

 Netti[®] ***EL-kit:***
tilt-, recline- and leg
support control

Mounting Descriptions



*inspire
joy of life*

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1. INTRODUCTION

Netti EL-kit is a kit for Netti multi-functional manual wheelchairs for wheeled transport for partially or fully immobile persons with physical and/or mental disabilities.

The Netti manual wheelchairs can be equipped with Netti electrical -tilt, -recline and -leg supports which ease the use of these functions.

The Netti electrical kit fit to the following wheelchairs: Netti III, Netti III HD, Netti V, Netti V All-round, Netti V El. They may be equipped with one or several of the electrical features: tilt, recline, leg support elevation. The electrical features are operated with a hand control.

In this manual the different electrical features are presented with their mounting description.

 **ELECTRICAL COMPONENTS ARE TO BE MOUNTED BY ALU REHAB OR CERTIFIED PERSONNEL.**

Important points are marked with the following symbols:

 **Symbol of forbidden actions.**
No warranty can be claimed whenever these actions are implemented.

 **Symbol of warning.**
Whenever this symbol is used, caution has to be taken.

 **Symbol for important information.**

 **Symbol for useful tips.**

 **Symbol for tools.**

 **Please study this mounting description and pay careful attention to the user manual for the wheelchair where the Netti electrical kit is mounted.**

 **User and attendant need instruction and training in the use of Netti wheelchair with electrical tilt-, recline and leg supports. A separate user manual - UM 0145 - is to be delivered to the end user.**

 **ADJUST THE WHEELCHAIR TO THE USER:**

Adjust seat depth and eventually the wheelchair balance, foot board height, armrest height, head support height and depth, chair back cushion height.

 **ANTI-TIP**
Correctly fitted, the anti-tip will secure the chair from tipping backwards. Please check the position of the anti-tips and adjust if the chair is unstable when tilted.

For more information about adapting the wheelchair to the user please see my-netti.com knowledge and tools.

 **Illustrations may differ from the delivered product.**

 **For visually impaired people, manuals and catalogues can be downloaded at my-netti.com**

2. THE NETTI EL-KIT ELECTRICAL COMPONENTS

Pos. 1 – 1 Control box complete

Pos. 2 – 1 Battery charger

Pos. 3 – 2 Leg support – actuator contacts with bracket

Pos. 4 – 1 Remote control

Pos. 5 – 1 Charging socket

Pos. 6 – 1 Back Recline Actuator - *to be ordered separately - dependent on wheelchair model*

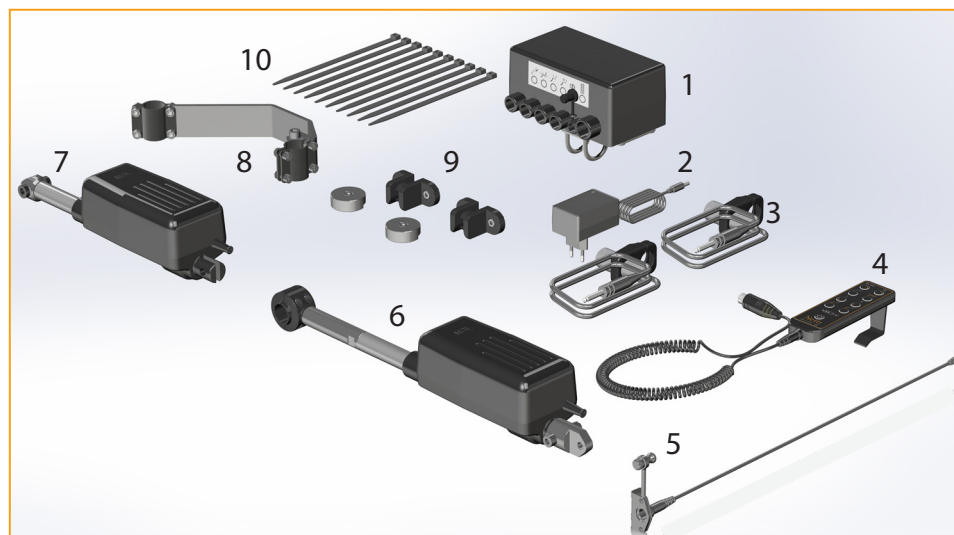
Pos. 7 – 1 Tilt Actuator - *to be ordered separately - dependent on wheelchair model*

Pos. 8 – 1 Tilt actuator bracket - *dependent on wheelchair model*

Pos. 9 – 2 brackets for fixing pos 3 - leg-support-actuator-contacts

Pos. 10 Strips for holding wiring

PLEASE NOTE! ELECTRICAL LEG SUPPORTS TO BE ORDERED ACCORDING TO WHEELCHAIR WIDTH.



The products are CE-marked and follows EMC standard EMC 60601-1-2.

Netti V kit for illustration

Weight of components:

Control box with batteries	750 gram
Tilt actuator:	1470 gram
Recline actuator:	1580 gram
Leg support actuator:	920 gram each
Hand control:	190 gram
Cable for charger:	20 gram
Total weight all inclusive:	5850 gram

The charger is free standing and not calculated as part of the weight of the wheelchair.

2.1 SPECIFICATION OF THE ELECTRICAL COMPONENTS

The control box with 24V 3-0 AH Li-ion battery.

