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## FITTING INSTRUCTIONS

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### VERTICAL BRAKE



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*PRODUCT CODE → HT-PUSH / HT-PUSH ECO*

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We just remind you that you're installing a driving device for disable people, so this device will be essential for a life as normal as possible in full autonomy.

Sure of your comprehension, we're certain that you'll install our device with the maximum attention in order to guarantee a trustable and lasting use.

## **Summary**

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## **Introduction**

This device is supplied with a standard kit that can be easily adapted to various types of vehicle with automatic or manual gears.

The special position it is installed in makes it possible to maintain steering wheel adjustments and does not modify knee airbag operation (where present).

The device allows the driver to brake smoothly and effectively with minimum movements and effort.

## **Kit parts:**

- 1 brake lever (standard or ECO)
- 1 telescopic shaft
- 1 connecting pipe
- 1 connecting pin + M10 ball joint
- 1 lever fixing kit (standard)
- 1 brake pedal fixing kit (standard)
- 1 "PUSH" finishing plate

## **Small parts bag with:**

- 1 Teflon washer, Ø8mm
- 1 bolt, M10, galvanized, white
- 1 bolt, M8, galvanized, white
- 2 self-locking bolts, M8, galvanized, white
- 2 split washers, Ø8mm, galvanized, white
- 2 split washers, Ø6mm, galvanized, white
- 6 washers, Ø8x16mm, galvanized, white
- 2 washers, Ø8x16mm, galvanized, white
- 2 hex head screws M8x50mm, galvanized, white
- 2 hex head screws M8x16mm, galvanized, white
- 2 hex head screws M6x20mm, galvanized, white
- 2 countersunk screws M8x16mm, galvanized, white
- 2 hex head set screws with cone point, M4x6mm, burnished



## General installation instructions

For installation to be correct, you must carry out a series of operations in a precise manner.



**Disconnect the battery.**

### Assembling the brake lever supporting bracket.

Identify the position where the brake lever is to be installed, considering that this position must allow the driver's seat to slide completely along the original runners or in some cases, where necessary, partially limit its travel.

In addition, consider that there must be a space of about 6 or 7 cm between the knob at the end of the brake lever and the steering wheel, so that the driver's hand does not interfere with the lever while he/she is steering. This distance is valid for all steering wheel shapes (in the case of an adjustable steering wheel).

Example of correct positioning (Picture 1-2).



Picture 1



Picture 2



**In addition to the indications given, evaluating the requirements and usual driving habits of the user is very important when positioning the parts.**

After having found the correct position, the lever supporting bracket must be assembled. This can be done using the standard bracket kit that is supplied.

Remove the plastic parts of the vehicle gearstick console (if necessary).

The brackets in the supplied kit must be shaped, welded and/or screwed together (using the M8x16mm countersunk hex screws) so that they can be fixed to the original seat runners of the vehicle, as shown in Pictures 3 - 4 - 5.



Picture 3



Picture 4



Picture 5

Naturally, the fixing points must be particularly robust and must guarantee that the brake lever supporting bracket is fixed safely.

It is also advisable to fix the brackets in a manner that is as non-invasive as possible, namely without cutting the vehicle plastic and carpet if possible, but using the space in the area where both meet, as shown in Pictures 6 and 7.



Picture 6



Picture 7

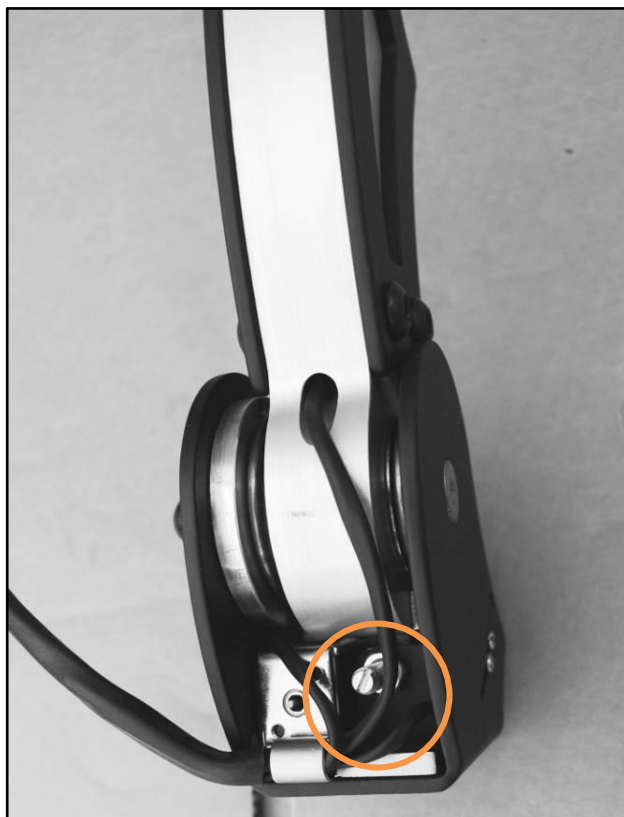
Before fixing the assembled bracket to the vehicle, drill a hole using a  $\text{Ø}7$  mm bit in the place where the brake lever is to be positioned and fixed.

