Installing ROLTEC restraining system for vehicles, model FB33 for ROLTEC Vision electric wheelchair

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General

This ROLTEC restraining system for vehicles was designed to restrain a ROLTEC electric wheelchair, model Vision, front wheel drive to increase safety for a user sitting in the wheelchair while the vehicle is in motion.
It is unnecessary to make changes to the wheelchair in order to use the restraining system.
The restraining system, which must be installed by an experienced mechanic, must be positioned so that the user faces the direction of travel.
It must be emphasised that the restraining system only secures the wheelchair itself. The user must therefore also use seat belts or restraints that are secured to the chassis of the vehicle.
We recommend that the user's instructions should be read in addition to these installation instructions before beginning installation to become thoroughly familiar with the way the restraining system works.
The restraining system for vehicles was constructed (and these instructions were written) in accordance with the requirements stated in ISO 10542-1. This standard is also the source of figure 1 and figure 5.

Included in the order:

- A bottom plate with hooks for securing the wheelchair to the floor of the vehicle.
- An operating panel for installing on the vehicle's dashboard.
- An electronic terminal box.
- A 2 x 0.75 mm^2 cable to connect the vehicle's fuse box to the electronic terminal box.
- A 6 x 1 mm^2 cable to connection the bottom plate to the electronic terminal box.
- A 6 x 0.34 mm^2 cable to connect the operating panel to the electronics terminal box.
- Installation instruction (these).
- User's instructions.
- A label for use in connection with reversing the position of the manual release handle.

Not included in the order:

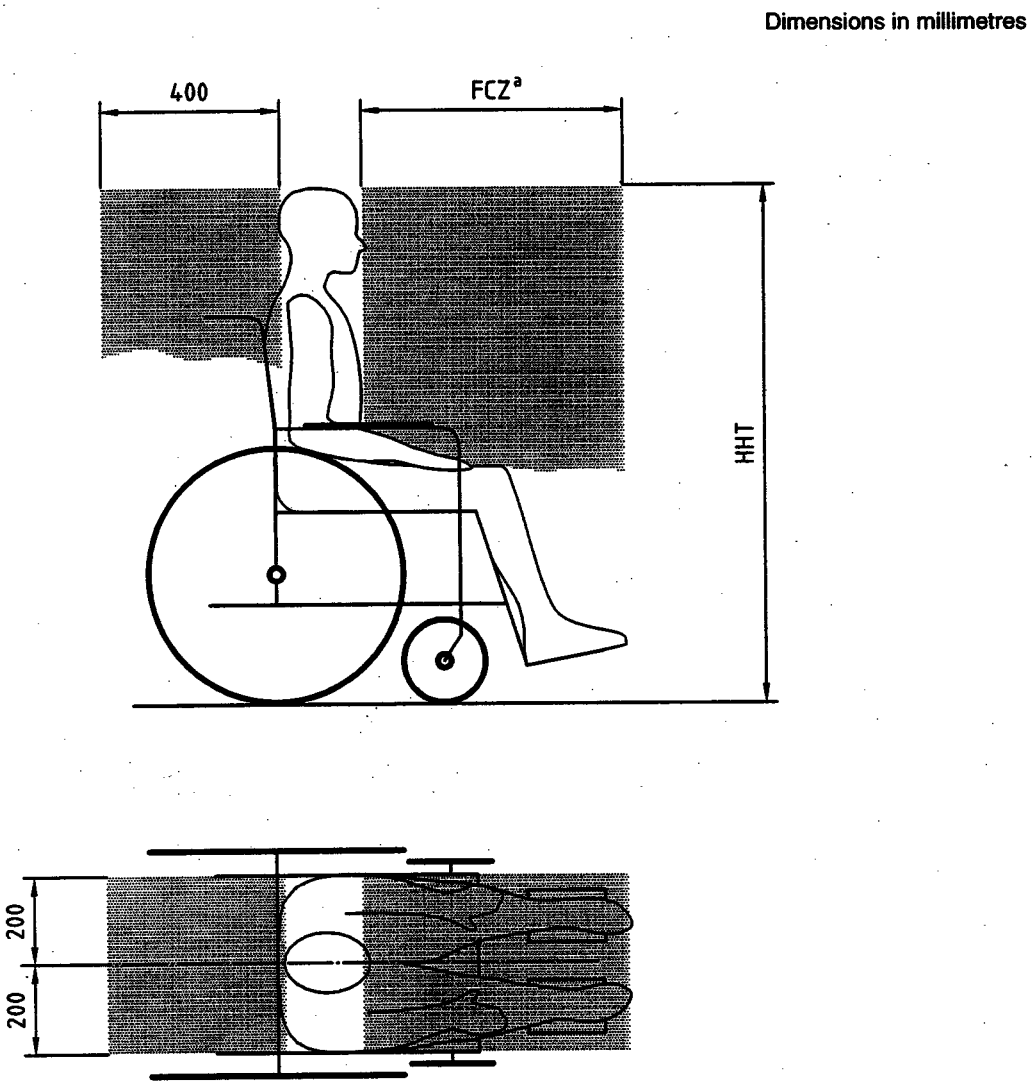
- Restraints.
- Cable fasteners, rubber bushes and similar for installing the electrical components.
- Bolts to secure the restraining system to the vehicle.
- Distance plates, where necessary, to place between the restraining system and the floor of the vehicle.

