

AUTOMATIC FRUNK REFRESHED MODEL 3

2021

INSTALLATION MANUAL



V. M3 FNK20-MkIII 00

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About this manual

Product

descriptions

All specifications and descriptions of the products in this installation guide were verified and checked at the time of writing and apply to the respective mentioned version. We reserve the right to make modifications and improvements to the products at any time.

Errors and inaccuracies

If you become aware of any errors or inaccuracies in this installation guide, or if you notice that some of the descriptions are not complete, please send your feedback to the following e-mail: **feedback@amptech.store**.

We are open to your recommendations and suggestions and are happy to receive them under the email.

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Safety

The automatic frunk was designed to enable the front hood (of the frunk) to be opened and closed comfortably and safely. However, as such, it does not replace the visual inspection. Therefore, always check before starting a journey whether your frunk is securely closed. In any case, the safety instructions mentioned in these instructions with the marking "⚠ATTENTION:..." must be observed. If the safety instructions are disregarded and the resulting damage to the AMPTech components or even vehicle parts, the warranty claim as well as any liability for damage or consequential damage expires through your own fault (see terms and conditions at www.amptech.store/agb/, V. liability). If you have any questions or problems with the frunk automation, please contact AMPTech on +49 176 64990890 or email support@amptech.store.

Specifications

Below you will find more information about the supplied components.

Lift arm specifications Lift

arms	
Maximum lift arm length	360 mm
Minimum lift arm length	112 mm
diameter	32 mm
Maximum working	700 N
Operating voltage	12 V DC
Operating	5 A
Operating temperature	-30° Celsius – 85° Celsius
protection	Static IP 67, in motion IP 65

Motor technical data for the Automatic Frunk

Motor for Automatic Frunk	
voltage	12 V DC
Operating	≤ 1.1 A
automatic torque	280 - 360 rpm
Blocking	≥ 4 Nm
Maximum current	20 A



Transmission	ratio 26.4
Acoustic emission	≤ 60 dB

Preparations

In order to be able to carry out the installation quickly, tools needed for the installation should be provided before beginning. The required tools are listed below.

List of tools required for installation

Tool	
Item	Designation
1	pliers
4	screwdriver
5	Plastic
7	Ratchet/cordless screwdriver
8	Socket wrench set/socket (10mm, 13mm socket attachment)
9	Cable tie/Velcro tape
10	Scissors
11	Insulating tape
12	material (e.g. aluminum butyl)
13	Flat-head screw (5.5-6.5)mm length



A standard tool box contains many of the tools required.

Please check the scope of delivery of the order before starting the installation.

List of the scope of

delivery	
Softclose	Designation
1	2 lifting arms
2	motor with lock device and emergency bowden cable
3	Control unit
4	Acoustic signal
5	Power adapter cable with fuse
6	2 cable harnesses
7	2 adapter plates for the lifting arms
8	3M adhesive strips (2x)
9	cable ties

After checking the scope of delivery and the provision of the tools, you can proceed to the installation guide.

Installation

Before proceeding to the removal of the inner lining, it is advisable to expose storage areas for the parts removed in the course of the installation. In addition, it is helpful to keep the clamps and screws that are removed sorted.

Removing the panel

- Remove the plastic trim facing the windshield. This is fastened with clamps and can be pulled off upwards (Figure 1).



Figure 1: Clamping the plastic cover

- Loosen the plastic cover over the ventilation by pulling on it with a jerk. The plastic cover is fixed at the edges with four clamps (Figure 2)



Figure 2: Clamps of the plastic

- Loosen the plastic cover over the lock fixed with 4 clamps and 3 lugs by pulling the cover upwards. Loosen the plug of the pushbutton (Figure 3) using a flat plastic tool or a slotted screwdriver. The plug is locked according to the barb principle



Figure 3: Clamping the lock cover

- You can now unscrew the plastic tub. This is fastened with seven screws (10 mm, hexagon). The screws are marked in Figure 4 and Figure 5.