### **Fixing the brake lever to the supporting bracket**

Position the brake lever on the supporting bracket and fix using the M6x20mm hex head screws together with the washers and split rings Ø6mm (Picture 8), tightening them on the M6 threads of the lever.



Picture 8



Picture 9

Adjust the M5 end stop regulator in the lower part of the lever, and position it correctly (Picture 9) according to the driver's needs and technical-functional requirements.

### **Assembling the brake lever fixing bracket**

This bracket connects the original brake pedal of the vehicle to the new brake lever by way of a telescopic rod, and it can be assembled using the standard kit that is supplied. It must be shaped so that the telescopic rod remains as close as possible to the plastic of the vehicle gearstick console, and in a manner that does not hinder foot movement between the accelerator pedal and the brake pedal while the vehicle is being driven by an able-bodied person.

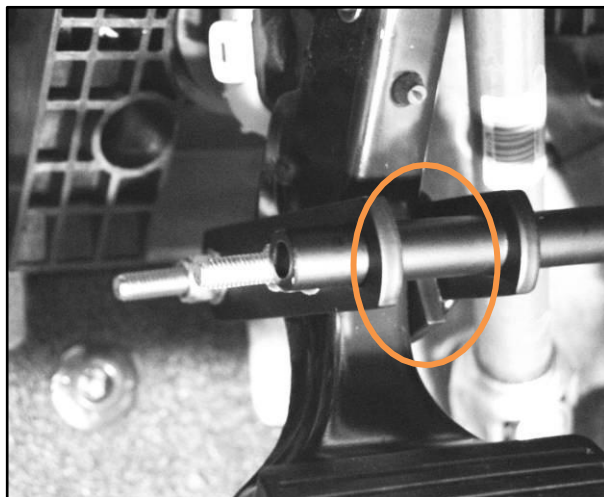
To fix it to the original brake pedal, tighten the new pedal between the two parts of the bracket using the M8x50mm hex head screws and respective Ø8mm washers and M8 self-locking nuts, without making holes in the original pedal.

The two parts of the bracket are connected to each other by the Ø15mm pipe supplied with the kit; the pipe, which has M10 threading at the end, holds the head of the telescopic rod.

Fix the Ø15mm pipe to the two parts by tightening the two M4x6mm threaded caps during the test phase and definitively welding it to the bracket parts that are to the right of the brake pedal (or to the left if the steering wheel is on the left).



Picture 10



Picture 11

When assembling this bracket, consider how the pedal moves as it brakes, and do not allow the bracket to collide with parts of the vehicle, for example plastic parts, accelerator pedal, etc. In addition, when assembling the bracket, consider that the brake pedal run can increase because of brake wear.

Apply the 30x25x5mm plate in the kit to the bracket to prevent rotation (Picture 11) while being pushed. As shown in Pictures 10 and 11, the bracket moves sideways, but it must not move more than 130/140mm from the pedal axis to prevent excessive pedal use and possibly dangerous situations.

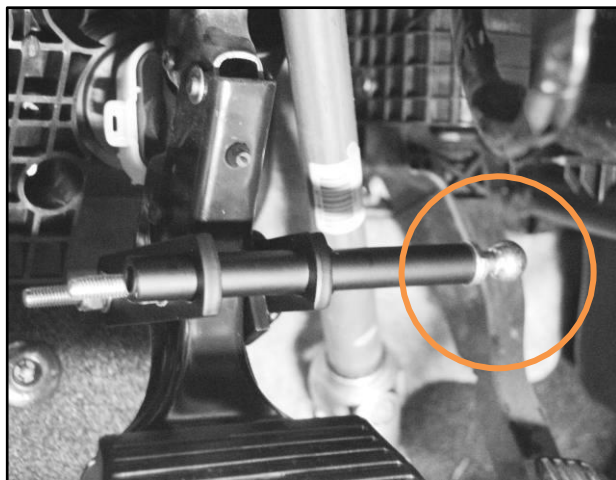


### **Positioning the telescopic rod that connects the brake lever and the fixing bracket to the pedal**

The kit includes an M10 ball joint (Picture 12).



