ebrake

Electrical Handbrake

INSTALLATION GUIDE

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The ebrake Installation Guide

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1. Introduction

The ebrake is a patented (Patent No 14/60245.8), bolt-on accessory designed to fit directly on RV's built on Al-Ko chassis from model year 2007 and onwards. With the use of the adaptor kit, it will also fit on most Fiat chassis. Even though the installation details might vary slightly between different vehicle models, the principal of the installation remains the same, and this guide should therefore be adequate for all models.

Safety Notes

- Although the installation is very straight forward, the ebrake must be installed by a professional RV technician for safety reasons.

- The ebrake does NOT replace the original manual hand brake, but acts as an additional method of applying the parking brake.

2. Preparation

2.1 Unpacking and checking of parts.

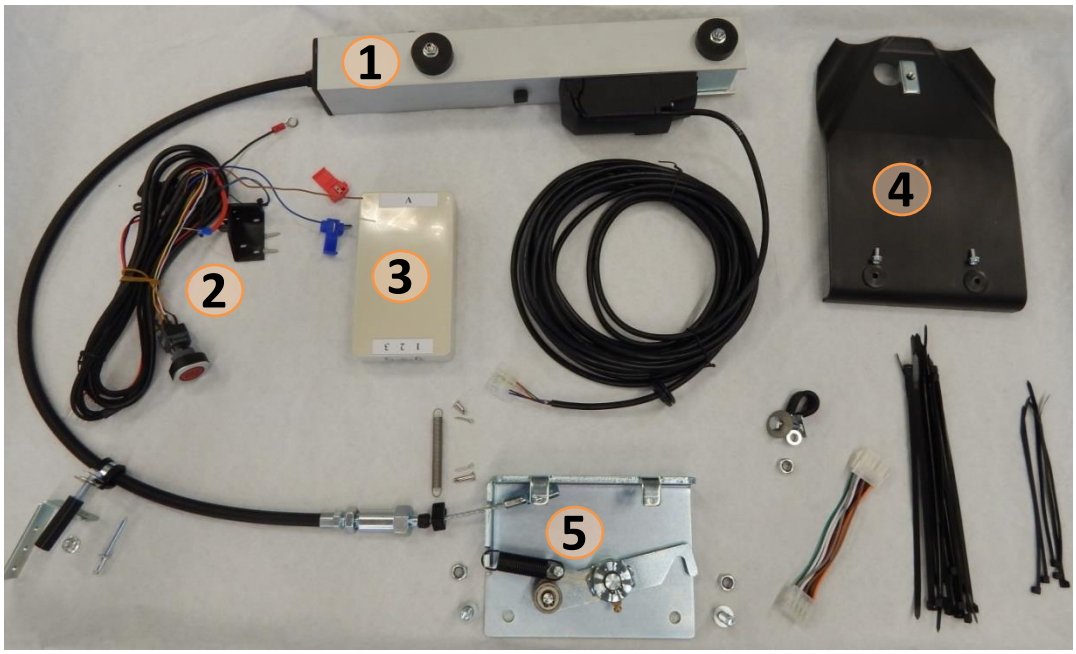
Start with unpacking the kit and check that all parts are present and free from damage.
Refer to the picture and parts listing below. Should any part be missing or damaged, please contact the distributor.

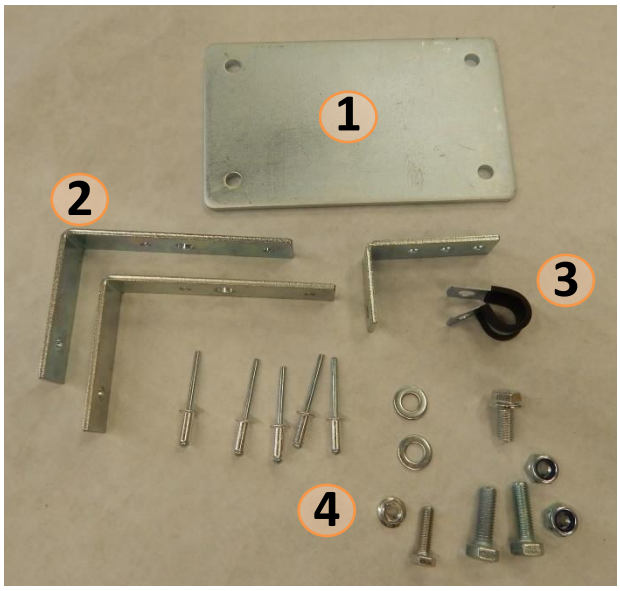
Left:
The Complete Kit as it comes in a box

Below:
The Complete Kit unpacked

Main Components;

1. **Electric Actuator**
2. **Wiring harness with Push button and Brake pedal switch**
3. **Control Box**
4. **Plastic Cover**
5. **Lever Arm Assembly**





Left:
Additional Mounting hardware to be used when mounting on a Fiat chassis.

1. **Extension plate**
2. **Actuator Mounting brackets**
3. **Wire Support**
4. **Additional Fasteners**

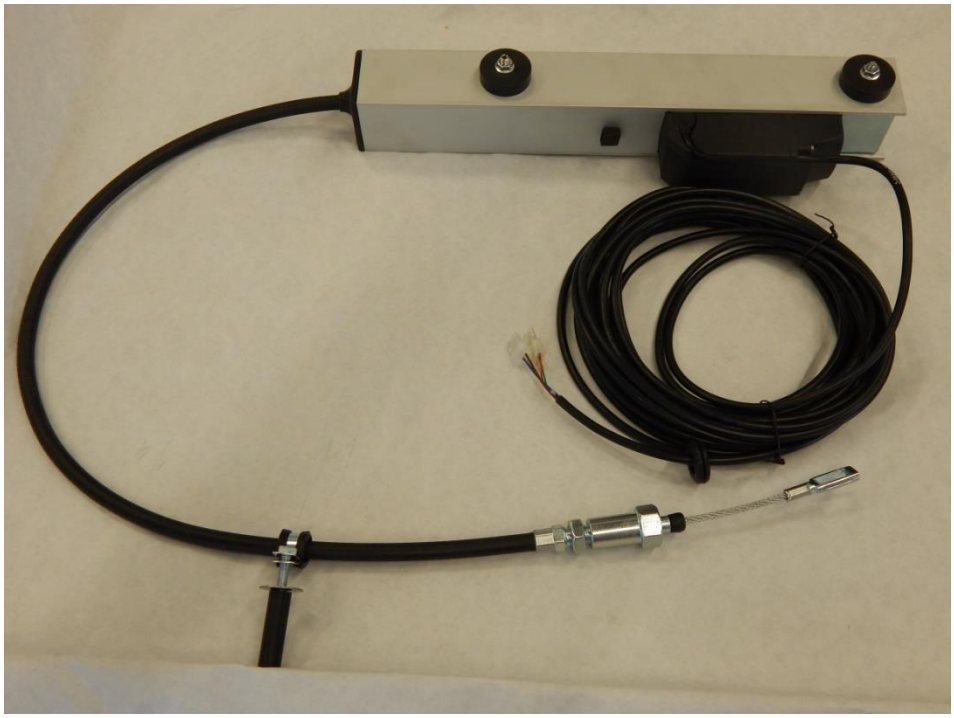
3. System Description

The ebrake consists of the following main components;

