AVIVA™ RX10

Power Wheelchair – Service Manual



PROVIDER: Keep this manual.
The procedures in this manual MUST be performed by a qualified technician.

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1 General

1.1 Introduction

This document contains important information about assembly, adjustment and advanced maintenance of the product. To ensure safety when handling the product, read this document and the user manual carefully and follow the safety instructions.

Find the user manual on DHCare's website or contact your DHCare representative. See addresses at the end of this document.

DHCare reserves the right to alter product specifications without further notice.

Before reading this document, make sure you have the latest version. You find the latest version as a PDF on the DHCare website.

Previous product versions may not be described in this Manual's current revision. If you require assistance, please contact DHCare.

For pre-sale and user information, see the user manual.

For more information about the product, for example product safety notices and product recalls, contact your DHCare representative. See addresses at the end of this document.

1.2 General Information

Service and maintenance work must be carried out taking this document into account.

Note that there may be sections in this document, which are not relevant to your product, since this document applies to all available models (on the date of printing). If not otherwise stated, each section in this document refers to all models of the product.

The models and configurations available in your country can be found in the country-specific sales documents.

It is imperative that you observe safety information.

Information about operation or about general maintenance and care work on the product should be taken from service manual.

Assembly of accessories/options might not be described in this document. Refer to the manual delivered with the accessory/option. Additional manuals can be ordered from DHCare. See addresses at the end of this document.

You can find information about ordering spare parts in the spare parts catalogue.

Spare parts must match original DHCare parts. Only use spare parts which have been approved by DHCare.

The product may only be maintained and overhauled by qualified personnel.

The minimum requirement for service technicians is suitable training, such as in the cycle or orthopedic mechanics fields, or sufficiently long-term job experience. Experience in the use of electrical measuring equipment (multimeters) is also a requirement. Special DHCare training is recommended.

Alterations to the power wheelchair which occur as a result of incorrectly or improperly executed maintenance or overhaul work lead to the exclusion of all liability on the side of DHCare.

If you have any problems or questions contact your provider.

1.3 Notes on Shipping

- If the power wheelchair has to be shipped back to the manufacturer for major repairs, you should always use the original packaging for transport.
- Please attach a precise description of the fault.

1.4 Symbols in This Manual

Symbols and signal words are used in this document and apply to hazards or unsafe practices which could result in personal injury or property damage. This document is printed in greyscale. For your information, the safety messages have the following colour coding according to ANSI Z535.6: Danger (Red), Warning (Orange), Caution (Yellow) and Notice (Blue). See the information below for definitions of the signal words.

DANGER!
Indicates a hazardous situation that will result in serious injury or death if it is not avoided.

WARNING!
Indicates a hazardous situation that could result in serious injury or death if it is not avoided.

CAUTION!
Indicates a hazardous situation that could result in minor or slight injury if it is not avoided.

NOTICE!
Indicates a hazardous situation that could result in damage to property if it is not avoided.

Tips and Recommendations
Gives useful tips, recommendations, and information for efficient, trouble-free use.

Tools
Identifies required tools, components and items which are needed to carry out certain work.

1.5 Images in This Manual

The detailed images in this manual are given marks to identify various components. Component marks in text and operational instructions always relate to the image directly above.

2 Safety

2.1 Safety Information

WARNING!
Installation, mounting, maintenance or repairs made by unqualified persons can result in hazardous situations to you and others

- The procedures in this service manual, must be performed by a specialised provider or qualified service technician.
- DHCare expects that the qualified technician is familiar with the product, with good technical knowledge to understand and follow the steps of the described instructions in this manual, and equipped with proper tools.
- Do not handle this product or any available optional equipment without first completely reading and understanding these instructions and any additional instructional material such as user manuals, installation manuals or instruction sheets supplied with this product or optional equipment.

- The CE marking is invalidated if components or accessories/options are replaced or added that have not been approved for this product by DHCare.
- In this case, the company that adds or replaces the components or accessories/options is responsible for the conformity assessment/CE marking or for registering the scooter as a special design and for the relevant documentation.

The information contained in this document is subject to change without notice.

2.2 Safety and Fitting Instructions

These safety instructions are intended to prevent accidents at work, and it is imperative that they are observed.

Before any inspection or repair work

- Read and observe this repair manual and the associated user manual.
- Observe the minimum requirements for carrying out the work (see *1.2 General Information, page 3*).

Personal Safety Equipment

Safety Shoes

The power wheelchair, and some of its components, are very heavy. These parts can result in injuries to the feet if they are allowed to drop.

- Wear standardized safety shoes during all work.

Eye Protection

It is possible that battery acid can be discharged when working on defective batteries or when handling batteries improperly.

- Always wear eye protection when working on any defective or possibly defective batteries.

Safety Gloves

It is possible that battery acid can be discharged when working on defective batteries or when handling batteries improperly.

- Always wear acid-proof safety gloves when working on any defective or possibly defective batteries.

General Safety Information and Information About Fitting / Removal

DANGER!
Risk of death, serious injury, or damage
Lighted cigarettes dropped onto an upholstered seating system can cause a fire resulting in death, serious injury, or damage. Power wheelchair occupants are at particular risk of death or serious injury from these fires and resulting fumes because they may not have the ability to move away from the power wheelchair.

- DO NOT smoke while using this power wheelchair.

WARNING!
Risk of serious injury or damage
Storing or using the power wheelchair near open flame or combustible products can result in serious injury or damage.

- Avoid storing or using the power wheelchair near open flame or combustible products.

CAUTION!
Risk of crushing
Various components such as the drive unit, batteries, seat etc are very heavy. This results in injury hazards to your hands.

- Note the high weight of some components. This applies especially to the removal of drive units, batteries and the seat.

CAUTION!
Injury hazard if the power wheelchair starts moving unintentionally during repair work

- Switch the power supply off (power button).
- Engage the drive.
- Before lifting up, secure the power wheelchair by using chocks to block the wheels.

CAUTION!
Fire and burn hazard due to electrical short-circuit

- The power wheelchair must be completely switched off before removal of voltage-carrying components! To do this, remove the batteries.
- Avoid short-circuiting the contacts when carrying out measurements on voltage-carrying components.

CAUTION!
Risk of burns from hot surfaces on the motor

- Allow the motors to cool down before commencing work on them.

CAUTION!
Injury hazard and risk of damage to power wheelchair due to improper or incomplete maintenance work

- Use only undamaged tools in good condition.
- Some moving parts are mounted in sockets with PTFE coating (Teflon™). Never grease these sockets!
- Never use "normal" nuts instead of self-locking nuts.
- Always use correctly-dimensioned washers and spacers.
- When reassembling, always replace any cable ties which were cut during dismantling.
- After completing your work / before renewed start-up of the power wheelchair, check all connections for tight fitting.
- After completing your work / before renewed start-up of the power wheelchair, check all parts for correct locking.
- Only operate the power wheelchair with the approved tyre pressures (see technical data).
- Check all electrical components for correct function. Note that incorrect polarity can result in damage to the control system.
- Always carry out a trial run at the end of your work.

CAUTION!
Any changes to the drive program can affect the driving characteristics and the tipping stability of the power wheelchair

- Changes to the drive program may only be carried out by trained DHCare providers.
- DHCare supplies all power wheelchairs with a standard drive program ex-works. DHCare can only give a warranty for safe power wheelchair driving behavior - especially tipping stability - for this standard drive program.

CAUTION!
Risk of injury
Adaptions to the power wheelchair can influence the performance.

- When adaptions with third party products are made, this is only allowed within the scope of a valid combination agreement.
- The maximum values and restrictions of both products shall be observed.
- Machining, bending, welding, or bracing on any safety relevant components is not allowed.

Mark all current settings for the power wheelchair (seat, armrests, backrest etc.), and the associated cable connecting plugs, before dismantling. This makes reassembly easier. All plugs are fitted with mechanical locks which prevent release of the connecting plugs during operation. To release the connecting plugs the safety locks must be pressed in. When reassembling ensure that these safety locks are correctly engaged.

3 Hygiene

3.1 Handling of Returned Used Products

When reconditioning or repairing returned power wheelchairs:

- Take precautions for yourself and the product.
- Use protection equipment as specified locally.

Before Transport (According to Biological Agents Ordinance)

Treat product according to following process steps:

Process Step	Component	Application	Conditioning technique	Work Station
Manual cleaning	Surface of used device	Before repair or reconditioning	Use saturated towel to apply cleaning detergent and remove residues after impact.	Cleaning and disinfection
Disinfection	Surface of used device	Before repair or reconditioning	Use saturated disinfectant wipes and clean* the device surface.	Cleaning and disinfection

*DHCare uses detergent "Nücosept Spezial" 1.5% in water ml/ml

Disinfection Tools

- Disposable wipes (fleece)
- Brushes to clean areas difficult to access

Further Information

For more information contact your DHCare service department.

4 Setup

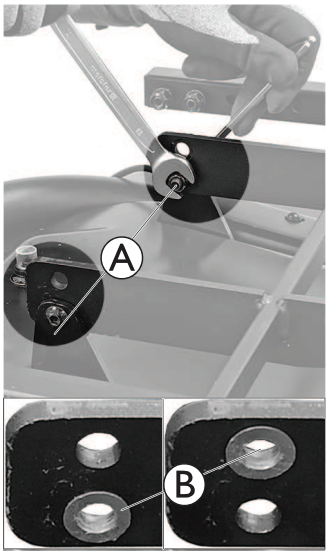
4.1 General Information on Setup

The tasks described in this chapter are intended to be performed by trained and authorized service technicians for initial setup. They are not intended to be performed by the user.