- Distance tubing or distance plates to maintain the bottom profile of the vehicle.
- Washers for installing beneath the bottom of the vehicle.
- Self-locking nuts for bolts.

These components are not included in the order as they differ from vehicle to vehicle. See detailed explanation in the section on mechanical installation below.

Mechanical installation:

Free zones in front of and behind the user's head must be taken into account when determining he position of the restraining system (see figure 1).
It may not be possible to comply with the dimensions indicated if the wheelchair user is to drive the vehicle sitting in the restrained wheelchair. Rigid components which lie within the free zones in the vehicle must be covered by padding which conforms to the requirements on shock absorbency in accordance with the standards FMVSS 201, EC 74/60, or UN/ECE 21.
If extra padding is installed in the vehicle this must have a combustion rate that does not exceed 100 mm per minute when tested in accordance with ISO 3795.



FCZ = Front clear zone = Free zone in front of the head (0.65 metre with shoulder belt, 0.95 metre with only pelvic restraint).
HHT = Seated head height (1.2 – 1.55 metres depending on the height of the user).

Figure 1.

Bolts, of at least size M10 and strength class 8.8, must be used to install the bottom plate of the restraining system. At least eight bolts must be used, of which at least four must be placed at the rear edge of the bottom plate and four at the front. It is best to use the holes in the bottom plate made at the factory, but new holes can also be drilled if this is necessary to install the restraining system. The location of the bolt holes in indicated in figure 2 and figure 3.
The bolts must be inserted with the heads on the floor of the vehicle as the wheelchair will run over them. Washers of at least 3 mm in thickness with a minimum area of 3000 mm^2 and with rounded corners with a radius of curvature of at least 5 mm must be used beneath the floor of the vehicle. It may be necessary to install reinforcements attached to the load-bearing components of the vehicle on some models. Each anchoring point in the vehicle must be capable of withstanding a tensile stress of at least 12,500 Newton in a forward direction in the vehicle's direction of travel, and at least 5,000 Newton at right angles to the plate it is mounted on. If the floor of the vehicle is profiled distance tubing or distance plates must be installed to avoid the vehicle's bottom profile from becoming flattened when the nuts are tightened. Self-locking nuts must be used. Note that self-locking nuts can only stand up to being tightened once.

