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Electric wheelchair

Model: 1.623 iChair DYNAMIC

Maintenance and Service manual

CE

MEYRA®

Contents

GENERAL

Foreword

This maintenance and service manual is intended for the specialist dealer and describes all adaptations and adjustments as well as the required service, maintenance, repair and replacement jobs.

This maintenance and service manual is supplemented by the following documents:

- the model dependent operating manual
  - ☞ (an operating manual is supplied with each vehicle),
- the model dependent operating manual < *Operating module* >,
  - ☞ (an operating manual is supplied with each vehicle),
- the safety and general handling instructions < *Electronic vehicles* >,
- the model dependent spare parts list,
  - ☞ (the required spare parts list can be obtained through the specialist dealer access on our website).

All required documents as well as additional information to our products are located on our website under:

< *www.meyra.com* >.

Meaning of the applied markers

Safety instructions with a coloured background are mandatory and need to be observed under any circumstance!

☞ This symbol indicates tips and recommendations.

[ ] Reference to a picture number.

( ) Reference to a function element within a picture.

Requirements concerning workshop personnel

During all corresponding work there is always a danger of jamming or skin abrasions!

Knowledge of this maintenance and service manual as well as the supplementing documents (view chapter *Foreword* on page 7) is mandatory for the correct and safe execution of the work required on the electric wheelchair.

Special knowledge is required to carry out the maintenance and service work described in this maintenance and service manual and may therefore only be carried out by educated qualified personnel.

☞ We therefore offer vehicle specific courses that provide the specialised personnel with the required qualification.

☞ The document, especially the chapter *Safety information* on page 11, must therefore be read carefully and observed by all persons, that are assigned to work on the electric wheelchair.

Customer support

Technical questions will gladly be answered by your national Meyra distribution partner.

INFORMATION TO MAINTENANCE AND SERVICE WORK:

☞ Every electric wheelchair should undergo inspection once a year.
– The inspection increases the safety and extends the life span of the electric wheelchair.

☞ For highly strained wheelchairs for example in case of:

– extreme strain,

– user still growing,

– users with changing disease patterns,

it is recommended to have the electric wheelchair checked, maintained and if required adjusted semi-annually.

☞ Only original Meyra spare parts are to be used for all maintenance and service.

☞ Before beginning with the service work check the general condition of the electric wheelchair.

☞ All screwed connections, if not otherwise noted, tightened according to table *Torque according to DIN for screwed connections* on page 46.

☞ The maintenance schedule (Checklist) should serve as a master for copying.
Maintenance schedules that have been filled out are to be kept on file and a copy handed to the customer!

WORKING ON THE VEHICLE

☞ For maintenance and repairs the vehicle is to be switched off and secured against unintentionally rolling away.

☞ Additionally the main-/battery fuse is to be removed.

☞ Before working on electric parts, the plugged connection from the battery cable to the power module might also need to be disconnected.

☞ Before working on electric adjustment the corresponding plug of the connection cable is to be pulled.

OVERVIEW

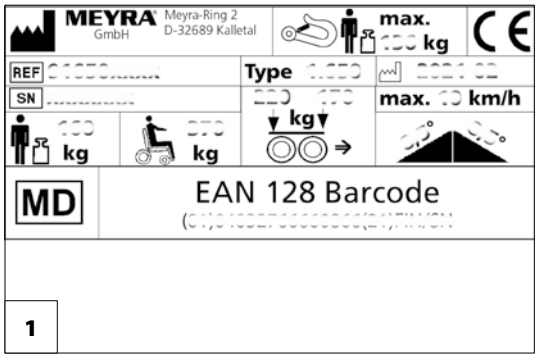
Model 1.623

VEHICLE IDENTIFICATION

For a definite vehicle identification in case you have questions, or for spare parts orders, the following data can be read off of the type plate:

☞ view sample-type plate [1]

1. The model description (in the field Type resp. Type).
2. The serial number (beside the field SN).



SERVICE POSITION

Danger of jamming the fingers, hands and arms in case of unintentional swivelling down of the seat unit possible.

☞ After swivelling the seat unit up, ensure the engaging of the locking bolt!

Danger of jamming the fingers, hands and arms is possible when lowering the seat unit into the regular driving position.

The service position describes a vehicle with corresponding seat position in order to enable e. g. unencumbered maintenance jobs.

Setting the service position

☞ Before adjusting the service position, remove the leg supports if necessary.

To adjust the service position, first remove the two attachment screws (1), then swivel the seat unit up until the locking bolt (2) engages.

☞ To lock the seat unit, the locking bolt must visibly and audibly lock into place (2).

☞ The locking device (2) is correctly engaged when:
– – the locking pin is has sprung out completely.
– – the handle plate lies directly on the hex housing.
– – the tension catch is screwed properly into the swivel arm.

Exit the service position

Only grab under the front of the seat plate, resp. under the seat frame tubes to swivel down the seat unit!

When lowering the seat do not grab under the suspension plate!

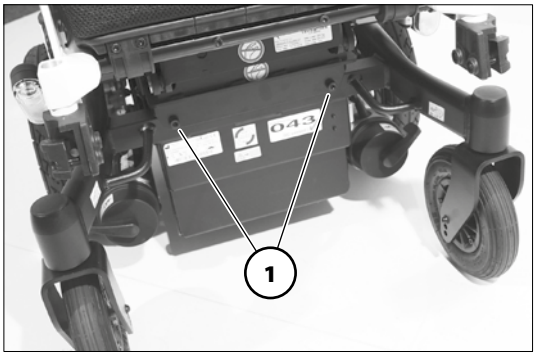
Danger of jamming when lowering the seat unit into the normal driving position.

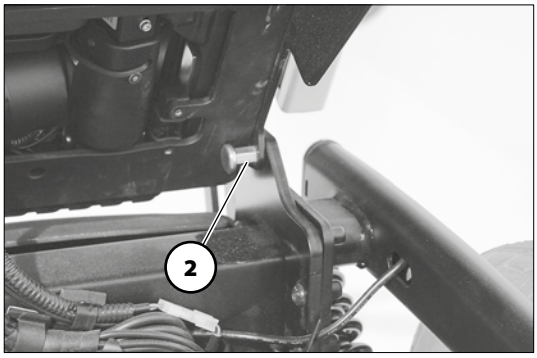
Swivelling down the seat unit

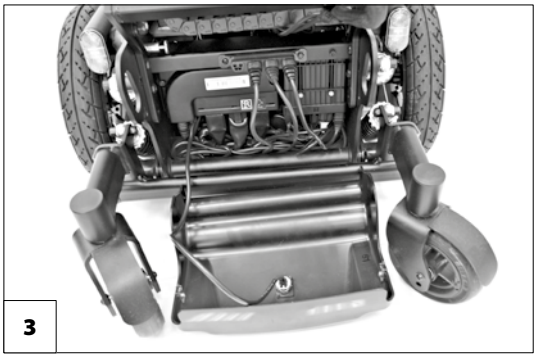
1. Hold the seat unit in position with one hand when swivelling down the seat unit.
2. Pull the seat locking device (2) and slowly swivel the seat unit down.

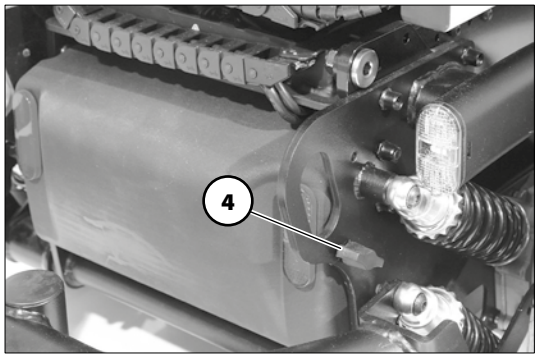
Removing the rear revetment

Remove the attachment screw (4) on both sides in order to remove the rear revetment [3].









SAFETY INFORMATION

☞ Wear suitable clothing during service-jobs as well as gloves and protective glasses when required.

– Danger of injuries caused by inappropriate work clothes.

☞ Secure the product against unintentional rolling motions, tilting over or falling down e. g. from a mounting rack.

– Damages due to a not secured electric wheelchair.

☞ Clean/disinfect the product before inspection.

☞ If necessary observe the care instructions and product specific inspection instructions in the corresponding user manual.

– Damages due to neglected cleaning.

☞ Keep your workspace clean and only use clean cloths.

– Damages caused by shavings and dirt particles.

☞ Use only suitable tools.

☞ View chapter *Required tools and aids* on page 11.

Damages caused by the use of incorrect tools.

☞ Replace loose screwed connections with thread safety with the respective nut or screw and new thread safety.

☞ If new screws or nuts with thread safety not be available, apply liquid thread safety compound with medium hardness e. g. Loctite® 241 or Euro Lock A24.20.

☞ Damages caused by loose screwed connections.

Storage

Dismantled parts are to be placed resp. stored safely and protected as well as sorted by commission.

REQUIRED TOOLS AND AIDS

For adjustments and maintenance we recommend the use of high quality tools.

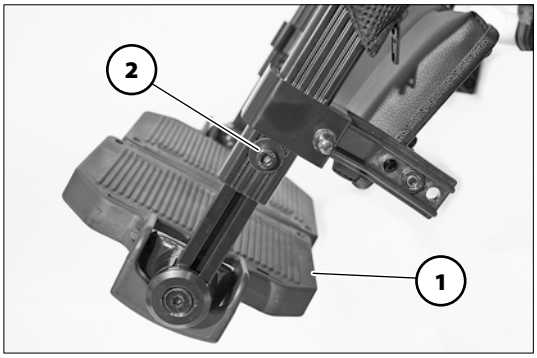
☞ High quality tools can prevent for example damages to the surface of the frame as well as minor injuries to the hand.

The tools required most frequently are:

– Socket wrench
– Open-end or ring spanner
– Hexagon socket spanner
– Phillips screwdriver
– Slot screw driver

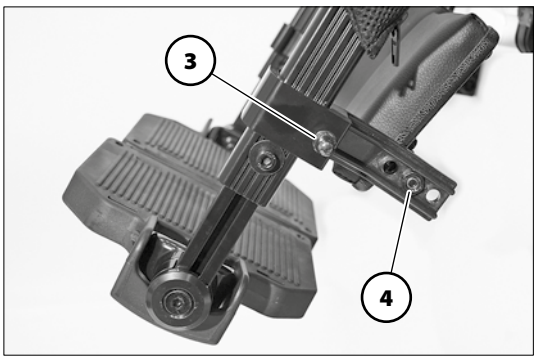
ADAPTATION AND ADJUSTMENT JOBS

The following chapters describe the fitting of the electric wheelchair to the changing individual demands of the user.



LEG SUPPORT

It is to be observed that other functions on the electric wheelchair are not impaired by the respective setting!



Mechanically adjustable leg support

Height adjustment of the footplate

1. Loosen the screws (2) for height adjustment of the footplate (1).
2. Telescope the footplate (1) to the desired height and then refasten the screw (2).

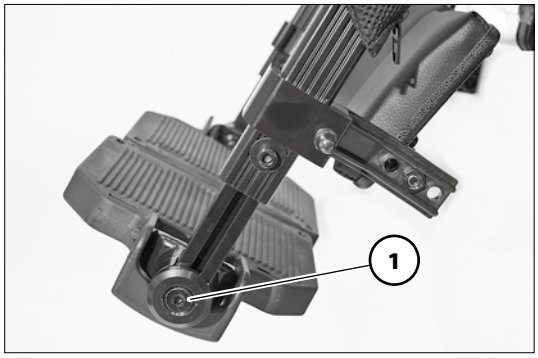
Height adjustment of the calf plates

1. Loosen the respective screws (3) of the calf plate bracket for height adjustment of the calf plate.
2. Slide the calf plate bracket to the desired height and refasten the respective screw (3).

Depth adjustment of the calf plates

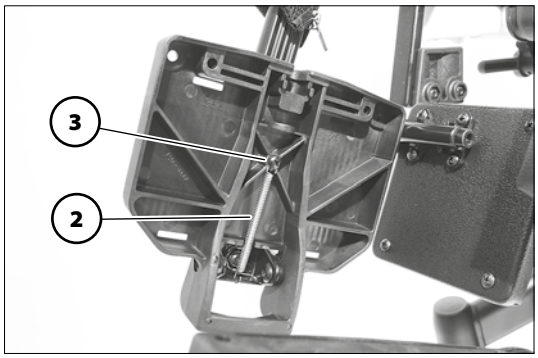
1. Remove the respective screw (4) to adjust the depth of the calf plates.
2. Position the calf plate in the desired depth position and remount to the calf plate bracket with the screw (4).