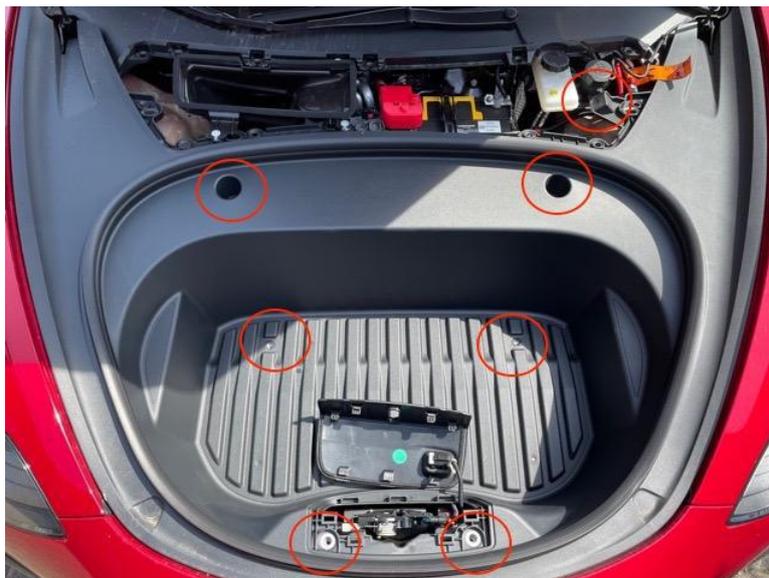


Figure 4: Screws on the tub lining

- The plastic tub is additionally clamped at the edges. Detach the tub by lifting slightly on the sides and then lift out the plastic tub (Figure 5)

WARNING

The clamps are fragile. So be careful when detaching the tub from the clamps.



Figure 5: Clamp on the edge of the plastic

Replace lifting arms

- Remove the lifting arms by levering the locking split pin with the slotted screwdriver and simultaneously pulling the respective end of the lifting arm by hand until the lifting arm releases at the attachment point (Figure 6)

Tip

If you loosen the cotter pin from its socket, you can press it back into its original position.



Figure 6: Levering the safety pin on the lift arm

 Tip

Loosen a lift arm and first attach the new lift arm to the lower attachment point. After the second lift arm is released at the top docking point, attach the first partially attached lift arm to the top docking point.

- Screw both adapter plates from the scope of delivery as far up as possible to the attachment points of the lifting arms in the front hood (Figure 7).

Use a 13mm nut attachment to loosen the nuts



Figure 7: Attaching the adapter plate for the lift arms (left),
Markings on the adapter plate (right)

- The adapter plates have markings that indicate the attachment position and direction. In figure 7 (right) you can see the symbols “L” and an arrow on the adapter plate. The “L” points to the **left side** of the vehicle in the direction of travel and the arrow points to the end of the adapter plate, which is screwed to the upper attachment point when the front hood is open. For both sides of the vehicle, the joint of the adapter plate points outwards when attached as described.
- The lifting arms for the Frunk automatic system are pressed against the ball of the ball bearing with the safety pin until they snap into place. The locking is noticeable by a "clicking noise". If necessary, the front hood must be held in position by a second person.

- Route the cables of the lift arms along the OEM¹ cables to the left-hand side of the frunk

Modify

- Mark the position of the lock unit so that it is attached to the same position after the modification (Figure 8)



Figure 8: Marking the lock

- Disconnect the plug on the left side of the lock in the direction of travel and loosen both hexagon screws (10 mm) (Figure 9). The lock assembly is



Figure 9: Plug and hex head

- Loosen the spring with needle-nose pliers (Figure 10) and remove it

¹ Original Equipment Manufacturer



Figure 10: Spring of the lock unit

- Tighten the nut and locknut on the motor end and Bowden cable end as shown in figure 12 and 13

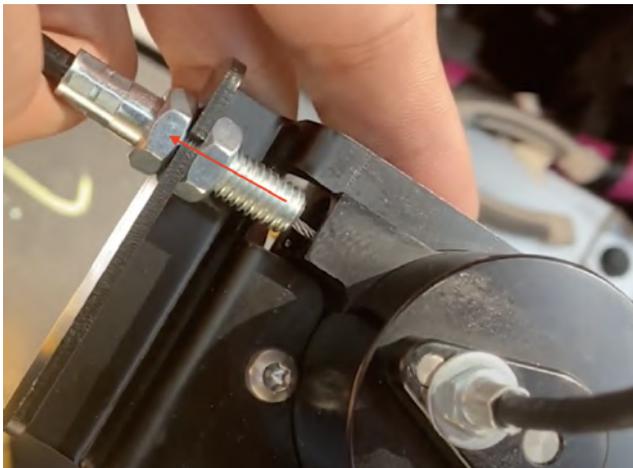


Figure 12 (left, motor end) and 13 (right, Bowden cable end): Fastening positions of nut and locknut

- Position the lock device behind the Tesla lock device and guide the end of the Bowden wire with the metal plate to the front of the Tesla lock device to the bracket. Press the bracket into the round hole of the metal plate (Figure 14).