4.2 Adjusting Seat Height

- 5 mm Allen key
- 13 mm wrench

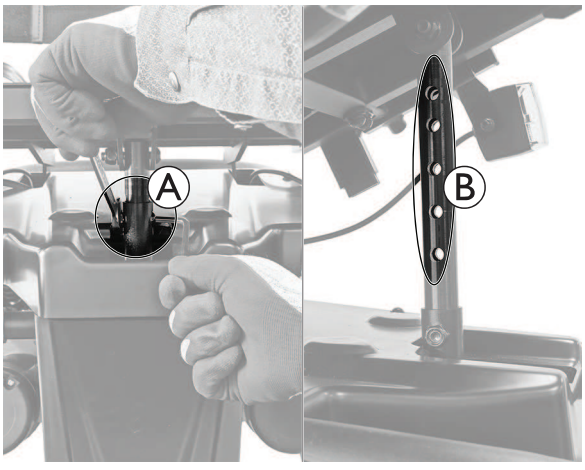
1. Remove screws, nuts and washers Ⓐ.
2. Adjust seat height by installing the seat frame with one of the two available drilling holes to the base.
   Make sure to put the washer Ⓑ in the correct height adjustment hole before installation.
3. Tighten screws.



Seat plate removed for better visibility of components.

4.3 Adjusting Manually Settable Tilt

1. Remove screw, nut and washer Ⓐ.
2. Adjust seat tilt by moving the seat frame up or down until the required angle is reached (see following table for depending seat tilt angle and drilling hole position).
3. Install the seat tilt tube to the depending drilling hole Ⓑ and tighten the screw.



Depending on the seat height some combinations of manual adjustable seat tilt angles are not valid, refer to the following table:

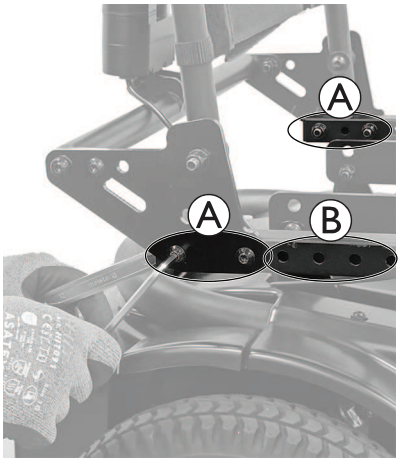
Pos. 1	Pos. 2	Pos. 3	Pos. 4	Pos. 5	Pos. 6
Seat-to-floor Height 450 mm					
0°	2.9°	6.9°	10.9°	15.1°	23°[1]
Seat-to-floor Height 470 mm					
-3.2°[1]	0.3°	3.7°	7.8°	11.9°	19.9°

1 Invalid setting

4.4 Adjusting Seat Depth

- 5 mm Allen key

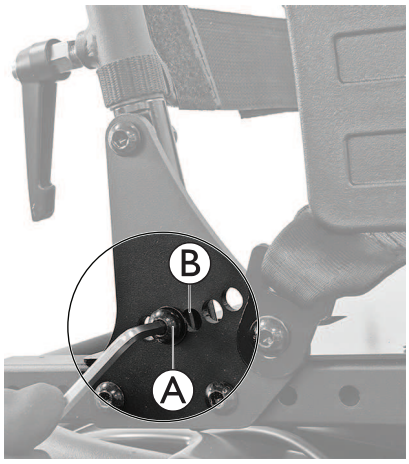
The seat depth adjustment is the same for manually adjustable backrests and for powered backrests.



1. Remove screws, washers and nuts Ⓐ on both sides of the seat.
2. Adjust backrest to desired seat depth for the user.
   Make sure the backrest support is adjusted to the same drilling holes Ⓑ on both sides equally.
3. Tighten screws on both sides of the seat.

4.5 Adjusting Manual Backrest

- 5 mm Allen key



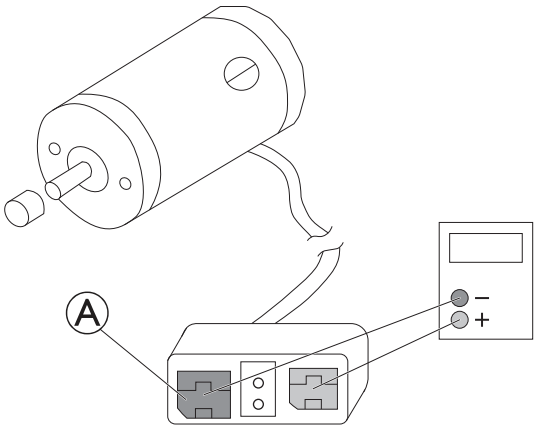
1. Remove screw and washers Ⓐ on both sides of the backrest support.
2. Adjust backrest with one of the five drilling holes Ⓑ to desired angle for the user.
   Make sure the backrest is adjusted to the same drilling holes on both sides equally.
3. Tighten screw on both sides of the backrest support.

5 Testing

5.1 Testing Motor

- Phillips screwdriver, size 2
- Digital multimeter with resistance measurement

1. Remove shroud, that covers power module, see *9.2 Replacing Power Module Shroud, page 31*.
2. Pull the motor plug out of power module.
3. Connect the digital multimeter to the motor plug contacts Ⓐ and measure the resistance between the contacts.



A resistance of between 0.5 ohms and 5.0 ohms indicates a motor ready for operation. A resistance of between 15.0 ohms and infinity indicates a defective motor. High resistances are normally caused by bad connections or worn carbon brushes.

5.2 Testing Motor Brake

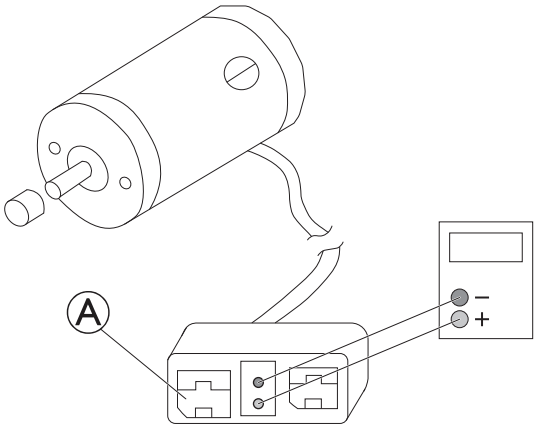
This test should only be carried out on power wheelchairs with conventional motor/gearbox units.

CAUTION!
Risk of damage to power module due to shorts in motor brake
— Never connect a shorted motor brake to an intact power module.
— Always replace shorted brakes immediately.

A defective motor can damage the power module, but a defective power module cannot damage the motor.

- Phillips screwdriver, size 2
- Digital multimeter with resistance measurement

1. Remove shroud, that covers power module, see *9.2 Replacing Power Module Shroud, page 31*.
2. Pull motor plug out of the power module.
3. Connect the digital multimeter to the adjacent central motor plug contacts Ⓐ and measure the resistance between the contacts.
4. If there is a defect, replace the motor and send it to DHCare Service for inspection or repair.



A resistance of between 40 ohms and 80 ohms indicates an intact brake. A resistance of 0 ohms or a very high resistance (mega-ohms or infinity) indicates a short-circuit, a bad connection or a defective brake.

5.3 Rain test

- Check to ensure that the black battery terminal caps are secured in place, gaiter is not torn or cracked where water can enter and that all electrical connections are secure at all times.
- Do not use the power wheelchair if the gaiter is torn or cracked. If the gaiter becomes torn or cracked, replace immediately.

5.4 Field Load Test

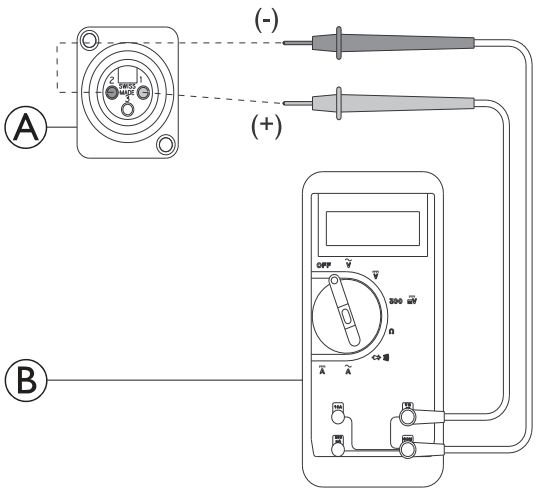
Old batteries loose their ability to store and release power due to increased internal resistance. In this procedure, batteries are tested under load using a digital voltmeter to check battery charge level at the charger connector. The charger connector is located on the remote. When voltage at the output drops 1.0 volts under load (2.0 volts for a pair), replace the batteries.

Read these instructions carefully and the manufacturer's instructions on the digital voltmeter before proceeding.

- Voltmeter

WARNING!
— When performing the following steps, ensure your feet are clear from casters and wall, otherwise injury may result.

1. Switch electronics OFF on remote.
2. Make sure battery is fully charged. An extremely discharged battery will exhibit the same symptoms as a bad battery.
3. Remove footboard / legrests from power wheelchair.
4. Connect voltmeter leads to charger connector Ⓐ on power wheelchair. Most digital voltmeters Ⓑ are not affected by polarity. However, analog meters (meters with swinging needles) can be and should be used carefully.
   A good meter reading should be 25.5 VDC to 26.0 VDC with the chair in neutral.
5. Switch electronics ON on remote.
6. Ensue that your feet are clear from casters and wall.
7. Run power wheelchair in neutral for at least 2 minutes.
8. Sit in power wheelchair drive the power wheelchair forwards, if possible upwards.
9. Read meter while motors are straining to determine voltage under load.
   If the voltage drops more than 2.0 volts from a pair of fully charged batteries during the 0.3 seconds, they should be replaced regardless of the unloaded voltages.



5.5 Checking Actuator

- Digital multimeter with resistance measurement



1. Turn OFF controls on remote.
2. If necessary, remove shroud.
3. Take note of the positions of all cables and sockets that they are connected to. Mark connectors and sockets or take a photograph with a digital camera.
4. Unplug actuator.
5. Connect multimeter to the contacts and measure the resistance between the contacts. The plug can have a different shape than shown in illustration.

   A resistance below 1 ohms indicates a short-circuit. Very high resistances indicates (mega-ohms or infinity) indicates a defective actuator. Actuator must be replaced in both cases.

5.6 Checking Battery Charge Level

The following “Don'ts” and “Do’s” are provided for your convenience and safety.

DON'T

- Don’t perform any installation or maintenance without first reading this manual.
- Don’t perform installation or maintenance of batteries in an area that could be damaged by battery spills.
- Don’t make it a habit to discharge batteries to the lowest level.
- Don’t use chargers or batteries that are not appropriate for the chair.
- Don’t put new batteries into service before charging.
- Don’t tip or tilt batteries.
- Don’t tap on clamps and terminals with tools.