Angle adjustment of the footplate



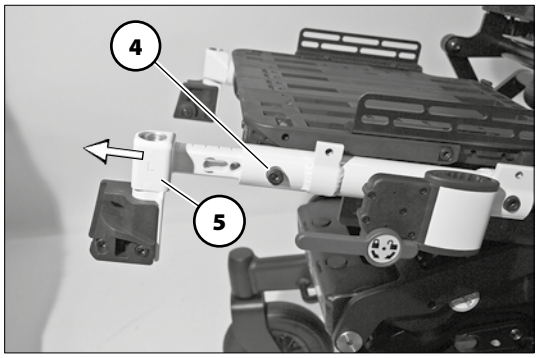
1. For this loosen the screw (1) so far that it no longer catches.
2. Disconnect the toothing of the footplate and adjust the angle of the footplate.
3. Retighten the screw (1) of the footplate.
   ☞ In doing so the teeth of the angle adjustment must join again.

Replacing the tension spring of the footplate



1. To replace the tension spring (2) of a footplate, remove the corresponding screw (3).
2. Unhook the tension spring (2) and replace it.
3. Hook the new tension spring (2) into place and re-mount it with the attachment screw (3) underneath the footplate.

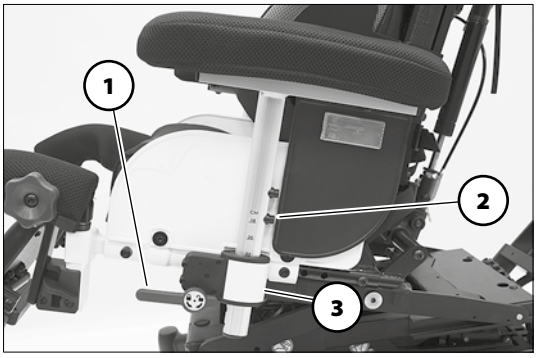
Depth adjustment of the leg support



1. For depth adjustment of he leg support, remove the screw (4) of the leg support receptacle (5).
2. Slide/push the leg support receptacle (5) to the desired position.
3. After positioning the leg support receptacle (5) remove the screw (4).

ARM SUPPORTS

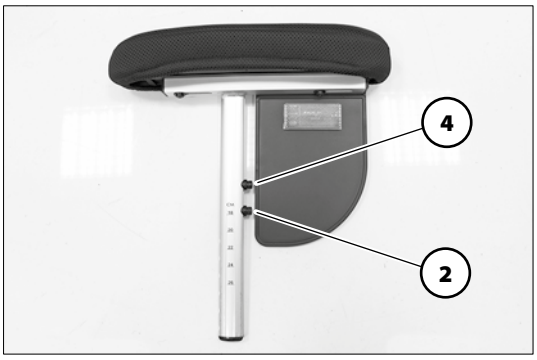
The maximum arm support height has been reached when the marking 26 becomes visible.



Adjusting the height of the arm supports

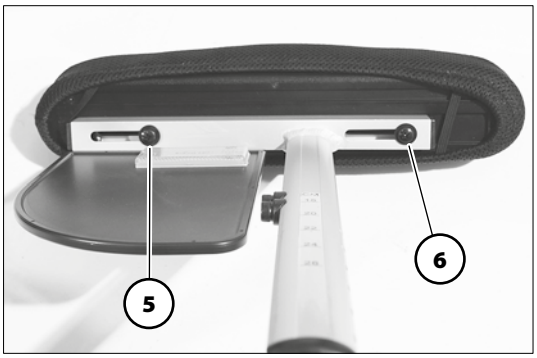
1. In order to adjust the arm support height, keep hold of the arm support with one hand and swivel the locking lever (1) up.
2. Pull/push the arm support to the desired arm support height.

   ☞ In doing so observe the maximum extension 26!
3. Swivel the locking lever (1) down.



Setting the memory-function

1. To set the arm support memory function, loosen the clamping screw (2).
2. Slide the clamping screw (2) as a stopper onto the arm support bracket (3).
3. Retighten the clamping screw (2).



Locking the arm support

1. To lock the arm support, remove the lower clamping screw (2).
2. Pull/push the arm support to the desired arm support height.
3. Slide the upper clamping screw (4) as a stopper onto the arm support bracket (3).
4. Reinsert the lower clamping screw (2), slide it underneath the arm support bracket (3) and tighten.

Positioning the arm support cushion

1. Loosen the clamping screws (5)+(6) in order to adjust the position of the arm support cushion.
2. Slide the arm support cushion to the desired position.
3. Retighten the clamping screws (5)+(6).

BACK SUPPORT, MECHANICALLY ADJUSTABLE

Removing the back support upholstery

1. For removal, first pull the upper back support flap (1) of the back cushion off and fold it forward [2].
2. Pull off the lower back flap (3) and guide it to the front.
3. Pull the back support upholstery from the adjustable back [4].

Placing the back support upholstery

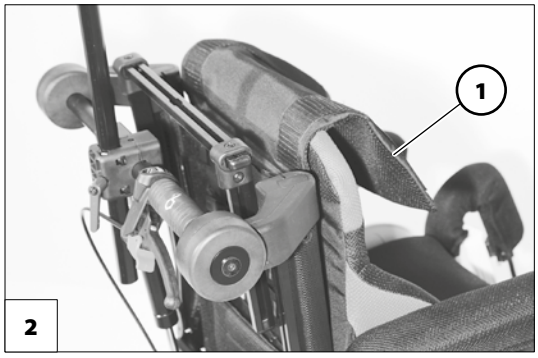
1. For reattaching, place the back support upholstery (1), flush with the upper edge of the back tubes, centered to the adjustable back (5) and fasten with the velcro strap [2].
2. Guide the lower back flap (3) toward the back, fold it upward and attach with the velcro fastener.
3. Finally fold the upper back flap (1) of the back support cushion toward the back and attach with the velcro fastener.

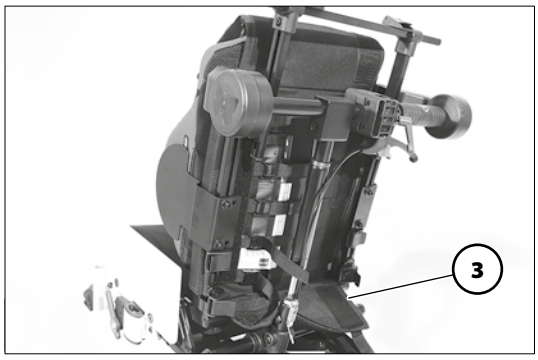
Adjusting the back support cushion

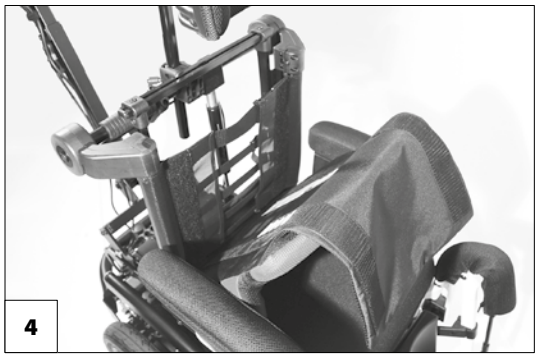
☞ For a soft upper edge you should leave a little space between the upper spanning belt and the folded upper back support flap (1).

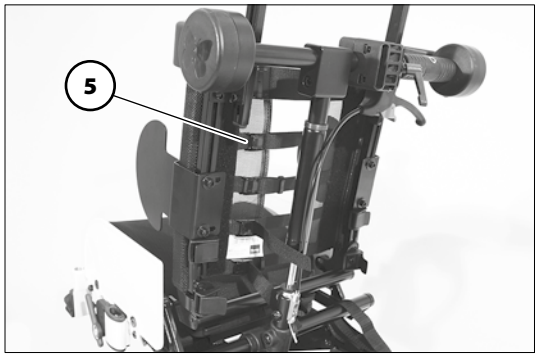
☞ The pressure of the back must be spread evenly throughout the back cover.

☞ A complete hand should fit in between the cover and back at the upper edge of the back cover.









Replacing the pneumatic spring

Observe the danger of jamming during the replacement procedure!

Conduct a function test after replacing the pneumatic spring.

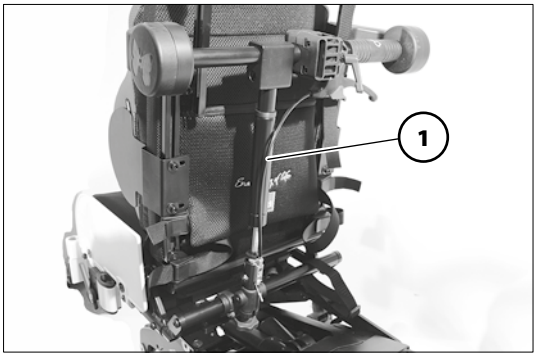
☞ Therefore observe chapter *Functional checks* on page 42.

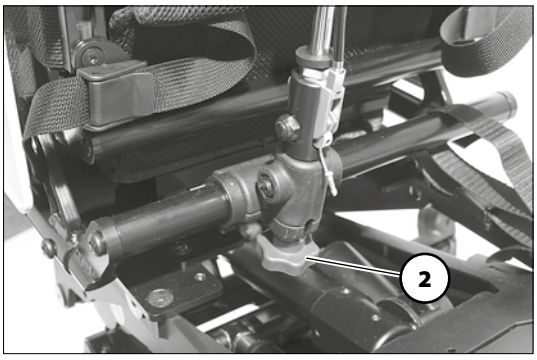
Removing the pneumatic spring

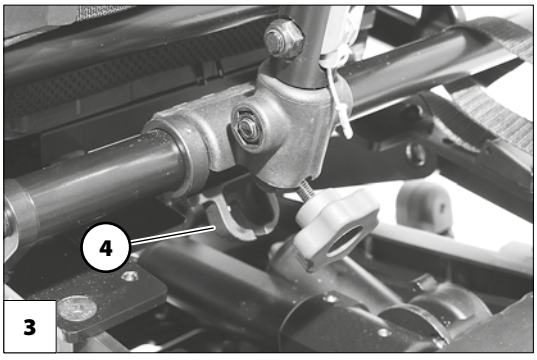
1. To remove the pneumatic spring (1) first loosen the clamping screw (2) and swivel it back [3].
2. Wedge the lower part of the tube clamp (4) open [3] and tilt the back support forward [5].
3. Tilt the pneumatic spring together with the tube clamp slightly back.
4. Remove the upper screw (6).
5. Screw the piston rod out of the bowden cable holder and remove the pneumatic spring.

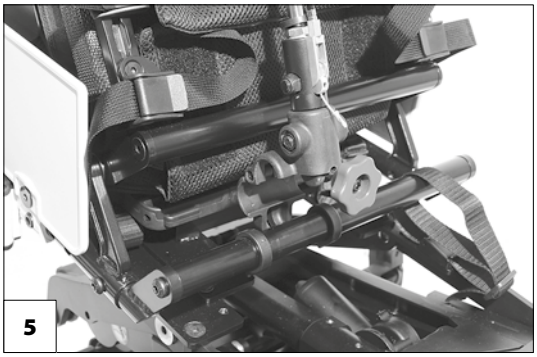
Mounting the pneumatic spring

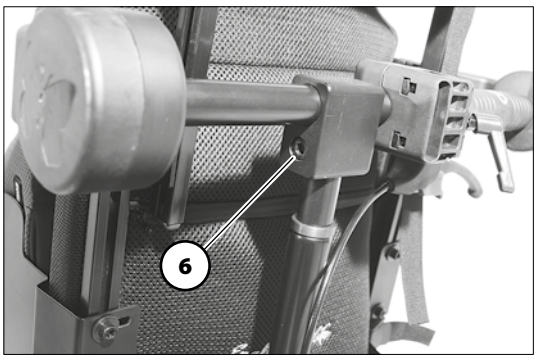
Assembly is done in reverse order to the removal of the pneumatic spring.







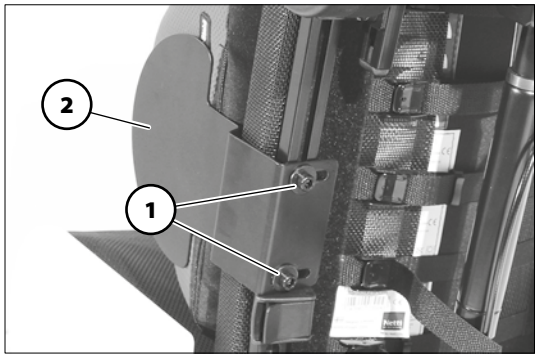




TORSO SUPPORT

Adjusting the position of the torso support

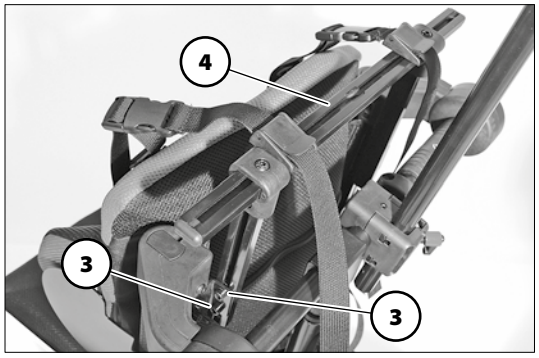
1. Loosen the clamping screws (1) to adjust the position of the torso support.
2. Slide the torso support (2) to the desired height and torso width.
3. Retighten the clamping screws (1) after positioning the torso support (2).