- Electro-mechanical actuator
- Lever system
- Electronic control box
- Activation push-button
- Wire harness

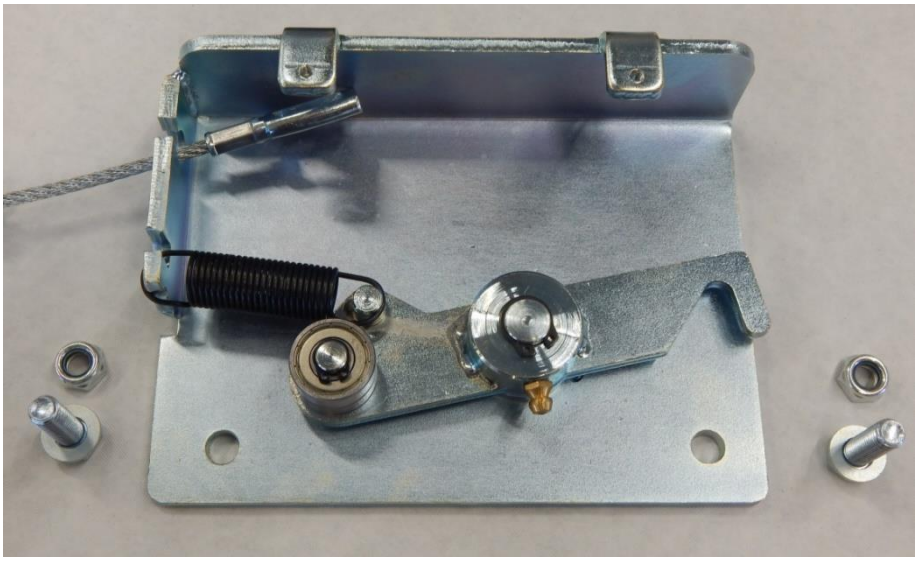
Below is a brief description of each component

3.1 The Actuator



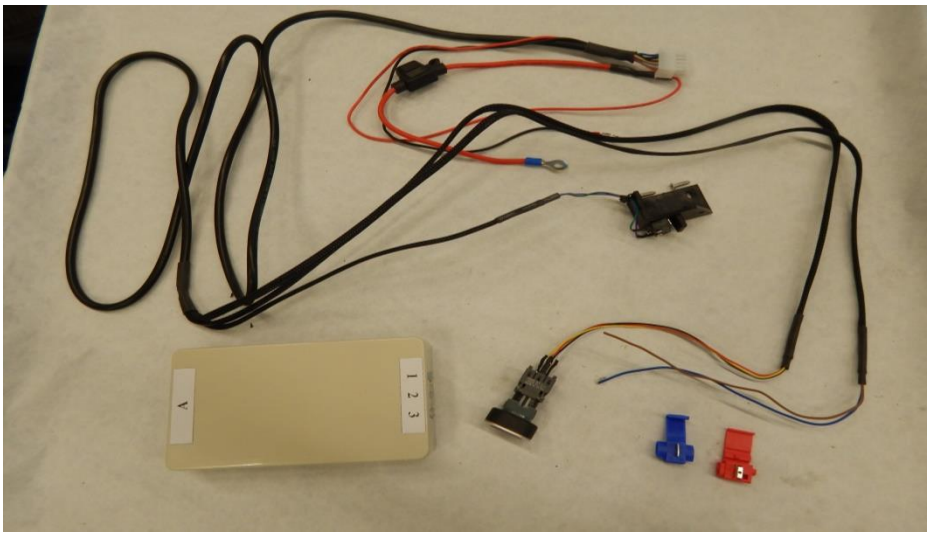
The actuator, shown above, is the main component of the ebrake system. It's made up of an electric motor connected to a wire rope. The end of the wire rope is fitted with an eyelet, which hooks on to a lever arm.

3.2 The Lever arm assembly



The lever arm assembly consists of a lever mounted on a metal plate. The lever transfers the motion of the actuator and has a bearing roller which pushes on the original handbrake of the vehicle.

3.3 Electronic Control box with associated wiring harness

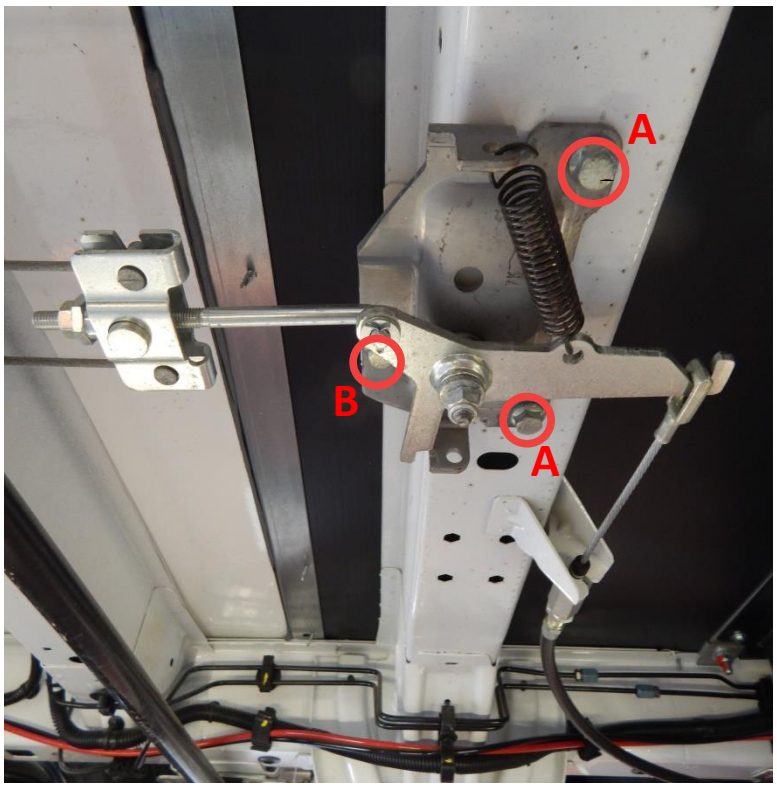


The control box receives the signals from the ebrake activation switch, the ebrake brake pedal switch, the ignition and the brake light and outputs power to control the actuator. The wiring harness connects the control box to the switches and to vehicle 12V power.

