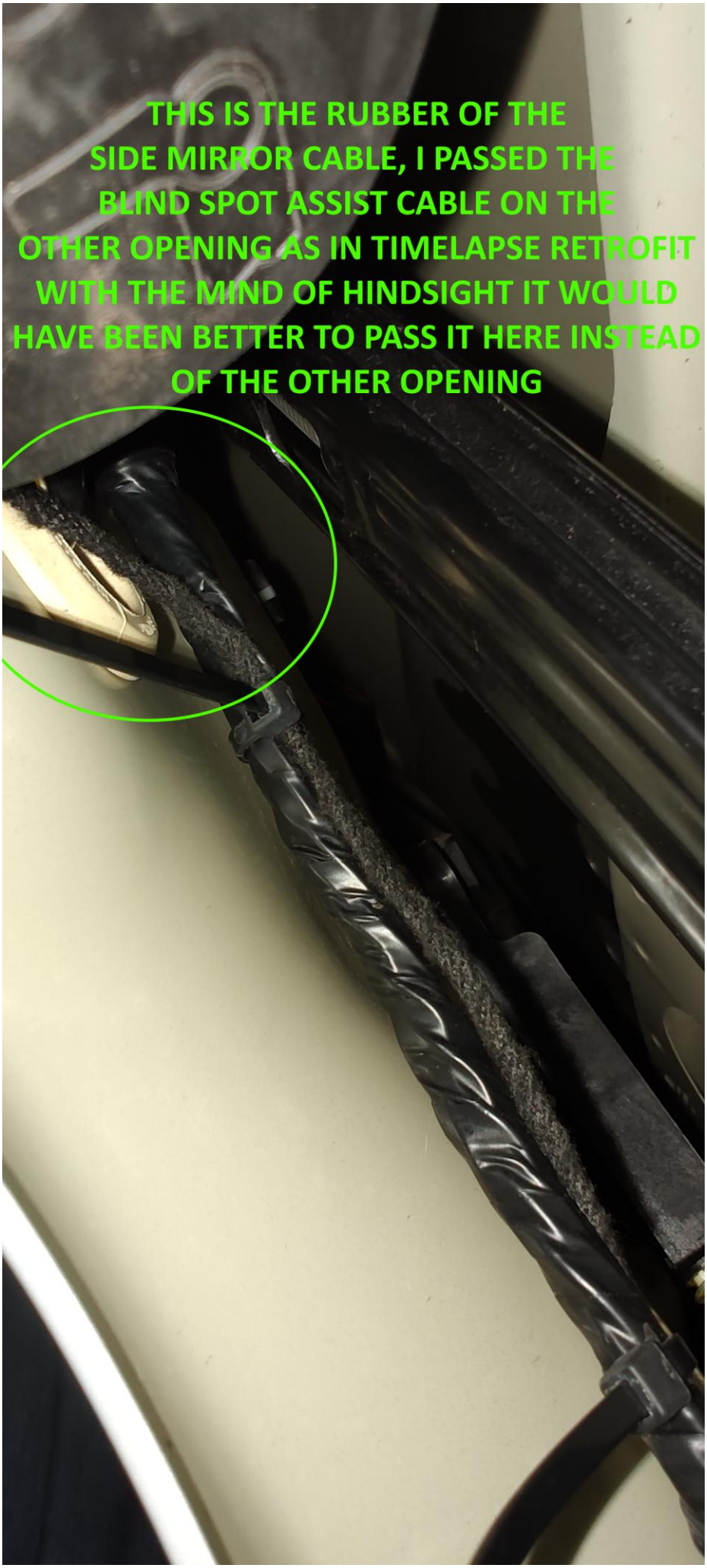


- **Add WHITE/YELLOW wire to PIN1, BROWN/YELLOW wire to PIN2 (GROUND)**

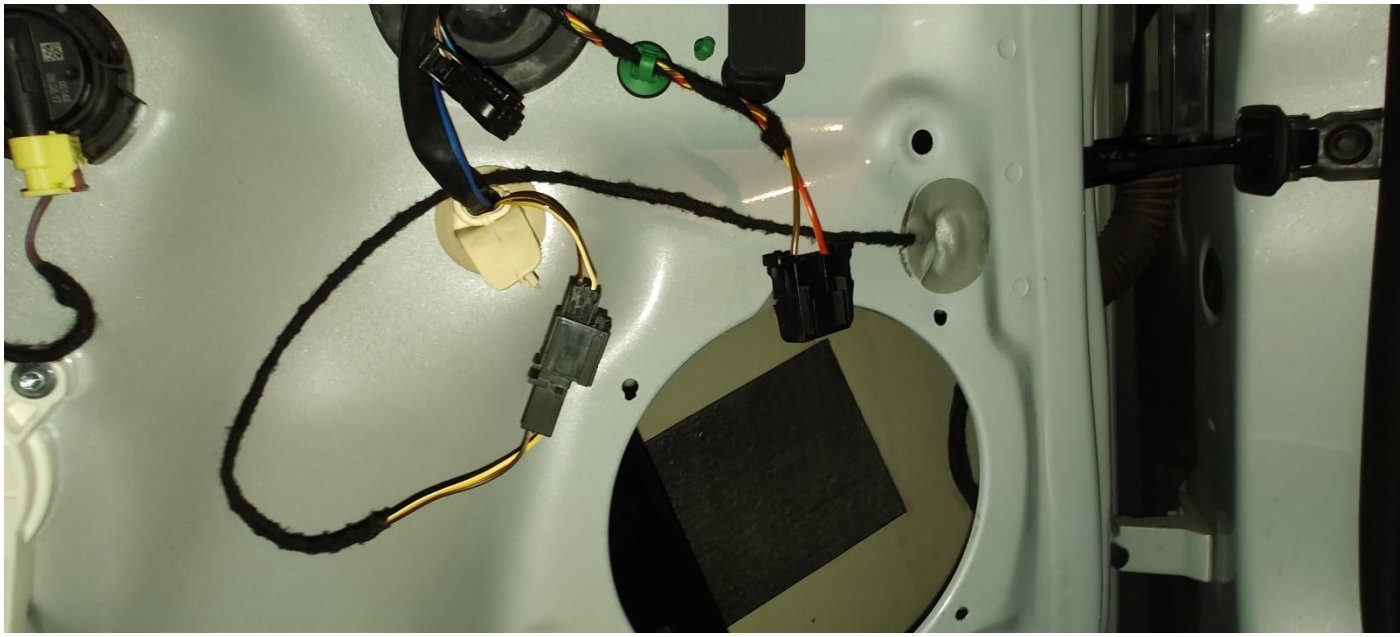
- **Pins added and external door connector housing inserted again (left)**
- **External door connector reinserted into place and pulling back cable (right)**
- **Pull back cable as much as possible, reapply rubber to external door connector and inserted again door plastic clip**