SHOULDER STRAP

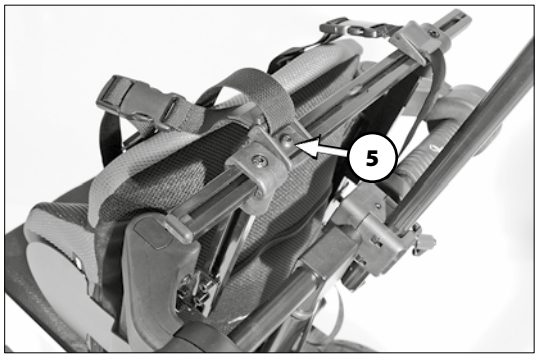
Adjusting the height position of the shoulder strap clamps

1. Loosen the clamping screws (3) on both sides to adjust the height position of the shoulder clamps.
2. Slide the profile tube (4), corresponding with the shoulder of the user, to the desired height.
3. Retighten the clamping screws (3) on both sides after positioning the profile tube (4).



Adjusting the distance of the shoulder strap clamps

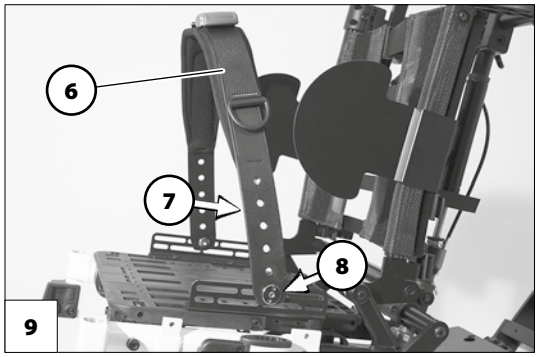
1. Loosen the respective clamping screw (5) to adjust the distance of the shoulder clamps.
2. Slide the shoulder clamps, corresponding with the shoulder of the user, to the desired distance.
3. After positioning the shoulder clamps retighten the respective clamping screw (5).



LAP BELT

Adjustment and assembly of the lap belt

1. Place the lap belt, in order to adjust the length of the lap belt (6).
2. Shorten the lap belt (6), according to the marker lines (7), to the desired length.
3. After the length adjustment, mount the lap belt (6) to the lateral profile sheets (8) of the seat plate [9].



HEAD SUPPORT

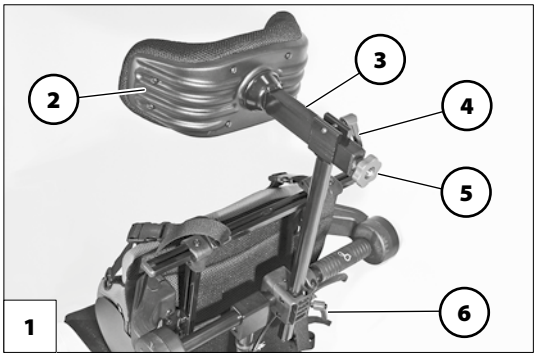
Observe danger of jamming in the adjustment sector!

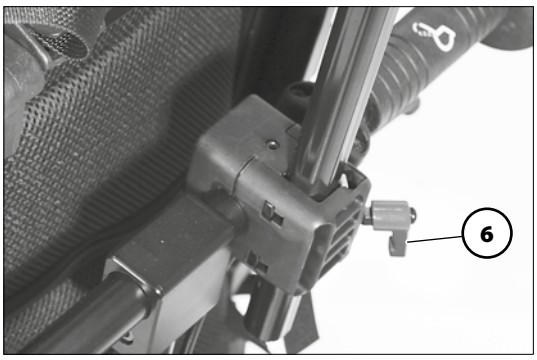
After adjustments conduct a functionality check.

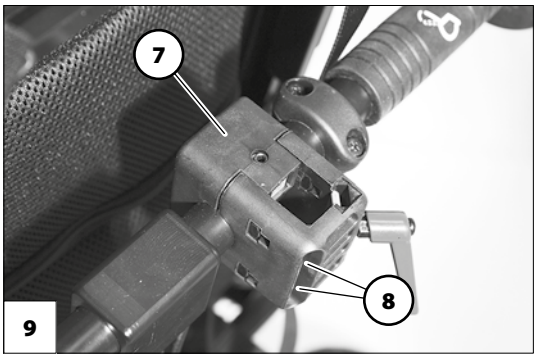
☞ Therefore observe chapter *Functional checks* on page 42.

The head support [1] is height and depth adjustable as well as removable.

☞ We recommend the fitting of two rear-view mirrors for driving with a head support.







Adjusting the head support cushion

1. After loosening the clamping screw (5), the head support cushion (2) is continuously adjustable to the desired position.
2. Afterwards retighten the clamping screw (5).

Adjusting the depth of the head support

1. Operate the clamping lever (4) to adjust the depth of the head support.
2. The head support cushion (2) is continuously adjustable to the desired head support depth.
3. Afterwards retighten the clamping lever (4).

Adjusting the headrest height

1. Operate the clamping lever (6) to adjust the height of the head support.
2. The head support (3) is continuously adjustable to the desired head support height.
3. Afterwards retighten the clamping lever (6).

Removing the head support

1. Operate the clamping lever (6) to remove the head support (3).
2. Pull the head support upward out of the clamping device (7) [9].
3. Retighten the clamping lever (6) after inserting the head support (3).

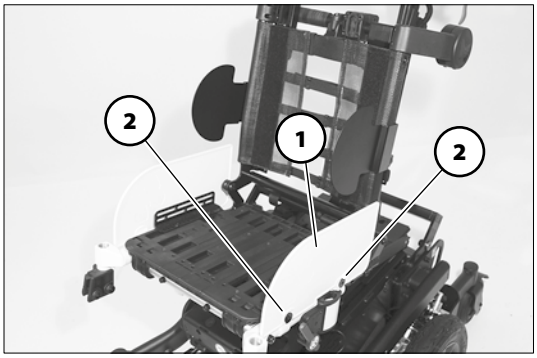
Removing the head support bracket

To dismantle the head support bracket (7), remove the attachment screws (8) on both sides.

SEAT

Remove the arm supports

Dismantle the attachment screws (2) in order to remove the arm supports (1) [3].

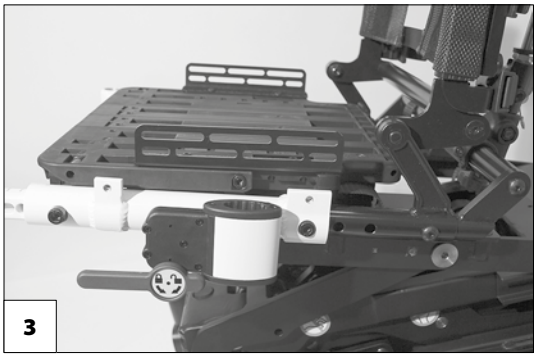


Adjusting the seat depth

The seat depth can be adjusted by repositioning the seat plate and the seat frame.

Adjusting the seat plate

1. Remove the seat cushion [3].
2. Dismantle the screws (4) of the seat plate on both sides.
   - ☞ For assembly, observe the position of the attachment latch (5) of the limitation straps underneath the seat plate.
   - ☞ The attachment latches (5) of the limitation straps underneath the seat plate are loose and can drop [6].
3. Position the seat plate according to chapter *Adjusting the seat depth* on page 20 .
4. Mount the screws (4) of the seat plate on both sides.
   - ☞ In doing so, reinsert the attachment latch (5) of the limitation straps underneath the seat plate and attach with the screws (4).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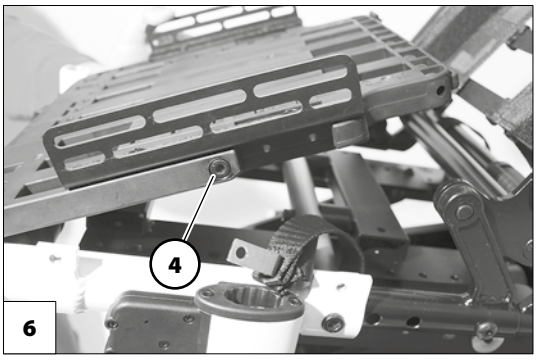

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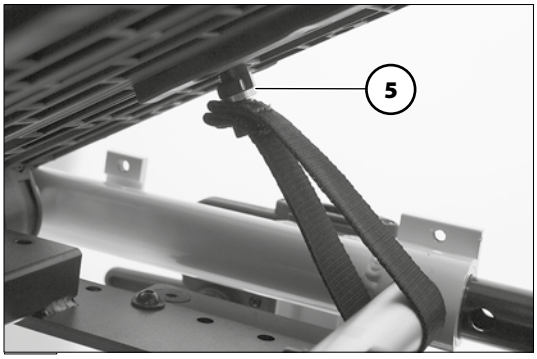


Adjusting the seat depth

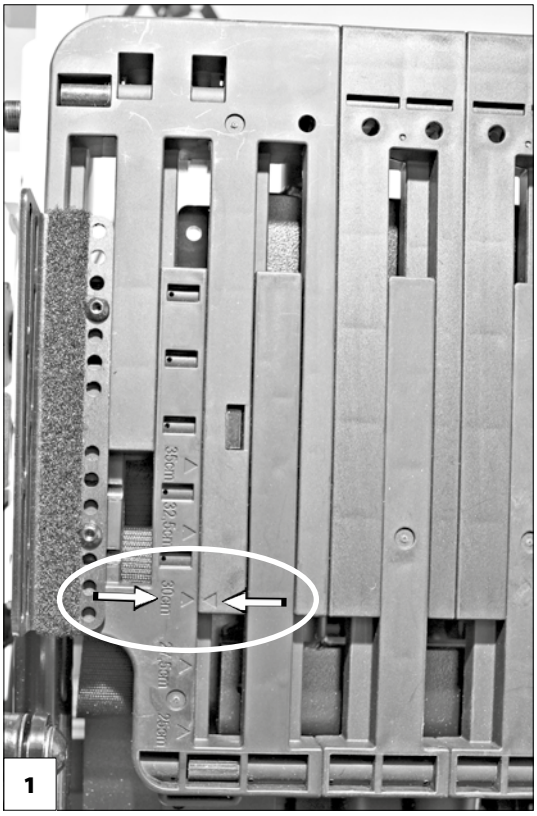
1. Slide the telescopic seat plate, according to table < *Adjusting the seat depth* >, to the desired seat depth until the arrow of the telescopic seat plate is aligned with the arrow of the desired seat depth [1].

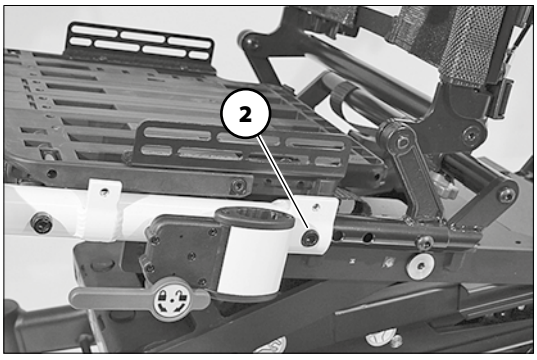
Adjusting the seat frame

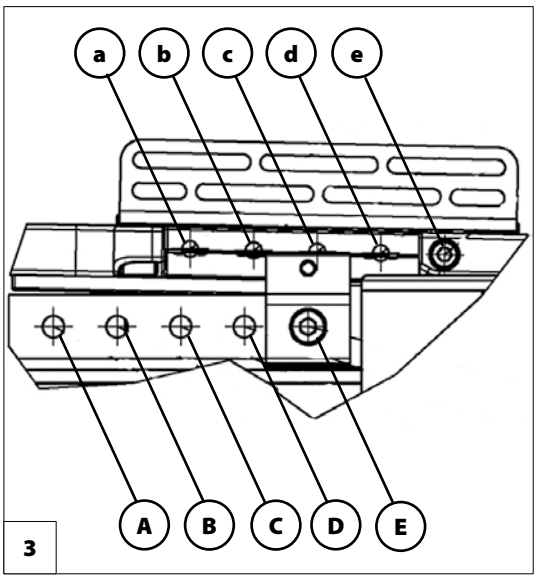
1. Dismantle the screws (2) of the seat frame on both sides.
2. Position the seat frame according to table < *Adjusting the seat depth* >.
3. Remount the screws (2) of the seat frame on both sides.