The tilt and the recline actuators, the remote control and the actuator socket brackets for the leg supports are plugged into the control box. The box is labelled accordingly.



Control box



Recline actuator

Actuators for Recline function and for tilt function R 3000

Max push force	2000N – 3000N
Max pull force	2000N – 3000N
Max speed (full load)	2,3 – 9,6 mm/s
Max speed (no load)	5,0 – 16,0 mm/s
IP-class	IPX4
Current consumption (full load)	1,6A – 6,0A
Feedback & switches	Motor 24VDC standard



Tilt actuator

Actuator for leg supports RE1001 are mounted to the leg support from factory

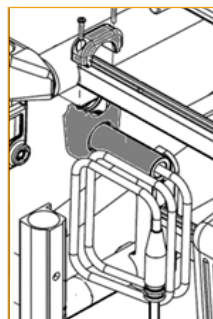
IP 41, 600N, 100MM, 24V, with special cable, with steel end bracket.

The leg support is fixed into the standard leg support brackets on the wheelchair seat frame.

The actuator socket bracket for the leg supports are fixed on each side of the front cross tube at the seating frame.



Leg support



Socket for the leg support

3. MOUNTING NETTI EL-KIT ON NETTI III

START BY REMOVING:

- cushions and head support
- arm supports and arm support brackets
- leg supports
- wheels
- tilt handle and recline handle with wires
- seat plate - for easier access to the rest
- the whole chair-back.



Remove the chair-back:

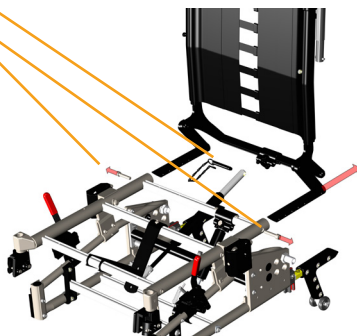
Pull out the spring loaded splint holding the recline actuator

Unscrew the 2 bolts holding the chair-back in the seat frame



2pc M8 x 40 hex socket screws
6 mm Allen key

Pull the chair-back out of the seat frame.

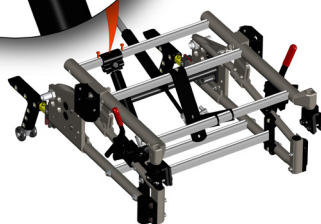
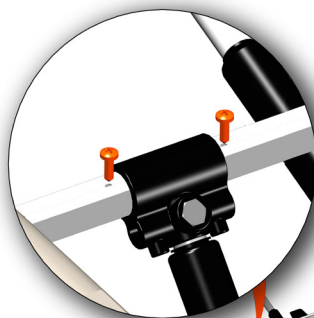


3.1 REMOVE TILT GAS SPRING

Unscrew the 2 screws holding the rear tilt gas spring bracket.

Netti III HD and Netti III XHD has 2 tilt gas springs and brackets that must be removed.

Pull the crossbar aside and slide off the tilt gas spring bracket.

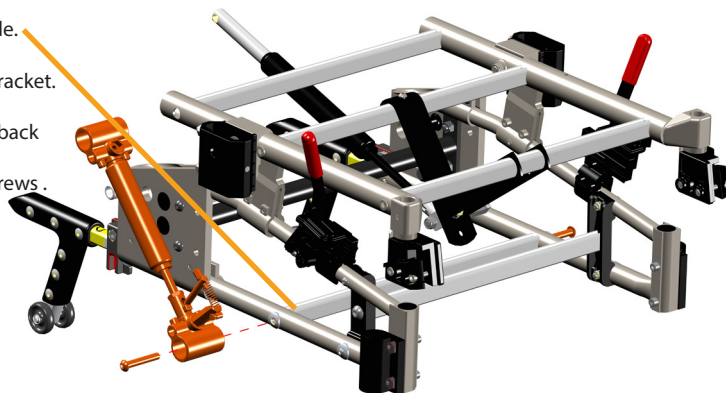


Unscrew and move the lower tilt crossbar aside. Slide off the lower tilt gas spring bracket.

Screw the lower crossbar back where it was positioned, without tightening the screws.

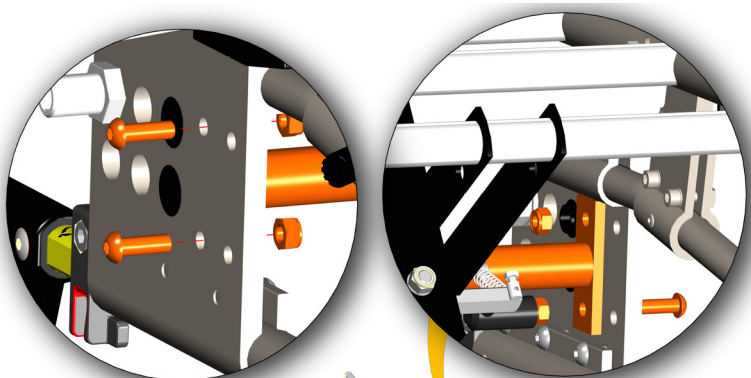


2pc M8 screws
6 mm Allen key

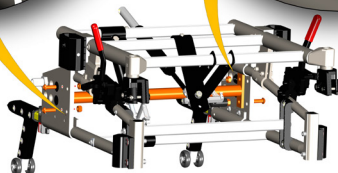


3.2 REPOSITION THE REAR CROSS BAR

Move the rear crossbar (here in orange for illustration) one step rearwards in the wheel bracket. It is moved rearwards to prevent conflict with the recline actuator.