4. Installation

4.1 Mechanical installation

4.1.1 Lever arm assembly mounting

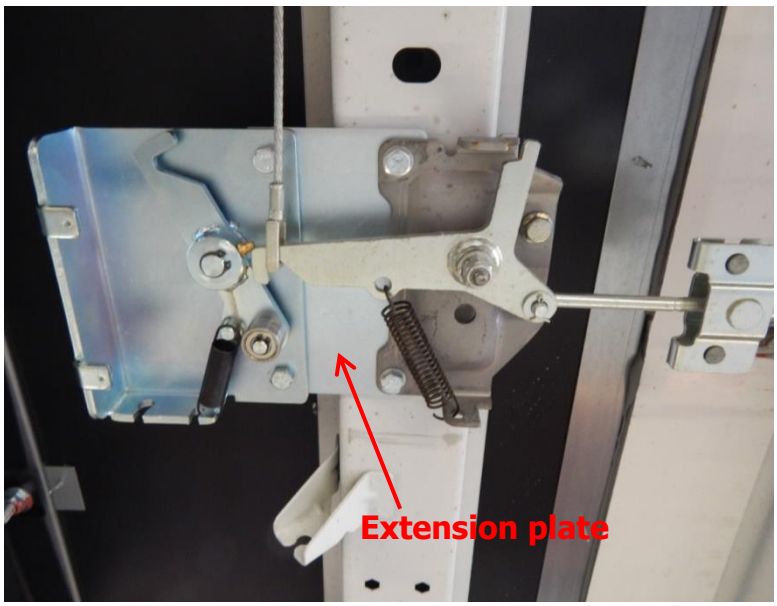


Locate the original handbrake lever assembly underneath the vehicle.

Make sure that the handbrake is released so there is no tension on the wires before start working on it.

Unscrew to two front 8 mm bolts marked "A" completely, and loosen the rear 8 mm bolt marked "B" on the picture.

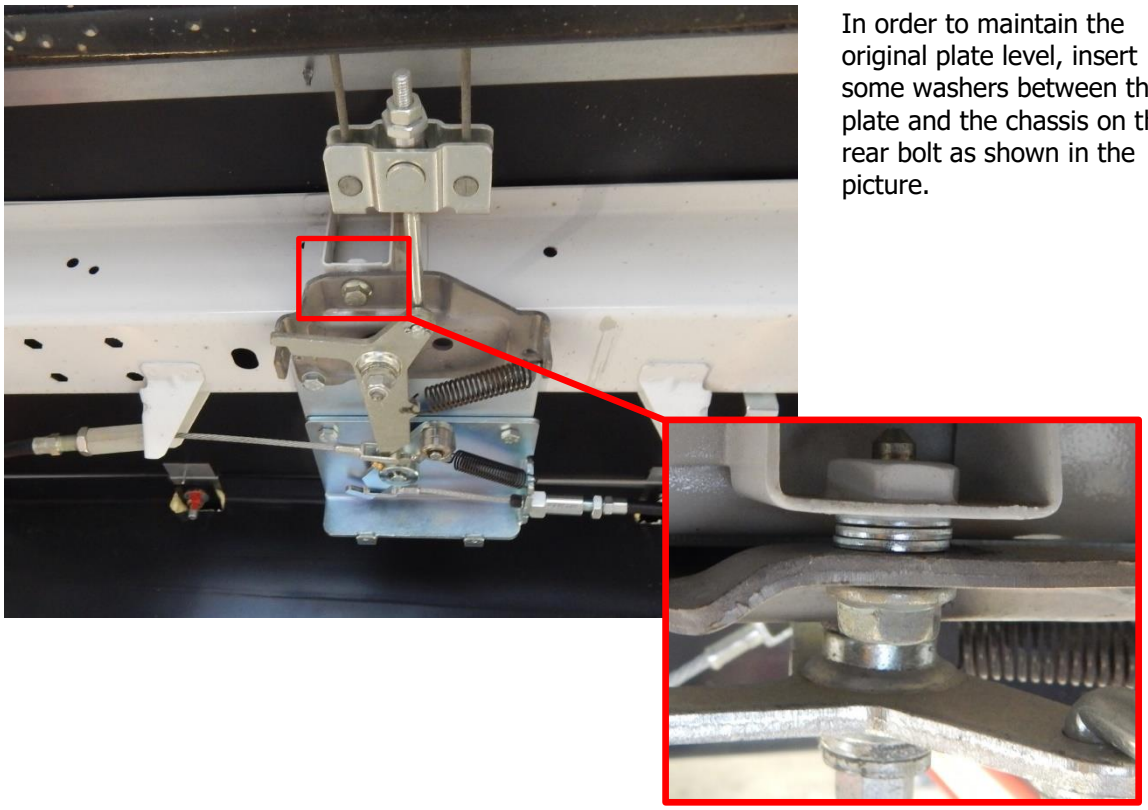
(The picture shows a Fiat chassis, Al-Ko chassis might be slightly different)



Mount the new lever arm assembly underneath the original as shown in the picture.

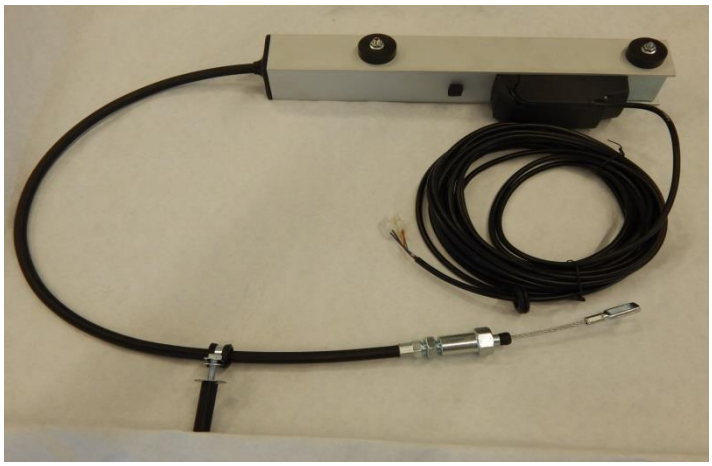
Use the longer 8mm bolts supplied in the kit as the original bolts might not be long enough.

