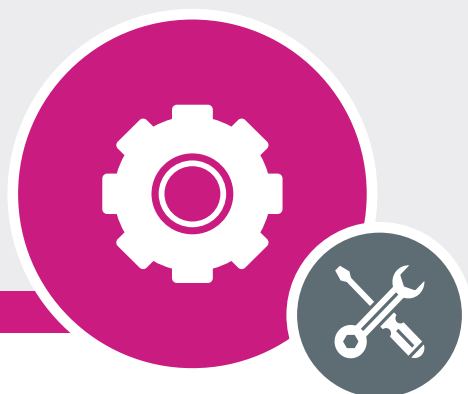


BENOIT SYSTEMES

Autonomy is power



2021

IMPORTER GUIDE

LIGHT DRIVE 2.1 & LIGHT ASSIST 2.1



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I. GENERAL

PRESENTATION

The **Light Range** power packs are an efficient addition to a wheelchair. However, their efficiency (battery life and maneuverability) will therefore be greatly improved if fitted to a wheelchair that runs well and is maneuverable. This is why the adjustments and accessories of the chair need to be chosen with care. The quality of the installation is also essential to preserve the wheelchair's dimensions and the user's autonomy. The adjustments of our power add-ons are kept simple but meticulous and have to be carried out particularly carefully to allow the maximum efficiency of our system.

(A.) Type of wheelchair

▶ **Folding frame / Rigid frame**

Our standard installation procedure describes how to install our power add-ons on folding frame wheelchairs. You will find the specific steps for rigid frame wheelchairs in the chapter "Installation on rigid frame wheelchairs".

▶ **Fixed backrest**

As a general rule, fixed backrests are the most standard wheelchairs for the installation of our power add-ons.

▶ **Reclining backrest**

Reclining backrests will quite often not even be used. You can ask the user if it is possible to block this function if it is not required.

With this kind of backrest, the rear wheels can be placed towards the rear. But you have to keep in mind that moving the wheels towards the rear can hamper the manoeuvrability of the chair and change its overall size.

▶ **Half-folding backrest**

These do not tend to get in the way of the installation, however, make sure that the profile bars do not get in the way of the mechanism by mounting them on the lower part of the backrest.

▶ **Folding backrest**

Once again, make sure that the hook bars do not get in the way of the folding mechanism. In the case of fixed frame chairs, they often have an H bar positioned too low for the installation of the power pack. You may have to modify the chair to move the bar higher.

Some backrests have height adjustable push handles. Be careful not to hinder their use. Make sure they don't block the hook bars or power pack.

▶ **Armrests**

It is best not to have armrests that finish behind the backrest as they can get in the way of installing the profile bars. Never fix the profile bars to the armrests.

▶ **Foldable armrests**

They can easily be removed even with the power add-on in place.

▶ **Flip back armrests**

Flip back armrests do not prevent you from installing the profile bars, but they can limit the user's autonomy if they wish to transfer with the power pack in place. Some of these kinds of armrests can be modified to make them removable.

▶ **Mudguards without armrests**

Make the user aware that they must pass the controller cable inside them to prevent them from rubbing on the tyres.

Wheels

▶ **Front castors**

Check the adjustments and make sure that they are in good working order. We advise at least 5" as they are better at getting over obstacles. This is all the more important when using a power pack.

Soft solid castors are the best as pneumatics deflate quickly and are therefore bad for maneuverability and for the life of the battery. Hard solids are not as comfortable and not as good for getting over obstacles.

▶ **Rear wheels**

Make sure they are well fixed on and do not wobble. If they are too far back, they make the chair less maneuverable and if they are too far forwards, the balance of the chair can be too tippy. The chair's adjustments must take into account the needs of each client.

It is essential that the chair is equipped with Marathon Plus inflatable tyres by Schwalbe. These must be maintained at a pressure between **6 and 8 bars** at all times. Solid tyres are not compatible with the Light Range as they will damage the motors. Metal hubs are better as the tyres might otherwise risk coming off the hubs whilst inflating the tyres.

Camber wheels are compatible with the power add-ons (up to 4°).