- **Inside this space the windows get lowered so you can’t leave cable floating around, otherwise they will get stuck while lowering. Zip tie the blind spot assist cable to the existing cable following its curved route as in the pictures**

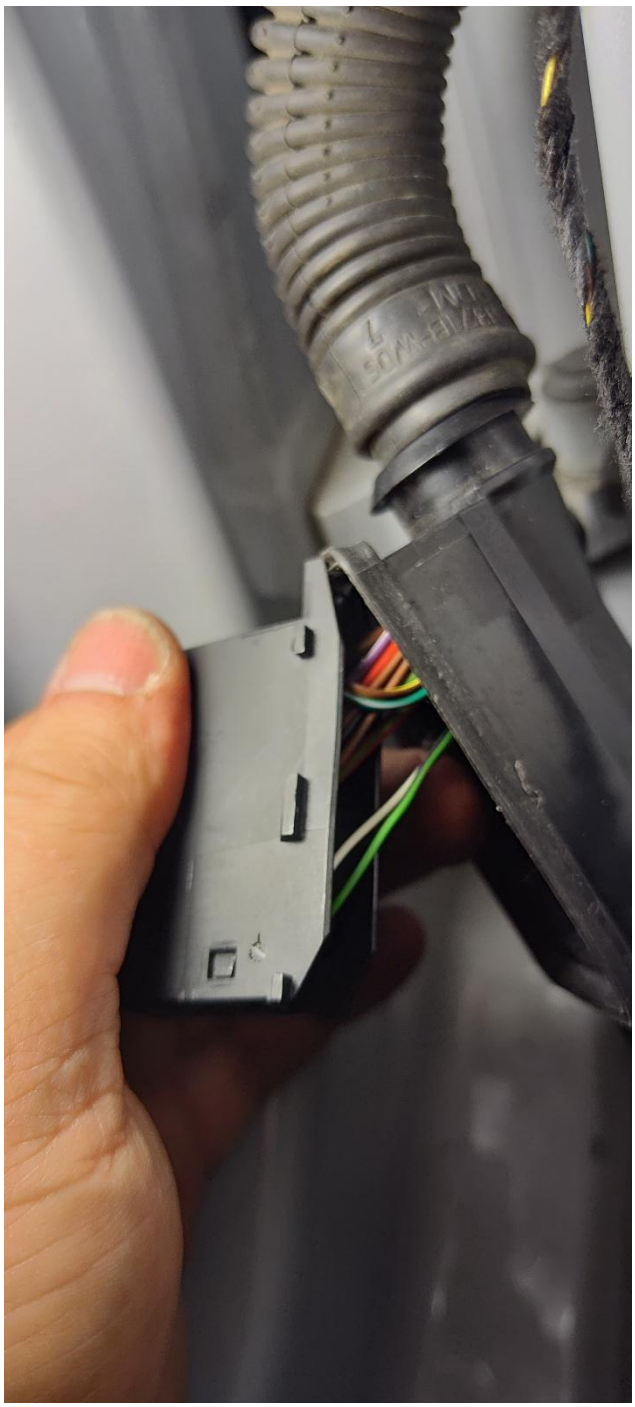

THIS IS THE RUBBER OF THE
SIDE MIRROR CABLE, I PASSED THE
BLIND SPOT ASSIST CABLE ON THE
OTHER OPENING AS IN TIMELAPSE RETROFIT
WITH THE MIND OF HINDSIGHT IT WOULD
HAVE BEEN BETTER TO PASS IT HERE INSTEAD
OF THE OTHER OPENING

- **Cable passed outside the door**



- **Connect the door trim provisionally just to check that the electric window goes up and down without any hindrance. If everything is fine, remove again the door panel trim and mount again the speaker securing it with 4 rivets using the riveter.**
- **Congratulations work on first door finished, reassemble the door trim**

- **Do the same for the right door, remember BLACK/GREEN wire to PIN1, BROWN/YELLOW to PIN2.**



Congratulate yourself the installation and wiring are all done, you have now just to perform coding and test it!

Additional Videos:

- **A full-time lapse video of a retrofit (https://youtu.be/tp0105g8xt0)**
- **A general overview video (https://youtu.be/G5056ySYUGc)**

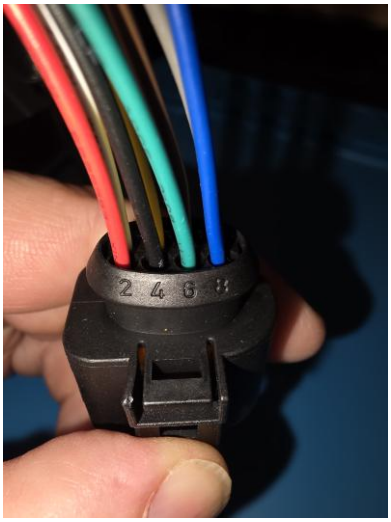
Installing the improved control units (optional step)

2Q0907xxx radars have the same connectors (1J0973714/1J0973814) but they have different pinouts as depicted in the picture below (borrowed from a Russian retrofit article and improved a little). Moreover, you have to run an additional wire from the left connector to the right one (PIN 3 685 → PIN 6 686).

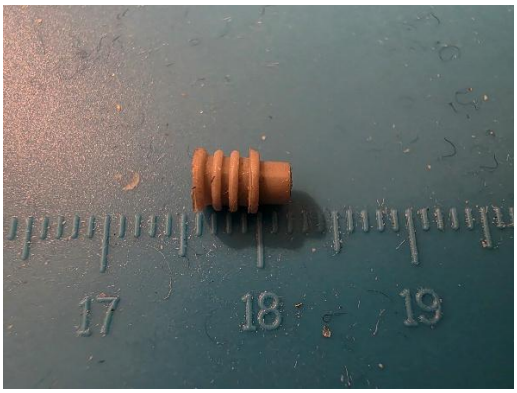
BLIND SPOT ASSIST JUNCTION CABLE		5Q0 907 xxx MALE CONNECTOR		2Q0 907 xxx FEMALE CONNECTOR
685 (LEFT)	Signal Left Mirror	4	move to →	6
	GND	5	same PIN	5
	CAN-L to 686	6	move to →	1
	CAN-H to 686	7	move to →	2
	"+15"	8	same PIN	8
	Signal Right Mirror from 685	3	wire to 686	6
686 (RIGHT)	CAN-L Extended	4	move to →	1
	CAN-H Extended	3	move to →	2
	GND	5	same PIN	5
	CAN-L to 685	6	move to →	3
	CAN-H to 685	7	move to →	4
	"+15"	8	same PIN	8
	Signal Right Mirror from 685	3	wire to (from 685)	6