When mounting on a Fiat chassis, use the extension plate supplied in the Fiat kit. (The picture shows the mounting on a Fiat chassis with the extension plate used)



In order to maintain the original plate level, insert some washers between the plate and the chassis on the rear bolt as shown in the picture.

4.1.2 Actuator assembly mounting



The Actuator is normally mounted on one of the chassis beams of the vehicle undercarriage.

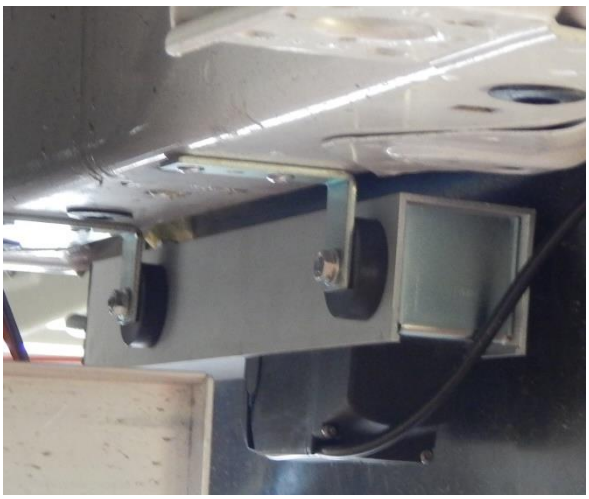
When choosing the mounting position, make sure that it doesn't interfere with any of the vehicle's original equipment.

Also ensure that a sturdy mount can be achieved and pay attention to that the resulting radius of the wire isn't too small when it's connected to the lever.

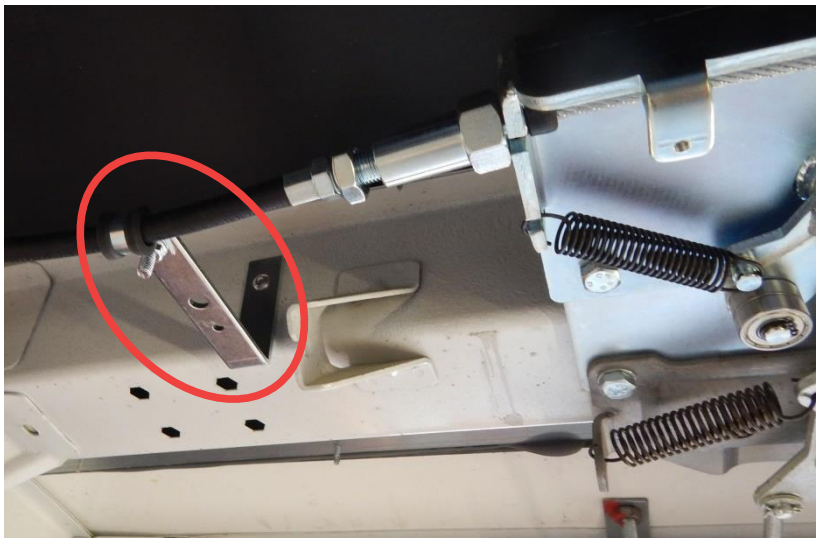
When a suitable mounting position has been found, temporarily mount the two mounting brackets on the actuator, hold the actuator in the desired position and mark the location where the holes need to be drilled.
Drill four holes with a drill sized to fit the blind rivets.

Remove the brackets from the actuator and mount the brackets on the vehicle beam, using the blind rivets supplied in the kit.

Finally mount the actuator to the brackets as shown on the pictures. Alternatively, the actuator can be mounted on the "inside" of the brackets.



4.1.3 Mounting of wire supports and retention spring

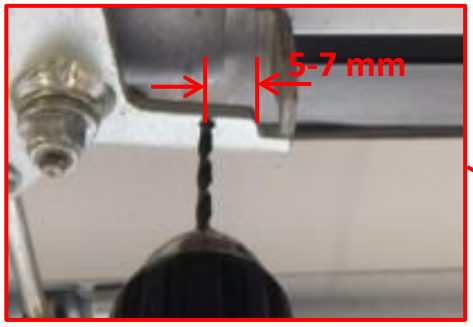


Hook up the actuator wire to the lever arm and adjust the wire tension nut so that there is a couple of millimetres play between the lever roller and the original handbrake lever.

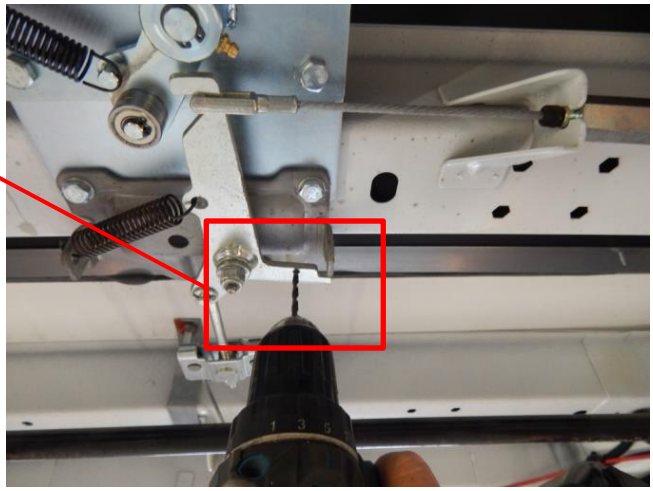
Mount the wire support bracket and clamp as shown in the picture.

When the ebrake is operated, the original handbrake wire loses its tension and becomes slack. In order to prevent the wire from disengage when it becomes slack, an additional spring is mounted to keep a certain tension on the wire.

The extra spring with accessories that is supplied with the kit.

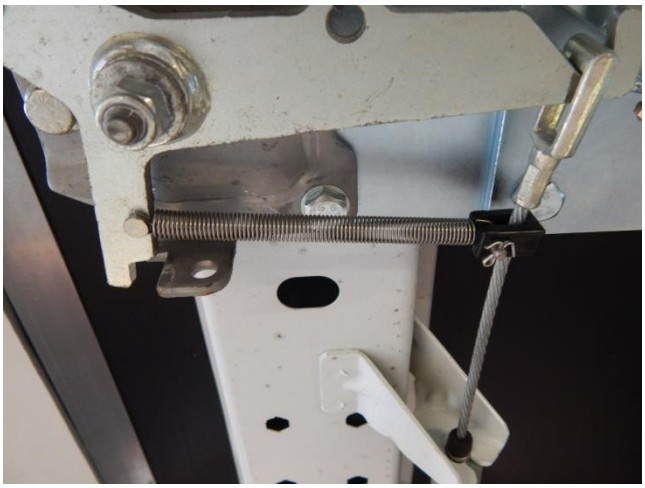


Drill a 4 mm hole in the original handbrake lever approximately 5-7 mm from the edge as shown in the picture.