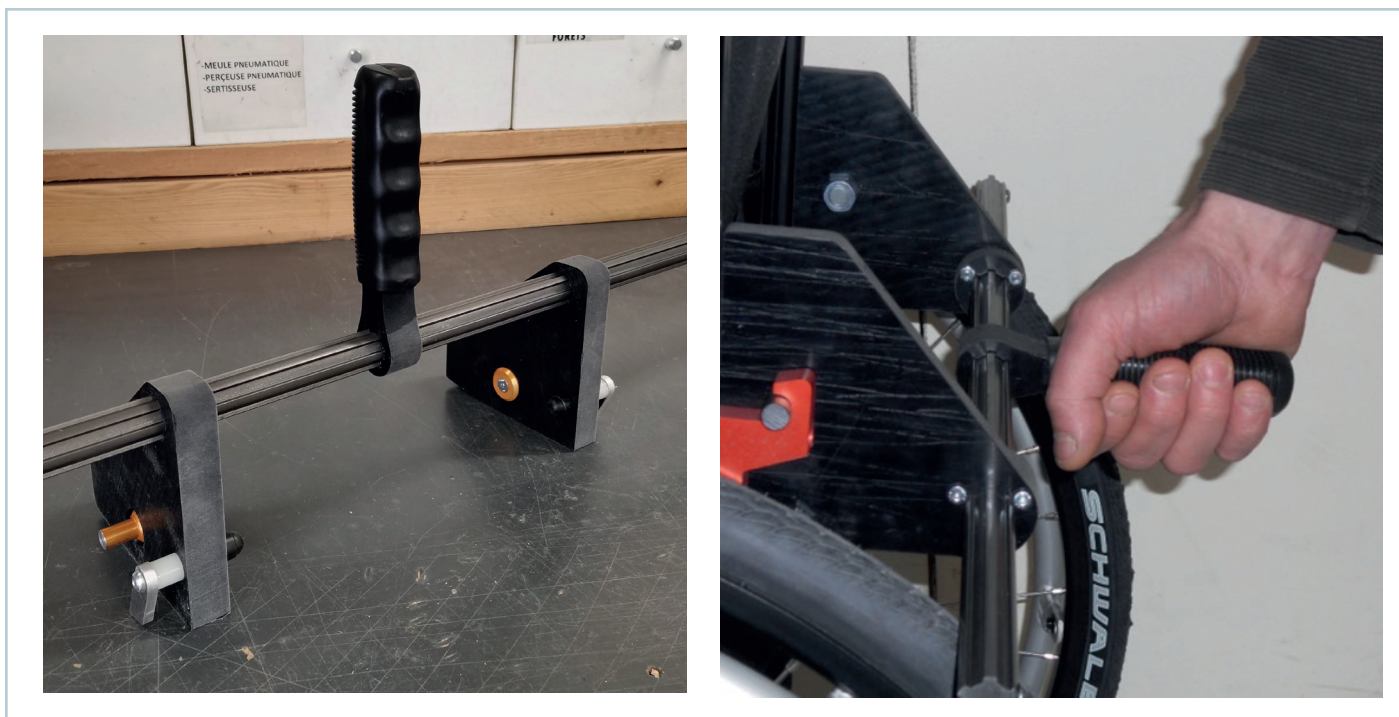
II. PREPARING THE WHEELCHAIR

Before anything, you must be sure that the chair has been **correctly adjusted for the user**, especially where new chairs are concerned as any modification once the power pack has been installed may require changing or re-doing the installation.

The parts mounted onto the chair must in no way prevent the folding or the use of the chair. You must ensure that they cannot harm the user for instance when transferring (i.e. joystick).

You have at your disposal various different parts in order to fasten the hook bars onto nearly any type of chair. Most chairs have existing holes which can be used. Most chairs have a choice of adjustments which are obtained with a series of holes and screws. The assembly of chairs is often by means of nuts and bolts. It is therefore possible to use the holes that have not been used or even using holes that are in use by changing the screws for longer versions in order to **fix the plates onto the chair**.

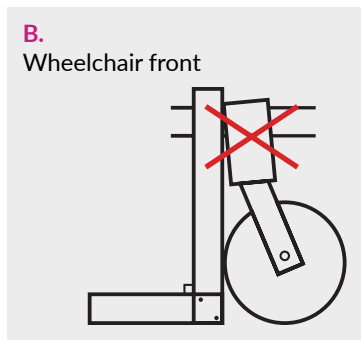
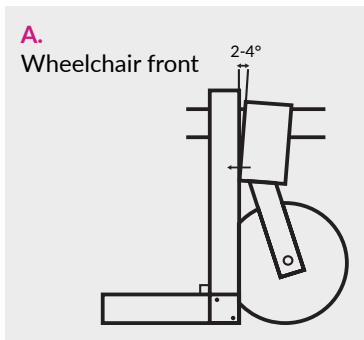
The installation gauge is very useful in order to get a clear picture of the various options of installation on each chair and to know precisely where the hooks need to be placed.



III. STANDARD INSTALLATION PROCEDURE

Forks adjustment

Check the adjustment of the front forks, they must be both at 90° to the floor and adjusted as shown in diagram A. The adjustment is to avoid vibrations.



Note: check that the castors do not touch the footrest

Brakes adjustment

Always check the brakes especially if you moved the wheels. The brakes must engage easily but still be locking.