DO

- Read and understand this manual and any service information that accompanies a battery and charger before operating the personal transporter.
- Move the personal transporter to a work area before cleaning terminals, or opening battery box.
- Recharge as frequently as possible to maintain a high charge level and extend battery life.
- Follow recommendations in this manual when selecting a battery or charger.
- Fully charge a new battery before using.
- Use a carrying strap to remove, move or install a battery.
- Push battery clamps on the terminals. Spread clamps wider if necessary.

6 Service

6.1 General Warning Information on Installation Work

CAUTION!
Risk of injury and damage to property, if the maximum speed reduction on a power wheelchair with a lifter does not function correctly
The power wheelchair's control unit must reduce the maximum possible speed as soon as the lifter is raised.
— Test the maximum speed reduction for correct function after any maintenance work or modifications to the power wheelchair.

6.2 Tightening Torques

CAUTION!
Risk of damage to power wheelchair due to improperly tightened screws, nuts or plastic connections.
— Always tighten screws, nuts etc. to the stated tightening torque.
— Only tighten screws or nuts which are not listed here fingertight.

The tightening torques stated in the following list are based on the thread diameter for the nuts and bolts for which no specific values have been determined. All values assume dry and de-greased threads.

Thread	M4	M5	M6	M8	M10	M12	M14	M16
Tightening Torque in Nm ±10 %	3 Nm	6 Nm	10 Nm	25 Nm	49 Nm	80 Nm	120 Nm	180 Nm

6.3 Troubleshooting

6.3.1 Operational Faults

Proceed as follows if you have any problems:

1. First assess the possible cause of the problem using the following table.
2. Check the remote status display. Evaluate the flash error code.
3. Carry out the necessary checks and repairs as recommended in the following table.

The various power modules can be fitted in connection with different remotes in the power wheelchair. Rectification of operational faults depends on the power module fitted. The power modules used are described in the corresponding controls manual.

The tables for rectification of operational faults listed in the following chapters are only an excerpt from the original manufacturer's manuals. You can obtain the original manuals from DHCare.

6.3.2 Drive Fault Diagnosis

Problem	Other Symptoms	Possible Cause	Solution	Documentation
Power wheelchair will not start	The remote status display illuminates normally and shows an error code.	Drive motors disengaged	Engage drive motors	See corresponding user manual
	Remote status display does not illuminate	Batteries defective	Replace batteries	See *11.4 Replacing Batteries, page 36*
		Completely discharged battery	Pre-charge batteries	See user manual
		Power supply to remote interrupted	Check status of circuit breaker or replace circuit breaker if necessary	See user manual and *11.5 Replacing Circuit Breaker, page 38*
			Check cables between modules for loose connections or damage	See *11.4 Replacing Batteries, page 36* or *10.3 Replacing Power Module, page 33*
		Remote defective	Replace remote	See *10.2 Replacing Remote, page 32*
	Remote status display flashing	Various causes	Assess error code	See corresponding user manual
Power wheelchair judders in drive mode	None	Batteries defective (unstable voltage)	Replace batteries	See *11.4 Replacing Batteries, page 36*
		Drive motor(s) defective	Replace motor(s)	See *13.2 Replacing Motor Gearbox Unit, page 47*
			Replace carbon brushes	See *13.3 Checking and/or Replacing Carbon Brushes, page 48*
Power wheelchair pulls to left or right	None	Drive motors running asymmetrically	Change programming to synchronise motors	See LiNX service manual
	Tyre visibly dented	Not enough air in tyre	Check air pressure, replace drive wheel if necessary	See *12.4 Replacing Drive Wheel, page 42*
Error message does not clear	None	Bad connections	Check all connecting cables.	See *11.4 Replacing Batteries, page 36* or *10.3 Replacing Power Module, page 33*
		Motor brake defective	Measure internal resistance of brakes, replace motor if defective.	See *5.2 Testing Motor Brake, page 9* or *13.2 Replacing Motor Gearbox Unit, page 47*

Problem	Other Symptoms	Possible Cause	Solution	Documentation
Motors stop and start again	None	Voltage decline	Stop driving and allow controls to cool down.	
Motor runs but loses power	None	High motor load allows power module to lower voltage	Stop driving and allow controls to cool down.	
Motors stop and do not start again	None	High motor load allows power module to lower voltage	Leave power wheelchair switched on and let power module operate. Charge batteries overnight with power wheelchair switched on.	
		Circuit breaker switched off	Check cabling and switch on circuit breaker.	See *11.4 Replacing Batteries, page 36* or *11.5 Replacing Circuit Breaker, page 38*
		Motor defective	Check carbon brushes and replace if necessary	See *13.3 Checking and/ or Replacing Carbon Brushes, page 48*
			Measure internal resistance of motor, replace motor if defective.	See *5.1 Testing Motor, page 9* or *13.2 Replacing Motor Gearbox Unit, page 47*
		Power module defective	Replace power module	See *10.3 Replacing Power Module, page 33*
Motors lose power while driving	None	Bad connections	Switch power wheelchair off, wait 10 seconds, switch power wheelchair on again. Check all cabling.	See *11.4 Replacing Batteries, page 36* or *10.3 Replacing Power Module, page 33*
Motor judders or runs irregularly, or only one motor runs	None	Carbon brushes worn	Check carbon brushes and replace if necessary	See *13.3 Checking and/ or Replacing Carbon Brushes, page 48*
		Bearing defective	Replacing motor	See *13.2 Replacing Motor Gearbox Unit, page 47*
		Collector defective	Measure internal resistance of motor, replace motor if defective	See *5.1 Testing Motor, page 9* or *13.2 Replacing Motor Gearbox Unit, page 47*

Problem	Other Symptoms	Possible Cause	Solution	Documentation
Motors do not run	None	Bad connections	Check all cabling	See *11.4 Replacing Batteries, page 36* or *10.3 Replacing Power Module, page 33*
		Circuit breaker switched off	Check cabling and switch on circuit breaker.	See *11.4 Replacing Batteries, page 36* or *10.3 Replacing Power Module, page 33* and user manual
		Batteries defective	Replace batteries	See *11.4 Replacing Batteries, page 36*
		Cabling to power module or remote defective	Check cabling	See *11.4 Replacing Batteries, page 36* or *10.3 Replacing Power Module, page 33*
		Power module defective	Replace power module	See *10.3 Replacing Power Module, page 33*
	Corroded contacts	Water, salt or urine has penetrated	Check cabling, replace if necessary	See *11.4 Replacing Batteries, page 36* or *10.3 Replacing Power Module, page 33*
Motor makes clicking noise	None	Bearing defective	Replacing motor	See *13.2 Replacing Motor Gearbox Unit, page 47*
		Collector defective	Measure internal resistance of motor, replace motor if defective	See *5.1 Testing Motor, page 9* or *13.2 Replacing Motor Gearbox Unit, page 47*
Scraping noise or motor blocked	None	Bearing defective	Replacing motor	See *13.2 Replacing Motor Gearbox Unit, page 47*
		Gearbox defective	Replace motor gearbox unit	See *13.2 Replacing Motor Gearbox Unit, page 47*,

Problem	Other Symptoms	Possible Cause	Solution	Documentation
Gearbox makes clicking noise	None	Gearbox defective	Replace motor gearbox unit	See *13.2 Replacing Motor Gearbox Unit, page 47*,
		Drive wheel loose	Tighten drive wheel, secure bolts with thread locking adhesive, if necessary	See *12.4 Replacing Drive Wheel, page 42*
Gearbox losing oil	None	Sealing ring on drive shaft defective	Replace motor gearbox unit if sealing ring defective	See *13.2 Replacing Motor Gearbox Unit, page 47*
			Check carbon brushes for oil wetting, replace motor if brushes wet	See *13.3 Checking and/ or Replacing Carbon Brushes, page 48*
Irregular running	None	Drive shaft movable or bent	Check drive shaft, replace gearbox if defective	See *13.2 Replacing Motor Gearbox Unit, page 47*
Batteries not being charged	None	Circuit breaker defective	Check circuit breaker	See *11.5 Replacing Circuit Breaker, page 38*
		Cable defective	Check cabling	See *11.4 Replacing Batteries, page 36* or *10.3 Replacing Power Module, page 33*
		Batteries defective	Replace batteries	See *11.4 Replacing Batteries, page 36*
	LEDs blinking on charging unit	Charging unit defective	Replace charging unit	See charger user manual
Short charging period	None	One of the batteries could be defective	Replace batteries	See *11.4 Replacing Batteries, page 36*
Power wheelchair runs too slowly	None	Remote defective	Replace remote	See *10.2 Replacing Remote, page 32*
		Batteries defective	Replace batteries	See *11.4 Replacing Batteries, page 36*

6.3.3 Charging Device Fault Diagnosis

Symptom	Possible Cause	Solution
No LEDs illuminating on battery charger	Charging device not connected to mains supply.	Ensure that the battery charger has been plugged in.
	No mains supply	Check the mains supply with a voltmeter.
	Defective mains supply cable.	Check the mains supply cable. Replace damaged cables or send the battery charger to DHCare Service for repair.
	LEDs are burnt out	Send the battery charger to DHCare Service for repair.
	An internal fuse might be burnt out.	Send the battery charger to DHCare Service for repair.
Batteries do not charge	Battery charger not connected to power wheelchair.	Ensure that the battery charger has been connected to the power wheelchair.
	No mains supply	Check the mains supply with a voltmeter.
	Defective mains supply cable.	Check the mains supply cable. Replace damaged cables or send the batterycharger to DHCare Service for repair.
	Battery charger could be defective.	Use a battery charger which you know is working properly to charge the batteries. Send the defective battery charger to DHCare Service for repair.
	Battery voltage is too low to operate power wheelchair.	Replace the batteries, see *11.4 Replacing Batteries, page 36*.

6.4 Service Plan (Once A Year)

CAUTION!
Risk of injury and damage to property, if the maximum speed reduction on a power wheelchair with a lifter does not function correctly!
The wheelchair's control unit must reduce the maximum possible speed as soon as the lifter is raised.
— Test the maximum speed reduction for correct function after any maintenance work or modifications to the wheelchair.