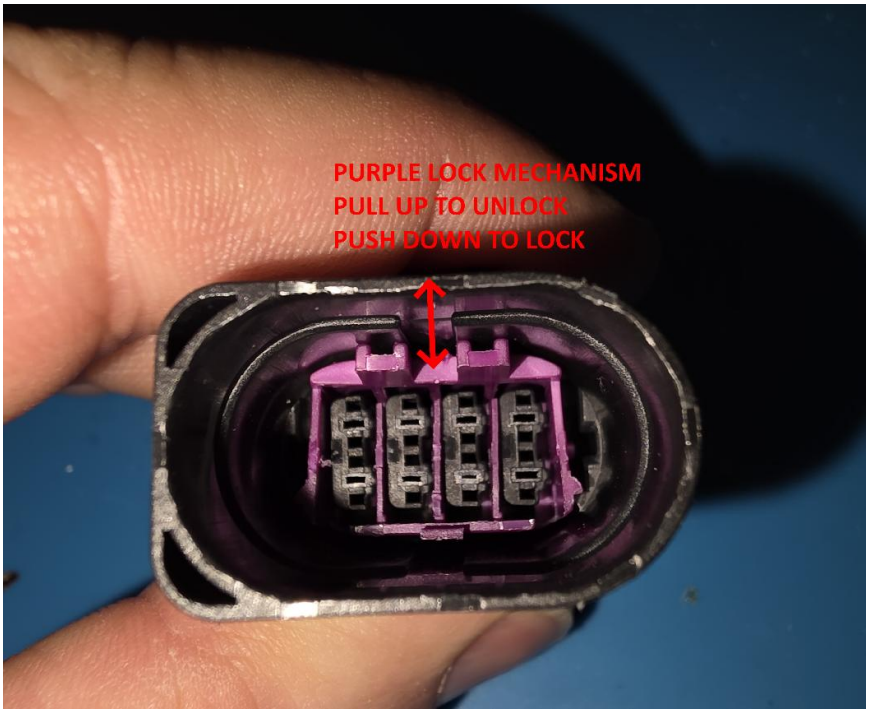
You can either perform a pin swap on the original cable or make a new junction cable, pick the one which works best for you. I chose to create a new junction cable; I attach some pictures:

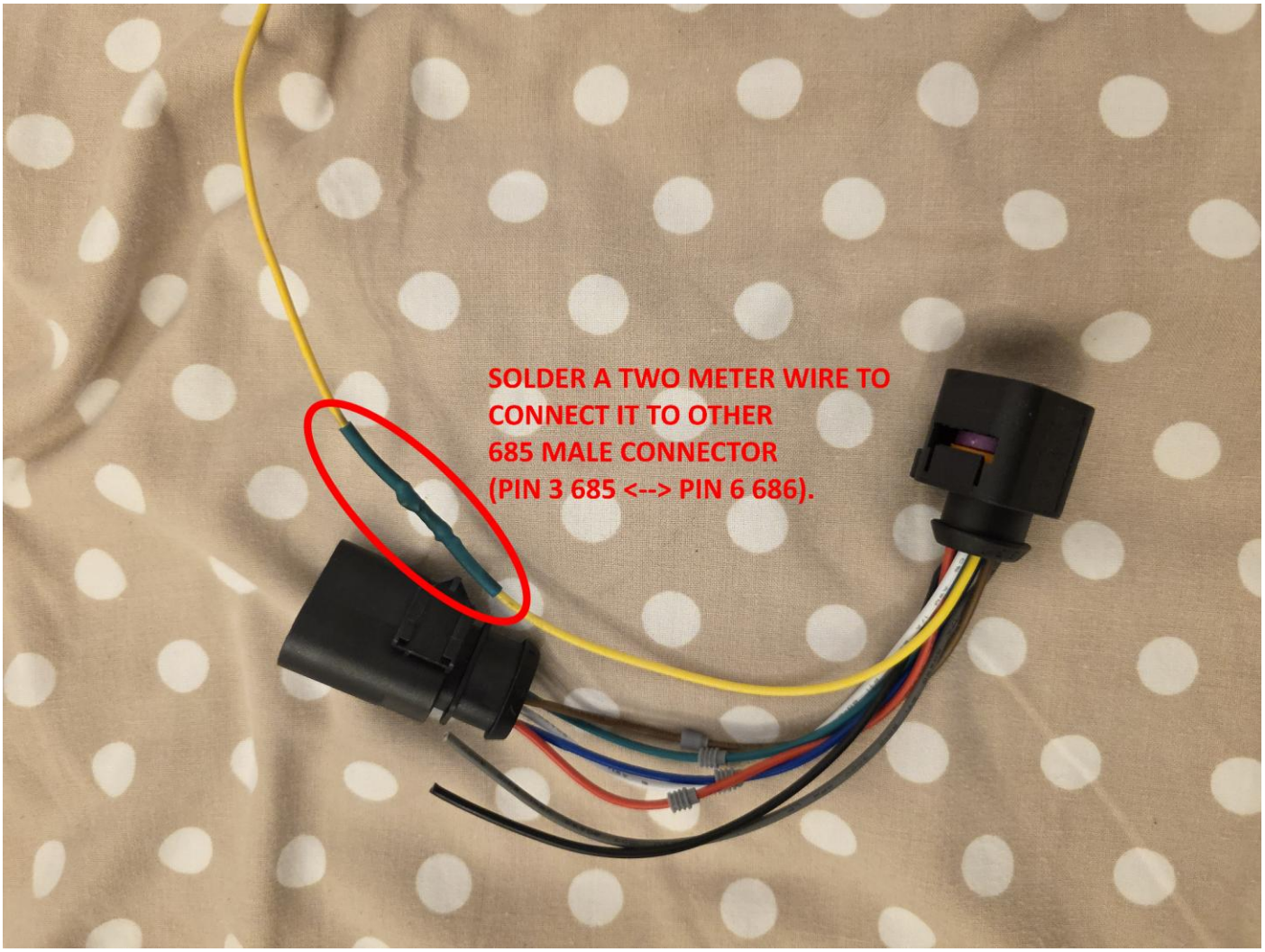
Female connector 1J0973814 with wiring
(note that the pin number is carved on connector)