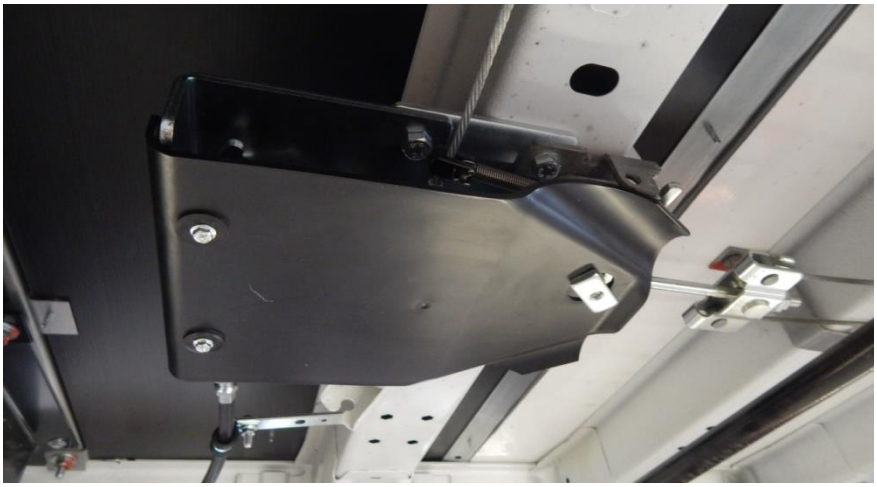


Connect one end of the spring to the lever with the use of the short retaining pin and lock it in place with the split pin.

Position the plastic U-clamp around the wire and connect it to the other end of the spring using the longer retaining pin and lock it in place with the split pin.



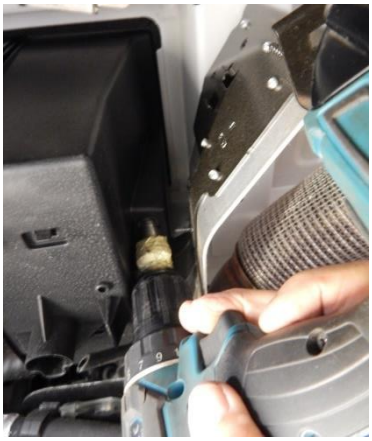
Finally, mount the plastic cover included in the kit over the lever assembly using the two 5 mm screws and the rectangular nut



4.2 Electrical installation

4.2.1 Actuator cable

Route the actuator cable along the chassis to the battery box. The best route varies between different vehicle models and other equipment mounted.



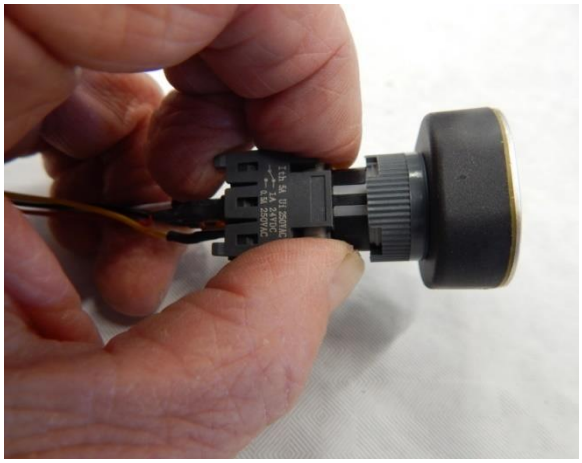
Drill a hole in the battery box, sized to fit the actuator cable rubber grommet. Feed approximately 50 cm of the cable in to the battery box and put some extra sealant around the cable to ensure proper sealing.

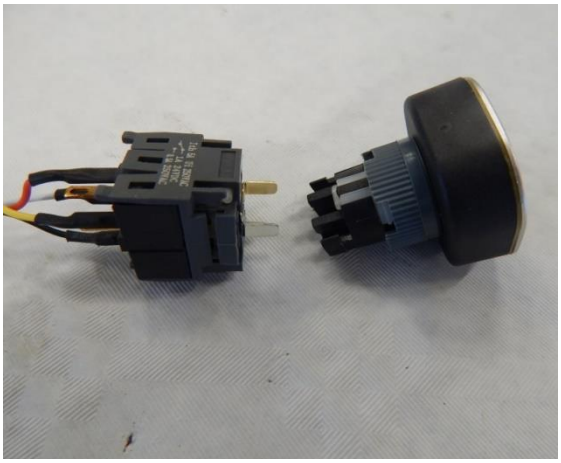
Wind up any excessive cable and strap it to the underside of the battery box.

4.2.2 Dashboard Activation switch mounting

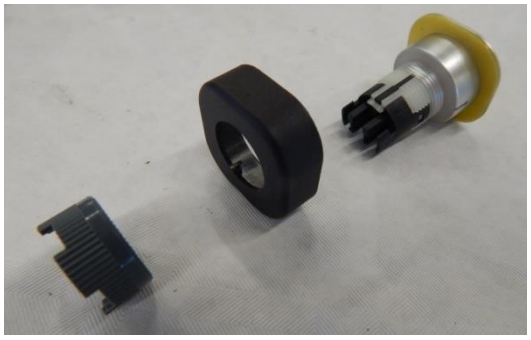
Begin with removing the air vent located to the side of the steering wheel.

Taking care not to damage any existing wiring behind the dash, drill a 22 mm hole in the dash board.

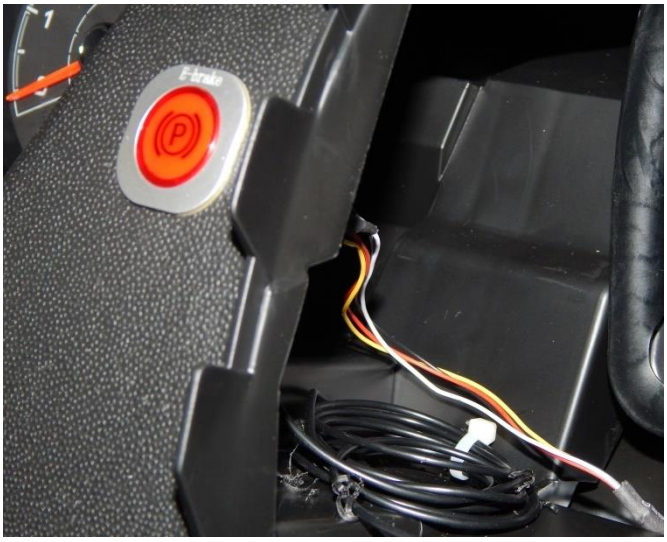




In order to mount the switch, the upper part of the switch first has to be separated from the back part.
Press on the locking lugs on the side of switch and pull of the front part.