Component	Check	Remedy	Notes	✓
Posture belt	Damage to postural belt	Replace belt if damaged	See *7.4 Replacing Seat Belt, page 23*.	
	Belt lock function	Replace belt if damaged	See *7.4 Replacing Seat Belt, page 23*.	
Armrests	Damage to armrests	Replace shroud if damaged	See *7.1 Replacing Armrest, page 21*	
	Armrest fixings	Tighten screws		
Clothes-guard	Damage to clothes-guard	Replace clothes-guard if damaged	See *7.1 Replacing Armrest, page 21*	
	Clothes-guard fixings	Tighten screws		
Seat lock	Seat lock defective	Replace seat lock		
Seat tilt	Tight fit of the pin retainers	Replace pin retainers if necessary		
Lifter (manual or electric)	Check screws	Tighten screws		
Powered recline (if fitted)	Damage to backrest	Replace parts if damaged		
	Seams			
	Fixing	Tighten screws		
	Check cable	Replace motor cable if necessary		
	Check function			
Frames (chassis) / battery mounting	Check fixings, welded seams and battery mounting	Tighten screws		
		Replace components if necessary		

Component	Check	Remedy	Notes	✓
Wheel suspension and wheels	Check drive wheels for tight fit and side play	Adjust, replace wheel	See *12.4 Replacing Drive Wheel, page 42*	
	Check castors for tight fit, float and side play	Replace wheels, wheel fork or wheel bearings	See *12 Wheels, page 40*	
	Tyres	Replace if damaged	See *12.4 Replacing Drive Wheel, page 42* or *12.6 Replacing Castor Wheel, page 44*	
	Check castor fork	Repair or replace if damaged	See *12.7 Replacing Castor Fork, page 44*	
	Check straight running	Replace wheels, wheel fork or wheel bearings	See *Replacing Dri12.4 Replacing Drive Wheel, page 42ve Wheel, page 1* or *12.6 Replacing Castor Wheel, page 44*	
Drive units, clutch mechanism	Motors	Check motors	See *5.1 Testing Motor, page 9*	
	Check functions in drive and push modes	Check carbon brushes, replace if necessary	See *13.3 Checking and/ or Replacing Carbon Brushes, page 48*	
	Check clutch mechanism	Replace motor if necessary.	See *13.2 Replacing Motor Gearbox Unit, page 47*	
		Tighten screws/nuts, adjust or replace if necessary		
Brakes	Inspect motor brake	Check motor brake	See *5.2 Testing Motor Brake, page 9*	
Legrests	Check welded seams, interlocking, screws, footplates	Tighten, replace if necessary		
Battery mounting	Check battery support and mounting belts for damage	Replace if necessary	See *11.4 Replacing Batteries, page 36*	

Component	Check	Remedy	Notes	✓
Batteries	Check batteries for damage	Replace batteries if necessary	See *11.4 Replacing Batteries, page 36* and *11.6 Disposing of Dead or Damaged Batteries Correctly, page 39*	
	Check battery voltage	Charge batteries	See user manual	
	Check contacts and terminals	Clean contacts and terminals	See *11 Batteries, page 35*	
Remote / Power modules	Remote, status display blinking	Evaluate error/blink code	See user manual	
	Fixings	Tighten fixings, replace if necessary	See *10.1 Replacing Remote Holder, page 32*	
	Cables and connecting plugs	Tighten cables and connecting plugs, replace if necessary		
	Joystick function	Replace joystick knob if necessary		
		Replace remote if necessary	See *10.2 Replacing Remote, page 32*	
	Power supply	Tighten cables and connecting plugs, replace if necessary		
Chair configuration	Check chair configuration version	Update software if newer version available.	See LiNX service manual	
Screws (every six months)	Check screws for tight fit	Tighten screws if necessary		

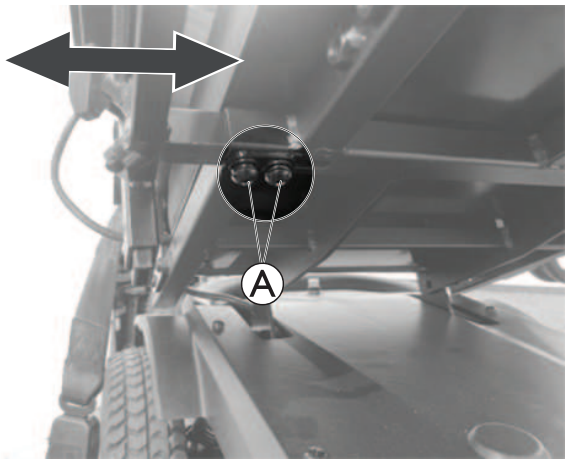
7 Seat System

This chapter deals with the replacement of interface components between the base of the power wheelchair and the corresponding seating system.

For detailed instructions on the seating system, see the service manual of the corresponding seating system.

7.1 Replacing Armrest

- 5 mm Allen key



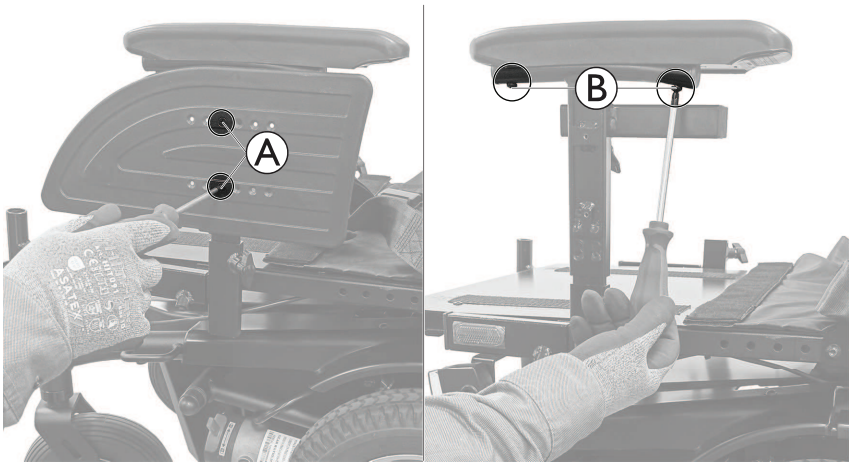
Removing

1. Loosen screws Ⓐ.
2. Remove armrest.

Installing

1. Install parts in reverse order.
2. Test all functions.

Replacing Armrest Pad



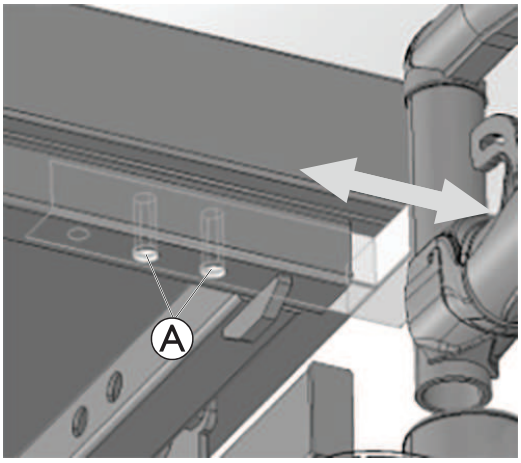
Removing

1. Remove screws Ⓐ.
2. Remove skirt guard.
3. Remove screws Ⓑ.
4. Remove armrest pad.

Installing

1. Install parts in reverse order.
2. Test all functions.

7.2 Replacing Standard 80° Legrest



Removing

1. Remove screws Ⓐ.
2. Remove legrest.

Installing

1. Install parts in reverse order.
2. Test all functions.

7.3 Replacing Headrest



Removing

1. Loosen hand screw Ⓐ.
2. Pull headrest out of bracket.

Installing

1. Install parts in reverse order.
2. Test all functions.

Replacing Headrest Bracket

- 5 mm Allen key
- 10 mm wrench



Removing

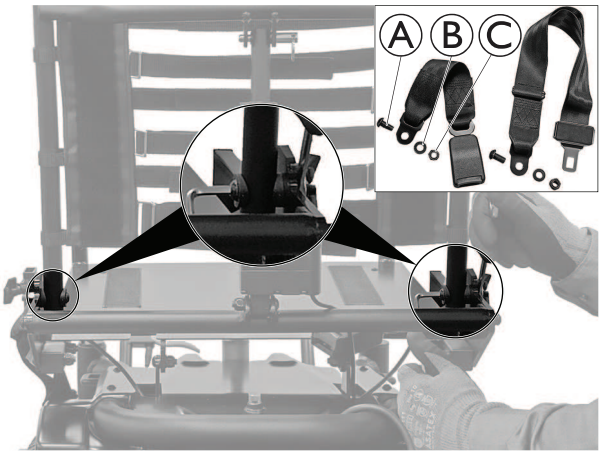
1. Remove nuts Ⓐ, screws and washers.
2. Remove headrest bracket from backrest bar.

Installing

1. Install parts in reverse order.
2. Test all functions.

7.4 Replacing Seat Belt

- 6 mm Allen key
- 17 mm wrench



Removing

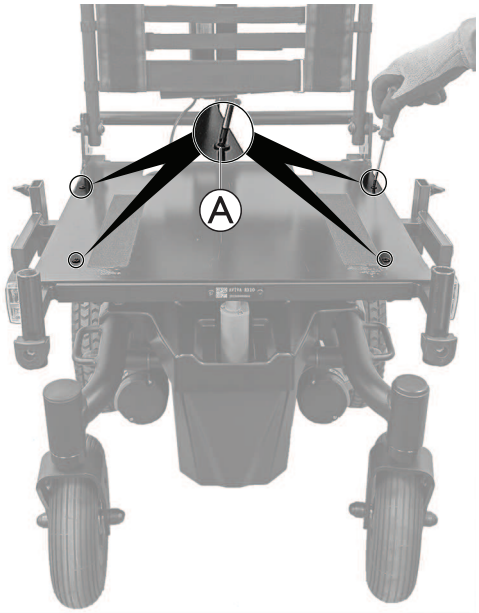
1. Remove screw Ⓐ, washer Ⓑ and nut Ⓒ on both sides.
2. Remove seat belt.