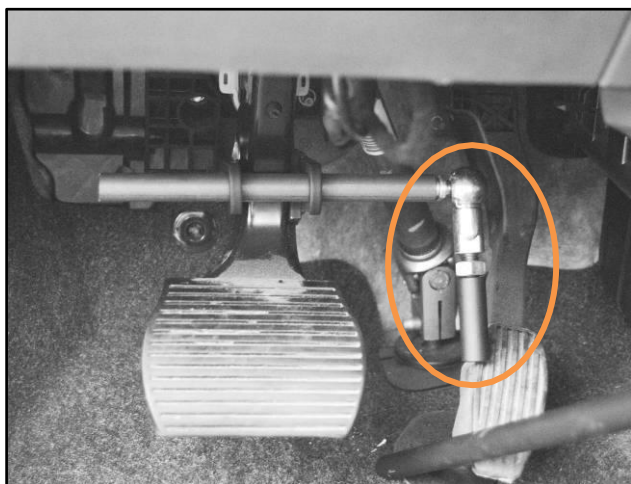
Picture 12



Picture 13

Remove the stop that binds the two parts of the joint, extract the spherical part with threaded rod and screw it into the M10 threaded hole that is present in the Ø15mm pipe of the previously assembled bracket (Picture 13).

The other part of the ball joint should be screwed onto the M10 threaded end of the connection, shown in Picture 14, while the rod is fixed to the other perforated and M8 threaded end of the connection. The pipe fixed to the brake lever should slide along the outside of the rod (Picture 15).



Picture 14

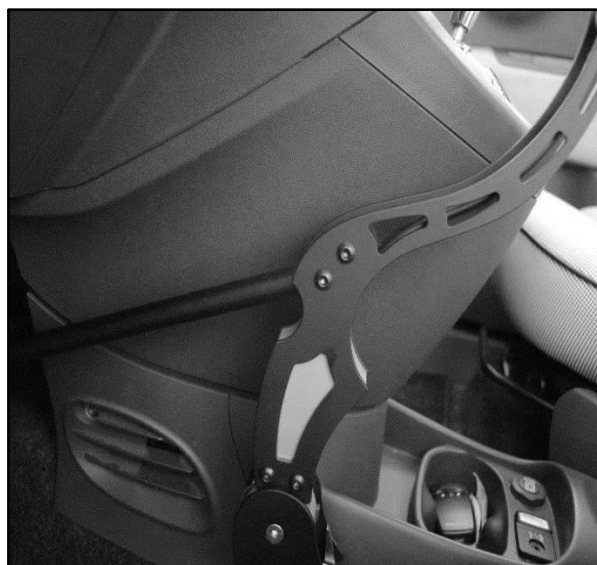


Picture 15

Both the rod and the pipe are longer than necessary therefore they must be cut to usable length as shown in Pictures 16 and 17. Remember that the rod must be about 40 mm shorter than the pipe.



Picture 16

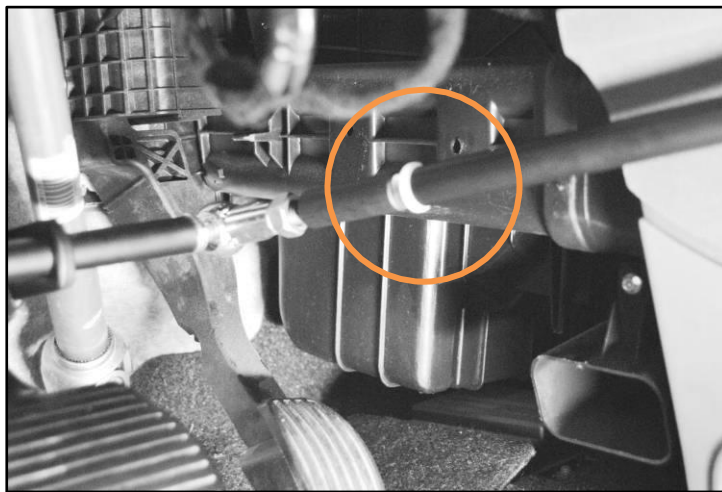


Picture 17

In some cases, to connect the brake lever and the brake pedal well, it may be necessary to move the position of the brake ball joint (Picture 18) by loosening the M6 nuts, removing the threaded cap and tightening everything in the required position.