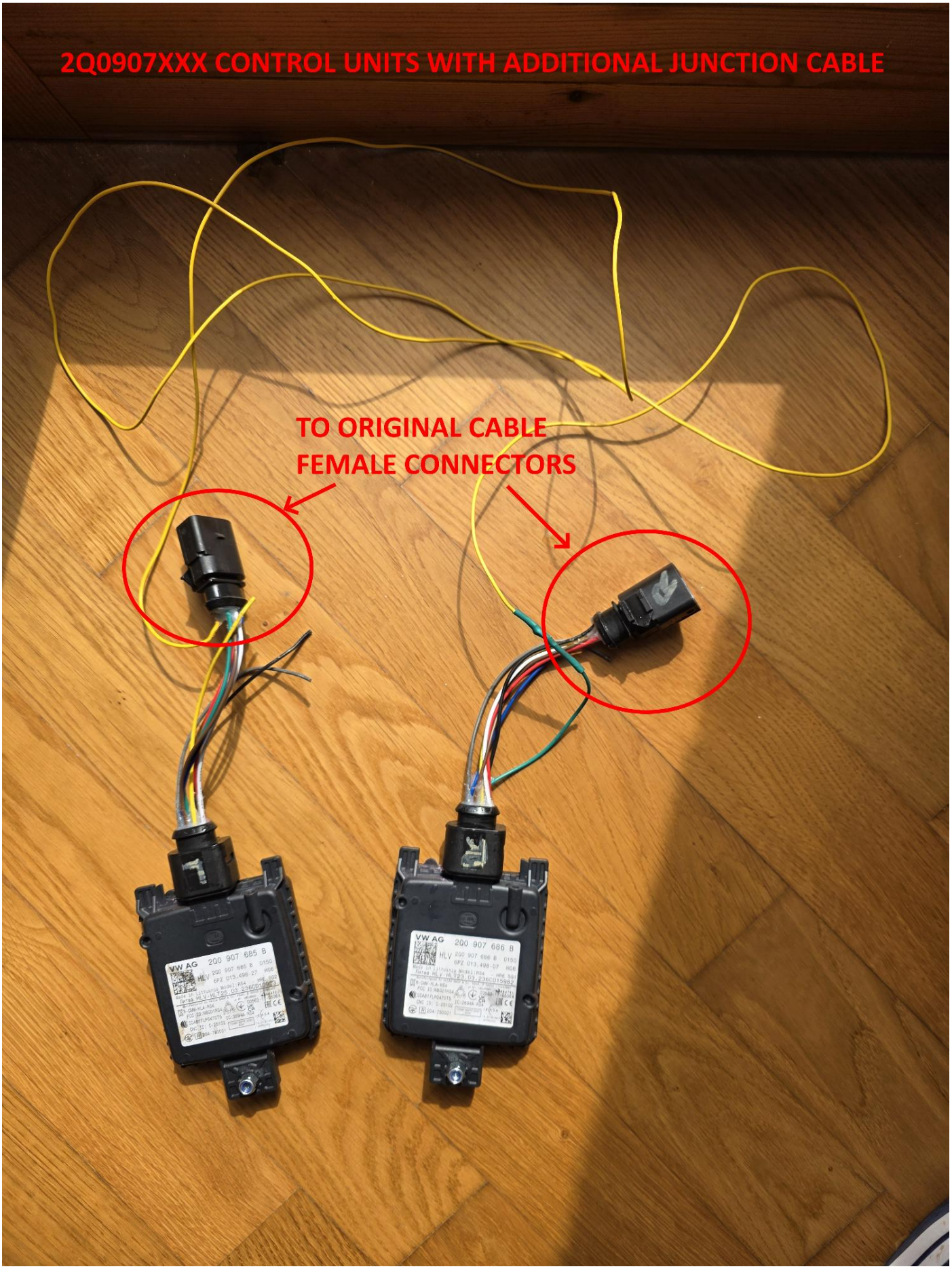


Male connector 1J0973714 with pin and rubber grommet
(note that the pin number is carved on connector)






SOLDER A TWO METER WIRE TO
CONNECT IT TO OTHER
685 MALE CONNECTOR
(PIN 3 685 <--> PIN 6 686).


2Q0907XXX CONTROL UNITS WITH ADDITIONAL JUNCTION CABLE
TO ORIGINAL CABLE
FEMALE CONNECTORS
VW AG 2Q0 907 685 B
VW AG 2Q0 907 686 B

Apply car wiring harness tape to new cable

Drill a new hole on the existing mounting plate to secure the new control units (the steps on this page are optional you can also use hot glue to fix the control units to the spacer wedge)