Unscrew the locking ring from the front part of the switch and remove the square retaining plastic.

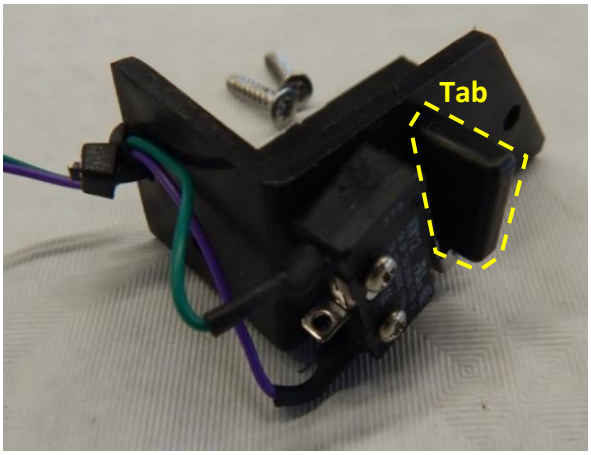


Mount the front part of the switch in the hole and lock it in place with the square retaining and the threaded locking ring.

Feed the back part of the switch with the wiring up through the back of the dash, and snap the switch together again.

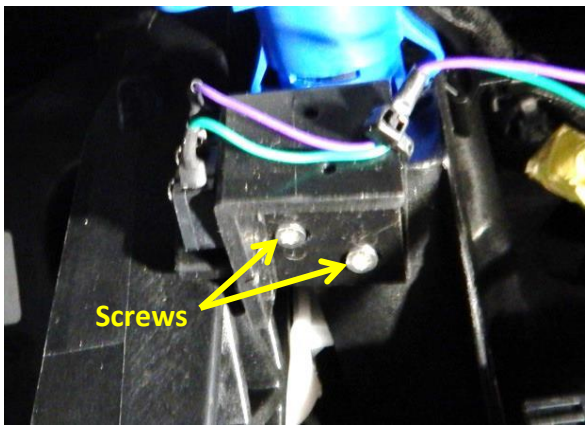
Put the air vent back in place.

4.2.3 Brake pedal switch mounting



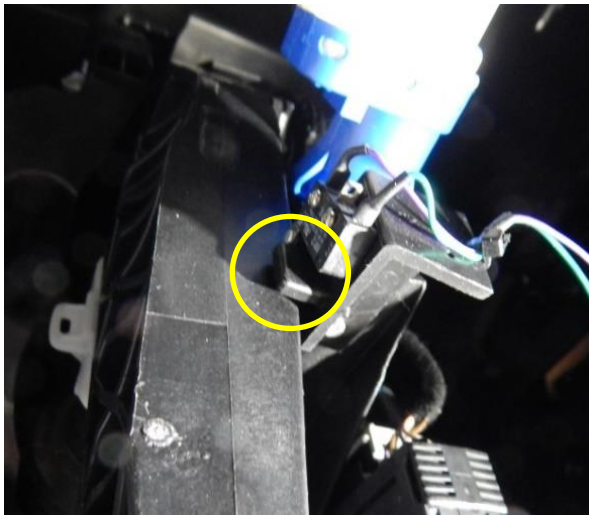
Mount the switch bracket with the two 3.5 mm self-tapping torx screws supplied with the kit.

Make sure that the switch is mounted so that the switch arm is pressed in when the brake pedal is up.

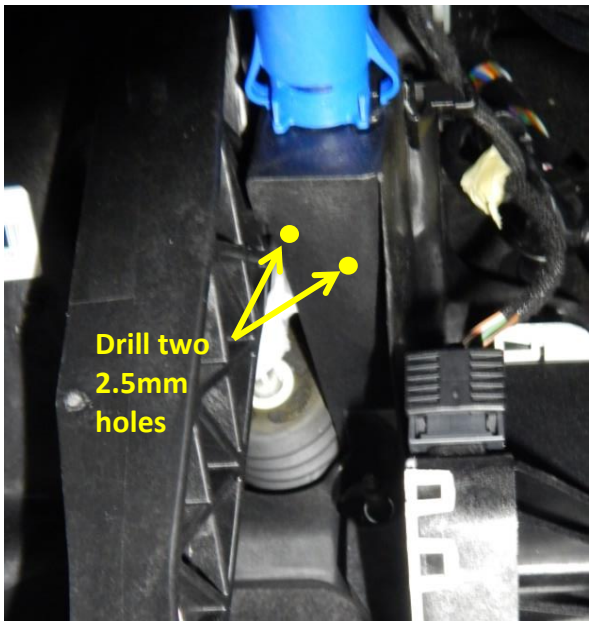


The brake pedal switch is used to give the control box feedback that the brake pedal is pressed. It's mounted on the original brake switch console, below the original switch.

Hold the switch bracket in a position so that the tab lies against the brake pedal arm when the pedal is fully released.



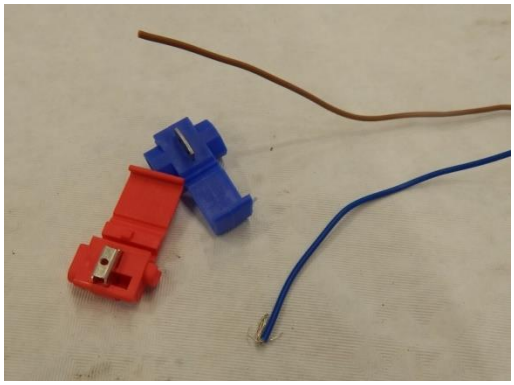
Mark the position and drill two 2.5 mm holes as indicated on the picture below.



The mounting varies slightly depending on the vehicle model; on newer models, it's mounted parallel to the brake pedal.

On older models, (not shown here) it's mounted perpendicular to the brake pedal.