4pc M8 screws
6 mm Allen key



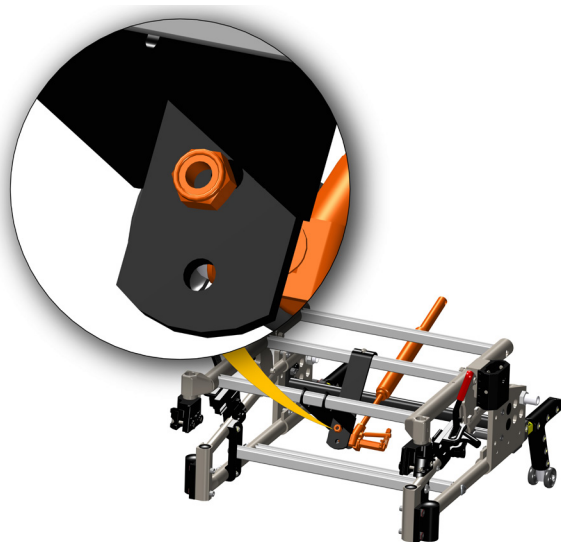
Re-tighten all crossbars that has been loosened firmly.

3.3 REMOVE RECLINE GAS SPRING

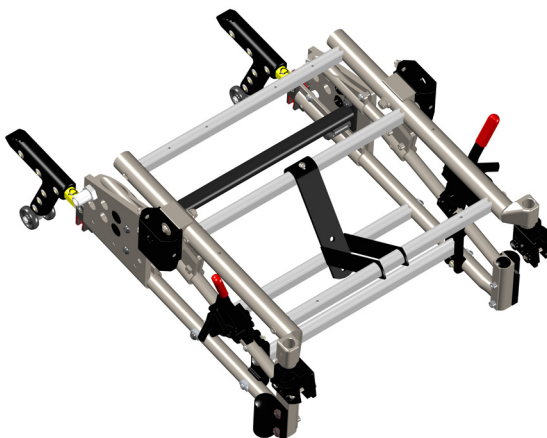
Recline gas spring to be removed from the bracket under the seat which is fixed with a square nut bolt and



M8 lock nut (orange) as shown.



Complete stripped down Netti III frame ready for mounting the EL-kit.

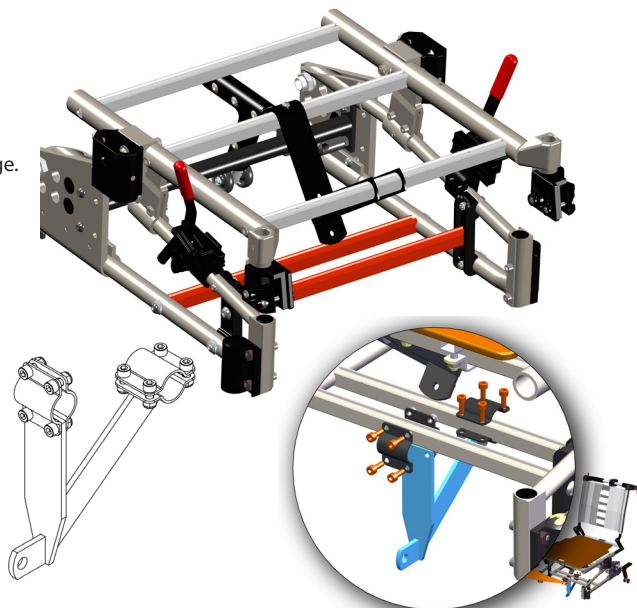


3.4 MOUNT THE TILT ACTUATOR

Fix the tilt actuator bracket (blue)
to the 2 crossbars - here illustrated in orange.



2 x 4pc M6 x 16 mm screws
4 mm Allen key

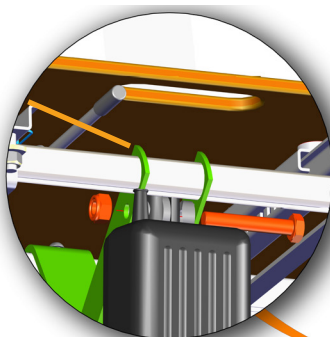


Fix the upper part of the tilt actuator to the tilt
bracket (green) by inserting:

- M10 x 60 hex screw
through the bracket under the seat plate -
2 curved washers help position the top of the
actuator in the bracket.
M10 Lock nut to fix.



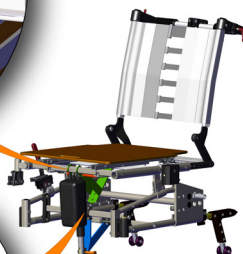
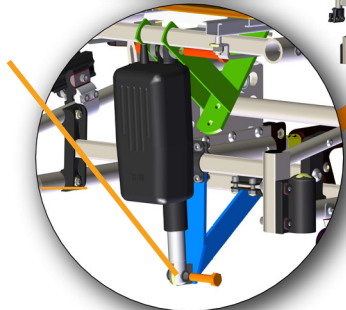
16 mm open end spanner.