Installing the hook bars

Materials:

- Complete hooks
- Hook bars, hook bar covers and nuts
- Installation plates depending on the wheelchair
- Nyloc nuts and nut covers
- Etc...



Fasten the plates on the hook bars using the hook bar nuts and the nyloc nuts.

Use existing holes to fasten on the wheelchair.

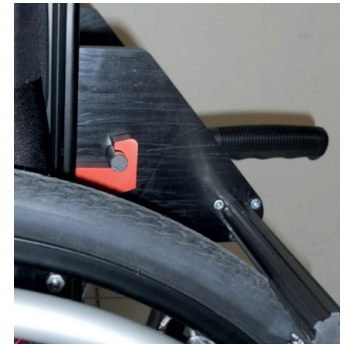
Use the installation gauge to imagine different installation ways and to know the position of the hooks. Fasten the hook bars in 2 points minimum, the best would be that the 2 points are vertically apart one from the other. A clip on a frame tube can be used on the top.

Note: Do not fasten a hook bar with two clips. If the fixation between the backrest and the base is fragile, fasten in 2 points on the base

Setting up the hooks

Use the installation gauge to set the hooks position.

Put the gauge on the hooks and adjust them in such a way as to rest the gauge on the tyres.

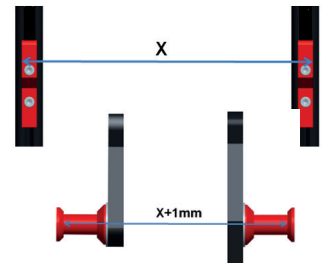


Light Drive 2.1 & Light Assist 2.1 Setting up the motor tubes and the clutches

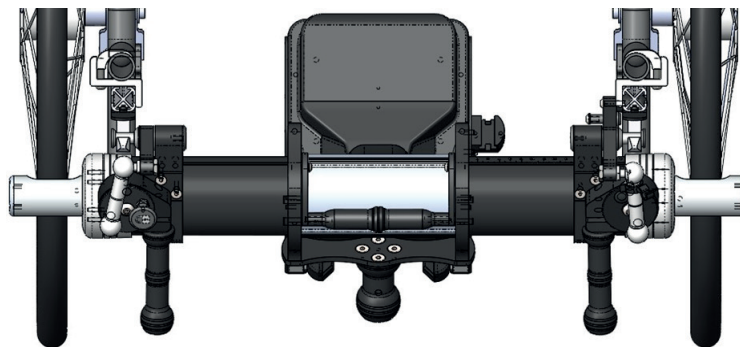
The screws on the roller cover must be loose.
The clutch handles must be pointing to the rear.

Put the power pack centered on the wheelchair: the axles must rest on the hooks.

Place the axles against the hooks. Leave 1 mm slack on each side.



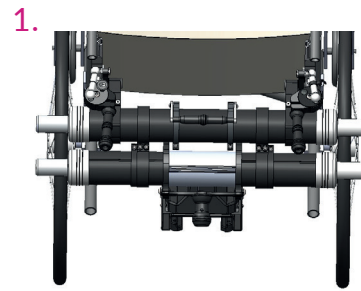
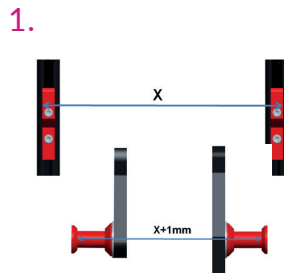
Roughly center the rollers on the tyres by bringing the motor tubes out of the central tube. You must leave at least 3 cm in the central tube so that you can lock them.



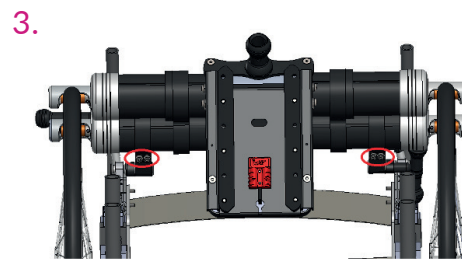
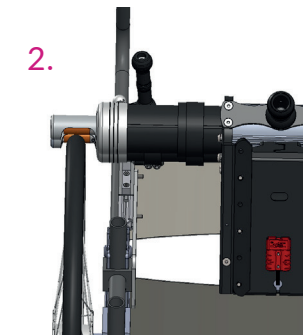
Tighten the clutch collars until the contact is made.