Installing

1. Install parts in reverse order.
2. Test all functions.

7.5 Replacing Seat Plate

- Phillips screwdriver



Removing

1. Remove screws Ⓐ.
2. Remove seat plate.

Installing

1. Install parts in reverse order.
2. Test all functions.

7.6 Replacing Seat Frame

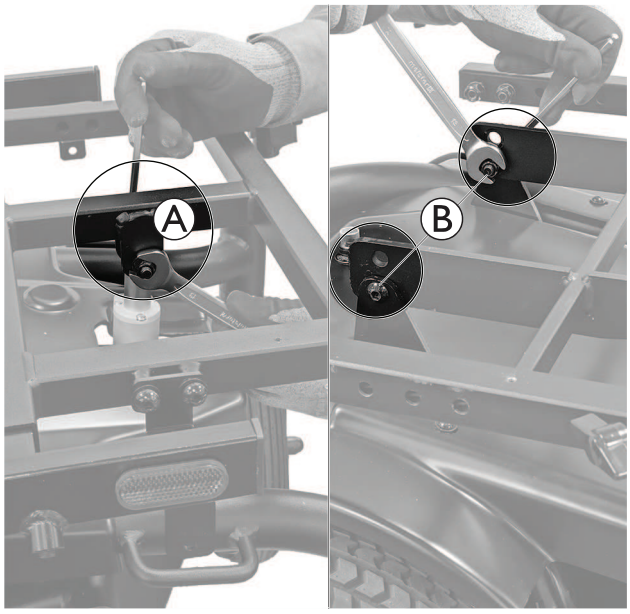
- 5 mm Allen key
- 13 mm wrench
- Oblique pliers
- Cable ties

Removing

1. Remove seat plate, see *7.5 Replacing Seat Plate, page 23*.
   The seat plate doesn't need to be removed, the screws can be accessed from front or rear as well.
2. Remove cable ties if necessary.
3. Remove screw, washer and nut from powered or manual recline Ⓐ.
4. Remove screws, washers and nuts from rear seat frame brackets Ⓑ.
5. Remove seat frame.

Installing

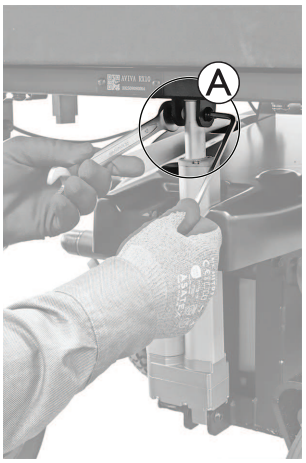
1. Install parts in reverse order.
2. Secure all cables with cable ties to seat frame again, if necessary.
3. Test all functions.



Seat plate removed for better visibility of components.

7.7 Replacing Tilt Actuator

- 5 mm Allen key
- 13 mm wrench
- Cable tie
- Oblique pliers

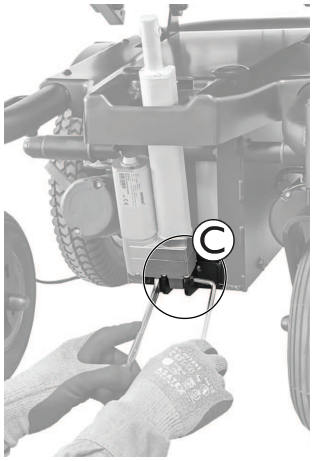


Removing

1. Remove front shroud, see *9.1 Replacing Front Shroud, page 31*.
2. Unplug actuator cable from power module, see *10.3 Replacing Power Module, page 33*.
3. Remove screw, washer and nut from upper actuator fixation Ⓐ.



4. For better accessibility of the recline actuator, you can fold the seat upwards after the upper fixation of the recline actuator is removed.
   a. Unplug light cable, if present, from power module, see *10.3 Replacing Power Module, page 33*.
   b. Fold the seat upwards and fix it with a cable tie Ⓑ to the chassis.



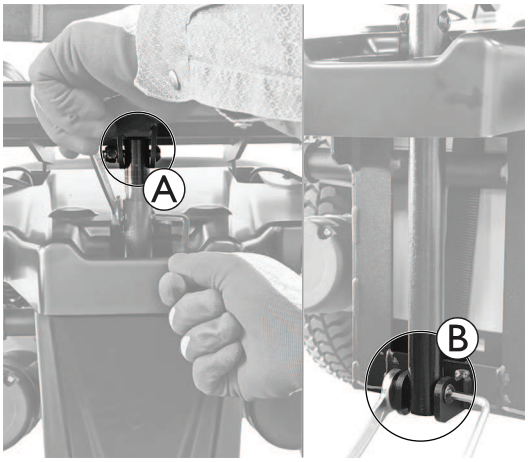
5. Remove screw, washer and nut from lower actuator fixation Ⓒ.
6. Remove tilt actuator.

Installing

1. Install parts in reverse order.
2. Test all functions.

7.8 Replacing Manually Settable Tilt Bracket

- 5 mm Allen key
- 13 mm wrench



Removing

1. Remove screw, washer and nut from upper tilt bracket fixation Ⓐ.
2. Remove front shroud, see *9.1 Replacing Front Shroud, page 31*.
3. Remove screw, washer and nut from lower tilt bracket fixation Ⓑ.
4. Remove tilt bracket.

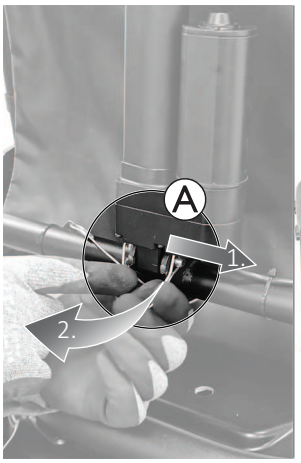
Installing

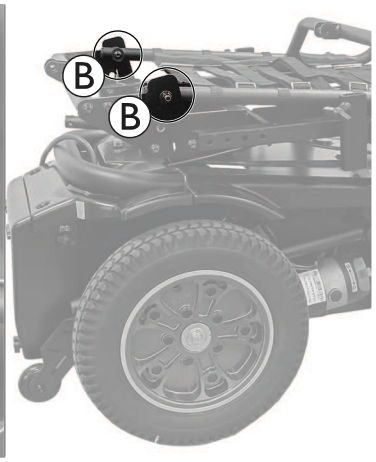
1. Install parts in reverse order.
2. Test all functions.

7.9 Replacing Powered Backrest

- 5 mm Allen key
- 13 mm wrench

WARNING!
Risk of pinch points
— Pay attention to your fingers, when removing or installing safety pin of backrest actuator.





Removing

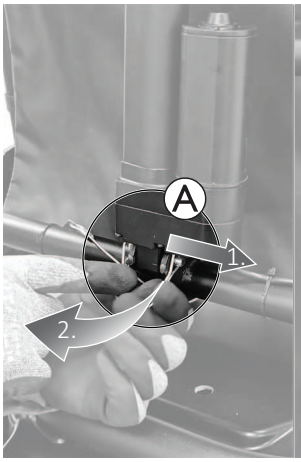
1. Unplug actuator cable from power module, see *10.3 Replacing Power Module, page 33*.
2. Remove safety pin Ⓐ on backrest actuator.
3. Fold down backrest.
4. Remove screw, washer and nut Ⓑ on both sides of the backrest.
5. Remove backrest.

Installing

1. Install parts in reverse order.
2. Test all functions.

Replacing Backrest Actuator

- 5 mm Allen key
- 13 mm wrench





Removing

1. Unplug actuator cable from power module, see *10.3 Replacing Power Module, page 33*.
2. Remove safety pin Ⓐ on backrest actuator.
3. Fold down backrest.
4. Remove screw, washer and nut Ⓑ from upper actuator fixation.
5. Remove backrest actuator.

Installing

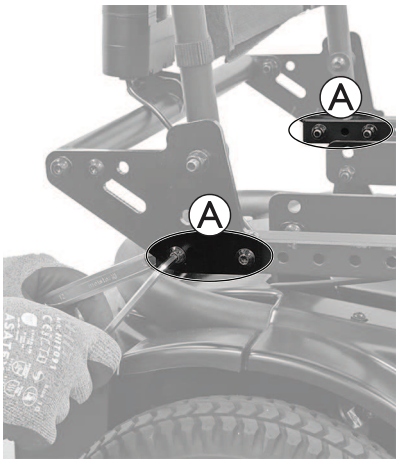
1. Install parts in reverse order.
2. Test all functions.

Replacing Powered Backrest Support

- 5 mm Allen key
- 13 mm wrench

Removing

1. There are two different options:
   a. Remove backrest, see explanation above.
   b. Remove backrest actuator, see explanation above.
   or
   a. Unplug actuator cable from power module, see *10.3 Replacing Power Module, page 33*.
2. Remove screws, washers and nuts Ⓐ on both sides of seat frame.
3. Remove backrest support.



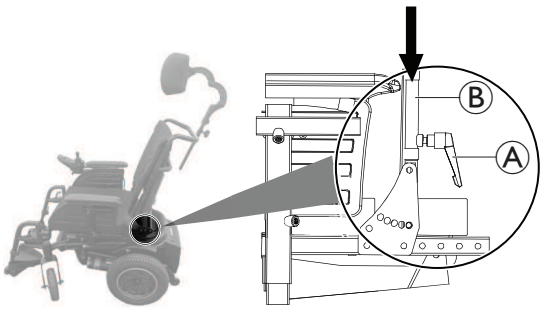
Installing

1. Install parts in reverse order.
2. Test all functions.

7.10 Replacing Manual Backrest

Removing

1. Loosen clamping lever Ⓐ on both sides of the seat.
2. Remove backrest from backrest holders Ⓑ.



Installing

1. Install parts in reverse order.
2. Test all functions.

Replacing Manual Backrest Support

- 5 mm Allen key
- 13 mm wrench

Removing

1. There is no need to remove the backrest, before removing the backrest support. But if the backrest should be removed, see explanation above.
2. Remove screws, washers and nuts Ⓐ on both sides of seat frame.
3. Remove backrest support.