Fix the lower part of the tilt actuator to the
bracket mounted (here illustrated in blue).



M10x37 bolt and
M10 lock nut.
16 mm open end spanner.



3.5 MOUNT THE RECLINE ACTUATOR:

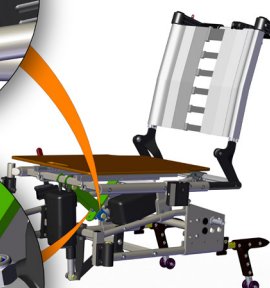
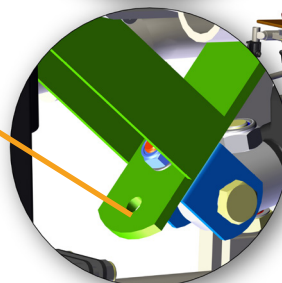
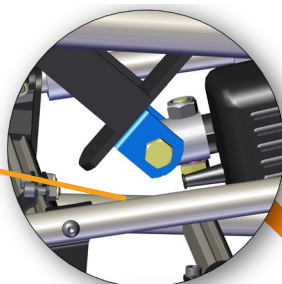
The chair-back must be mounted to the seat frame and fixed in desired seating depth.



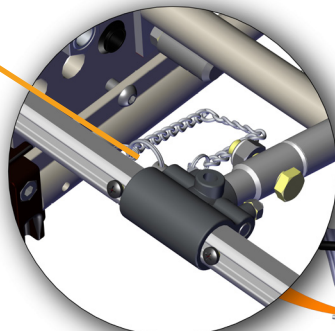
Fix the bracket 21094 (blue) to the lower end of the recline actuator with M10 x47 mm. 16 mm open end spanner.



Fix 21094 to the bracket under the seat (green) with square nut bolt and M8 lock nut (red) as shown.



Fix the recline actuator head in the recline bracket sitting on the lower chair-back crossbar with a spring release bolt that is pushed through the bracket and through the actuator head.

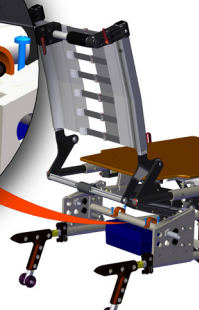
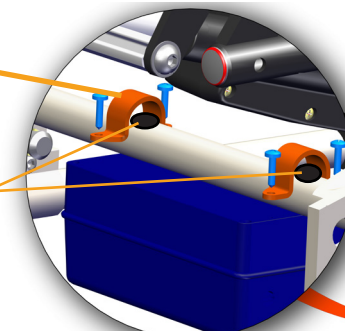


3.6 MOUNT THE CONTROL BOX TO THE REAR LOWER BEAM



4 pc screws Ø3 x 16 Phillips

Glue one round black rubber washer on the crossbar where the brackets shall sit. The rubber washer will prevent the control box brackets from rotating on the crossbar.



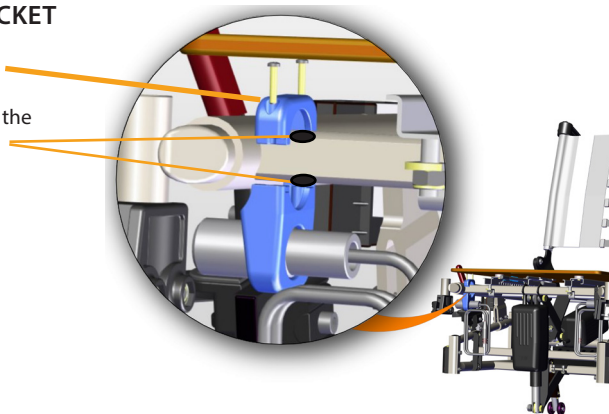
3.7 MOUNT THE LEG SUPPORT SOCKETS TO THE FRONT UPPER BEAM BRACKET

As shown in blue - right and left.

Glue two round black rubber washer on the crossbar where the brackets shall sit



2 pc screws POZ Ø3 x 16.



3.8 MOUNT THE CHARGING SOCKET.

On the right side of the wheel frame, close to the vertical bracket - as shown in the picture.



Alternative: mount the charger socket (if enough space is available) under the push bow - see picture.



3 mm Allen key
2 pc M4 cylinder head screws -
2 M4 nuts

Plug in the rubber knob in the charger socket when the charger is not connected.



CONNECT ALL COMPONENTS TO THE CONTROL BOX.

The box is labelled for each feature.

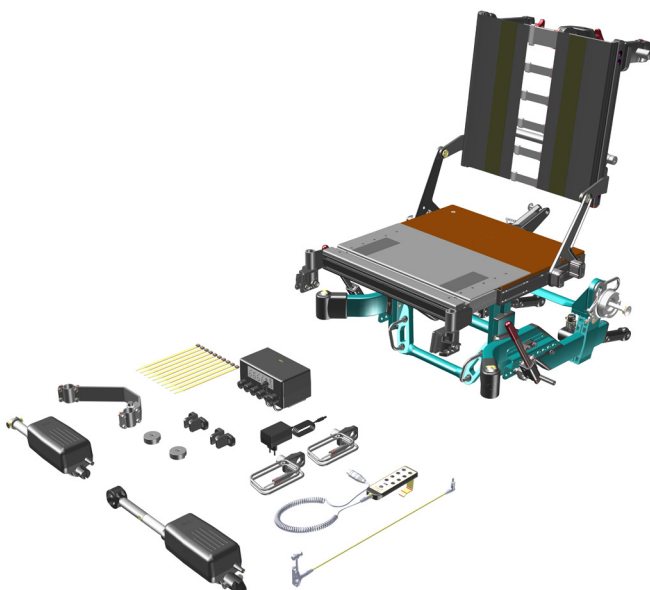
Charge and check that all functions work correct.