Light Drive & Light Assist PLUS 2.1

Setting up the motor tubes and the clutches

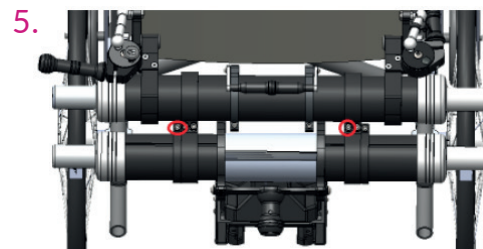
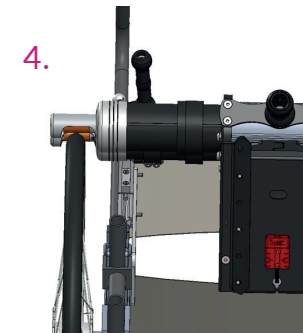


1. The screws on the roller cover must be loose. The clutch handles must be pointing to the rear. Put the power pack centered on the wheelchair: the axles must rest on the hooks. Place the axles against the hooks. Leave 1 mm slack on each side.



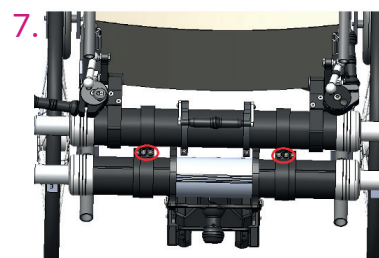
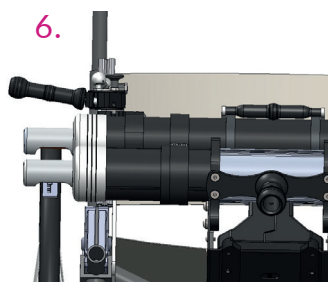
2. Bring the motors out of the upper tube and center the rollers on the tyres.

3. Tighten the right and left clutch collars to prevent the motors from moving.



4. Bring the motors out of the lower tube and center the rollers on the tyres.

5. Tighten the lower motor collars on both sides to prevent the motors from moving.

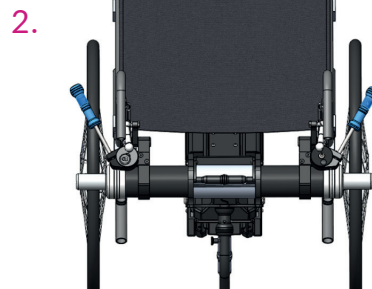
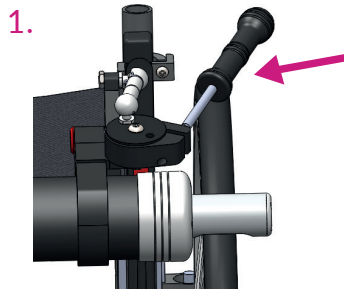


6. In neutral position: put 3mm wedges between the lower rollers and the tyres.

7. Tighten the screws of both double collars. Remove the 3mm wedges.

Setting up the clutch handles

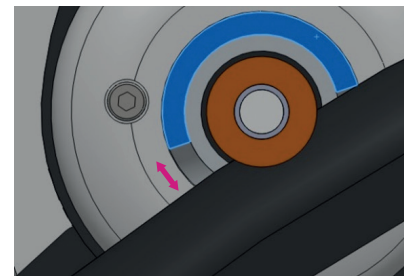
1. Lightly tighten the screw on the handle to avoid turning around the drum. Engage on the right-hand side by pushing the handle towards the front, on the outside. Loosen again to bring the handle against the backrest (you must leave enough space for one hand)
2. Set up the second handle symmetrically:



Setting up the roller pressure

Slightly loosen the motor cup screws in order to turn the roller cover against the tyre.

When the power pack is in engaged position, the space between the roller cover and the tyre on the opposite side of the contact should be 7 to 9mm (10 to 12mm for Light Drive PLUS & Light Assist PLUS).



Setting up the roller pressure

In case of a large discrepancy, set up the hooks height on the hook bars. Lower the hooks to increase the pressure.

Light Drive PLUS & Light Assist PLUS

In case of a discrepancy of pressure between the right-hand side and the left-hand side lower motors, loosen the double collar on the side to be set up. Press lightly on the lower tube and tighten the double collar back

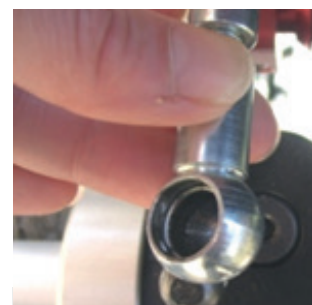
For a more accurate adjustment, set up the ball joints:



Remove the clip on the ball joint.



Remove the ball point by levering up the hinge using an appropriate tool.



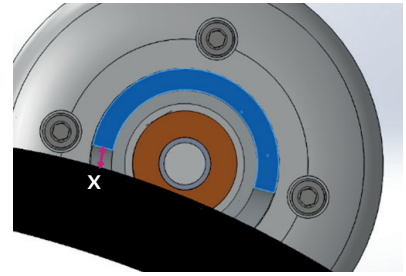
Unscrew the ball joints to increase the pressure or screw to decrease the pressure.

Note: once you have put the ball joint back, do not forget to put the clip back by passing it through the 2 provided holes.