Figure 14: Fixing the metal plate

- Clamp the spring back into its original position using needle-nose pliers. Make sure that the spring arm is clamped above the attached metal plate (Figure 15)



Figure 15: Clamping the spring again

ATTENTION

Ziehen Sie händisch die angebrachte Bowdenzug Vorrichtung nach unten und beobachten Sie, ob die Gleitschienen der Mikrotaster beim allmählichen Loslassen eingehakt und dadurch beschädigt werden können. Sollten sich die Gleitschienen an der Metallplatte eingehaken, biegen Sie die Gleitschienen am äußersten Ende so ein, dass die Metallplatte an den Schienen vorbei gleitet und diese nicht mehr eingehakt werden.

- Align both lock assemblies on top of each other and secure with both hex head screws. markings set at the beginning lock

 Tip

If the motor does not lock the lock, you can reduce the number of visible turns towards the Bowden cable head.

Bowden cable and control unit



Optional tip: To reduce the noise emission, encase the motor with Alubutyl. Make absolutely sure that the Bowden cable wire is not enclosed or touched by the Alubutyl!

- Attach the Bowden cable motor with the supplied 3M double-sided adhesive tape on the plastic surface (if possible on a flat surface) far down on the left side (Figure 16 and 17). Make sure that the Bowden cable is relaxed
- **Alternatively:** The Bowden cable motor can alternatively be screwed at the following point (Figure 19, right). To do this, use the pan-head screw and, before attaching it, screw a thread into the opening on the soft-close motor (Figure 18, left)



Figure 16 and 17: Attaching the Bowden cable



motor Figure 18 (left) and 19 (right): Attaching the soft-close motor

- **For the frunk automatic Spare Cable Kits:** Tie the yellow colored tab on the cable ties. To do this, use a plastic tool to pry the tow cap and loosen it. Pass the tab through the opening of the tow cap from the inside. Tie the tab to the cable with cable ties (Figure 20 and 21)
- Use 3M double-sided tape and cable ties to attach the control unit to the strut next to the battery (Figure 22)



Figure 20 and 21: Tow cap and attachment for Emergency bowden cable



Figure 22: Attaching the control unit

Wiring



Figure 23: Plug connection of the lock signal, micro button (on the left in the picture) and lock right in the picture)

- Connect the black-colored plug with gray locking pin to the connection for the lock signal (the original plug has already been disconnected, see Figure 10) and the Y-piece to the plug that has already been disconnected before.
- Connect the plug from which a turquoise cable comes off to the connector of the micro push button. The connector is located on the lock plate included in the package
- Connect the blue and black Y connectors of the harness for the clamping unit to the connector and terminal of the lock motor (Figure 23). The connections of the lock motor are located on the right-hand side in the direction of travel
- Connect the free connector of the clamping unit harness to the matching mating connector of the main harness.
- Connect the brown colored connector to the Bowden motor connector (Figure 24).



Figure 24: Brown Bowden

- Connect the connections of the lift arms to the mating connectors of the main wiring harness Connect
- the button to the connection in the cover of the closing unit (picture 3)
- Connect the acoustic signal generator to the red colored connector of the main wiring harness and fasten it under the black colored strut
- Insulate the remaining free onesconnector with insulating tape

 Tip

You can cover the acoustic signal generator with insulating material (e.g. felt or aluminum butyl) to reduce noise emissions.

Power supply

- To tap the voltage, connect the current adapter cable (Y-cable with fuse) with the forked cable lug to the positive pole of the battery. To do this, pull off the red-colored cover on the positive terminal and loosen the nut on the positive terminal. Slide the forked cable lug under the nut. Then fasten the nut (Figure 25).



Figure 25: Power adapter cable on battery

 CAUTION

Be careful not to cause a short circuit with the tool or other conductive materials.

- Use the spade cable lug on the main wiring harness to pick up the ground on a screw on the underside of the frunk (Figure 26)



Figure 26: Screw for picking

- Insert the flat connector sleeve on the main harness into the white-colored connector located on the power adapter cable. This must first be disconnected from its counterpart. After insertion, check whether the flat plug sleeve is locked in the plug by carefully pulling on the cables.
- Insulate the fuse and the white-colored plug on the power adapter cable with isotape.

- Tie excess lengths of cable together and secure to surrounding OEM cable bundles with cable ties or Velcro tape
- Connect the main harness to the control unit and lock the latch fuse in place

As soon as the power supply is connected and the main wiring harness is connected to the control unit, a signal tone sounds and the LED light of the control unit starts to flash. If the signal tone does not sound and the LED light does not flash, check the power supply to the control unit and the connection of the acoustic signal generator. The installation is now complete. Check again all plug connections and their fuses. Initialize the system and perform a system test before starting to dismantle the components. If you wish, you can also change the system settings and adapt them to your personal needs. Both the initialization and the system settings are described in the following chapter.