4.2.4 Connection of Ignition and Brake warning light wires



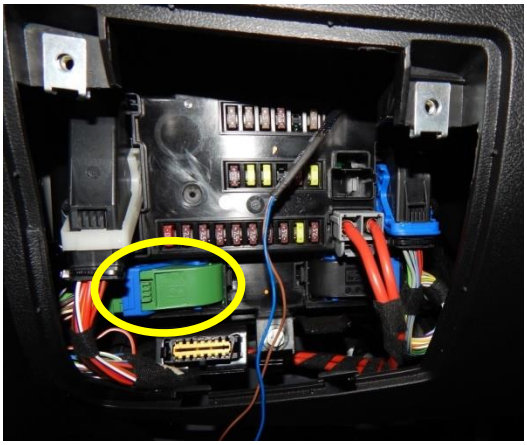
Route the two leads behind the dash to the vehicle fuse panel.

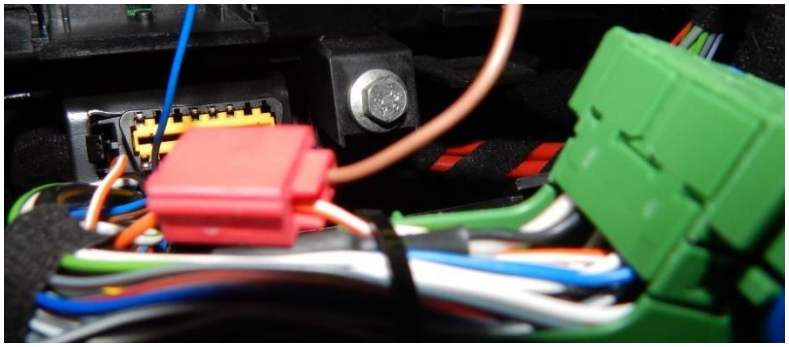
Disconnect the Green connector from the fuse panel.

Locate the orange/white lead going in to the connector. Connect the brown wire to the orange/white wire using one of the tap wire splice connectors supplied in the kit

The wiring harness has two flying leads; one blue wire and one brown.
The blue lead connects to a point that is powered when the vehicle ignition is turned on.
The brown lead connects to the vehicle brake warning light.

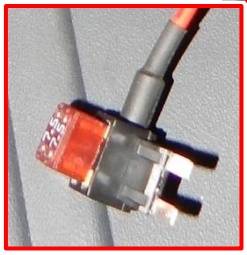
Route the two leads behind the dash to the vehicle fuse panel.



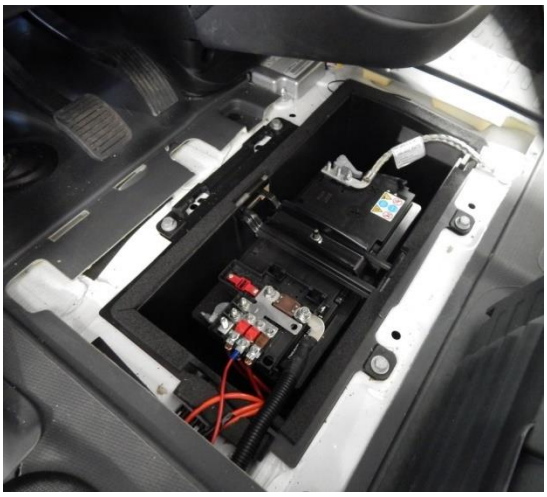


For the blue (ignition) lead, the easiest way to connect it, is to use a fuse tap adaptor.

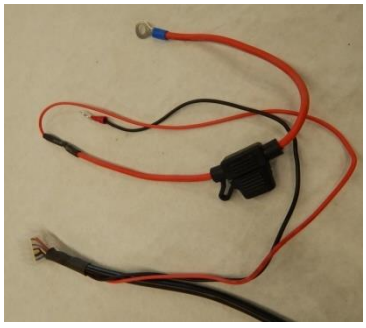
Splice the tap adaptor fuse holder on to the blue lead, and replace an existing fuse that is powered by the ignition with the adaptor.



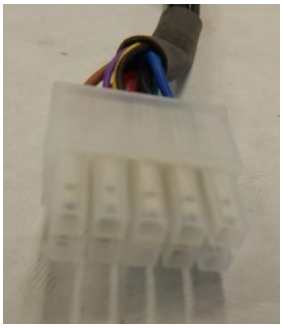
4.2.5 Installation and connection of the Control box



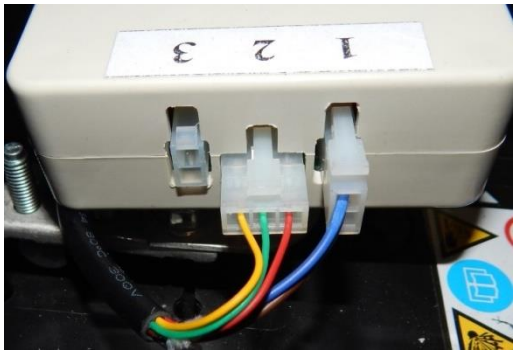
Remove the cover of the battery compartment and place the control box on top of the battery in the battery compartment.



Find a route to the battery box for the remaining end of the wiring harness.

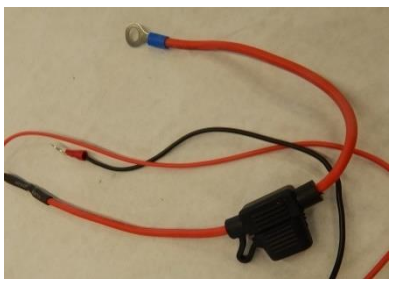


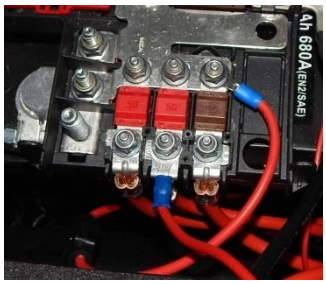
Plug the wire harness ten pole connector in to the connector marked "A" on the control box.

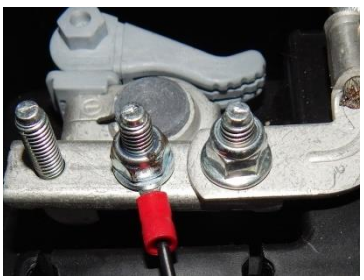


Find the end of the actuator cable and plug the two pole connector (blue and brown wires) in to the connector marked "1" on the control box and the three pole connector (yellow/green/red wires) in to the connector marked "2".