Cut a little bit of plastic to allow a washer

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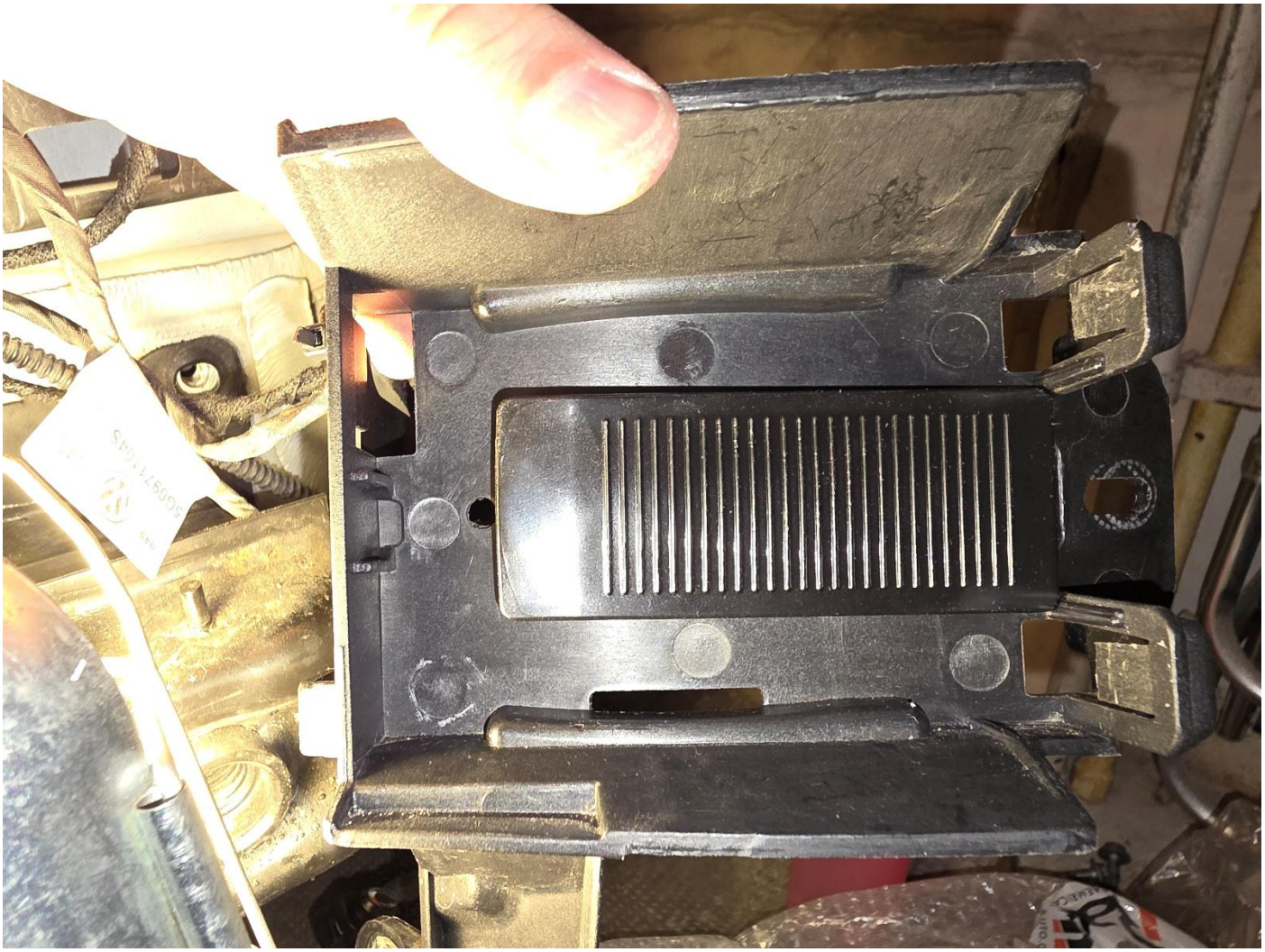
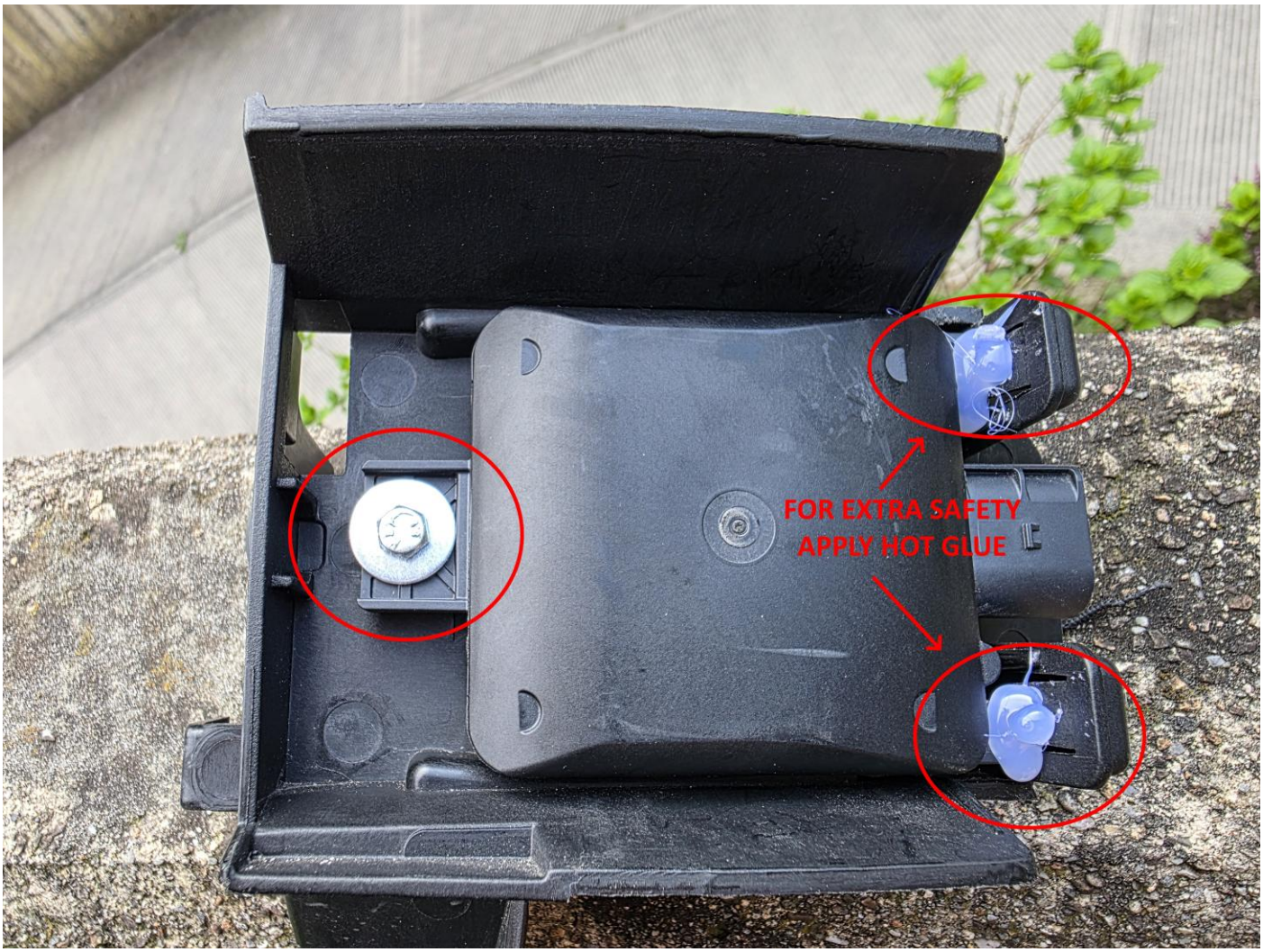
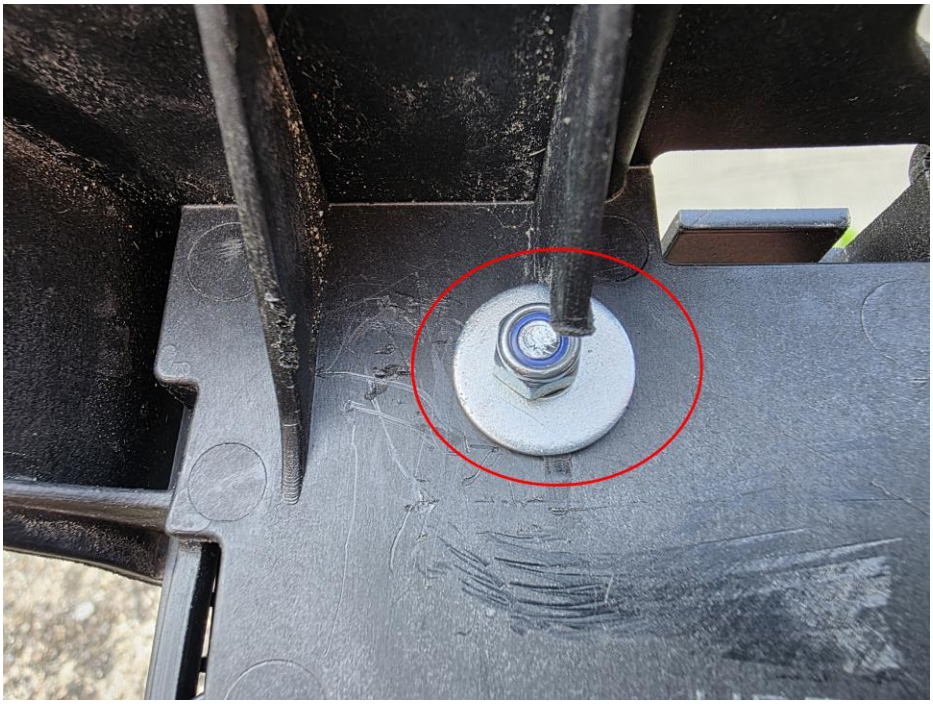
Stick with hot glue the wedge spacer on the bracket, the taller side should be on the same side where the control unit connector is located (opposite to the hole drilled)