System test and system settings

Before you start dismantling, a function check with subsequent system initialization should be carried out. To check the functionality, lock the lock on the locking unit manually with a plastic lever or a screwdriver. Then connect the plug (Figure 3) of the button and press the button. The lock unlocks. The functional check is complete.

To initialize the system, press and hold the button on the control unit until you hear a beep. The system is now initialized. You can now close and open your front hood using the button, the multifunction display, the Tesla Key Fob or using the Tesla app.

The possible settings that can be made with the automatic frunk are described below.

- **Height Adjustments:** Manually position the front hood to the desired height, then press and hold the button on the control unit until a continuous beep is heard. This sounds after approx. 5 seconds. The beep signals that the set height has been saved. Carry out a system test by pressing the button once so that the front hood closes automatically and open the front hood using the multifunction display or the Tesla app
 - **Speed settings:** Open the front cover. You can access the speed settings by pressing and holding the button on the control unit. First, a long signal tone sounds and then two short signal tones in succession. When you release the button, the front hood closes at the lowest speed setting. In total, you can choose between five speed levels. The number of successive beeps indicates which speed level you are at. Only release the button when the desired speed level has been reached.
-

If the front cover does not close, you can reduce the number of visible windings. Reducing the number of windings results in a longer tightening of the front cover. Also check whether the closing lug on the front hood hits the lock when closing. The clamping unit can be adjusted horizontally so that the closing lug meets the lock vertically. In addition, the position of the front hood lug can be checked and, if necessary, adjusted accordingly using spacers.



Checklist

The following checklist will help you to quickly review all the steps and correct them if necessary.

Assembly of the components:

- The control unit is attached to the black-colored strut next to the battery with 3M adhesive strips/cable ties
- The motor is attached to a flat surface with 3M adhesive strips (on an alubutyl and coated with alubutyl) or screwed on
- The adapter plates for the lift arms are on the front hood like this mounted as high as possible
- The lift arms are locked
- The Bowden cable is routed correctly from the engine (no kinks) and is not tensioned
- The spring and the lock device are firmly attached to the lock and secured by the screws
- All plastic cladding is clamped
- on The lock can be opened using the button unlock
- Automatic Frunk sets with emergency bowden cable: The yellow-colored tab is tied to the cable of the tow

wiring and plug connections:

- Y-connector is lock and tight
- Y-connector is lock attached
- connector is connected
- The brownr is cable connected to
- The power supply is routed and the positive nut and ground screw are tightened and tight
- The spade terminal is locked in the white connector
- The fuse and white connector of the power adapter cable are insulated
- The lift arm connections are on the mating connectorswiring harnessBuzzer connected
- to main wiring harness and secured to
- to control unit and locking latch is locked
- All cables are tied to OEM wiring harnesses with velcro or zip ties
- Excess lengths of wiring are tied together and securely

Deconstruction

After you have performed the system test and made your desired settings, you can start dismantling the components.

- Tie excess cable lengths with cable ties and tie them in turn to existing cable bundles (preferably OEM cable bundles) or struts (Figure 27)



Figure 27: Cable routing and cable

- Disconnect the plug of the button from the cover.
- Align and replace the tub cover. Make sure that the plug of the pushbutton is passed through the front opening
- Make sure that the side clamps snap into place
- Tighten the tub cover with all seven screws
- Insert the plastic trim above the vent.
- Insert the plastic panels facing the windshield.
- Remove all the tools from the front trunk.



Software

update More up-to-date software can be loaded onto the central control unit at any time and will be provided by AMPTech. You can upload the software to the central control unit while your automatic frunk is in operation or you can connect the control unit to a 12V power source. In any case, the central control unit must be accessible for the software update. The software may include additional features or fix an issue caused by a Tesla software update.

When installed, first loosen the plastic covering on the windshield and remove the rubber stopper on the control unit. A 2 GB micro SD card is required for the software update (FAT32 formatting). Follow the instructions below to complete the software update.

Process:

1. Prepare a micro SD card (FAT32 formatting, 2-32 GB)
2. Copy the firmware onto the data medium on a computer
3. Make sure that the file on the data medium is named "update .yst"
4. Connect the controller to a 12V power source if not already operational
5. Wait for the
the memory card into the designated slot on the controller and wait for the update to complete

One fast blink: update is in progress (about 5 seconds)

Steady light : update is complete

7. Remove the memory card

The blinking starts again, confirming that the process was successfully completed.

Re-initialize your Automatic Frunk and test the closing and opening process. Reinstall the trim pieces.