Table: Adjusting the seat depth [3]

Seat depth [mm]	250	275	300	325	350	
Pos. seat plate	a	b	c	d	e	
Pos. seat frame	A	B	C	D	E	







WHEELS

Wheel change

Never loosen the connection screws of the rim halves (1) to disassemble the wheel.
– Danger of injury!

Before starting disassembly of a wheel, support the frame to prevent the electric wheelchair from tipping over and secure it to prevent an unwanted movement or tipping over.

☞ Always change tyres in pairs.

Disassembly of the wheels

Before dismantling the drive wheels the respective cover (2) in the middle is to be removed [3].

Take off the wheel by removing the respective wheel screw (4)/(5).

Assembly of the wheels

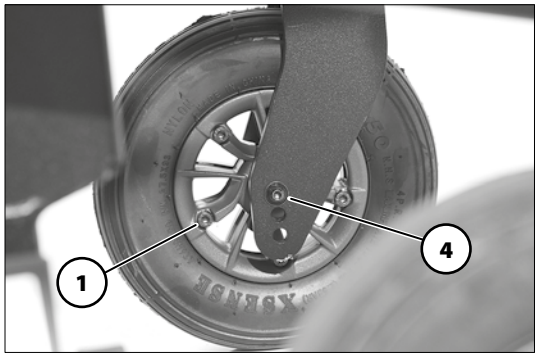
1. Mount the steering wheels according to table: Steering wheel position [6].
2. After replacing/attaching the wheel secure the respective wheel screw (4)/(5) again with Loctite 243 and tighten.

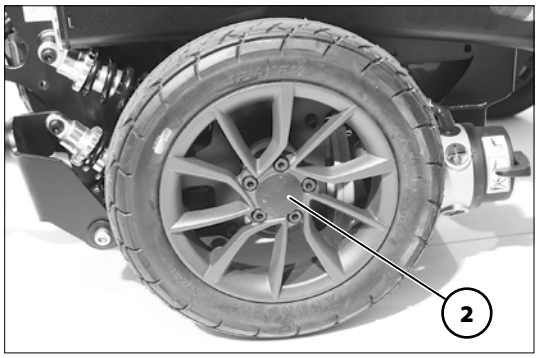
☞ Therefore observe chapter *DIN norms and guidelines* on page 46.

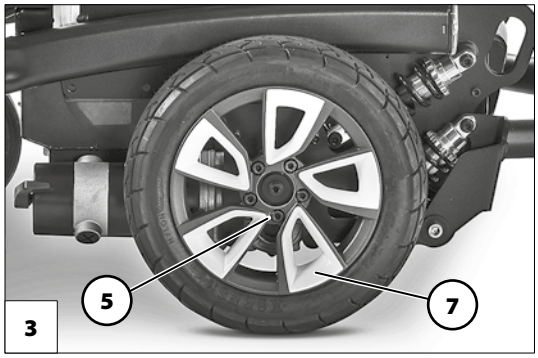
Table: Steering wheel position			
Item		Steering wheel	with drive wheel
a		9"	12 1/2"
b		–	–
c		–	–

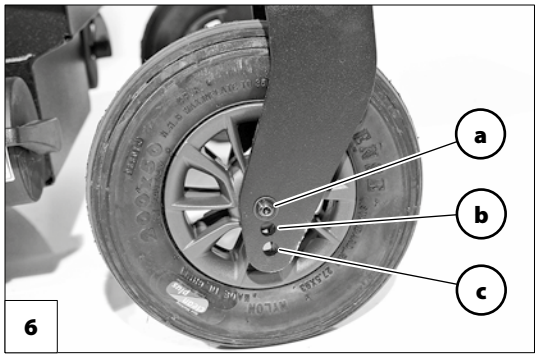
Replacing the decorative applications

1. For replacement, pull the decorative applications (7) off.
2. After cleaning the rims, press the decorative applications (7) back into place.







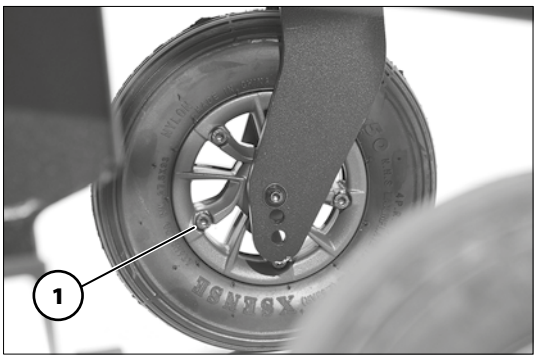


Changing the tyres

Disassembly of the tyres

Never loosen the rim half connection screws (1) in order to disassemble the tyre before previously completely deflating the tyre!
☞ Danger of injury!

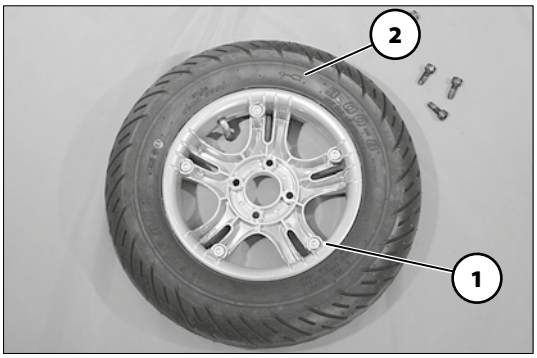
1. Disassemble the wheel.
2. Completely deflate the tyre.
3. Unscrew the rim-half connection screws (1).



Assembly of the tyres

During assembly the rim halves may not damage the tube or let it be jammed.

1. Place the tyre cover with crease free tube between the rim halves.
   ☞ In doing so observe the running direction of the tyre (view running direction arrow (2)).
2. Tighten the rim-half connection screws (1) evenly.
   ☞ Therefore observe chapter *DIN norms and guidelines* on page 46.
3. Assemble the wheel.
   ☞ Therefore observe chapter *Assembly of the wheels* on page 21.

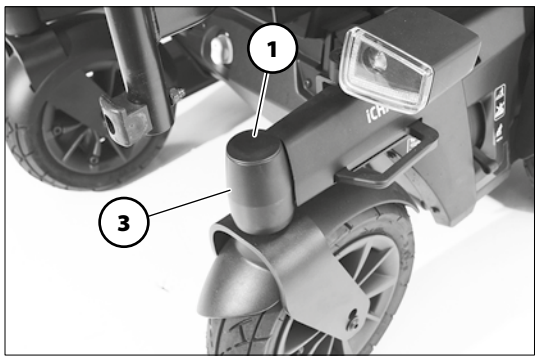


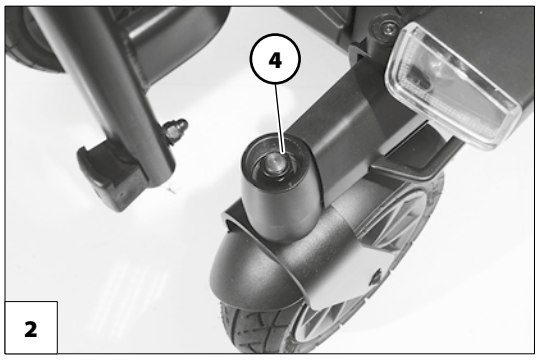
Adjusting the castor stem

Observe the torque in the castor stem bearing of 0.5 +/- 0.1 Nm.

If the steering fork is loose the castor stem needs to be adjusted.

1. Remove the cover cap (1) [2].
2. Adjusting the castor stem (3).
   ☞ For this tighten the screw of the castor stem (4), so that the steering fork can still be turned, but the plate washers still have effect.
3. Tighten the castor stem screw (4) with a torque spanner.





Support castors

Replacing new support castors

☞ Double-support castors [5] with extreme wear, such as tears or missing pieces should be replaced.

4. In order to replace the double-support castor the screwed connection (6) is to be removed.
5. Replacing the support castors.
6. Mount the support castors with screw (6) according to table: *Support castor position* [7].

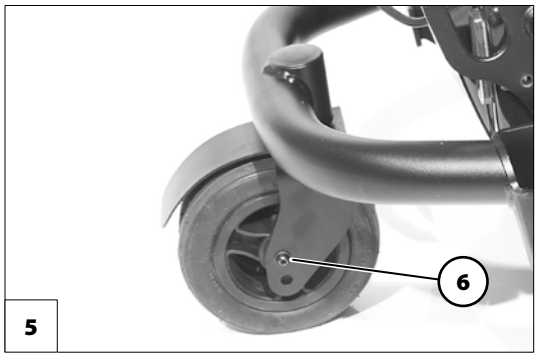
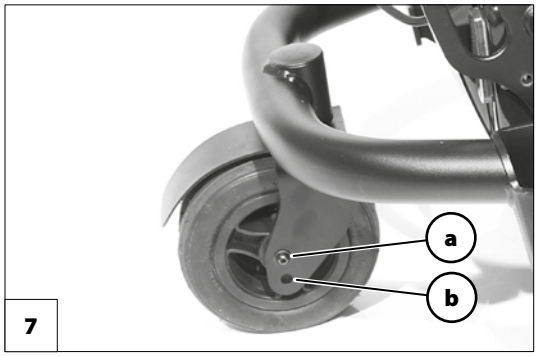


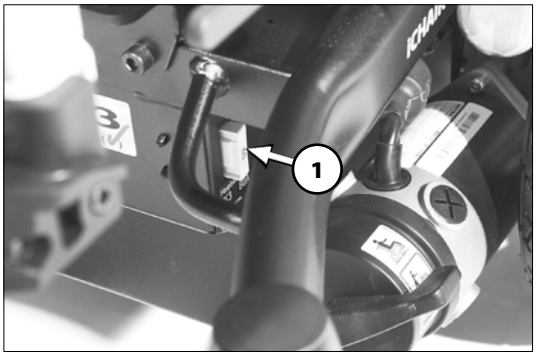
Table: Position of the support castor			
Item		with steering wheel	with drive wheel
a		9"	12 1/2"
b		–	–



FUSES

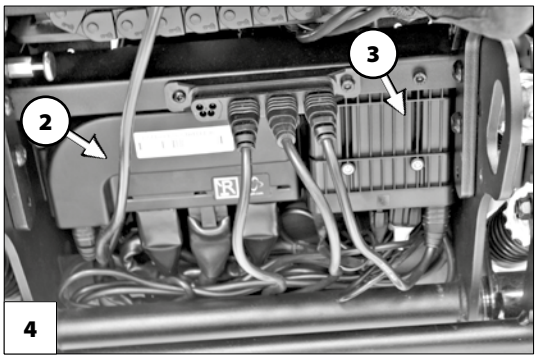
Main fuse

The main fuse (1) is located, viewed in driving direction, in the front left of the battery case.



Electronic security

In case if a shortage only the defective component is deactivated. All other components (e.g. all other lights except for the defective one) remain available. After removal of the shortage, the affected component is automatically activated again.



Power module

All electrical components (except for the batteries) are electronically protected by the power module R-Net (2). The power module also sees to a power limitation of the motors.

☞ The power module is located behind the rear revetment on the left side of the electronic compartment [4].

Lighting- / adjustment module R-Net

All electric adjustments are secured electronically through the adjustment module (3) as well as the combined lighting-/adjustment module.
The corresponding adjustment module is mounted beside the power module (2).

☞ The adjustment module is located behind the rear revetment on the right side of the electronic compartment [4].

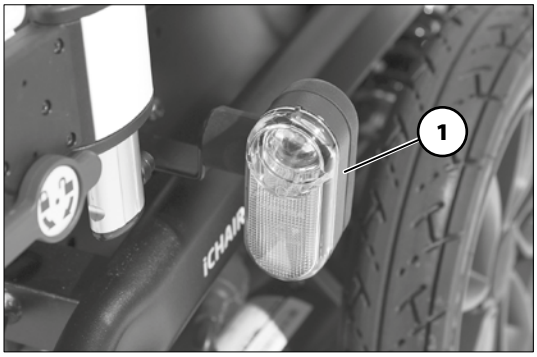
LIGHTING

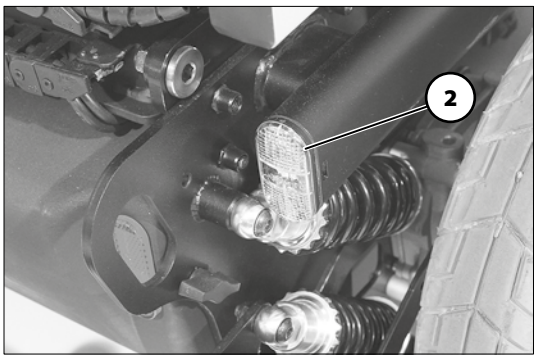
It is to be observed that the cables are not damaged or extremely bent when being placed. They must be placed according to their diameter in a reasonable radius.
☞ Otherwise danger of fire through short circuits!