Picture 18



Picture 19

Push the rod into the pipe, with the Teflon washer positioned as shown in Picture 19, and make sure that the rod slides freely inside the pipe, without any friction (the sliding movement can be heard when the vehicle is used by an able-bodied person).

Insert the telescopic rod ball joint into the spherical part fixed to the brake pedal fixing bracket and carry out an operation check while the vehicle is moving.

### **Functional verification**

During the operation check, make sure that the vehicle brakes well and that the assembled brackets do not bend excessively. In addition, there must be a distance of at least 30-40 mm between the brake lever and the dashboard when braking in a marked manner, with the lever being at the end of its run. This space is necessary for guaranteeing braking even if the brakes are worn.

### **Painting the assembled brackets**

If the functional check gives a satisfactory result, dismantle the various components and paint the brackets, after having checked the various welds.

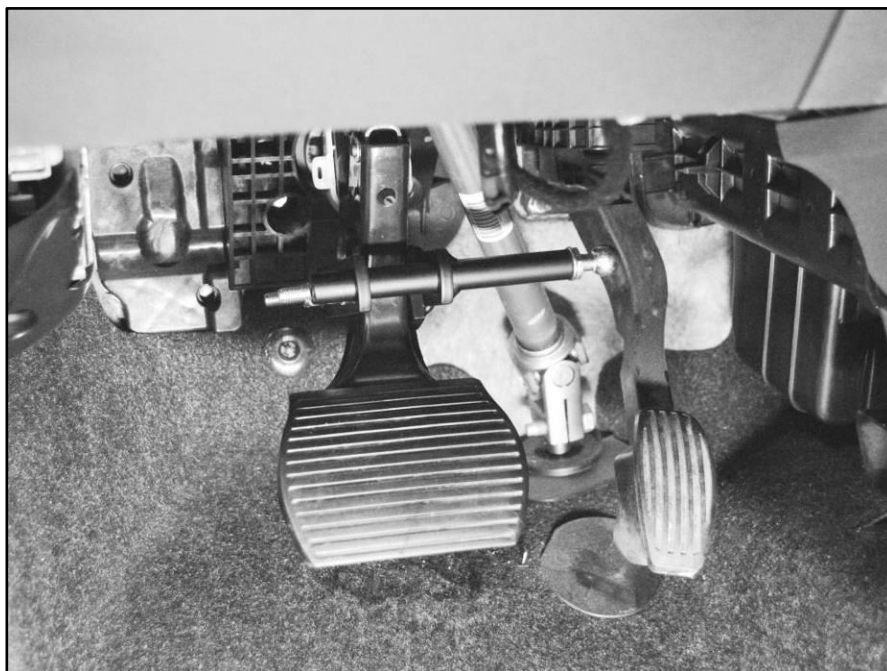
We advise eliminating any burrs and rounding any sharp edges; wash them carefully with degreasing liquid, treat with rust preventer and paint them opaque black, as close to the colour of the lever as possible.

### **Final installation**

Re-position the two brackets, carefully tightening the various nuts and bolts (Picture 20 and 21)



Picture 20



Picture 21

Fix the brake lever to the supporting bracket, tightening the two M6x20mm hex head screws (Picture 22 – 23).



Picture 22

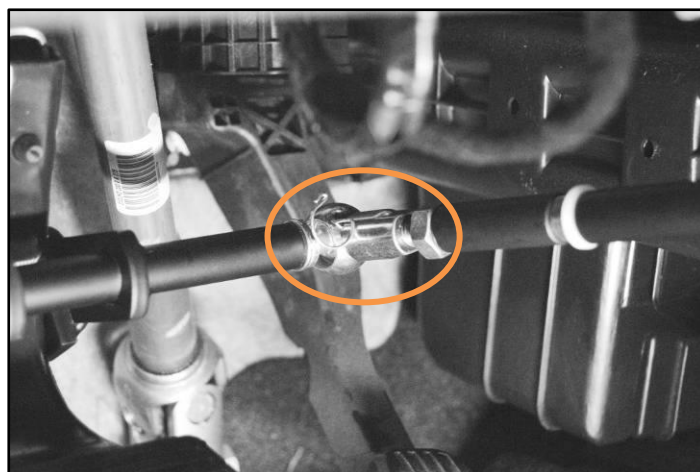


Picture 23

Fix the connecting telescopic rod between the bracket applied to the pedal and the brake lever, screwing the pipe into the ball joint on the lever in order to fix the internally sliding rod to the connection (do not forget to add and lubricate the Teflon washer). On the opposite side of the connection, the ball joint is inserted into the sphere (use thread-locking fluid to tighten the sphere) as shown in Picture 24; remember to insert the safety stop as shown in Picture 25 and rotate it to lock it in position definitively.