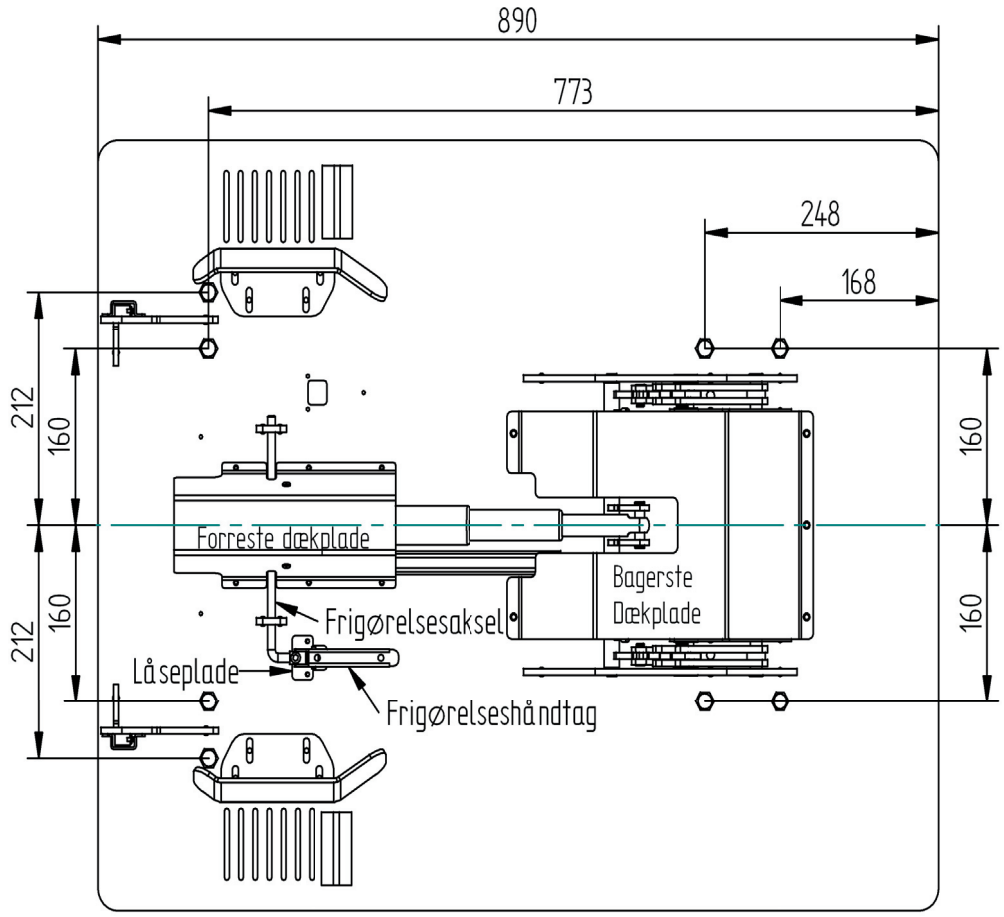
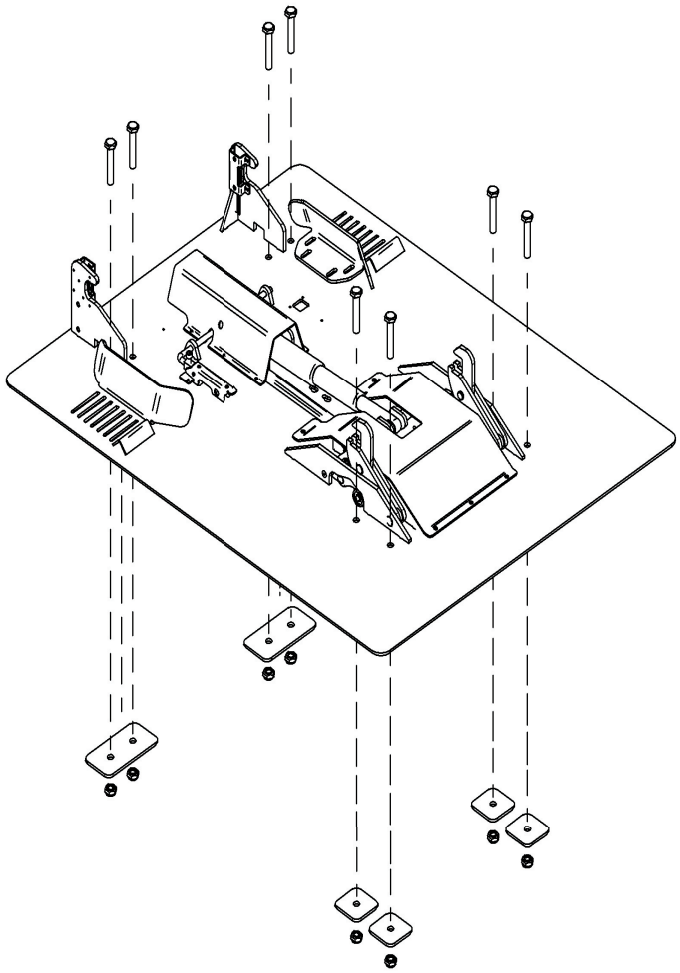