The lighting (1)+(2) is equipped with longlife LED-technology.

☞ Replace previously removed cable binders by new ones.

☞ Then carry out a function test.
  ☞ Therefore observe chapter *Functional checks* on page 42.





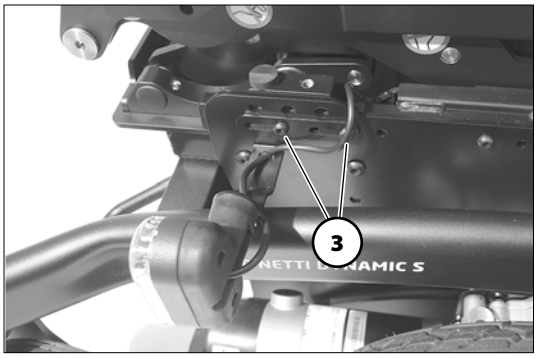
Headlight / front turn signal

The headlights (1) should be set in such a way that the light cone is visible on the road. – The lower edge of the light cone should be set at distance of 3 meters to the front of the electric wheelchair.

Adjusting the headlights

In order to adjust the headlight horizontally, loosen the attachment screws (3) and adjust the lighting fixture accordingly.

The angle adjustment of the lighting fixture is achieved through the clamping screw in the housing.



Replacing the lighting fixture

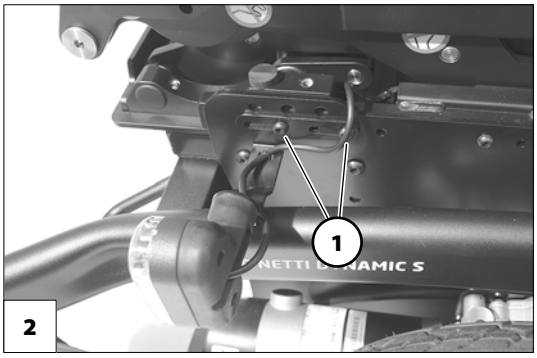
A defective lighting fixture can only be exchanged completely.

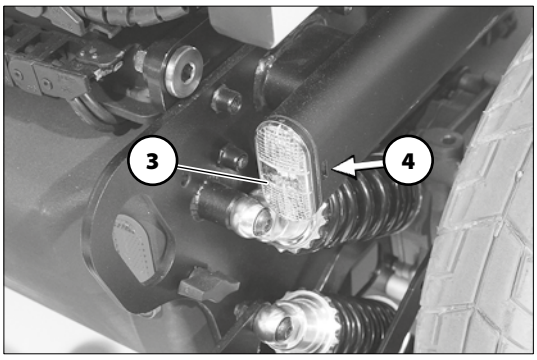
☞ For safe identification of the defect (lighting fixture or lighting module) switch the plugs on the lighting module for left, resp. right lighting.

  ☞ The defect switches sides. – The lighting module is defective.

  ☞ The defect remains on the same side. – The lighting fixture is defective.

1. Disconnect the electric connector of the defective bulb.
2. Remove the cable ties.
3. Dismantle the screws (1) of the lighting equipment.
4. Mount the new bulb [2].
5. Re-establish the plugged connections for the power supply.
6. Guide the cable carefully and secure it with cable ties.





Replacing the back light

1. Pull the light bulb (3) out of the frame tube.

  ☞ For this press the clips at the side (4).

2. Remove the cable ties.
3. Disconnect the electric connector of the defective bulb.
4. Replace the defective bulb.
5. Re-establish the plugged connections for the power supply.
6. Guide the cable carefully and secure it with cable ties if needed.
7. Press the bulb (3) into the frame tube.

  ☞ By pulling lightly on the bulb (3) you need to ensure that the clips at the sides (4) have engaged correctly.

BATTERIES

After folding the seat unit up, the batteries can be replaced.

Removing the batteries

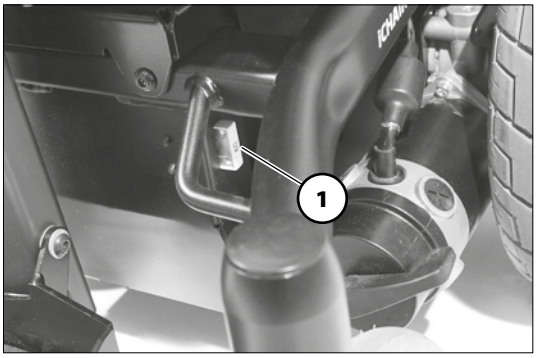
1. Pull the battery fuse (1).
2. Set into service position [2].
   ☞ Therefore observe chapter *Setting the service position* on page 10.
3. Unscrew the pole clamps (3).
4. Lift out the battery with help of the carrying strap (4) [5].

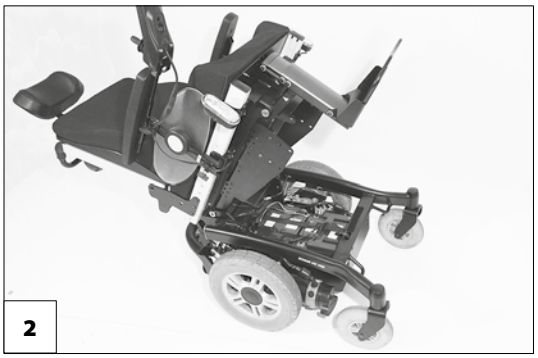
Positioning the batteries

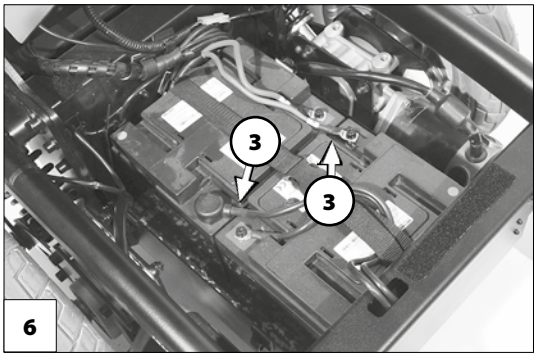
It is to be observed that the pole clamp cover is fastened correctly above the battery poles.
☞ Otherwise danger of fire through short circuits!

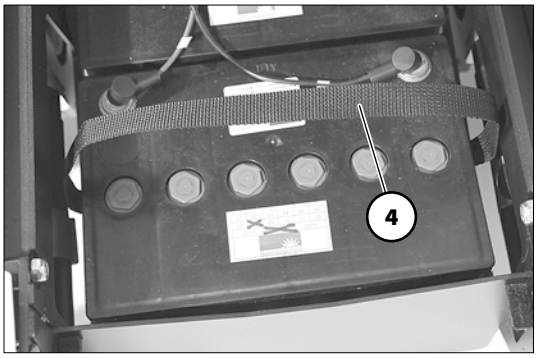
The replacement of the battery is carried out analogue in reverse order to chapter *Removing the batteries* on page 27 [6].

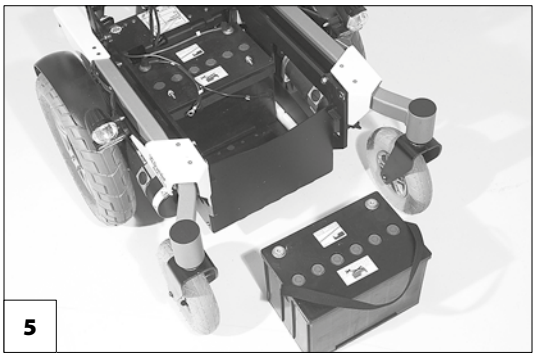
☞ Then carry out a function test.
☞ Therefore observe chapter *Functional checks* on page 42.



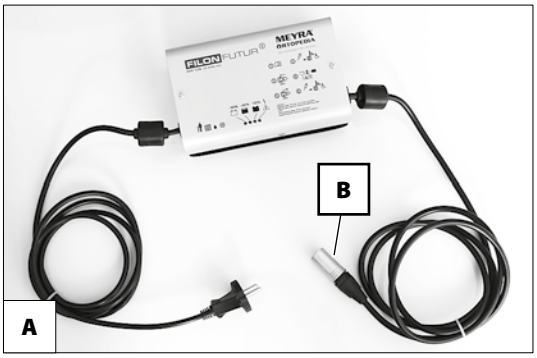








BATTERY CHARGER



☞ When changing to batteries with considerably different capacity also use a corresponding charger, so that the charging periods remain limited and the batteries are charged completely.

Technical requirements:

for the following drive batteries,
– max. charging voltage: 28.5 V

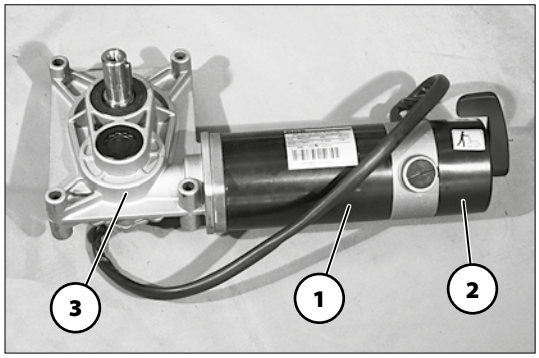
For sealed drive batteries:
– up to 40 Ah – 5 h / 50 Ah – 20 h
– Charging current: 6 A alternatively 5 A

For sealed drive batteries:
– from 40 Ah – 5 h / 50 Ah – 20 h
– Charging current: 8 A

– from 65 Ah – 5 h / 82 Ah – 20 h
– Charging current: 12 A

DRIVE

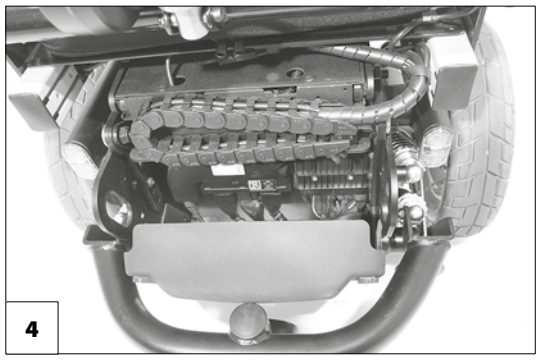
The vehicle is fitted with a drive on each side. The drive consists of the motor (1), the magnetic brake (2) and the worm gear (3). The drive can only be replaced completely.

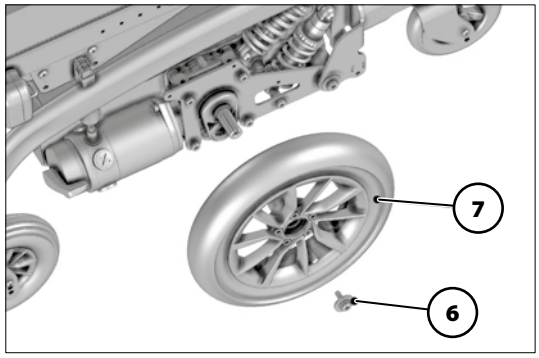


Removing the drive

The following describes the replacement of the left drive. The replacement of the right drive is to be done accordingly in the same fashion.

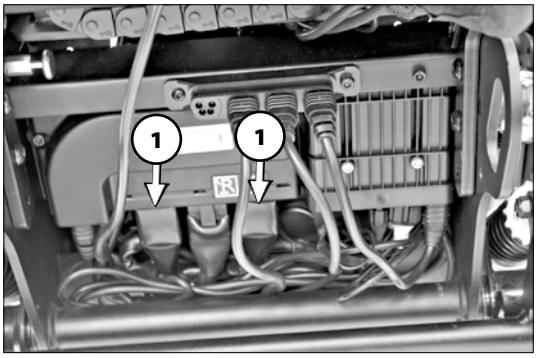
1. Remove the attachment screws at the sides and take of the lid of the electronic cover [4].
2. remove the center cover cap (5) of the wheel attachment.
3. Dismantle the central screw and washer (6).
4. Pull the drive wheel (7) with hub.





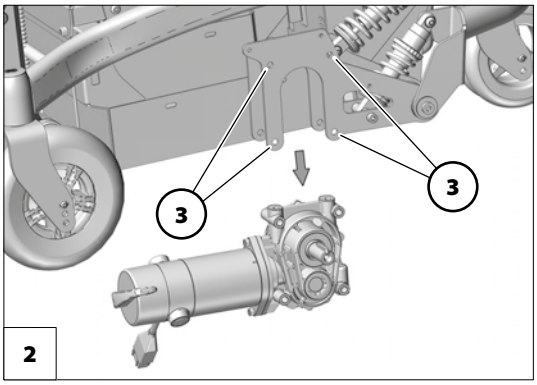
5. Pull the motor connector plug leaving the drive (1) off of the power module.