Route all cables to prevent them from getting pinched or getting caught on other objects when moving the chair.

4. MOUNTING NETTI EL-KIT ON NETTI V

START BY REMOVING:

- cushions
- head support
- arm supports
- leg supports
- wheels
- tilt and recline handles and wires
- tilt and recline gas cylinders



4.1 MOUNT TILT ACTUATOR BRACKET

Fix the lower part of the tilt actuator bracket to the lower front cross bar with 4 pc M6 x 16 screws and M6 lock nuts.

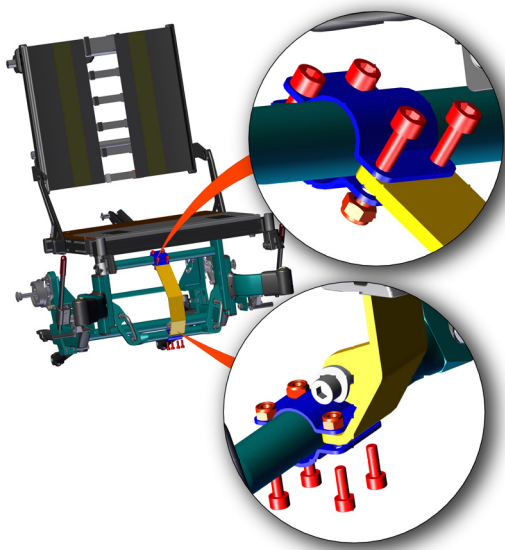


5 mm Allen key and 10 mm open end spanner

Fix the upper part of the tilt actuator bracket to the upper cross tube - see picture.
Use 4 pc M6 x 16 screws into 4 M6 lock nuts.



5 mm Allen key and 10 mm open end spanner



MOUNT TILT ACTUATOR

Fix the upper end of the tilt actuator in the actuator bracket on the rear seat profile with a M8 x 63 mm hex socket screw and M8 lock nut.

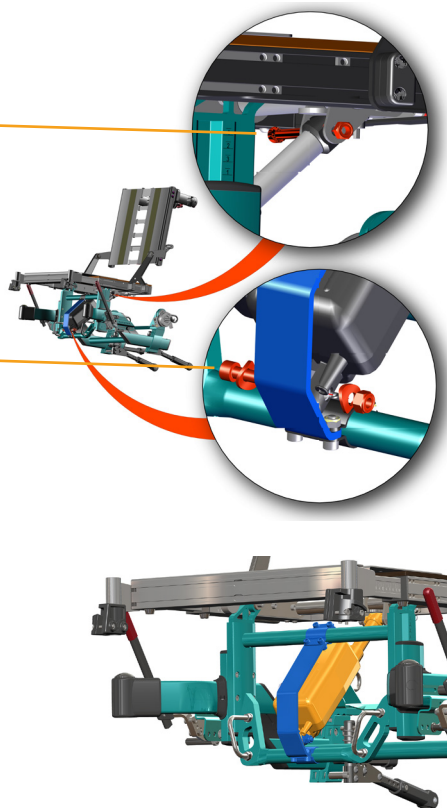


6 mm Allen key and 13 mm open end spanner

Fix the lower end of the tilt actuator in the lower end of the bracket by inserting a M8 x 40 hex socket screw with bent washes through the bracket and the end of the tilt actuator. M8 lock nut



6 mm Allen key and 13 mm open end spanner



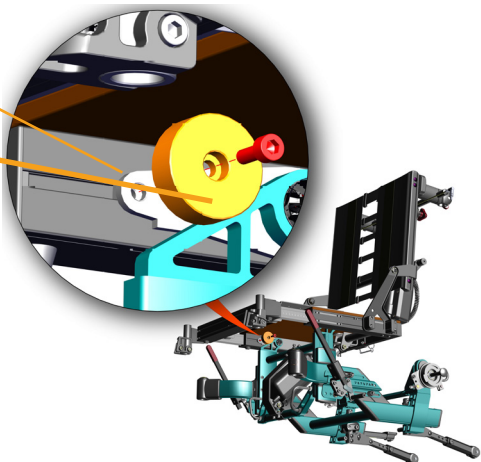
4.2 MOUNT TILT LIMITER

Remove the bolt holding the height bracket in the seat frame and

replace it with a M6 x 22 mm hex socket screw inserted through the tilt limiter disk and into the nut sitting in the seat frame profile.