Picture 24

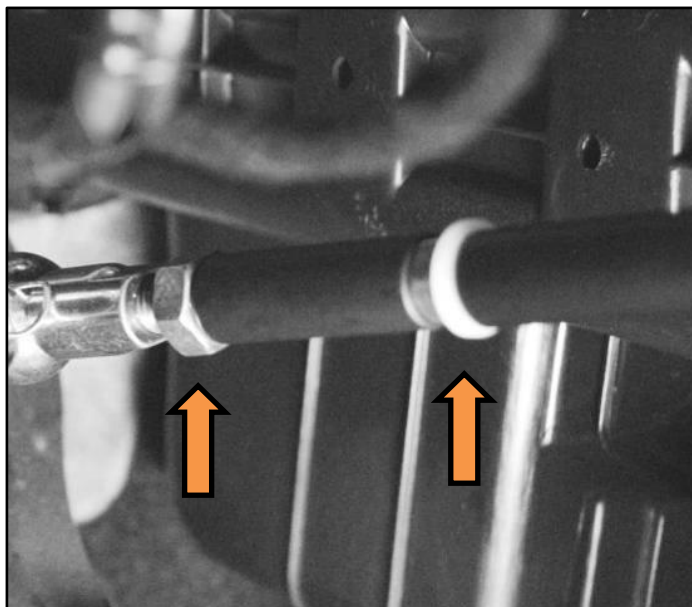


Picture 25

At this point carry out a brake test; if the lever, before it pushes the telescopic rod, shows any slack, even if only a few millimetres, it must be eliminated by adjusting the rod or the brake lever end stop (as described previously on page 6).

To adjust, work on the joint between the telescopic shaft and the ball joint until the slack has been eliminated; after adjusting, tighten the two nuts (M10 against the ball joint and M8 against the connection as shown in Picture 27).

(To rotate the head remove it from the spherical part).



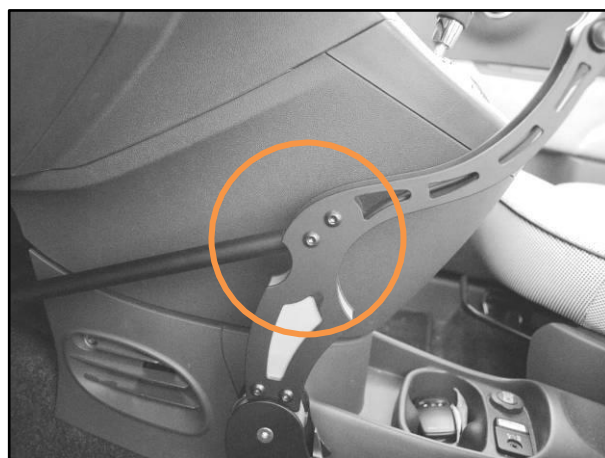
Picture 27

If you had to push the brake pedal forward gently to install the shaft, do not remove the slack but adjust the shaft instead. To do this, reduce the lever pressure on the brake pedal shaft using the two previously described adjustment options.

The pipe that forms the telescopic shaft is screwed into the M10 ball joint fixed to the brake lever, as shown in Pictures 28-29.



Picture 28



Picture 29



**When fixing, it is important to insert strong thread-locking fluid and screw the pipe fully into the ball joint.**

At this point the whole system has been fixed, therefore test it while the vehicle is moving. Check for possible slack, bends and the tightness of the various parts.

### **Electrical connections**

The system has an electric brake drum controlled by the red push button positioned near the lever knob, and by a black push button that is connected to the vehicle horn (not present in the ECO version).