6. Remove the drive [2].
   ☞ For this disassemble the screws (3).



Mounting the drive

It is to be observed that the cables are not damaged or extremely bent when being placed. They must be placed according to their diameter in a reasonable radius.
☞ Otherwise danger of fire through short circuits!



Assembly of the drive is done analogue in reverse order to chapter *Removing the drive* on page 29.

☞ Replace previously removed cable binders by new ones.

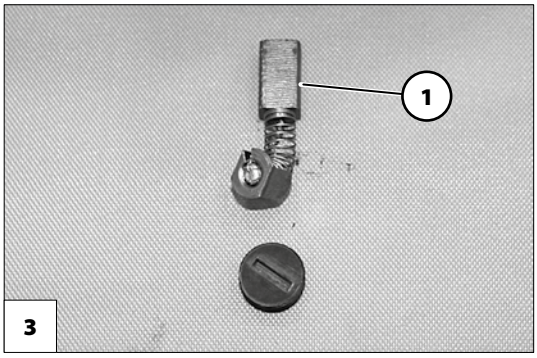
☞ Then carry out a function test.
   ☞ Therefore observe chapter *Functional checks* on page 42.

Carbon brushes

The carbon brushes (1) are supplied as a set and are to be replaced as a set.

☞ Do not touch the friction surface of the carbon brushes!

☞ The carbon brushes are worn when they are used up to 8 mm length.
They are also to be replaced when the contacts appear black and dull. – On intact carbon brushes the contacts are anthracite coloured and shining.

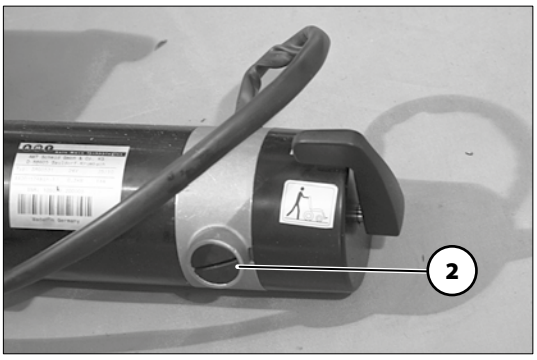


3

Removing the carbon brushes

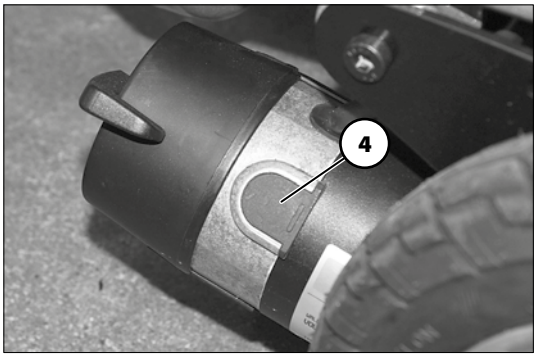
Version 1:

1. Unscrew the locking cap (2) of the carbon brush counter-clockwise.
2. Pull the pressure spring with the carbon brush (1) out of the guide shaft [3].



Version 2:

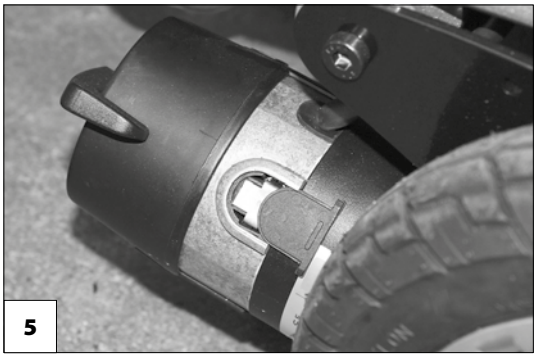
1. Slide the cap (4) of the carbon brush out towards the back [5].
2. Pull the pressure spring with the carbon brush out of the guide shaft [6].



Mounting the carbon brushes

Assembly of the carbon brush is done analogue in reverse order to chapter *Removing the carbon brushes* on page 31.

☞ During assembly of the carbon brushes, after a visual inspection, ensure that the carbon brushes have the same assembly position as before and glide freely in the guiding groove.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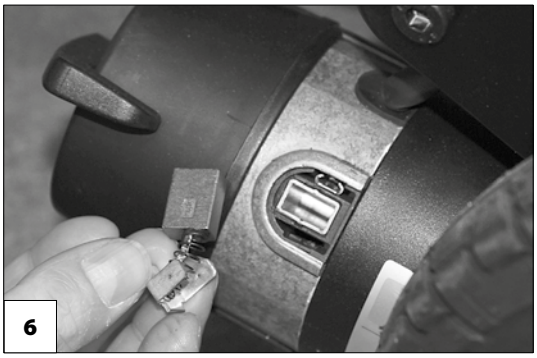

6

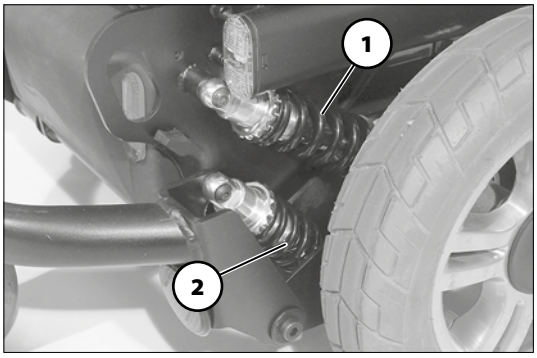
VEHICLE SUSPENSION

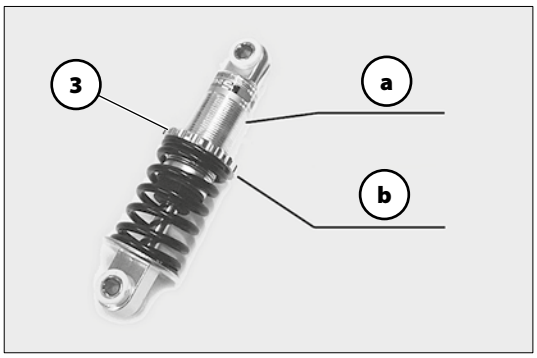
Suspension of the chassis

The setting rings must fit securely with an unburdened chassis.

For optimal sitting comfort the suspension (1)+(2) can be adjusted according to the desire of the user.

☞ In doing so observe that both absorbers (1) and (2) have different functions





Seat suspension

The absorber (1) with a hard spring and large spring rate flexibly supports the drive rocker on the electric wheelchair frame.

Support suspension

The absorber (2) with a soft spring and low spring rate flexibly presses the support castors to the ground.

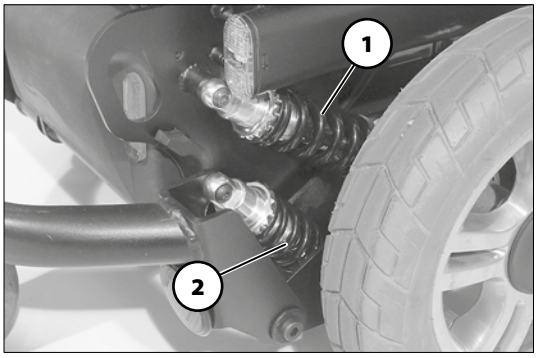
☞ The adjusted pre-tension of this spring has influence on the stability and driving behaviour of the electric wheelchair.

A low pre-tension in the spring enables comfortable driving over obstacles and a good traction of the drive wheels, but also permits a premature lift-off of the steering wheels, e.g. when driving on inclinations.

A high pre-tension of spring stabilises the electric wheelchair, but reduces the „climbing ability“ at the edges of obstacles and the traction of the drive wheels, especially when driving slowly across transverse grooves and when driving downhill.

☞ In the same way the stability and driving behaviour of the electric wheelchair are influenced by the position of the overall balance point to the drive axle.

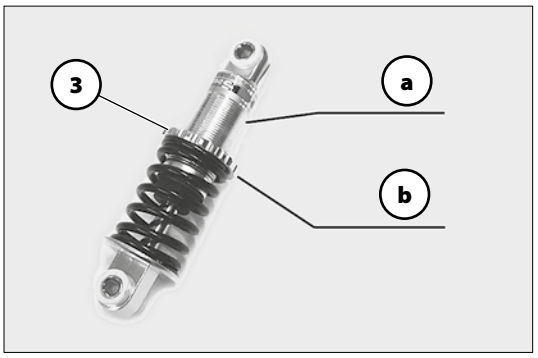
Adjusting the seat suspension



Tighten a loose adjustment ring (3) with an unstrained chassis so far that the pressure of the spring prevents further loosening.

Observe the minimum pre-tension path of 2 mm.

The springs, left and right, have to have the same pre-tension.



Adjustment of the seat suspension can only be carried out with completely slackened springs.

– For this jack up the wheelchair until the back and drive wheels completely lift off the ground.

The pre-tension of the pressure spring can be changed through the adjustment ring (3).

For adjustment of the suspension the adjustment ring (3) is screwed forward or backward accordingly.

In doing so the following indications are valid:

Seat suspension, absorber (1)

Adjustment ring slightly screwed:

a – little spring pre-tension

☞ For normal sitting comfort (manufacturer setting)

Adjustment ring extremely screwed:

b – high spring pre-tension

☞ Depending on the demand of users with a high user weight, the spring pre-tension can be increased to 7 mm – resp. by 5 mm opposed to the manufacturer setting.

Seat suspension, absorber (2)

Adjustment ring slightly screwed:

a – little spring pre-tension

For normal driving comfort (manufacturer setting)

Adjustment ring extremely screwed:

b – high spring pre-tension

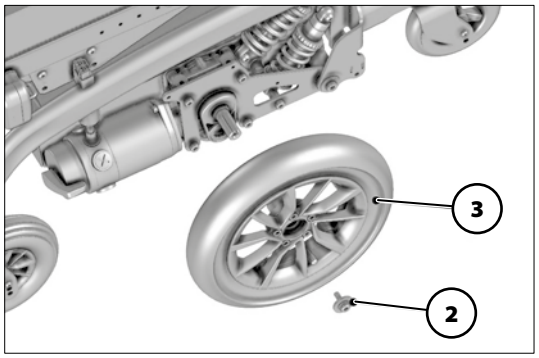
☞ Depending on the demand of tall users and users with a high user weight, the spring pre-tension can be increased to 7 mm – resp. by 5 mm opposed to the manufacturer setting.

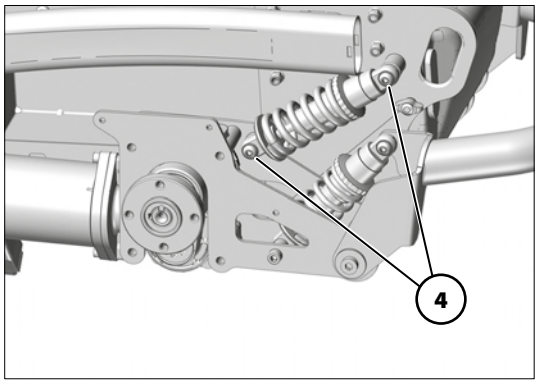
Replacing the spring

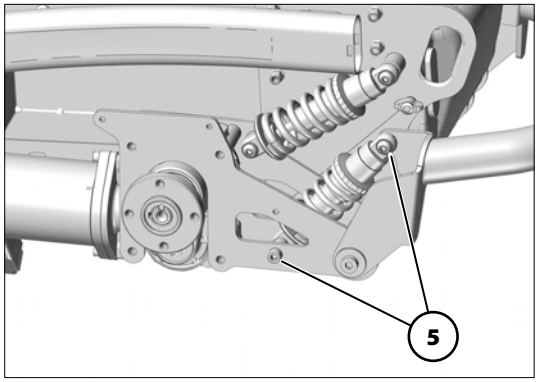
The spring might be under extreme pressure.

☞ For this observe chapter *Support castors* on page 23.

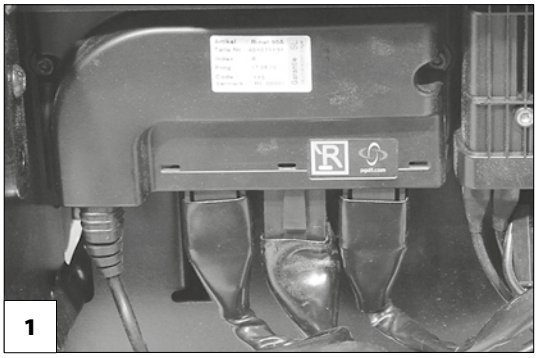
1. Remove the center cover cap (1) of the wheel attachment.
2. Dismantle the central screw and washer (2)
3. Pull the drive wheel (3) with hub.
4. For replacement of both springs for the chassis the screws (4) on both sides are to be removed.
5. For replacement of both springs for the rear rocker, the screws (5) on both sides are to be removed.
6. Replace the respective springs.
7. Mount the screws (4) / (5) on both sides.
8. Mount the drive wheel.
9. Insert the center cover cap (1).