Finally connect the power leads (red and black wires) on the wiring harness to the positive and negative battery terminals







5. Testing and Adjustment

5.1 Applying the E-brake

- Make sure that the vehicle is completely stationary before operating the E-brake
- Turn on the ignition if not already on.
- Apply the E-brake by simply pressing in the E-brake push-button located on the dashboard.
- The button has a built-in light which should start flashing when the brake is operating
- Once the brake is fully engaged, the light should go to steady on and stay on as long as the ignition is turned on.
- **Please Note! It's important that the light goes to a steady on before it goes out.** If the light continues to flash until it goes out, something is probably not correctly adjusted or the mechanism is jamming. If this is the case, it needs to be corrected, as the ebrake mechanism otherwise could get damaged.
- **Please Note: It is not recommended to use the manual handbrake when the E-brake is activated as this could possibly cause kinking in handbrake wire.** If however, the manual handbrake has been applied by mistake while the E-brake is activated, **always release the E-brake first, and then release the manual handbrake!**

5.2 Releasing the E-brake

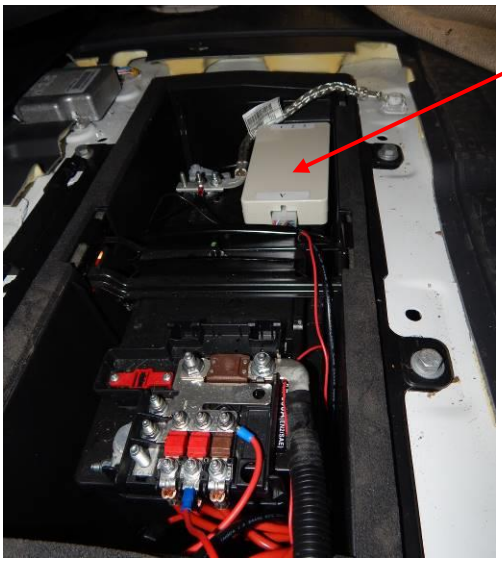
- First turn on the ignition if not already on.
- Then press the E-brake button on the dash so it comes out to its outer position, this far nothing should happen, the light in the button should still be on, indicating that the brake is still engaged.
- Now press down the brake pedal, again the light should start flashing, indicating that the E-brake is operating.
- Once the E-brake is fully released, the light should go out.

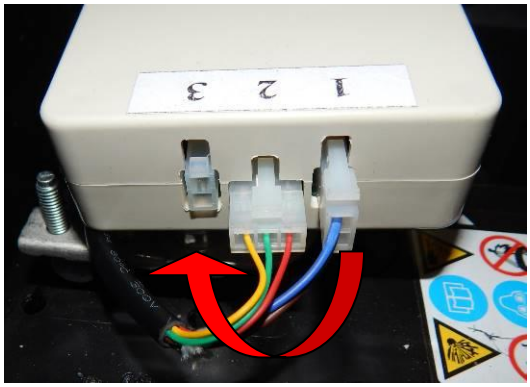
The E-brake should stay powered on for approximately one minute after the ignition has been turned off. This is to ensure that the E-brake completes its operation in case the ignition should be turned off before the current operation is finished.

5.3 Emergency release procedure

In the unlikely event that a malfunction in the control system should occur, follow the steps below to release the E-brake so that the vehicle can be moved.

1. Locate the E-brake electronic control box. It's normally located in the battery compartment in the floor in front of the driver's seat.





2. Now locate the connection marked "1" on the control box, unplug the connector (blue & brown wires) from the No 1 connection and plug it in to the No 3 connection instead.

3. Provided that the actuator itself is ok, this should release the E-brake and disable it for further use until it can be serviced by a qualified technician.

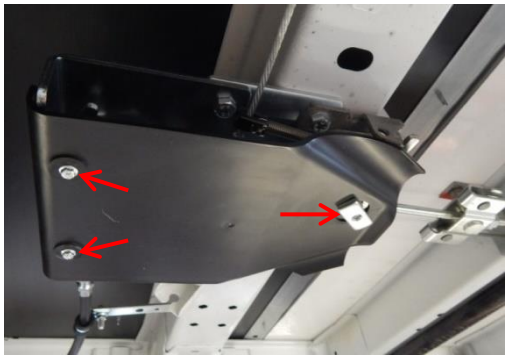
5.4 Adjustments

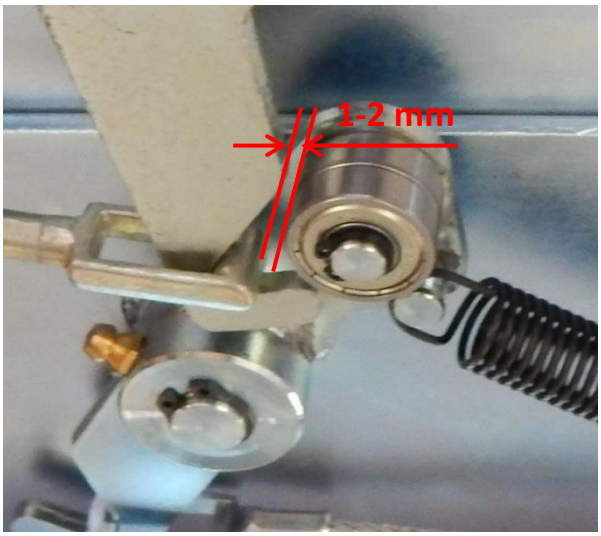
First make sure that the original manual handbrake is adjusted according the manufacturer's instructions.

The only E-brake adjustment that needs to be checked is the tension of the actuator wire, follow the below procedure;

Make sure that the E-braked is in the released position.

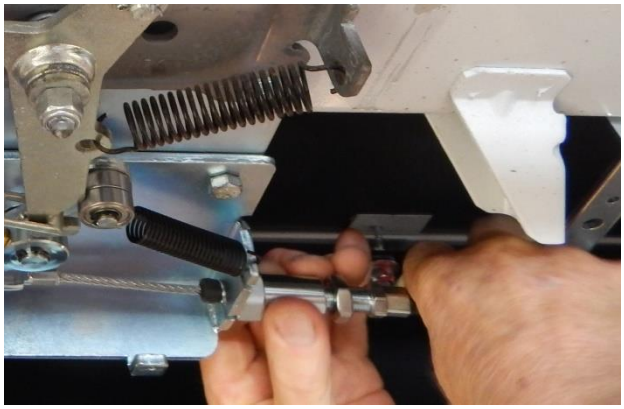
If mounted, remove the plastic cover over the lever arm assembly by unscrewing the square nut and the two 5 mm hex bolts.





Check that there is a space of 1-2 mm between the ebrake lever arm roller and the original handbrake arm when both the original and the ebrake are released.

Now activate the ebrake and listen carefully to hear that the motor in the actuator actually stops when the brake has been applied, and don't continue to run until the power is cut.

Also check that the light in the button on the dash, stops flashing and goes to a steady on before the ebrake cuts the power.

If necessary, adjust the actuator wire to achieve the proper space.