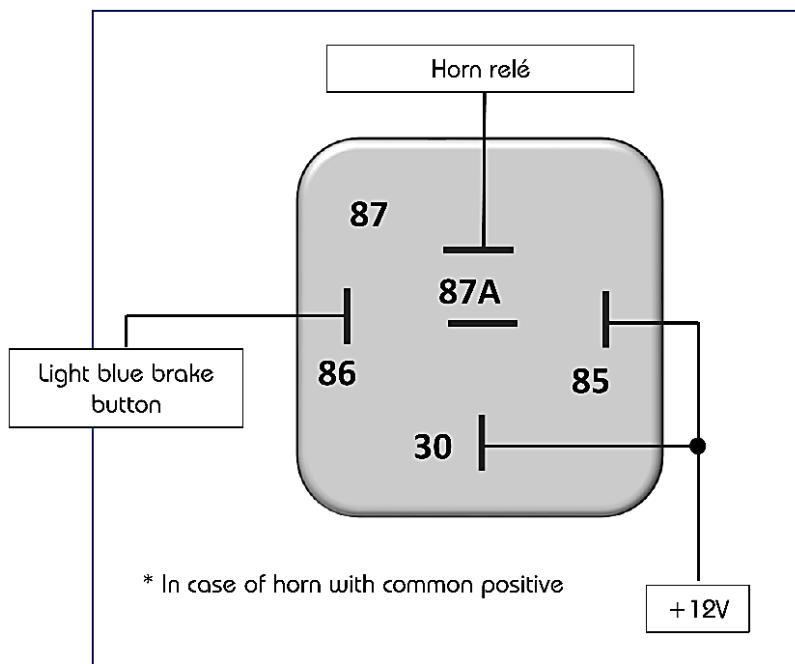
(Picture 30).



Picture 30

A double insulated cable exits from the brake lever; inside it there are 5 wires of different colours as indicated below.

***HT PUSH / HT PUSH ECO***



- **Black wire (not present in the ECO version):** connect to the vehicle ground
- **Red wire:** connect to the 12 Volt ignition, inserting a 5 Amp fuse (if possible use the free positions in the fuse block; if there are no free positions use an external block (not supplied)).
- **Blue wire (not present in the ECO version)** to be connected to the cable that powers the horn control relay; this signal is negative, therefore should the relay be powered with a positive signal (which occurs on extremely rare occasions), a small electrical system made up of a relay must be assembled to activate the horn as shown in the drawing\*



The blue cable has a very small section, therefore it can only be used to activate the horn control relay and not to directly control the horn. If the horn has to be controlled directly, an interposing control relay must be added.

- **Green wire:** connect to the brown/red wire or brown/white of the accelerator control unit (HT- SPEED DOWN / HT-SPEED UP / HT-TOUCH EVO)
- **White wire:** connect to the brown wire of the accelerator control unit (HT- SPEED DOWN / HT-SPEED UP / HT-TOUCH EVO)

Run the cable exiting from the brake lever below the plastic parts that cover the gearstick console and below the dashboard, connecting it to the connection points of the original system of the vehicle. Do not allow it to come into contact with moving mechanical parts.

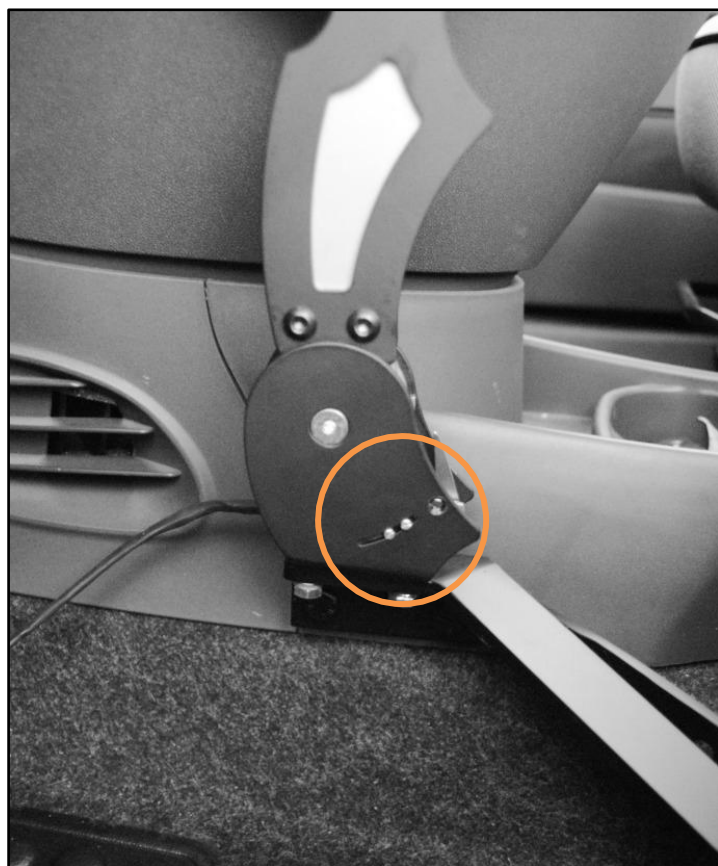
The connection points must be proofed and protected with some heat shrink tubing and also fixed along their run using plastic strips.

Make sure the horn is working correctly by pressing the black push button.

Make sure the brake drum is working correctly, better if the vehicle is moving. Push the lever forward and press the red push button, then release first the lever and then the push button. The electromagnet that blocks the lever activates. After this, push the lever forward and make sure it is released when returning to the home position.