ELECTRONIC MODULES


1

Power module

The power module R-Net [1] saves the setting of the driving parameters and as power electronic takes over the control of the driving motors.

The inlets and outlets of the power module are short circuit proof, so that the lead fuse is not applicable.

Programming the driving behaviour

An extension of the system with additional driving desks or other input devices is not permitted.

The driving behaviour of the electronic vehicle can, vehicle dependently be adjusted through a programming device.

The parameter values of the delivery configuration are selected in such a fashion that the requirements of the (EG) regulation 2017/745 (CE-marks) are fulfilled. Programming that differs from these requirements might not fulfil the regulations.

The driving behaviour of the electric wheelchair should be adjusted to the individual requirements and the learning process of the respective user at regular intervals.

In doing so the driving experience, the physical limits of the user and the main field of operation must be considered:

- ☞ When programming the delay value observe that on one hand extreme braking can endanger the driver, on the other hand the braking distance must correspond to the maximum values of EN 12184 (view chapter *Braking distance* on page 42).
- ☞ The programming must be specially tailored to the user. The capacity of reaction, the constitution as well as physical and psychical abilities are to be considered. A talk with the doctor or therapist can be very helpful.
- ☞ An adjustment to the manufacturer settings of the driving parameters changes the optimal driving behaviour of the vehicle.

Independent of this the safety of the electric wheelchair and especially the driver must be guaranteed after a change of the parameters.

- ☞ All changes to the parameters underlie solely the responsibility of the person making the modifications.
- ☞ Parameters can accidentally be adjusted to settings that cannot generally exempt hazards.

Standard setting of the R-Net driving parameters

The parameter values listed in this table correspond to the standard parameters authorised by us at the time of print of this document.

Profile allocation	**Profile**
Accompanying person	8

Standard setting of the R-Net driving parameters profile 8					
Number of enable Drive Profiles		**8**			
	maximum / minimum				
Speed	**6 km/h**				
Forward Speed [%]		80 / 28			
Reverse Speed [%]		50 / 15			
Turn Speed [%]		20 / 5			
Forward Acceleration		15 / 0			
Forward Deceleration		50 / 10			
Reverse Acceleration		10 / 5			
Reverse Deceleration		20 / 5			
Turn Acceleration		30 / 20			
Turn Deceleration		15 / 5			
Power [%]		100			
Torque [%]		100			
Tremor Damping [%]		0			

Power module, replacing the lighting, resp. lighting/adjustment module

It is to be observed that the cables are not damaged or extremely bent when being placed. They must be placed according to their diameter in a reasonable radius.
☞ Otherwise danger of fire through short circuits!

1. Before replacing a module all plugged connections are to be disconnected.

☞ In doing so it is recommended to place each plug that is pulled directly into the new module.
  ☞ This prevents establishing incorrect plugged connections.

2. Afterwards remove the screws of the defective module.

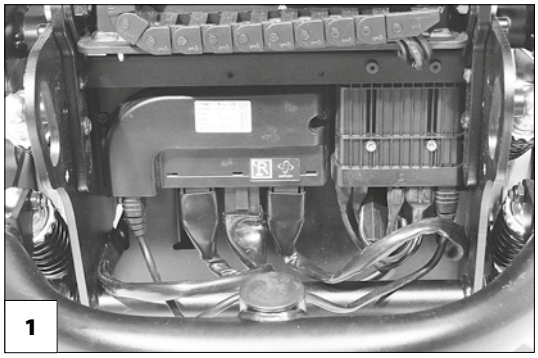
3. Remount the new module analogue in reverse order.

☞ Replace previously removed cable binders by new ones.

☞ Then carry out a function test.
  ☞ Therefore observe chapter *Functional checks* on page 42.

Power module

The power module is mounted behind the electronic cover at the left side of the battery case [1].

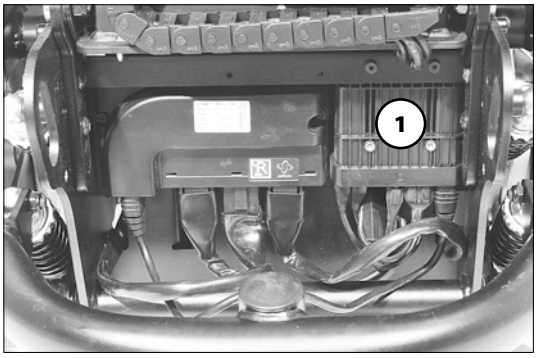


1

Lighting- / adjustment module R-Net

All electric adjustments are electronically protected through the adjustment module (1).

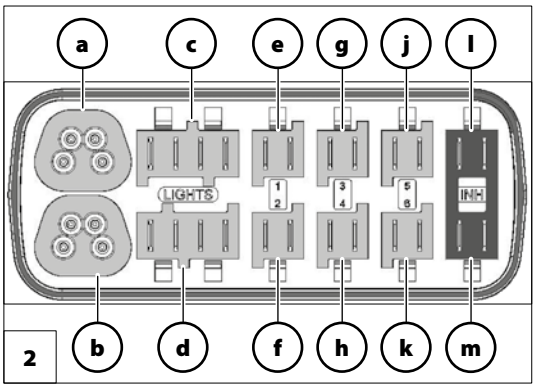
The adjustment module is mounted behind the electronic cover at the right side of the battery case (1).



Plug allocation of the lighting/adjustment module R-Net

Overview of the plug allocation of the lighting/adjustment module R-Net [2]:

(a) R-Net Bus
(b) R-Net Bus
(c) left lighting
(d) right lighting
(e) adjustment motor: electric back support
(f) adjustment motor: camber
(h) adjustment motor: left leg support
(g) adjustment motor: right leg support
(j) adjustment motor: seatlift
(k) adjustment motor: Recaro 12 V
(l) Inhibit 4: Switch seatlift
(m) Inhibit 5: Tilting switch



ELECTRICAL ADJUSTMENTS

Seat height adjustment

Replacing the adjustment for seat height adjustment

It is to be observed that the cables are not damaged or extremely bent when being placed. They must be placed according to their diameter in a reasonable radius.

☞ Otherwise danger of fire through short circuits!

Replacement of the adjustment motor is only to be carries out by specialist dealers with corresponding education.

Lift the seat into the highest position [2], to replace the adjustment motor (1) for seat height adjustment.

1. Secure the seat unit in the topmost position!
2. Pull the connection plug of the seat height adjustment (3) off of the adjustment module.

☞ In doing so watch for cables that might still be attached. – If required, remove corresponding cable binders.

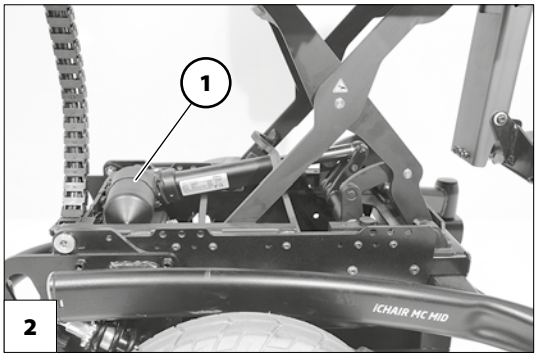
3. Remove the bolted connection (1) of the adjustment motor for seat height adjustment.
4. Remove the bolted connection (2) and replace the adjustment motor for seat height adjustment incl. the bushing.

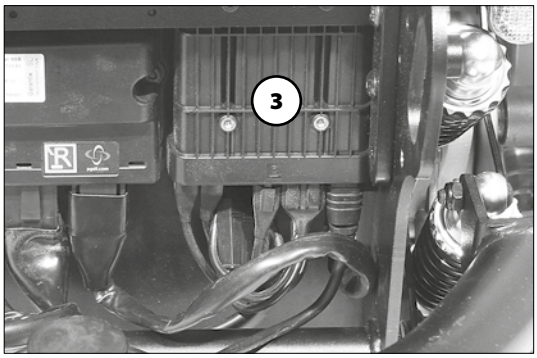
☞ In doing so watch for cables that might still be attached. – If required, remove corresponding cable binders.

Assembly of the adjustment motor incl. bushing is carried out analogue in reverse order.

☞ Previously removed cable ties are to be replaced.

☞ Then carry out a function test.
  ☞ Therefore observe chapter *Functional checks* on page 42.





Camber function

Replacing the adjustment motor for camber function

It is to be observed that the cables are not damaged or extremely bent when being placed. They must be placed according to their diameter in a reasonable radius.
☞ Otherwise danger of fire through short circuits!

Replacement of the adjustment motor is only to be carries out by specialist dealers with corresponding education.

Lift the seat into the highest position [2], to replace the adjustment motor (1) for camber adjustment.

1. Pull the connection plug of the corresponding adjustment motor (1) off of the adjustment module (3).

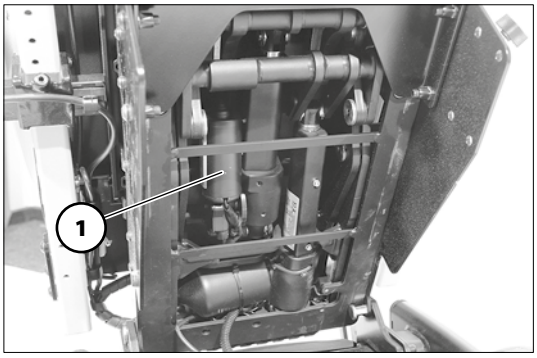
2. Remove the corresponding bolted connections (4)+(5) for attachment of the adjustment motor for camber adjustment.

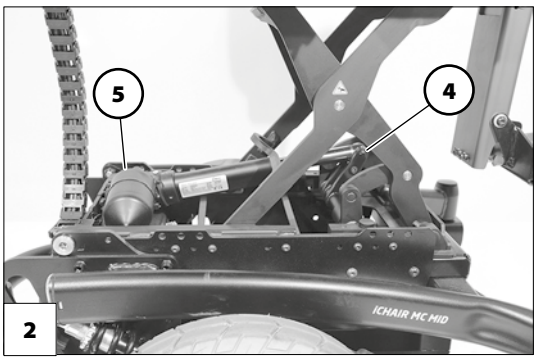
☞ In doing so watch for cables that might still be attached.
– If required, remove corresponding cable binders.

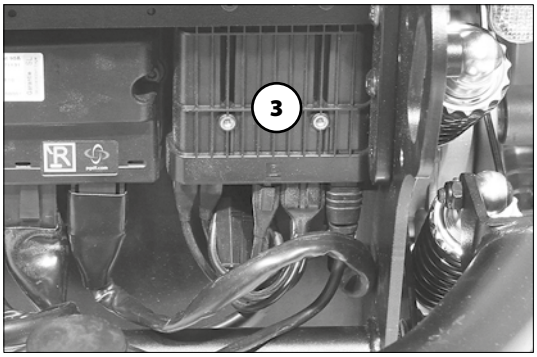
Assembly of the adjustment motor is done analogue in reverse order.

☞ Previously removed cable ties are to be replaced.

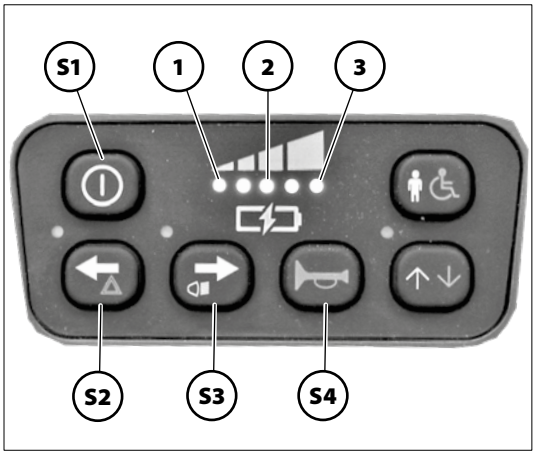
☞ Then carry out a function test.
☞ Therefore observe chapter *Functional checks* on page 42.







ERROR INDICATION



An error has occurred when the LED (2) of the battery gauge blinks after switching on the wheelchair.

The LEDs (1)+(3) are lit in red, the number of blinking impulses of LED (2) indicates an existing error according to the following table Error indication.