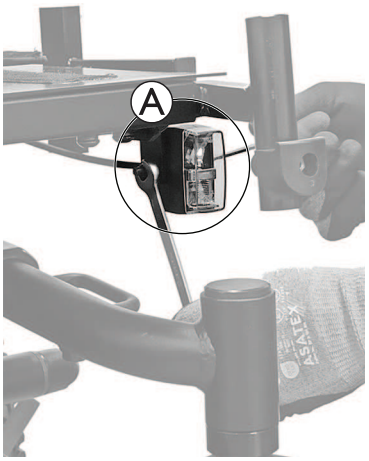
Installing

1. Install parts in reverse order.
2. Test all functions.

8 Lighting Unit

8.1 Replacing Front Light

- 4 mm Allen key
- 10 mm wrench
- Oblique pliers
- Cable ties



Removing

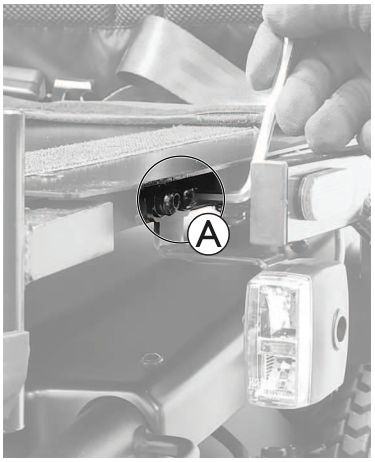
1. Remove cable ties that secure front light cables to seat frame.
2. Unplug front light cables from power module, see *10.3 Replacing Power Module, page 33*.
3. Remove screw, washer and nut Ⓐ from front light.
4. Remove front light.

Installing

1. Install parts in reverse order.
2. Secure all cables with cable ties to seat frame again.
3. Test all functions.

Replacing Front Light Bracket

- 5 mm Allen key



Removing

1. There are two different options:
   a. Remove front light, see explanation above.

   or
   a. Remove cable ties that secure front light cables to seat frame.
   b. Unplug front light cables from power module, see *10.3 Replacing Power Module, page 33*.
2. Remove screws and washers Ⓐ.
3. Remove front light bracket from seat frame.

Installing

1. Install parts in reverse order.
2. Secure all cables with cable ties to seat frame again.
3. Test all functions.

8.2 Replacing Rear Light

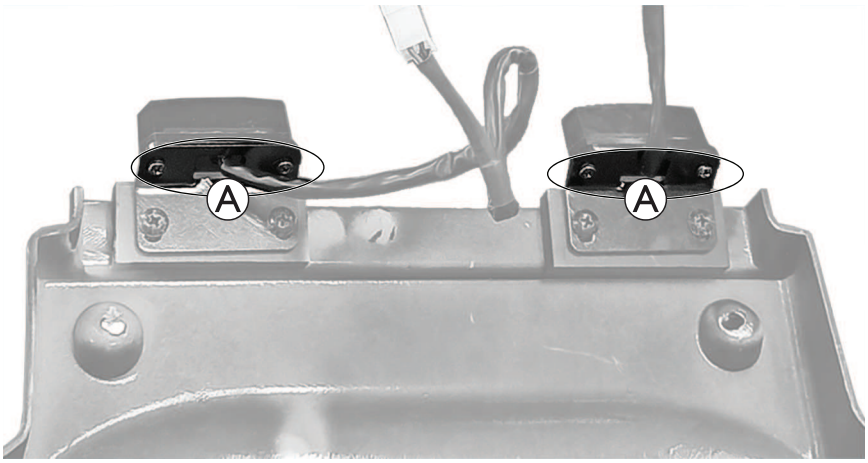
- 5 mm Allen key
- Phillips screwdriver

Removing

1. Remove power module shroud and unplug front light cables from power module, see *9.2 Replacing Power Module Shroud, page 31*.
2. Remove rear shroud, see *9.3 Replacing Rear Shroud, page 31*.
3. Remove screws Ⓐ.
4. Remove rear light from bracket.

Installing

1. Install parts in reverse order.
2. Test all functions.



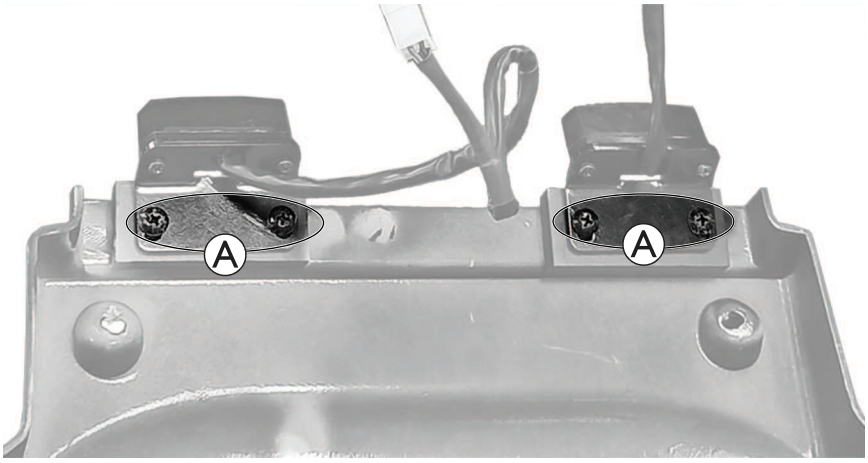
Replacing Rear Light Bracket

Removing

1. Remove power module shroud and unplug front light cables from power module, see *9.2 Replacing Power Module Shroud, page 31*.
2. Remove rear shroud, see *9.3 Replacing Rear Shroud, page 31*.
3. Remove screws Ⓐ.
4. Remove rear light bracket.

Installing

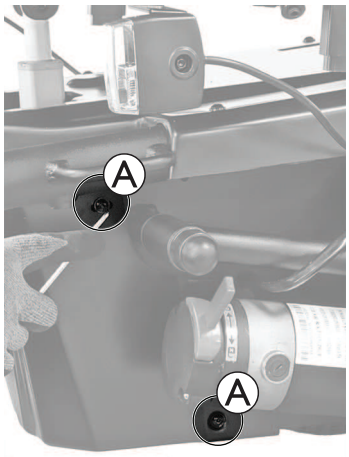
1. Install parts in reverse order.
2. Test all functions.



9 Shrouds

9.1 Replacing Front Shroud

- 3 mm Allen key



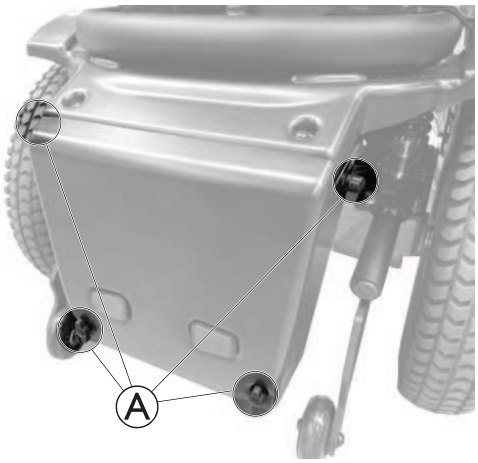
Removing

1. Remove screws Ⓐ on both side of front shroud.
2. Remove front shroud.

Installing

1. Install parts in reverse order.
2. Test all functions.

9.2 Replacing Power Module Shroud



Removing

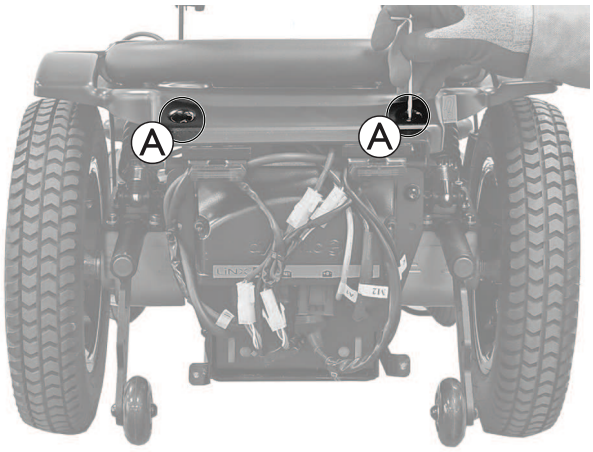
1. Remove handscrews Ⓐ.
2. Remove power module shroud.

Installing

1. Install parts in reverse order.
2. Test all functions.

9.3 Replacing Rear Shroud

- 3 mm Allen key



Removing

1. Remove power module shroud, see *9.2 Replacing Power Module Shroud, page 31*.
2. Remove screws Ⓐ on both sides of rear shroud.
3. Remove rear shroud.

Installing

1. Install parts in reverse order.
2. Test all functions.

10 Controls

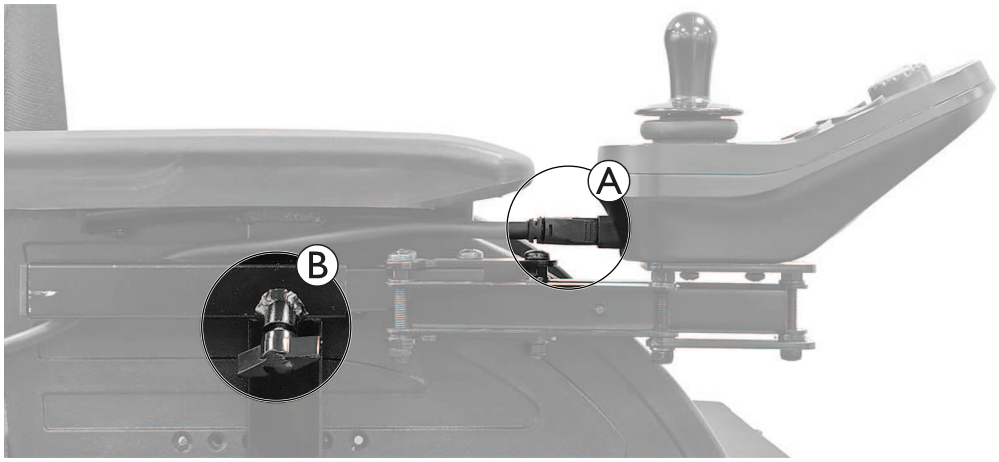
10.1 Replacing Remote Holder

Removing

1. Unplug BUS cable Ⓐ from remote.
2. Loosen hand screw Ⓑ.
3. Pull remote holder out of bracket.

Installing

1. Install parts in reverse order.
2. Test all functions.



10.2 Replacing Remote

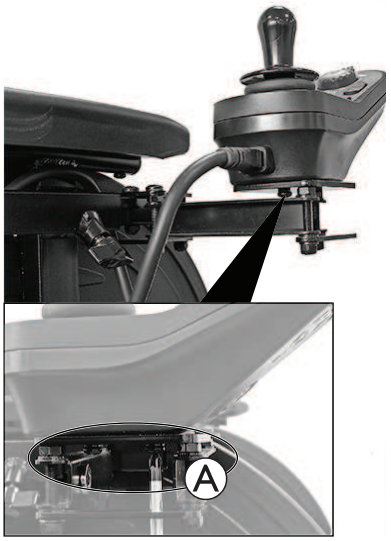
- Phillips screwdriver

Removing

1. Unplug BUS cable from remote.
2. Swing away remote.
3. Remove screws Ⓐ.
4. Remove remote from swing away remote holder.