After carrying out these checks, adjust the microswitch on the lower part of the lever which disables acceleration.

Adjust by loosening the two M2 screws that connect it to the brake lever support (Picture 31) and making it slide in the slots; use a flat-blade screwdriver.



Picture 31

It is advisable to adjust the microswitch so that acceleration disables during the final phase of braking; in this manner the user can manage uphill starts (simulating departure with the handbrake) at best.



Tighten the two M2 screws when you have finished adjusting and fix the finishing plate, positioning it and then fixing it with the M3 countersunk screw. (Picture 32).



Picture 32



Picture 33

Remove the film on the double-sided tape and fix the finishing plate, after having cleaned the surface carefully (Picture 33).

Very carefully re-assemble the previously removed plastic parts and also any other parts. Should it be necessary, shape these parts to allow the assembled brackets to pass through.

Definitively connect the battery and repeat the system operation check, both with the vehicle stopped and during a test run.

### What to do if...

1. After starting the motor, the brake lever is in a particularly forward position and is very hard to push.

Make sure the lever has not remained blocked by mistake: if it has, release it.  
Check the integrity of the electrical system and the 5 Amp protection fuse.

If the problem continues, the brake drum mechanism may be blocked. The hooking pin can be seen partially in the lower part of the lever, behind the casing (Picture 34); try to release it with a small screwdriver.

Make sure the spring returns correctly towards the steel hook that is controlled by the electromagnet; the system will not work if the spring does not return or if the spring has yielded, therefore try to fix it. Lubricating the sliding parts may be sufficient.



Picture 34

2. The brake drum does not hook when the red key is pressed

There may be a problem with the brake drum electrical system, and there are two possible solutions:

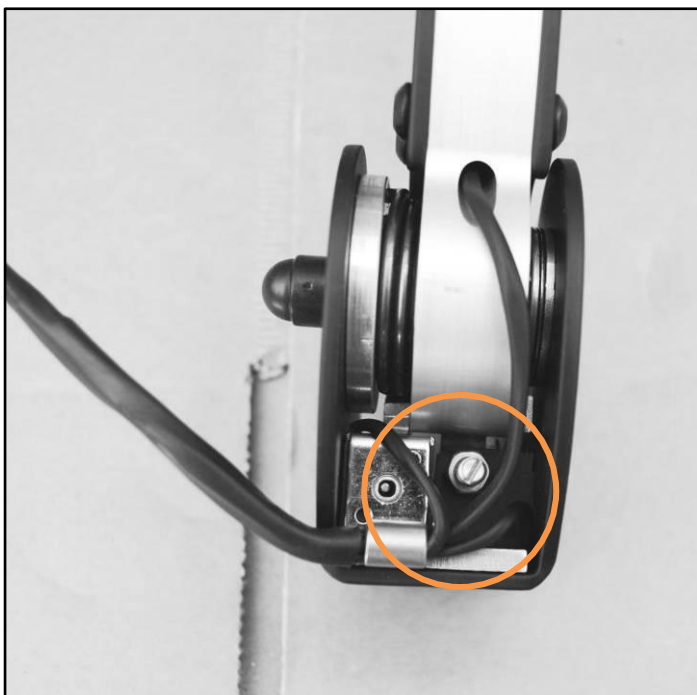
- Check the integrity of the electrical system and the 5 Amp protection fuse.
- Make sure the hooking system and the electromagnet are sliding and moving correctly; adjust them if necessary or simply lubricate the parts.

3. The horn does not sound when the black key is pressed

Check the integrity of the original fuse in the vehicle, if necessary, replace it with one of the same amperage; also check the integrity of the electrical system.

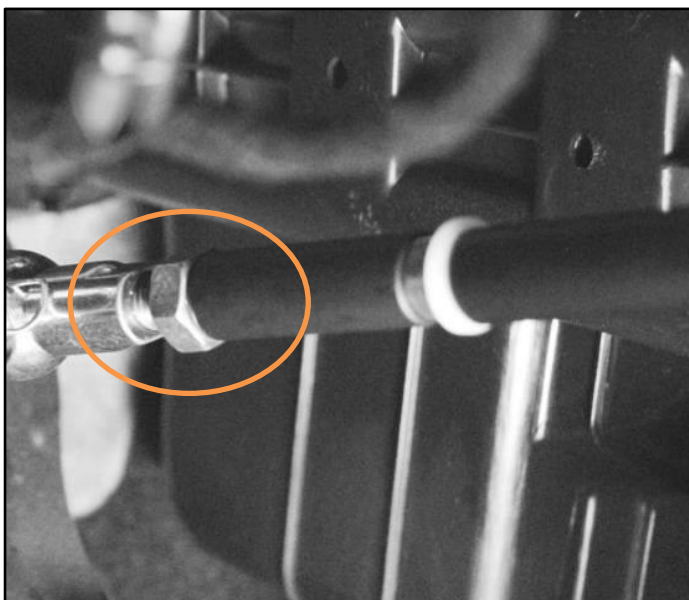
4. The brake lever carries out an idle stroke from its home position when used