Secure the 2Q0907XXX control unit with the M5 HEX bolt, 2 washers and a self-locking nut. For extra safety apply a little bit of hot glue (optional). If you have skipped the drill of a new hole, you can use hot glue to fix the control units to the spacer wedge.



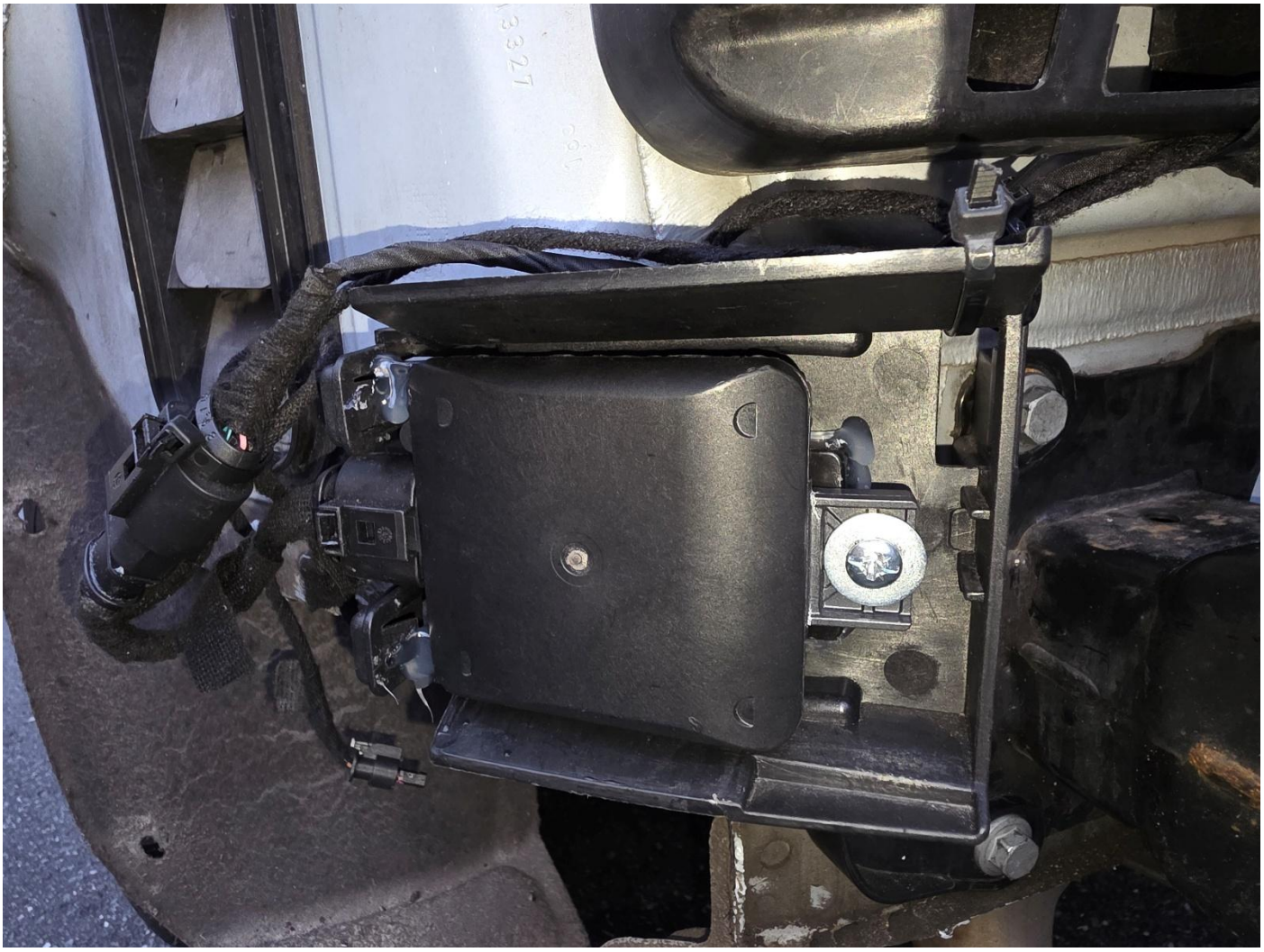


Final result

Right control unit (after installing the wedge spacer I replaced the original bolt with a longer one with a cross head)