Figure 2.

When tightening the bolts it is important to check that the bottom plate of the restraining system does not bend either longitudinally or transversely. Check that the bottom plate is flat by placing a long ruler or similar on it. It may be an advantage to use an extra bolt in the centre of the bottom plate; the hole for this bolt was made at the factory and can be found beneath the large cover plate at the rear of the bottom plate. It may be necessary to block up with plates or washers between the bottom of the vehicle and the bottom plate of the restraining system. If the bottom

plate is not flat in the longitudinal direction of the vehicle as determined with the help of the ruler, the distance between the fixed hooks at the front of the bottom plate and the movable hooks at the rear will not fit the frame of the wheelchair. If the bottom plate is not flat in the transverse direction of the vehicle as determined with the help of the ruler, the mechanical movement of the hooks on the restraining system may be hampered.
Check the free movement of the hooks on the restraining system by operating the manual release device. Follow the instructions on the label on the front cover plate. The manual release device will only work if the restraining system is in locked position with the hooks open. It is possible to put the restraining system into locked position by making a temporary connection of the cables to the electronic terminal box and then to the vehicle's battery or fuse box (see section on electrical installation). The restraining system can then be locked without the wheelchair being in position by activating one of the two microswitches at the front of the restraining system with a finger while pushing the contact toggle on the operating panel towards the symbol showing the locked padlock.



This drawing shows an exploded view of the bolts, washers and nuts used for installation.

Figure 3.

The position of the manual release handle

We recommend ensuring that the manual release handle on the restraining system should face the nearest vehicle door, so it easily can be operated from outside the vehicle. If required the manual release device can be operated from the opposite side of the vehicle by turning the actuators ram to remove any kind of strains from the release axis. Please see the User´s instruction section "Returning to normal state".

Remove the front cover (fig. 2), and loosen the two Allen screws which secure the middle of the release axis. Then the release handle must be raised by loosen the Allen screw which holds the release handle onto the release axis. Now you can pull out the release axis. Unscrew the locking mandrel (the spherical mandrel which holds the handle correctly positioned) and the lock washer (see fig. 2) and mount them on the opposite side of the restraining system.
Put back the release axis, but from the opposite side this time. Turn the release handle until the Allen screw is positioned upwards again. Mount the handle in the middle of the lock washer with the handle catches underneath the lock washer, and tighten the two Allen screws while the handle is pushed forward to the release axis. Before tightening the two Allen screws, it is necessary to turn the bushing, in which they are placed, to the correctly position by pressing downwards on the bracket, which is welded on the bushing. When the two Allen screws are tightened, mont the front cover again. Stick the enclosed label on the opposite side of the old label on the restraining system. Remove the old label or cross out the text. To ensure the new label will stick firmly it is necessary to degrease the cover plate with spirit or benzine.