5 mm Allen key

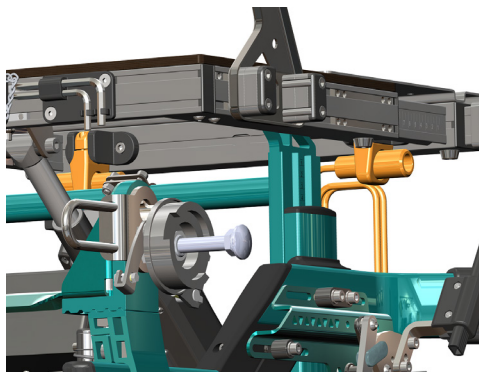
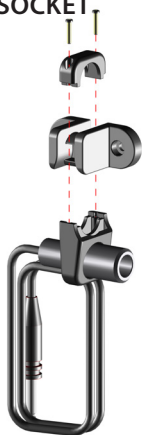


4.3 MOUNT LEG SUPPORT SOCKET BRACKETS

Pre-mount the fixing units to the 2 leg support sockets.



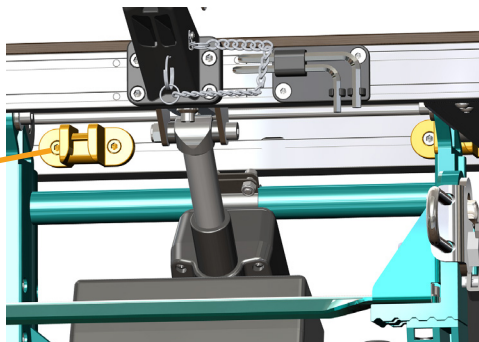
2 pc screws POZ Ø3 x 16.



Mount the 2 leg support brackets to the nuts sitting inside of the front seat profile.



2 pc M6 x 16 mm screws
5 mm Allen key



4.4 MOUNT CONTROL BOX

Fix the control box bracket to the crossbar with 2 bolt bows into 4 pc M6 lock nuts.

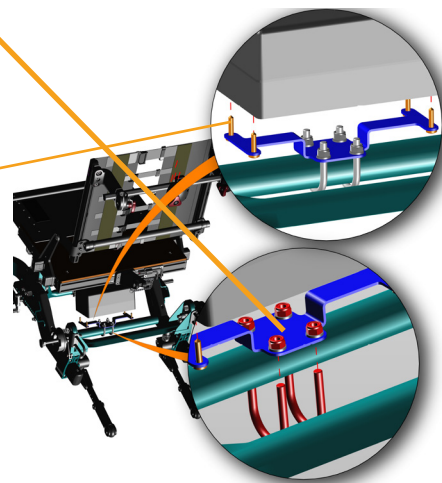
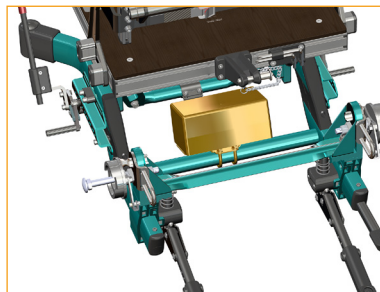


10 mm open end spanner

Fix the control box to the bracket with



4 pc POZ 4,2 x 19

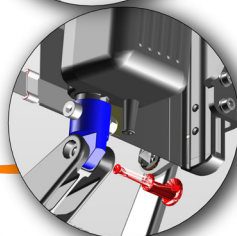
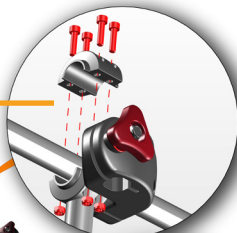
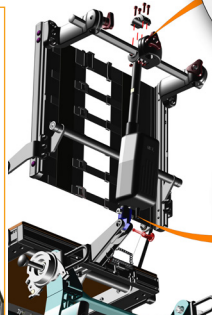
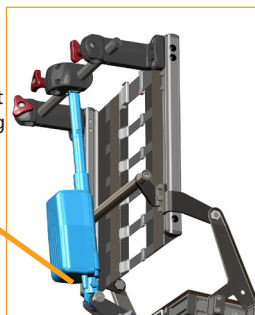


4.5 MOUNT RECLINE ACTUATOR

Fix the top of the recline gas spring with the bracket holding around the cross bar 4 pc M5 x 20 mm screws.

 4mm Allen key

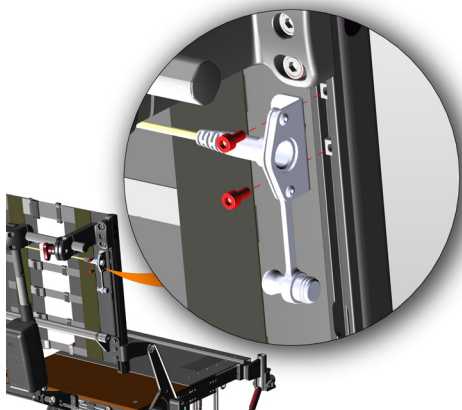
Fix the recline gas spring at the lower end with a spring release bolt that is pushed through the bracket and through the gas spring head.



4.6 MOUNT CHARGING SOCKET

Fix the charging socket to 2 nuts running in the chair-back profile with 2 pc M5 x 10 mm screws.