Setting up the roller covers

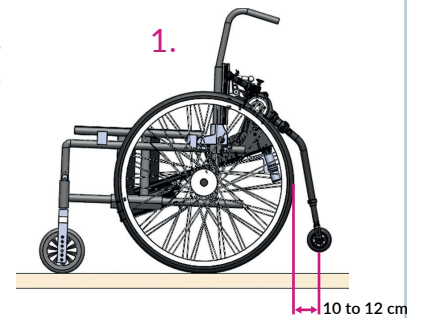
When the power pack is in engaged position, the roller covers must not touch the tyres. Let 3 mm slack at the front of the roller cover (x).
(2 mm for Light Drive PLUS and Light Assist PLUS).

A 3 mm wedge will help you do the setting up.
Fix the motor cup by tightening the 4 screws crosswise.

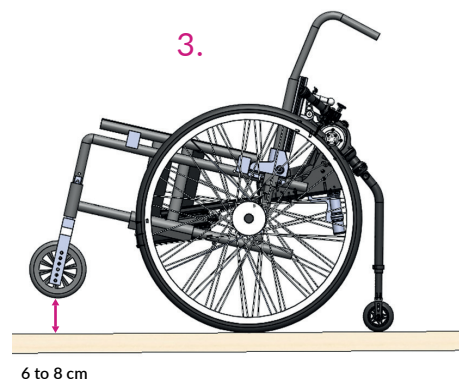
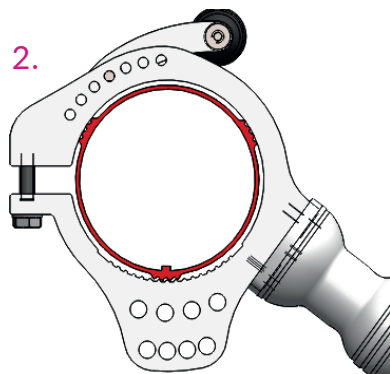


Setting up the anti-tip

1. The power pack must be in engaged position for the anti-tip installation. There should be a space of 10 to 12 cm between the anti-tip and the tyres
2. The anti-tip position can be adjusted by sliding the central collars around the central tube, and by adjusting the caster tube height.



3. When the wheelchair rests on the anti-tip, the space between the front castors and the floor should be 6 to 8 cm :



Tighten the central collars.

Note : for the Light Assist 2.1, the anti-tip is shifted on the side so as not to get in the way of the attendant.

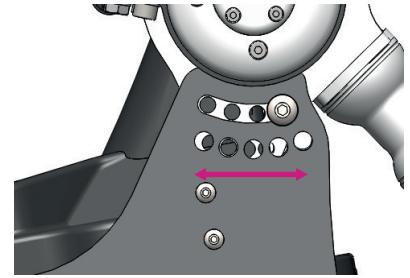
Slider support inclination

The battery should come as closely as possible to the cross-brace when the power pack is in engaged position.

It should not be too close to the floor (minimum 5 cm; approx. same height as the footrests) and should not touch the floor when the power pack is in disengaged position.

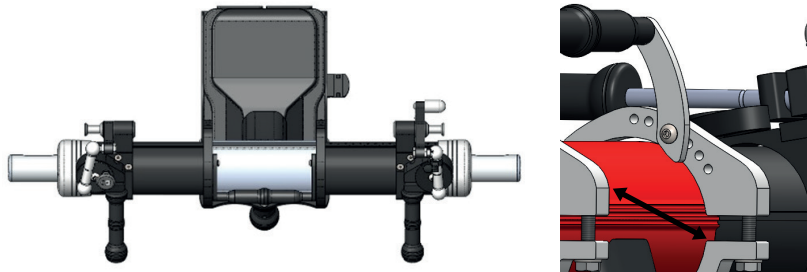
Set up the battery slider support with the opening and the different holes, then tighten the screws for fastening.

Note : be careful that the electronics unit of the power pack does not touch the wheelchair seat. It could cause bedsores.



Setting up the upper handle

Put the clutch handles in neutral position.



The upper handle position should allow to place and remove the power pack easily with one hand, with the correct inclination.

Adjust the balance by changing the position of the upper handle using the different holes.

LightDrive2.1 Installing the controller bracket fixation

Place your arm on the armrest and install the bracket at the vertical of the wrist if possible. If it is not possible, use the different configurations and angle adjustments described in « Assembling & installing the controller bracket fixations ».

Check that there is enough space between the controller bracket fixation and the brake. The bracket must not get in the way of the brake.

Follow the instructions described in "Assembling and installing the controller bracket fixations".



LightDrive2.1 Joystick

Place the joystick on the flat angle supports with 2 M5x16 Button Head screws. Slide the hand-rest between the joystick and the supports before tightening the screws.