Electrical installation

The accompanying electronic terminal box for the restraining system should be installed close to the vehicle's battery or fuse box so that the 12 V wire to the electronic terminal box is as short as possible, preferably not more than 50 cm. The electronic components of the restraining system must be protected by a 10 Amp fuse. The vehicle's chassis acts as the negative pole.
The cable (6 x 1 mm^2) from the restraining system can be led from the plug outlet beneath the front cover through one of the two large holes at the front of the cover, beneath the bottom of the vehicle and to the electronic terminal box. There is a securing fitting for attaching a cable binder next to each of the two large holes. The cable should be shortened if it is longer than necessary.
Place the operating panel in a suitable place on the dashboard and lead the cable (6 x 0.34 mm^2) to the electronic terminal box. The length of this cable is not critical.

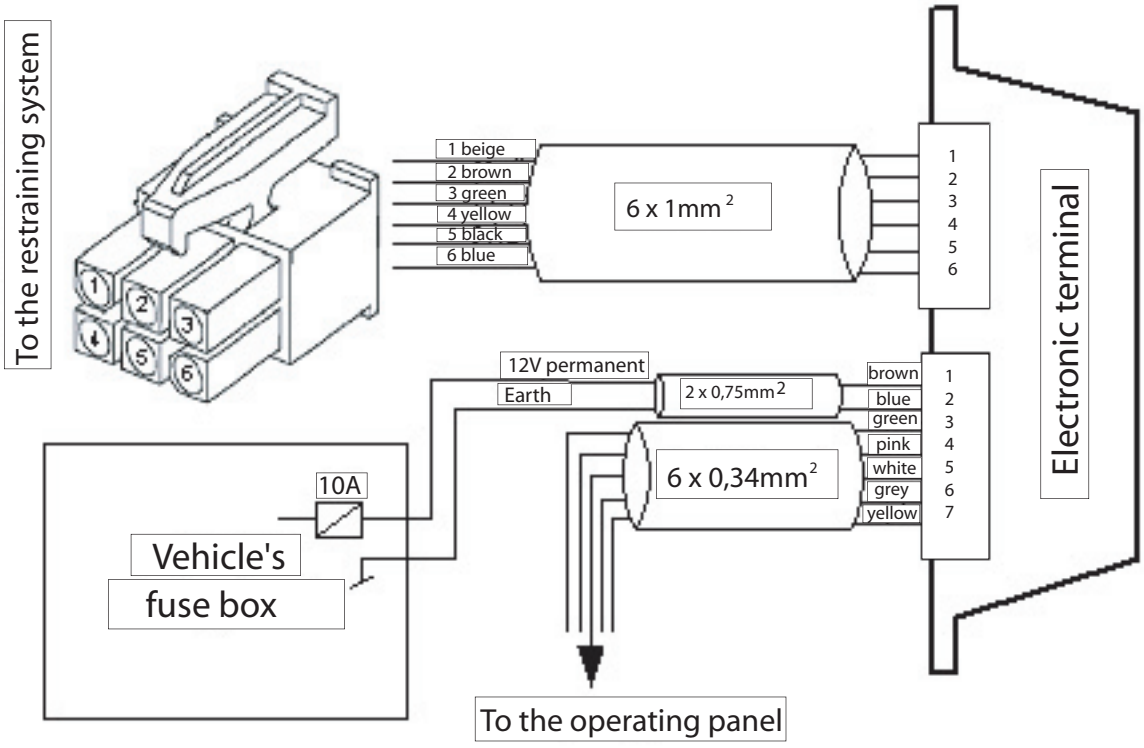
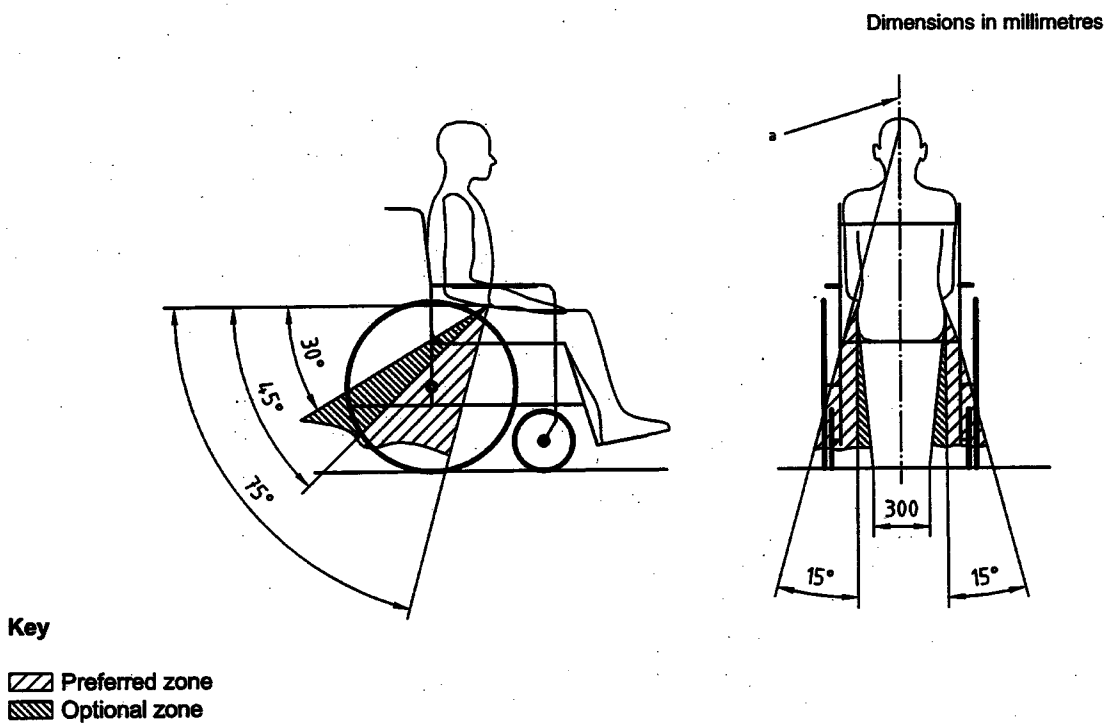