 4mm Allen key



CONNECT THE REMOTE CONTROLLER

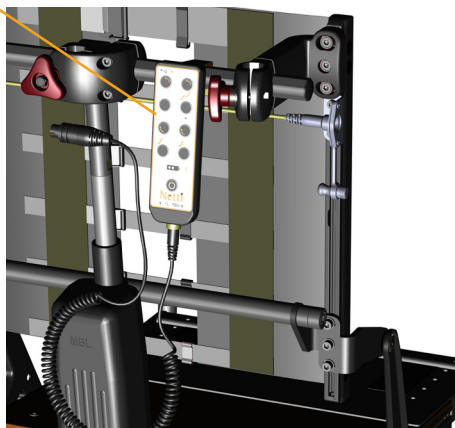
CONNECT ALL COMPONENTS TO THE CONTROL BOX.

The box is labelled for each feature.
Charge and check that all functions work correct.

Run all functions to max and min position. Check that there are no conflicts between actuators and control box.

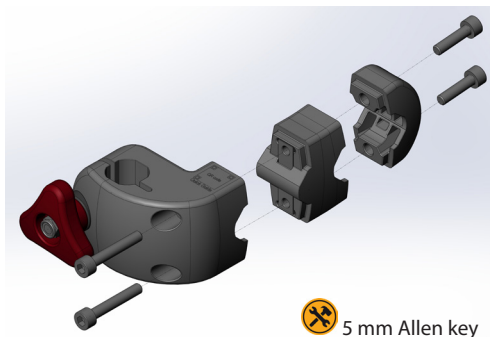
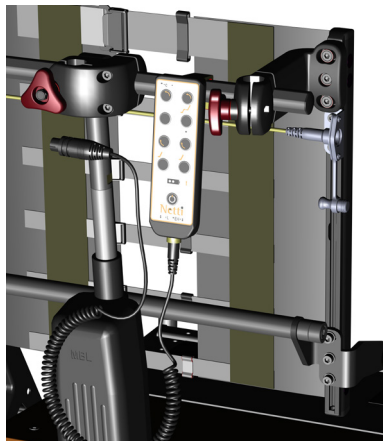
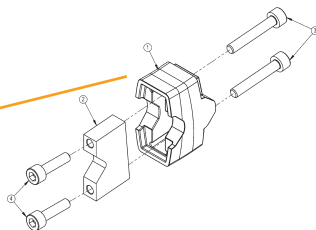
If necessary adjust the position of control box (rotating on the tube it is sitting) to avoid eventual conflicts.

Route all cables with the wiring strips to prevent them from getting pinched or getting caught on other objects when moving the chair.



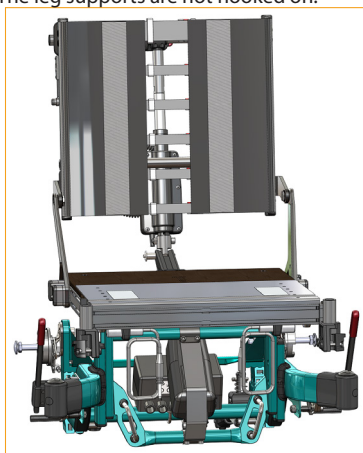
4.7 MOUNT HEAD SUPPORT BRACKET WITH ADAPTER

When mounting electrical back recline actuator on Netti V el, the head support bracket must be extended backwards with the adapter. This ensures that the head support vertical pole does not get in conflict with the actuator with max back recline.



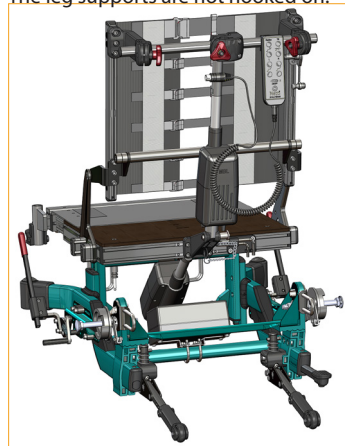
FRONT VIEW OF NETTI V WITH EL KIT MOUNTED.

The leg supports are not hooked on.



REAR VIEW OF NETTI V WITH EL KIT MOUNTED.

The leg supports are not hooked on.



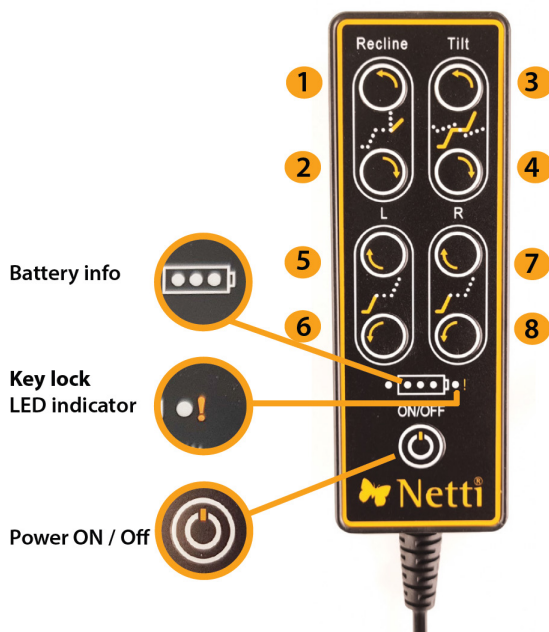
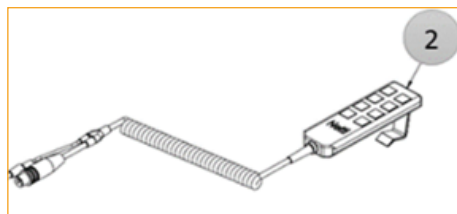
5. USE OF THE NETTI EL-KIT

5.1 REMOTE CONTROL

The remote control unit is connected to the control box fixed to the wheelchair frame.

i A holder for hand control can be mounted as accessory.