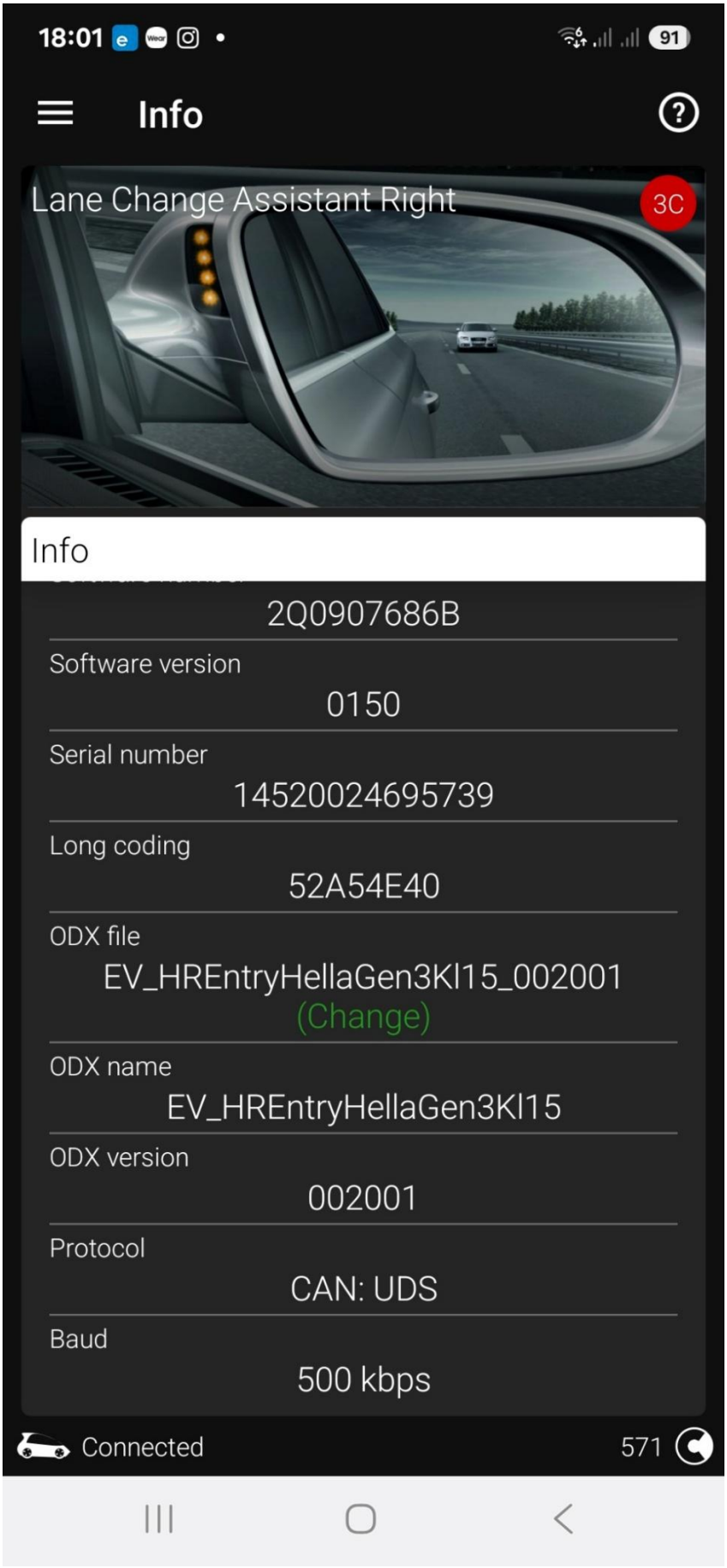
Right wedge spacer detail

Left control unit (after installing the wedge spacer I replaced the original bolt with a longer one with a cross head)



Left wedge spacer detail

Control unit correctly recognized in OBD11



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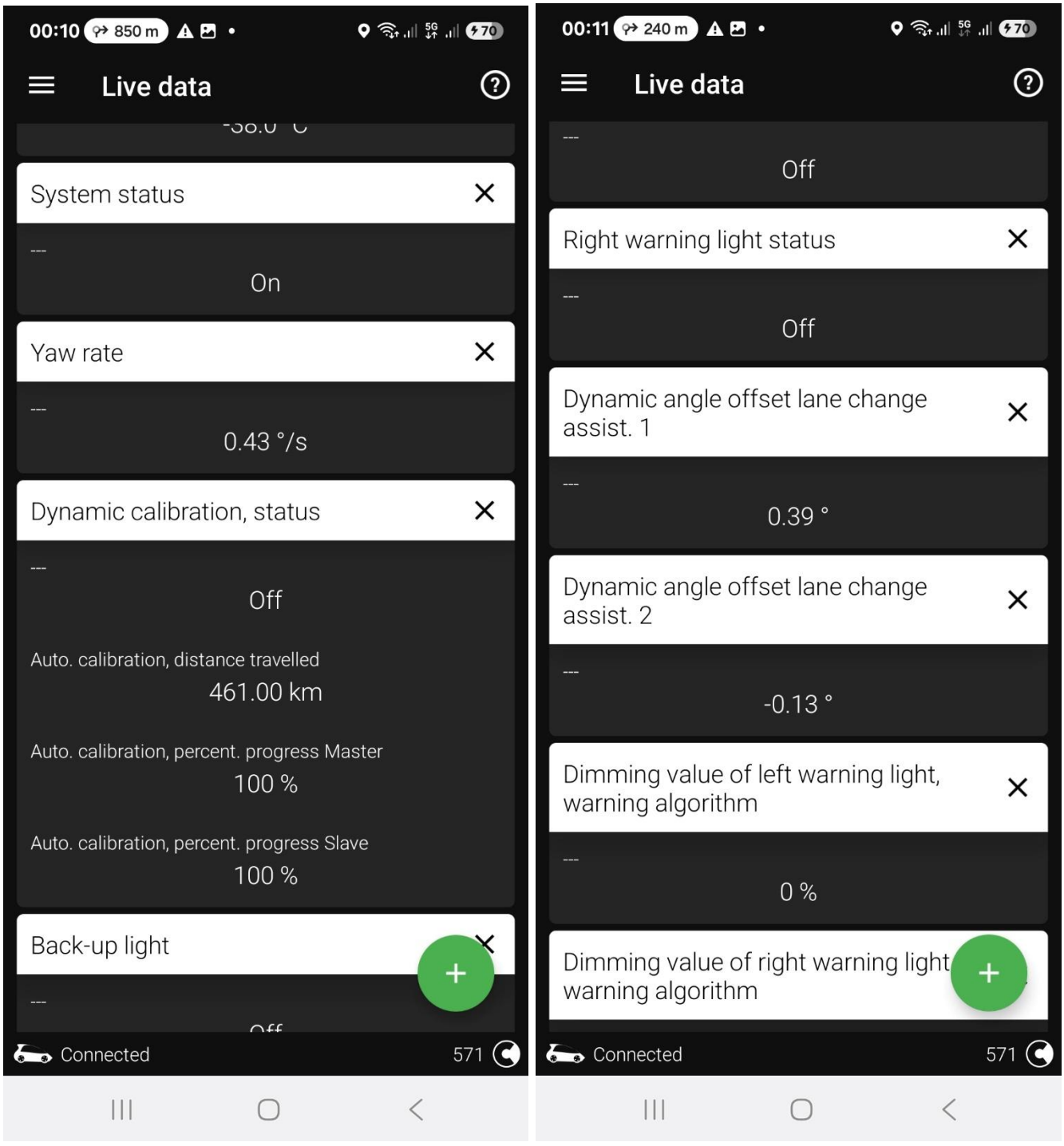
Live data from OBD11