Light Assist2.1 Installing the handles

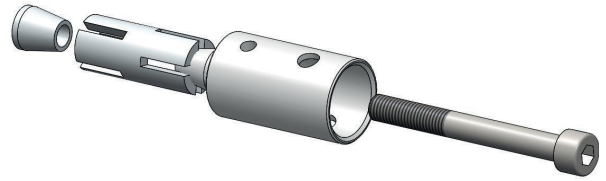
Cut the end of the rubber handle to insert the handle holder with expanding sleeve.

Hold the holder while completely tightening the screw inside.

Repeat the same on the other handle.

If necessary, use the M6 tapping to put the stiffener back.

Insert the static handle on one side and the throttle handle on the other side, they will lock with a spring mechanism.



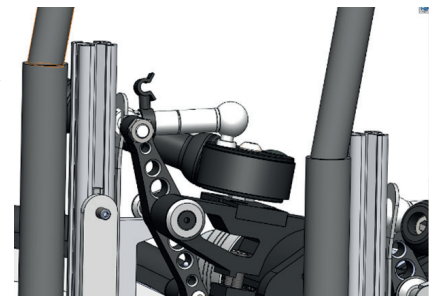
Note: there are 2 diameters of expanding sleeves according to the wheelchair handle tube.

Light Drive 2.1 Storage controller bracket

Install the storage controller bracket as described in "Assembling & installing the controller bracket fixations".

Joystick cable

Fasten the joystick cable on the ball joint on the same side as the joystick using the joystick clip, so that it does not get pinched against the hook plate when engaging the clutch.



Final trial

Try out the wheelchair and check:

1. That the front castors do not vibrate, otherwise go back to "Forks adjustment".
2. That the rollers are centered on the tyres when the user sits on the wheelchair (the tyres take their functioning position once the chair is laden down), otherwise loosen the screws on the collar to be able to move the motor tubes in or out.
3. If the balance of the wheelchair is frail, it is possible to adjust the length of the battery to have it go further front (see Battery length adjustment).

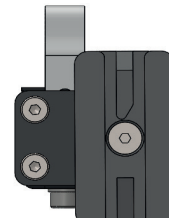
IV. ASSEMBLING & INSTALLING

THE CONTROLLER BRACKET FIXATIONS

2 configurations are possible for installing the base reinforcement plate, in addition to the angle adjustment.

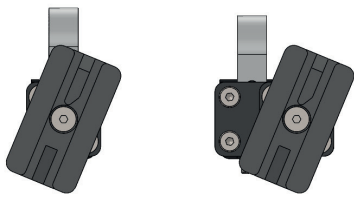


A - Bracket in front of the metal strip

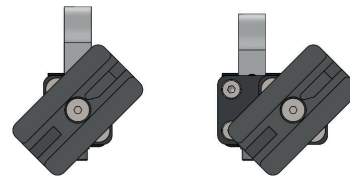


B - Bracket shifted on the side of the metal strip

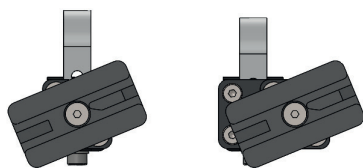
Possibilities of angle adjustment for both configurations A and B:



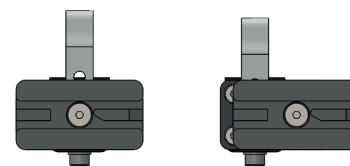
Bracket at 22.5°



Bracket at 45°



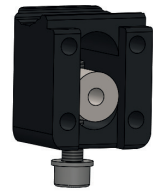
Bracket at 67.5°



Bracket at 90° (or in case of installation on a vertical tube)

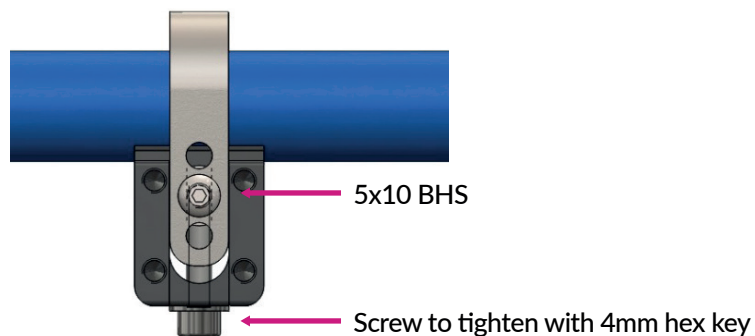
Controller bracket base

Slide the mobile axle into the controller bracket base. Start tightening the M5x25 cap screw with the Ø5 washer into the radial tapping of the mobile axle.