Installing

1. Install parts in reverse order.
2. Test all functions.

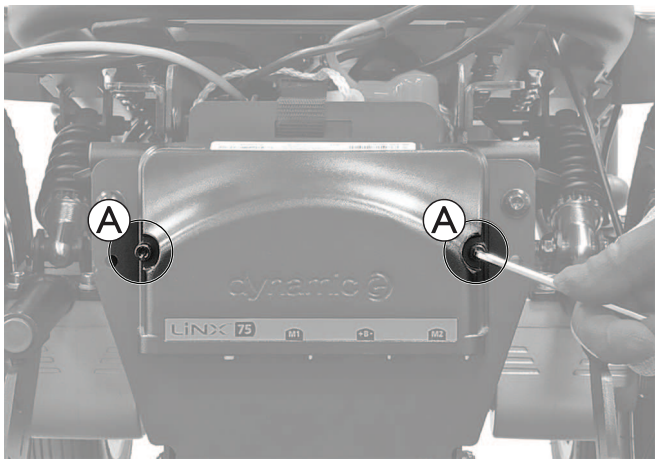


10.3 Replacing Power Module

- 4 mm Allen key
- Oblique pliers
- Cable ties

Removing

1. Remove power module shroud, see *9.2 Replacing Power Module Shroud, page 31*.
2. Remove rear shroud, see *9.3 Replacing Rear Shroud, page 31*.
3. Remove a ll cable ties.
4. Unplug cables from power module.
5. Remove screws Ⓐ.
6. Remove power module.



Installing

1. Install parts in reverse order.
2. Secure all cables with cable ties again.
3. Test all functions.

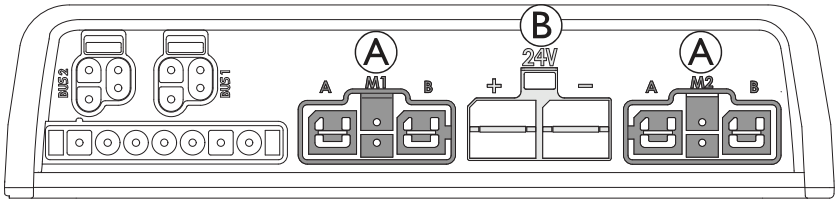
Overview Power Module Ports

Ⓐ Motor

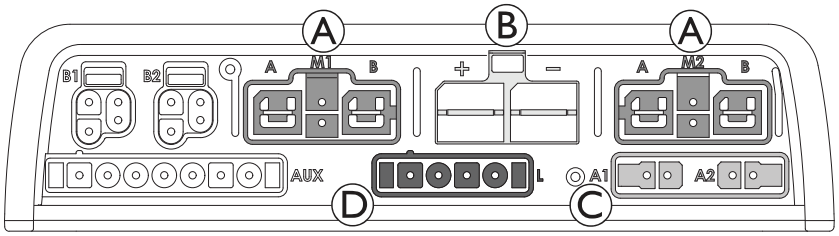
Ⓑ Battery

Ⓒ Actuators

Ⓓ Light



Power Module DLX-PM75



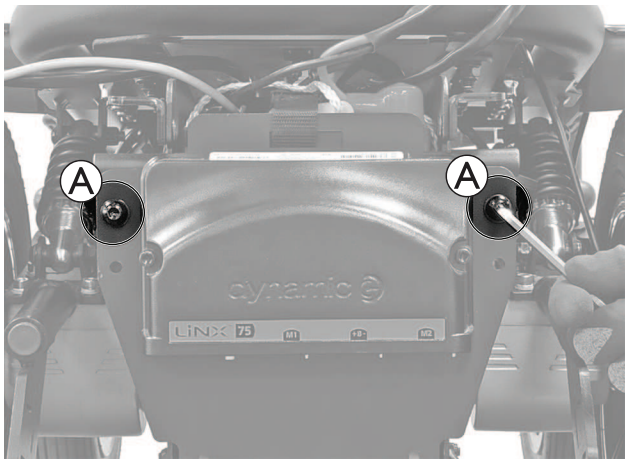
Power Module DLX-PM75 AL

10.4 Replacing Power Module Bracket

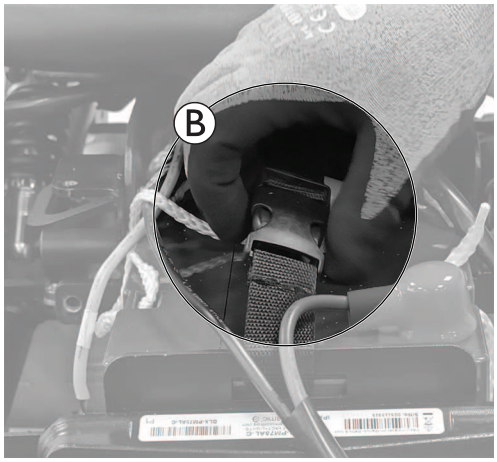
- 5 mm Allen key
- Oblique pliers
- Cable ties

Removing

1. Remove power module shroud, see *9.2 Replacing Power Module Shroud, page 31*.
2. Remove rear shroud, see *9.3 Replacing Rear Shroud, page 31*.
3. Remove all cable ties.
4. Unplug cables from power module.
   The power module must not be taken off to remove the bracket.
5. Remove screws Ⓐ.



6. Carefully pull out battery tray until plastic buckle is visible. Open plastic buckle Ⓑ.
7. Remove power module bracket.



Installing

1. Install parts in reverse order.
2. Secure all cables with cable ties again.
3. Test all functions.

10.5 Updating Software

See LiNX service manual.

11 Batteries

11.1 Safety Information

CAUTION!
injury hazard and possible material damages if batteries are handled improperly
The installation of new batteries may only be carried out by authorised specialists.
- Observe the warning information on the batteries.
- Only use battery versions stated in the specifications.

CAUTION!
Fire and burns hazard if battery terminal is bypassed
- Take great care to ensure that the battery terminals are never short-circuited with tools or mechanical power wheelchair parts.
- Ensure that the battery terminal caps have been replaced if you are not working on the battery terminals.

CAUTION!
Risk of crushing
Batteries can be extremely heavy. This results in injury hazards to your hands.
- Handle the batteries with care.
- Ensure that batteries do not fall to the ground when removed from chassis.
- Pay attention to hands.
- Use proper lifting techniques.

When removing, take care of small parts such as screws and washers. Put all small parts down so that they can be installed in correct sequence.

11.2 General Instructions on Handling Batteries

- Never mix and match different battery manufactures or technologies, or use batteries that do not have similar date codes.
- Never mix gel with AGM batteries.
- The batteries reach their end of life when the drive range is significantly smaller than usual. Contact your provider or service technician for details.
- Always have your batteries installed by a properly trained power wheelchair technician or a person with adequate knowledge. They have the necessary training and tools to do the job safely and correctly.

11.3 Handling Damaged Batteries Correctly

WARNING!
Risk of burns
- Never touch or remove overheating batteries. Only unplug the charger.
- Never touch leaking batteries.

WARNING!
Burn hazard
injury hazard due to discharged acid.
- Always wear acid-proof protective gloves when handling batteries.
- Always wear protective goggles when handling batteries.

What to do if acid is discharged
- Always take clothing which has been soiled by or dipped in acid off immediately!
- Rinse any areas of your skin which has come into contact with battery acid off immediately with plenty of water!

If contact with eyes is made
- You should also consult an eye specialist immediately afterwards!

- Place damaged batteries in an acid-resistant receptacle immediately after removing them.
- Only ever transport damaged batteries in an appropriate acid-resistant receptacle.
- Wash all objects that have come into contact with acid with lots of water.

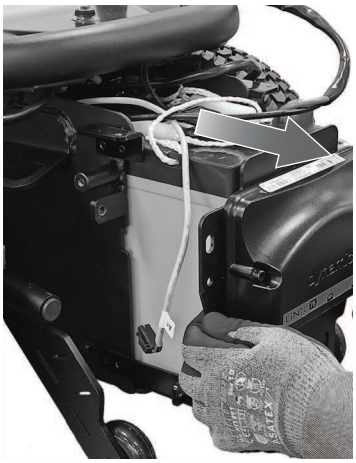
11.4 Replacing Batteries

- Phillips screwdriver

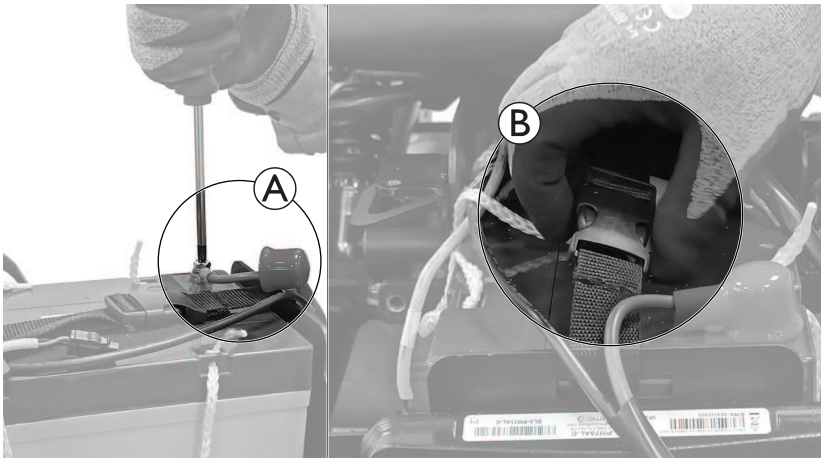
Removing

1. Remove power module shroud, see *9.2 Replacing Power Module Shroud, page 31*.
2. Remove rear shroud, see *9.3 Replacing Rear Shroud, page 31*.
3. Remove screws of power module bracket, see *10.4 Replacing Power Module Bracket, page 34*.
4. Carefully pull out battery tray until first battery is visible.