Figure 4.

must be 30° or greater in relation to horizontal, and preferably between 45° and 75° so that the restraint can be positioned low and because in the event of a collision it is better to place a strain on the thighs than on the abdomen (see figure 5). A suitable mean angle of approximately 60° can be achieved by installing the lower anchoring point of the restraint opposite the foremost of the two securing bolts on each side of the rear end of the bottom plate (as suggested in figure 2). The uppermost anchoring point or belt guide for the shoulder restraint must be positioned at or above shoulder height in order to minimise the downward strain on the spine and so that the belt passes across the body close to a point between the shoulders. Both the pelvic restraint and the shoulder restraint must be installed so as to reduce the possibility that the user's head and chest can come into contact with the vehicle's interior components (see figure 1).
Note that the distance of head and chest movement depends on the location of the shoulder restraint's anchoring point. Movement will be increased if the distance between the anchoring points above and behind the user is increased.
The restraint must be protected against contact with sharp corners and edges and corrosive liquids.
The anchoring points must be able to withstand a tensile stress of at least 27,000 Newton.
If a neck support is anchored to the vehicle the back of the seat must also be anchored to the vehicle in order to minimise the movement of the back of the seat in relation to the neck support with the consequent risk of injury to the user's neck. The wheelchair and the restraint must not be installed in such a way as to obstruct the release of an airbag. An airbag may only be used as a supplement to the restraining system and seat belts. In case of doubt with regard to the installation method please contact ROLTEC el-kørestole A/S. Please also contact the company if any of the components supplied are to be modified or replaced by other components.



Preferred zone
Optional zone = the permissible zone, if the preferred zone is impracticable.

Figure 5.