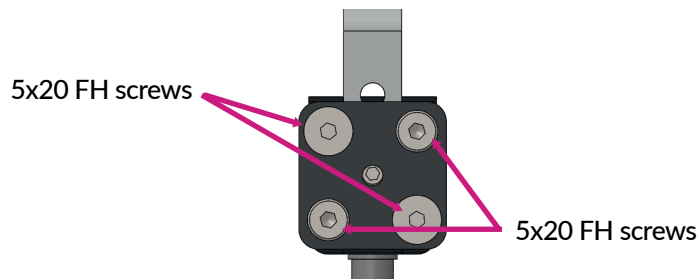
A - Bracket in front of the metal strap

1. Place the metal strap around the tube and tighten with 2 5x10 Button Head Screws (BHS). Tighten the screw on the other end with a 4mm hex key to bring the fixation closer to the tube.

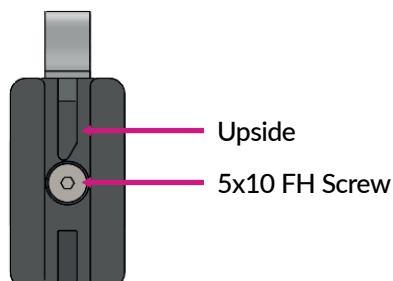


Note: choose the appropriate holes on the metal strap according to the diameter of the tube.

2. Fasten the standard reinforcement plate with 2 5x20 Flat Head (FH) screws and 2 5X20 Low Head (LH) screws.



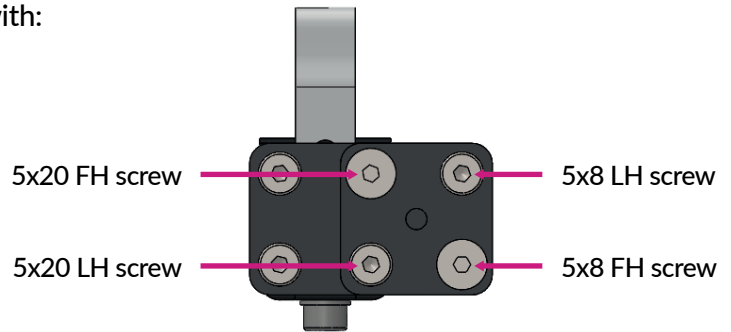
3. Fasten the controller bracket with a 5x10 Flat Head screw.



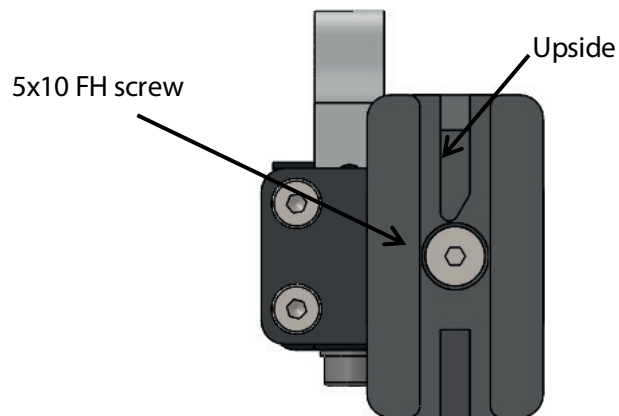
B - Bracket shifted on the side of the metal strip

1. Fasten the standard reinforcement plate with:

- 1 5x20 Flat Head screw
- 1 5x8 Flat Head screw
- 1 5X20 Low Head screw
- 1 5X8 Low Head screw



2. Fasten the controller bracket with a 5x10 Flat Head screw.



Angle adjustment

1. Unscrew the 5X10 FH screw at the center of the bracket for a few turns and turn the bracket at the desired angle (22.5°; 45°; 67.5°; 90°)

Note: the bracket can only be turned clockwise.

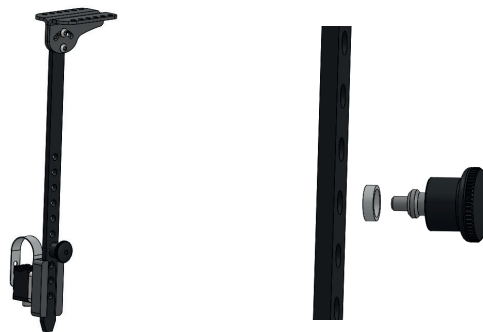
2. Tighten the central 5X10 FH screw once the bracket is in the desired position.