On the remote control the icons are describing the different functions:



Hand control functions:

1. Recline forward
2. Recline back
3. Tilt forward
4. Tilt back
5. Left leg support up
6. Left leg support down
7. Right leg support up
8. Right leg support down

5.2 KEY-LOCK

A key lock function to lock one or several channels / functions is available.

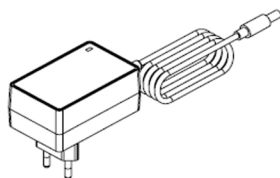
- To lock a channel: press both buttons for that channel at the same time – for 3 seconds, until the alert indicator LED is lit. The channel is locked.

i If turning of the system with the on / off button and then start again, the red LED will light up for a short while to indicate that a key lock is active.

- To unlock: press both channel buttons at the same time for 3 seconds until the alert indicator LED is switched off.

5.3 CHARGER

MBL's charger for the Li-ion batteries is manufactured by Dongguan GeoFanDe Technology Co., Ltd. in China with 100-240V, 50/60Hz, 1.0 A Max, IP20 and insulation class 2. A separate user manual for the battery charger to be downloaded from my-netti.com under electrical upgrade kit.



5.4 CHARGING

To charge the electrical kit you need to connect the charger to the charger socket - it may be mounted on the right side of the wheelchair frame or on the push handle bracket.

-  On the hand held remot controller the battery info LEDs indicates the level of battery power left.
-  The batteries should be recharged when the LED on the hand control is showing low battery.
Charge every day after use.
-  When the green light on the charger is glowing, the batteries are fully charged
-  Replace the rubber plug in the charger socket when the charging is finished.
-  Maximum charging time: 24 hours.
-  The chair cannot be used during charging.



5.5 FIRST USE

Connect battery:

Plug in the standard charger delivered with the control box into the charger socket on the wheelchair. Plug in the charger into a wall socket. Wait 5 sec and unplug the charger. The battery is now connected.

-  Charge the batteries before first use.
-  **Automatic battery disconnect:**
To prevent deep discharge and protect batteries, the battery automatic goes into DEEP SLEEP if there is no operation within 30 minutes after power on.

5.6 WAKE UP PROCEDURE:

-  Push the power button on on the hand control, the system will automatic wake up.
- Charge the battery if required.

5.7 TROUBLESHOOTING EL FUNCTIONS

General the procedure below is to be followed for all the actuators.

If an actuator is not responding when pressing the remote control panel:

BATTERY and CHARGER check:

- Check battery status on the remote control panel.
- Set the wheelchair to charge. It will increase the actuator performance if the control box is low on battery.
- Check that the charger is charging: Green light when connecting to current - this changes to red when the charging is taking place and back to green when the battery charging is complete.
If the charger show no light when connected to current, the charger is defect and need replacement.
- Check that the battery is being charged on the remote control - it show running LED lights.
- If the charger does not charge, connect it direct to the control box (1). If it now charges there is a remote control cable (5) breakage.
- If it does not charge with the charger connected to the control box, the battery is probably defect. Open the control box and check battery voltage. If the battery voltage is too low (less than 18V) replace the battery.
- If the battery voltage is OK, the control box is defect. (Fully charged battery voltage is 24,6V).

ACTUATORS NOT WORKING:

- Check that the Key lock function is not active. The red indicator LED next to battery LED indicator on the remote control, lights up when the key lock is active. **To unlock:** press both channel buttons at the same time for 3 seconds until the alert indicator LED is switched off.
- Check that all contacts to the actuators are securely in position.
- If an actuator has had an overload it will stop. Turn the power off and on on the remote control to activate the actuator again.
- If the actuator still does not work, connect it to another outlet on the control box. If it still does not work the actuator needs to be replaced.
- If extension cable (3)Y-adapter is used the actuator must be directly connected to the control box to eliminate possible breakage in the extension cable /Y-adapter, which need replacement if defect.
- If a leg support actuator is not working, switch side of the leg supports. If it still does not work it needs to be replaced. If the other leg support is not working now, check the extension cable/Y-adapter by connecting the leg support direct to the control box. If it works the Y-adapter needs replacement.
- If it does not work, try another remote control. If a new remote control does not work, replace the control box.

Troubleshooting for Netti electrical equipment:

Symptom	Possible cause	Action to be taken
No response on remote control	Poor connection Low battery level Defective remote control	Check cables and connections Check the battery Try another remote / replace if necessary
No charging	Defective charger / no lights Poor connection /defect cable Battery is not receiving current	Replace charger Check connections & cables, connect the charger direct to the control box. Replace battery (18-24,6 V)
Battery loose current too quick	Old battery	Replace battery
Actuators not moving	Low battery level Bad connections Defective outlet Defective actuator Defective remote control	Charge the battery Checks cables and connections Try another outlet, replace actuator Replace actuator Replace remote control
Actuator moving only one direction	Actuator had overload	Turn power off and on, on the remote cont
Actuator clicks/ move unevenly	Low battery level	Check battery indicator, Charge battery

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