- Check if the lever has cleared its end stop (Picture 35), and if necessary, adjust the M5 pin.



Picture 35

- A possible solution for solving this problem is to loosen the M10 bolt on the pipe connected to the telescopic shaft, rotate the head counter-clockwise and tighten the M10 bolt (Picture 36).



Picture 36



If your system has a problem that is not listed, you must contact Handytech - Carrozzeria 71 s.r.l.

## MAINTENANCE ONLY TO BE CARRIED OUT IN AUTHORISED HANDYTECH CENTRES

### **First check: Km. 1.500**

- Check if the horn is working.
- Check brake drum operation
- Check the tightness of the various parts and if there is any irregular allowance
- Make sure the lever rotates on its pin correctly
- Check the ball joints at the ends of the telescopic shaft and lubricate them.
- Check how the telescopic shaft slides and lubricate it
- Make sure braking is correct, and adjust if necessary.
- **Check vehicle operation as it is moving.**

### **Subsequent checks**

#### **KM. 25,000 (or after 8 months)**

- Repeat the checks carried out at 1500 km.
- **Check vehicle operation as it is moving.**

#### **KM. 50,000 (or after 16 months)**

- Repeat the checks carried out at 1500 km.
- In some cases of wear it is advisable to replace the ball joint that connects the telescopic shaft to the brake pedal.
- **Check vehicle operation as it is moving.**

#### **KM. 75,000 (or 24 months)**

- Repeat the checks carried out at 1500 km.
- **Check vehicle operation as it is moving.**

#### **KM. 100,00 - 125,000 - 150,000 or at least once a year**

- Repeat the checks carried out at 1500 km.
- It is advisable to check the conditions of the parts that are subject to wear (heads, sliding shafts, etc.), and replace them if necessary.
- **Check vehicle operation as it is moving.**

#### **KM. 175,000 km or above**

- Repeat the checks carried out at 1500 km.
- It is also advisable, together with CARROZZERIA 71 S.r.l., to check the system state and substitute any parts that need to be replaced.
- **Check vehicle operation as it is moving.**

### **PAY ATTENTION:**

After 2 years it is advisable, together with CARROZZERIA 71 S.r.l., to check the system state and substitute any parts that need to be replaced.

Unfortunately, when the guarantee ends the maintenance programme is at your discretion, but our advice is to follow it scrupulously because neglect can cause system faults, problems and create dangerous situations while driving. The device maintenance interventions, both when covered by guarantee and not, are at the full charge of the client.

**WARRANTY: 24 MONTHS OR 80,000 KM**

## SPARE PARTS (only for standard HT-PUSH)

Code	Description	Quantity
HT-FRV/R-01	Ball joint M10 (lever)	1
HT-FRV/R-02	Angular ball joint M10 (brake rod)	1
HT-FRV/R-03	Electromagnet	1
HT-FRV/R-04	Steel hooking pin (brake drum)	1
HT-FRV/R-05	Partial steel hooking pin (brake drum)	1
HT-FRV/R-06	Return spring (brake drum)	1
HT-FRV/R-07	Bushing made of synthetic material	1
HT-FRV/R-08	Aluminium block with push buttons	1
HT-FRV/R-09	Knob covered in BLACK leather	1
HT-FRV/R-10	Knob covered in BEIGE leather	1
HT-FRV/R-11	Knob covered in GREY leather	1
HT-FRV/R-12	Knob covered in DARK GREY leather	1
HT-FRV/R-13	Telescopic shaft equipped with threaded rod Ø8mm + threaded pipe M10	1
HT-FRV/R-14	Telescopic shaft connection	1
HT-FRV/R-15	Sheet finishing plate (lever)	1
HT-FRV/R-16	Lever and brake pedal fixing kit (standard)	1
HT-FRV/R-17	"BLACK" plastic plate	1
HT-FRV/R-18	"SILVER" plastic plate	1
HT-FRV/R-19	Microswitch for accelerator disabling	1