Table Error indication

Number of blink impulses	Cause	Required measure
1	–	–
2	Left Hall sensor	Conduct a calibration, if required send in / replace the accompanying person control.
3	Right Hall sensor	Conduct a calibration, if required send in / replace the accompanying person control.
4	Left gas lever	Conduct a calibration, if required send in / replace the accompanying person control.
5	Right gas lever	Conduct a calibration, if required send in / replace the accompanying person control.
6	Faulty initialisation	Repeat diagnostic test.
7	Faulty CPU	Send in / replace accompanying person control.
8	Faulty source code	Send in / replace accompanying person control.
9	Software watchdog	Send in / replace accompanying person control.
10	R-NET internal error	Read out R-NET error protocol.
11	Diagnostic test failed	Repeat diagnostic test.

Conduct calibration

1. Disconnect R-NET adjustment module from the system!
2. Depress S2, S3 and S4 simultaneously and then press S1.
3. Keep hold of S2, S3 and S4 until a beep sound is heard (about 5 sec.).
4. LED 1 is lit -> move the right gas lever completely once.
5. LED 2 is lit -> move the left gas lever completely once.
6. LED 3 is lit -> move the steering column completely to the left once.
7. LED 4 is lit -> move the steering column completely to the right once.
8. Calibration is completed.

FUNCTIONAL CHECKS

Checking the cable layout

It is to be observed that the cables are not damaged or extremely bent when being placed. They must be placed according to their diameter in a reasonable radius.

☞ Otherwise danger of fire through short circuits!

The cables may not reach out further than the contour of the vehicle.

The cable may not be jammed or twisted.

After replacing defective parts and during maintenance always check the correct cable layout!

☞ Replace previously removed cable binders by new ones.

Inspection during standstill

☞ Check all screws, attachments and connections in the area of the assembly or service work carried out.

☞ Conduct a functionality check of the changed or adjusted options / parts groups / codes.

☞ Conduct a functionality check and if necessary adjust the replaced parts.

☞ Do a visual check of the complete vehicle.

☞ Switch to push mode and check the free movement of the wheelchair.

☞ Switch to drive mode, switch the vehicle on and check the battery charging voltage.

☞ Check all lighting components and electric adjustments for function.

Inspection of the electric adjustments

Conduct the inspection without user.
☞ Danger of injury!

☞ Go through the electric adjustments, watch for jamming areas, clearance and resp. collision with other parts as well as irregular sounds.

Test drive

☞ Initially drive carefully and observe if the driving behaviour of the vehicle has changed.

☞ Watch for unusual sounds.

☞ After a short drive check the temperature of the motor, worm drive and magnetic brake.

☞ Conduct a braking test.

Braking distance

When programming the delay value observe the maximum value of the braking distance of EN 12184.

Maximum braking distance of EN 12184	
Speed	max. braking distance
6 km/h	1.0 m
8 km/h	1.5 m
10 km/h	2.1 m
12 km/h	2.9 m
13 km/h	3.4 m
15 km/h	4.5 m

MAINTENANCE

Electric wheelchairs are *medical devices of the class I-MDD*. As a medical device they underlie the operator provision and are to be maintained regularly. We recommend at least once a year. The work done and replacement of essential components is to be documented.

For the documentation in the course of the maintenance the itemised maintenance checklist can be used.

The maintenance checklist is intended for copying. The filled in maintenance checklists are to be added to the documentation.

With the signature the undersigned declares to have duly performed the measured declared in the maintenance checklist.

Reinstallment

Before reimplementation the electric wheelchair is to undergo a complete inspection.

- ☞ The hygienic measures required for reinstallment are to be carried out in correspondence with the validated hygienic plan.
- ☞ A revision/renovation or particular amendment to the vehicle, without the use of original spare parts, may mean a renewed placing of the vehicle into the market.
- ☞ This will further entail that new conformity assessments and tests might need to be conducted.

Designation:	Maintenance/Inspection date:
SN-No. (Serial-no.):	Maintenance/Inspection done by:
Year of construction:	Signature:

Stamp of the executing workshop:

Maintenance checklist of the annual maintenance jobs	
	Preparation for visual check
❑	Removed seat and back support upholstery. If necessary, clean the vehicle or the modules before the visual check.
	Visual check coachwork / frame
❑	Checked the frame, add-on components and accessories for damage, corrosion and damaged paintwork.
❑	Covers and revetments are free of dents and tears.
❑	Checked function of the designated attachment points such as screws or velcro straps.
	General checks
❑	Checked the securing screws for tightness.
❑	Checked the securing of all add-on parts and elements.
❑	Checked the attachment of the plastic parts, handgrips, add-on parts and accessories.
	Chassis
❑	Checked steering and drive wheel attachment.
❑	Checked the quick release axle, if existent.
❑	Wear of axle bushing: The axles of the drive wheels do not show radial run-out and run easily.
❑	Check the rubber buffer for signs of wear, replace if necessary.
❑	Wheel forks are not bent or torn.
❑	Checked the condition, functioning and smooth-operation of the steering wheel suspension.
❑	Screws, with which the drive is attached to the vehicle, are tightened with the torque according to DIN.
	Tyres and rims
❑	Tread pattern depth of the tyres is greater than 1.5 mm.
❑	The tyres are free of damages or alien objects and are not porous.
❑	Checked tyre pressure front and rear.
❑	Hubs do not show tears or raptures.
❑	The lateral lag of the rims is max. 2 mm.
❑	Wheel attachment screws are tightened with torque according to DIN.
	Batteries

Maintenance checklist of the annual maintenance jobs	
❑	No dirt or outer damage to the batteries.
❑	Checked the screwed connections of the battery poles.
❑	Poles and attachment clamps are clean and greased with Vaseline or Acid protector grease.
❑	Cover caps are placed onto the battery poles.
❑	Operation capability of the batteries ensured (capacity check conducted).
❑	The battery case is not damaged, the batteries are secured correctly.
	Electrical conduits and alignment
	Control- and charging cable as well as battery and cable are:
❑	a) undamaged
❑	b) lay out without tension or jamming points (acc. to chapter *Checking the cable layout* on page 42)
❑	Plugged connectors are undamaged and not corroded.
❑	The holders for the charging and controller fuse a well as the main fuse are filled correctly.
❑	The cables to the lighting units and sensors are undamaged and attached correctly.
	Control panel / Control
❑	The operating pad keys function bounce-free.
❑	Checked the control displays for function.
❑	The keypad symbols are visible.
❑	The director (e. g. joystick) functions easily and returns to its original position from any motion.
❑	The zero sector (the sector within which, even when the director is moved, no driving impulses are transmitted) for forward and backward driving are equal.
	Lighting
❑	Checked function of all components of the lighting equipment.
❑	The dispersion discs of the lights are undamaged.
❑	The headlights are adjusted correctly.
❑	Passive lighting (reflectors) complete, clean and undamaged.

Maintenance checklist of the annual maintenance jobs	
	Brakes
❑	Checked the function of the brakes.
❑	The maximum braking distance corresponds to EN 12184.
	Oil/Grease
❑	Checked turning points and bearing areas of operating levers and moveable parts for easy functioning.
	Final check
❑	Checked the lighting and signalling devices.
❑	Conducted brake-/steering-/driving test on inclinations and slopes.
❑	Conducted a general function test of the mechanical adjustment units.
❑	Conducted driving test.
❑	The inspection certificate filled out in the operating manual.

DIN norms and guidelines

The torque according to DIN for screwed connections can be extracted from the table at the side.

Tyres

Filling pressure front: ..... min. 2.5 / max. 3.5 bar (35 psi)

Filling pressure rear: ..... min. 2.5 / max. 3.5 bar (35 psi)

Minimal profile depth acc. to STVO: ..... 1.5 mm

Items with order number

Loctite 243 (medium hard) 205 638 800

Torque according to DIN for screwed connections

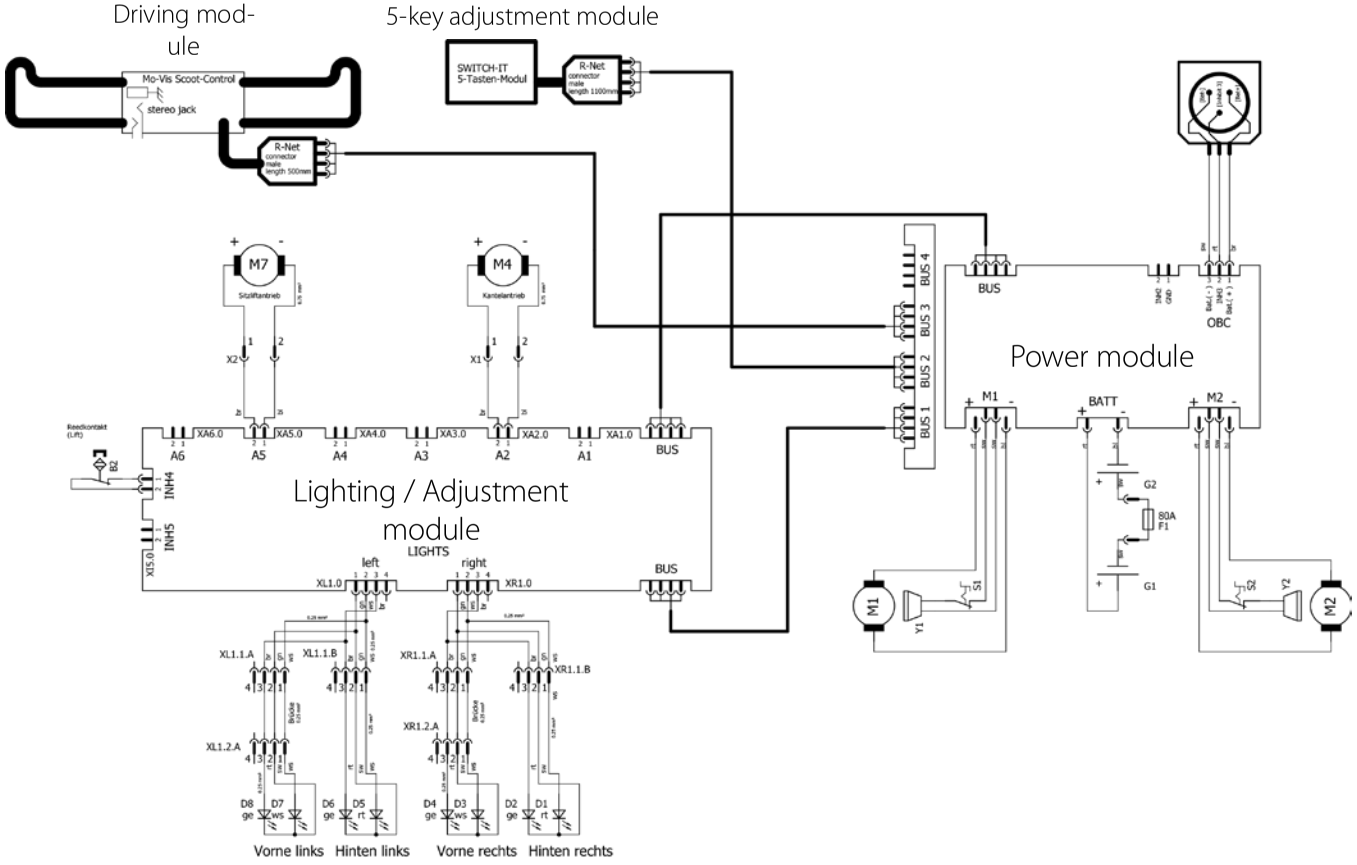
Thread diameter	Tightening torque
M 4	3 Nm
M 5	5 Nm
M 6	10 Nm
M 8	25 Nm
M 10	50 Nm
M 12	85 Nm

CIRCUIT DIAGRAM

Electronic type R-Net

Legend:

G1	Drive battery 12 V
G2	Drive battery 12 V
F1	Main fuse 80 A
M1	Driving motor left
Y1	Left brake 12 V
S1	Drive/push switch, left
M2	Driving motor right
Y2	Right brake 12 V
S2	Drive/push switch, right



M3	Back support motor
R3	Sensor back support motor
R3.1	Back-coding-sensor
M4	Leg support motor
R4	Sensor leg support motor
R4.1	Leg support-coding-sensor
M5	Rising motor
R5	Sensor rising motor
R5.1	Rinsing-coding-sensor
M6	Camber motor
R6	Sensor camber motor
R6.1	Camber-coding-sensor
M9	Lordosis pump
R20	Calibrating dongle
S4.3	Memory-final position-key not in base position.
S4.4	Memory-key base / interim position
D1	Right rear light
D2	Indicator rear right
D3	Headlight right
D4	Indicator front right
D5	Left rear light
D6	Indicator rear left
D7	Headlight left
D8	Indicator front left
X1	4-pole Molex Microfit
X2	4-pole Molex Microfit
X3	4-pole Molex Microfit
X4	4-pole Molex Microfit
X5	2-pole Molex
X6	4-pole Molex Microfit
X7	3-pole snap-in binder

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