I haven't received any dynamic calibration errors since almost 500 kms, however the angle of one control unit seems to be varying from this value up to 2.3 degrees (still acceptable), but I want to stabilize it by using the 3d printer spacer wedges which are more rigid than the PVC spacer bought at Leroy Merlin.



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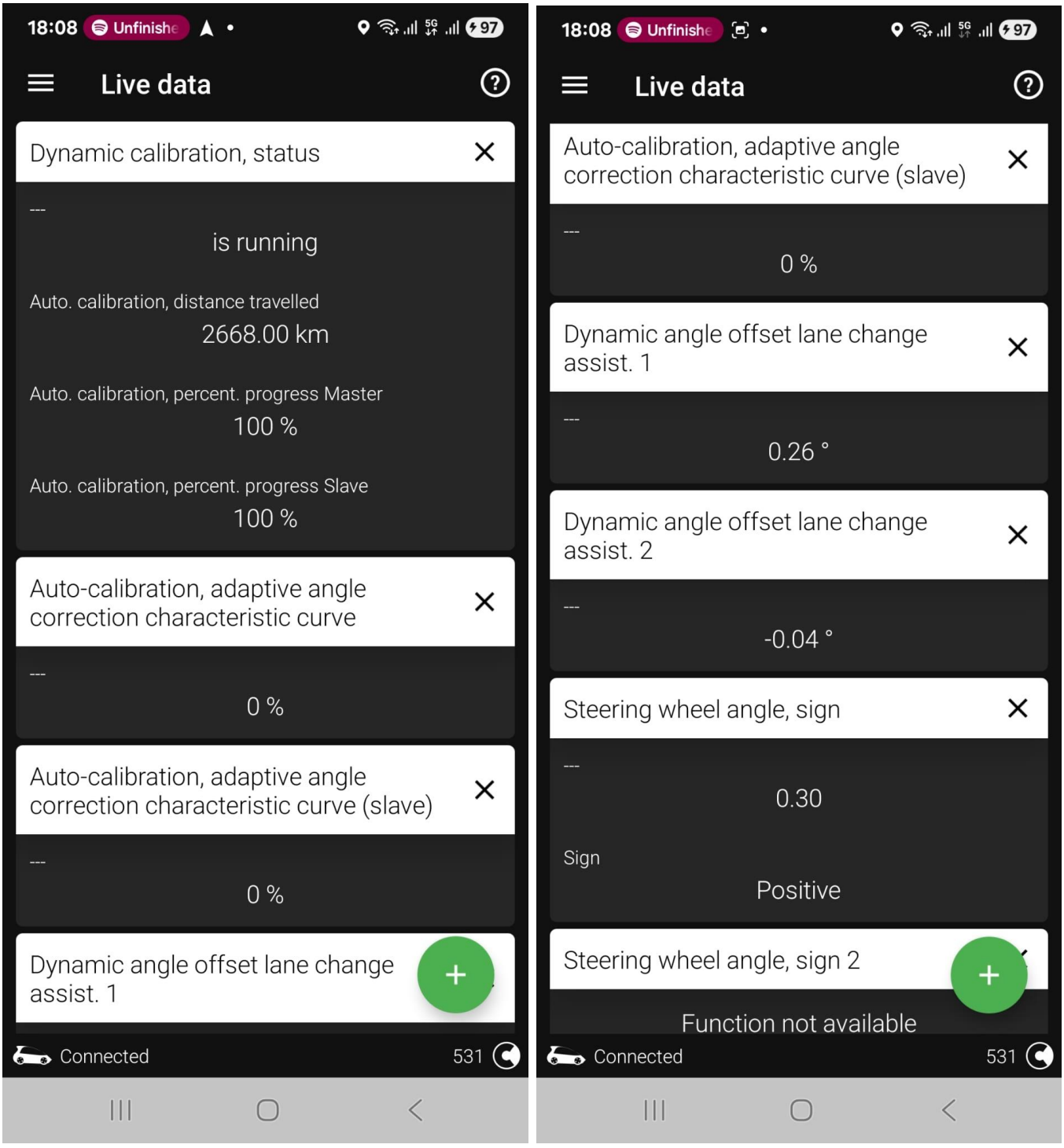
By replacing the Leroy Merlin spacer wedge with the 3d printed spacer wedge I designed on Thingiverse the things greatly improved and I haven't received any dynamic calibration errors after driving for more than 5000 km (the OBD 11 live data reports 2668 km because dynamic calibration does not happen every km you drive), the calibration angles of the two control units is almost perfect (0.26 and -0.04 degrees!). If you have another VW group car you realize an ad hoc spacer wedge by customizing the Thingiverse 3d model specifying any angle you need for your car (which you can understand from OBD11 live data).



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Quirks about parametrization

I just point out two quirks about the parametrization of the 2Q0907xxxB units

- The parameter file for these control units is not a plain XML file as other control units but it consists of a zip containing an XML file + a binary FRF file and you have to upload the whole zip in order to parametrize the control units otherwise it will always fail (due to this non-standard behaviour I spent almost two days in attempts in order to discover it, notwithstanding it was written on some forums).
- Moreover, the dataset file which needed to be upload changes according to the way the control units are mounted:
    - If both the control units connectors point to the inside of the car (e.g. towards the plate) use parameter files for VW Jetta, VW Passat, VW Golf, VW Polo Hatch
    - If both the connectors point to the outside of the car (like in my pictures above) use parameter files from Skoda Superb, Skoda Karoq, Skoda Fabia, VW Tiguan, Audi A1