Joystick support and joystick extension

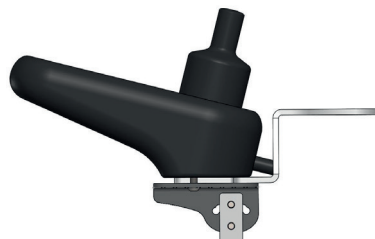
1. Assemble the Right and Left flat angle supports on the joystick extension with a M5x10 BHS

2. Place the extension in the bracket and tighten the 2nd screw so that the flat angle supports are horizontal.

3. Place the index plunger with the index plunger spacer into the hole while adjusting the extension height.



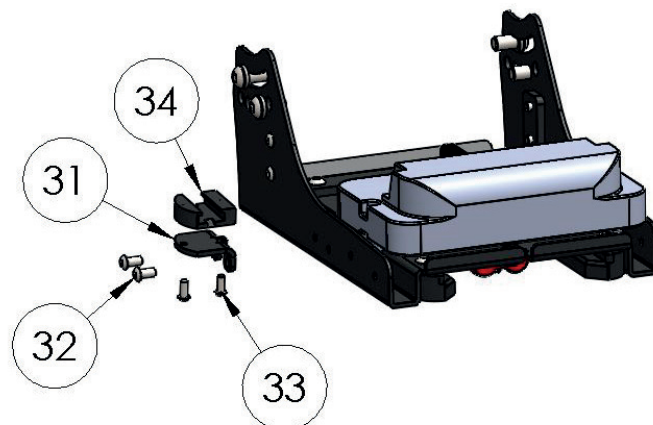
4. Insert the right or left-hand side handrest between the joystick and the support before tightening the screws.



Storage controller bracket

Install the elements of the storage controller bracket on the RHS or LHS (same side as the joystick) of the central unit.

Thread the 2 holes with a 5 thread.



V. ADJUSTMENT OF THE BATTERY LENGTH

This adjustment is necessary when the balance of the wheelchair with the power add-on is too weak (wheelchair tipping backwards), or when the battery rack is too long hence too close to the floor.

Upper cover

Unscrew the cable gland.

Unscrew the 6 M4x20 screws of the cover to access the cables (be careful not to lose the water tightness washers).



To make the battery rack shorter

⚠ WARNING :

- Risk of damage and fire of the battery if use of longer screws
- In order to preserve the water tightness of the battery case, imperatively use the existing M5x10 screws, otherwise ensure the water tightness of the threads with thread lock or silicone.

1. Unscrew the 6 M5x10 BH screws which fasten the battery case on the rack plate. Unscrew the 2 lower screws.
2. Tighten the rack at the desired position by putting back all the screws in order to guarantee the water tightness.

Pull the cable back inside the cover and close it. Tighten the cable gland.



2.



To make the battery rack longer

Same as above ; make sure you extend the cable enough out of the battery case.

- ⚠ WARNING : the battery case must be fastened to the rack plate with at least 4 screws

VI. INSTALLATION ON RIGID FRAME WHEELCHAIRS

You will find below the specific steps for installing our power add-ons on rigid frame wheelchairs.

Forks adjustment - Brakes adjustment Hook bars installation - Power add-on settings Joystick installation

See Standard installation procedure.

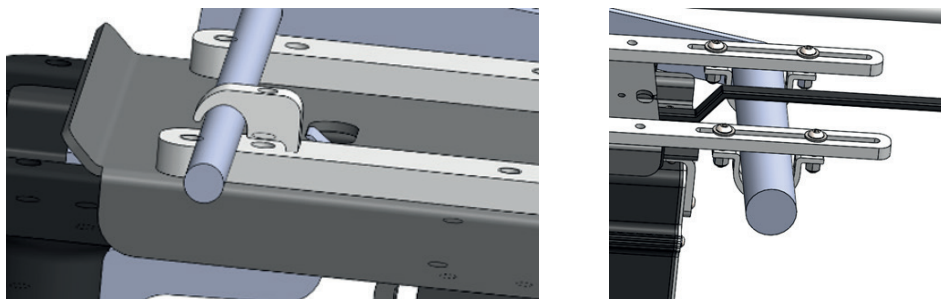
To install the hook bars, if necessary, modify the position of the backrest bar by following the instructions described in "Modification of the backrest bar"

Sliders support installation

The sliders support for rigid frame wheelchair is always installed in the front of the chair.

It is equipped with two plates, which must be positioned as far forward as possible (balance) without getting in the way of the legs.

They have to be fastened on the seating frame on one side, and on the wheel axle on the other.



Use preferably 2 hooks on the higher side, and 2 U clips on the lower side (fastening will be more stable).
Center the sliders support and tighten until secure without damaging the parts.
Place the washers between the screws and the plate and tighten the hooks.

Installing the connector Connection with the power add-on

1. Fasten the red connector of the sliders support to the hook bar with 2 M5x20 cap screws, in order to connect the battery to the NVR2 electronics unit.
2. In case it is impossible, fasten the red connector on a frame tube using a controller bracket fixation plate and a metal strip.
3. Connect the electronics unit connector to the one of the hook bar.



VII. DOCUMENTATION

▶ SPARE PARTS CATALOGUE

Light Drive 2.1

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