   Don't pull battery tray out too far otherwise the circuit breaker can get damaged.



5. Remove red battery connector Ⓐ of first battery.
6. Open plastic buckle Ⓑ.
7. Remove power module bracket.



8. Remove black battery connector of first battery.
9. Remove first battery from tray.
10. Carefully pull out battery tray to release second battery.
11. Remove battery connectors, first red then black of second battery.
12. Remove second battery from tray.



Installing

1. Install parts in reverse order.
2. Take care of the correct assembly of the battery connectors, first black, then red.
3. Test all functions.

Battery Wiring

Ⓐ First battery

Ⓑ Second battery

Ⓒ Circuit breaker

Ⓓ Power module

Ⓔ Positive terminal of first battery

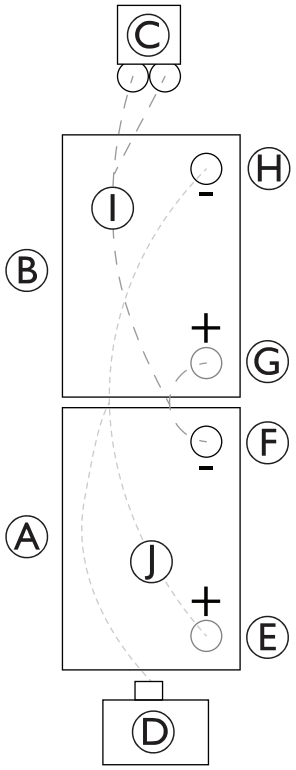
Ⓕ Negative terminal of first battery

Ⓖ Positive terminal of second battery

Ⓗ Negative terminal of second battery

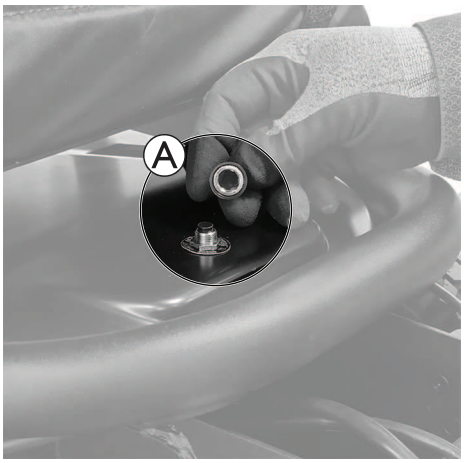
Ⓘ Battery harness to circuit breaker

Ⓙ Battery harness to power module



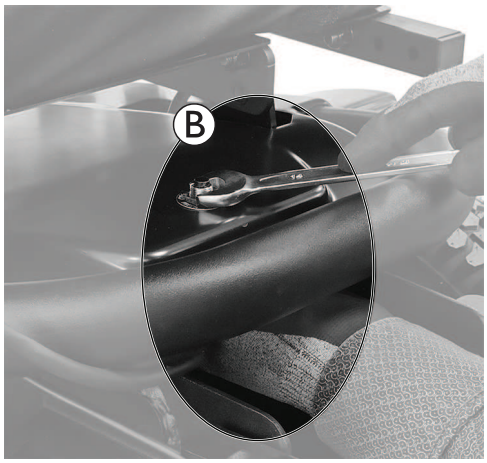
11.5 Replacing Circuit Breaker

- 14 mm wrench
- Phillips screwdriver

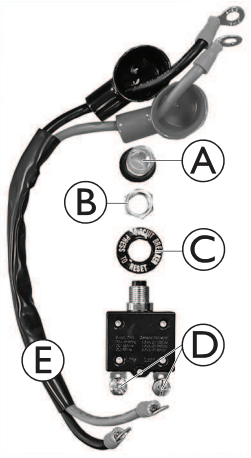


Removing

1. Remove power module shroud, see *9.2 Replacing Power Module Shroud, page 31*.
2. Remove rear shroud, see *9.3 Replacing Rear Shroud, page 31*.
3. Remove batteries, see *11.4 Replacing Batteries, page 36*.
4. Unscrew cap Ⓐ.



5. Remove nut Ⓑ, counter circuit breaker from below to prevent circuit breaker from turning.
6. Remove circuit breaker from shroud. Take care of identification ring Ⓒ during disassembly.



7. Remove screws Ⓓ.
8. Remove cable Ⓔ from circuit breaker.

Installing

1. Install parts in reverse order.
2. Test all functions.

11.6 Disposing of Dead or Damaged Batteries Correctly

WARNING!
Environmental hazard
- DO NOT dispose of batteries in normal household waste.
- DO NOT throw batteries into a fire.
- Batteries MUST be taken to a proper disposal site. The return is required by law and free of charge.
- Only dispose of discharged batteries.
- Cover terminals of batteries prior to disposal.

CAUTION!
Fire and burns hazard if battery is not stored correctly
- Take great care to ensure that the battery terminals are never short-circuited by metallic parts or liquids.
- Ensure that the battery terminal caps have been installed before storing.

Batteries are following special disposal rules. Your provider has all information available to safely exchange and dispose the defect batteries.

12 Wheels

12.1 Repair Instructions

CAUTION!
Risk of crushing to hands and feet by weight of pPower wheelchair
- Pay attention to hand and feet.
- Use proper lifting techniques.

CAUTION!
Risk of uncontrolled movement of power wheelchair
- Turn off power supply (power button).
- Engage drive.
- Before raising power wheelchair, secure wheels by blocking them with wedges.
- Prevent the power wheelchair from tipping, by propping it upon a jacking device which is long and wide enough under the battery case. It the jacking device is too short or too high, the power wheelchair can still tip.

12.2 Tyre Pressure

CAUTION!
Risk of damage to rim and tyre when tyre pressure is exceeded
- Observe recommended tyre pressure.

For recommended tyre pressure see inscription on tyre, rim, or contact DHCare. Compare table below for conversion.

psi	bar	psi	bar	psi	bar	psi	bar
22	1.5	28	1.9	33	2.3	39	2.7
23	1.6	29	2.0	35	2.4	41	2.8
25	1.7	30	2.1	36	2.5	42	2.9
26	1.8	32	2.2	38	2.6	44	3.0

12.3 Overview of Wheel Types and Specif Tightening Torques

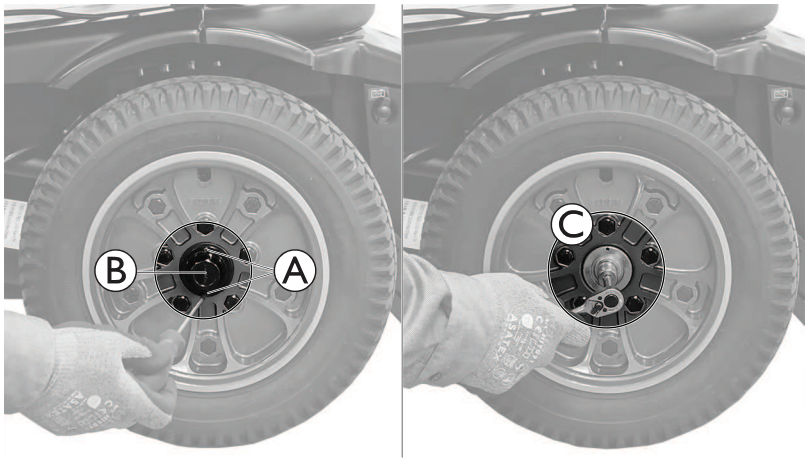
There are three different types of tyres or inner tubes, and specific points must be observed for the replacement of each type. The individual types of tyres can be easily distinguished:

pneumatic = black valve cap	puncture-proof = no valve

Drive Wheel		Castor Wheels	
 Solid Rim (1-Bolt Installation)		 8" double sided fork	 9" double sided fork
Type			
Specific Tightening Torques			
Wheel Fixation	18 Nm	25 Nm	25 Nm
Rim Halves	18 Nm	5 Nm	25 Nm

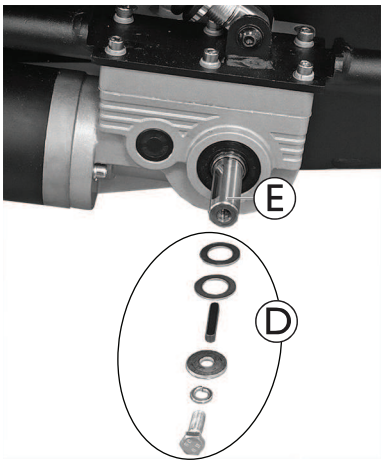
12.4 Replacing Drive Wheel

- Phillips screwdriver
- 13 mm wrench
- Torque wrench
- Jacking device
- Medium-strength threat locking adhesive (Loctite 242 or similar)

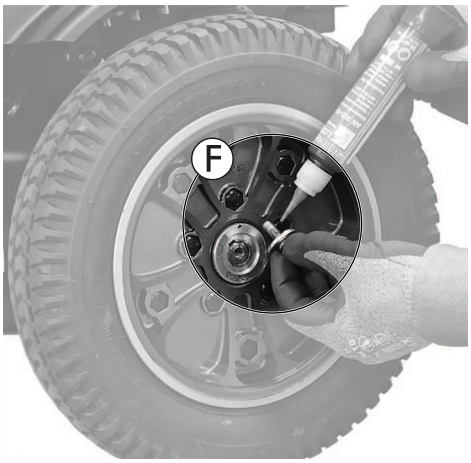


Removing

1. Jack up power wheelchair.
2. Remove screws Ⓐ.
3. Remove cap Ⓑ.
4. Remove bolt Ⓒ.



5. Remove wheel and drive wheel fixation kit Ⓓ from axle Ⓔ.



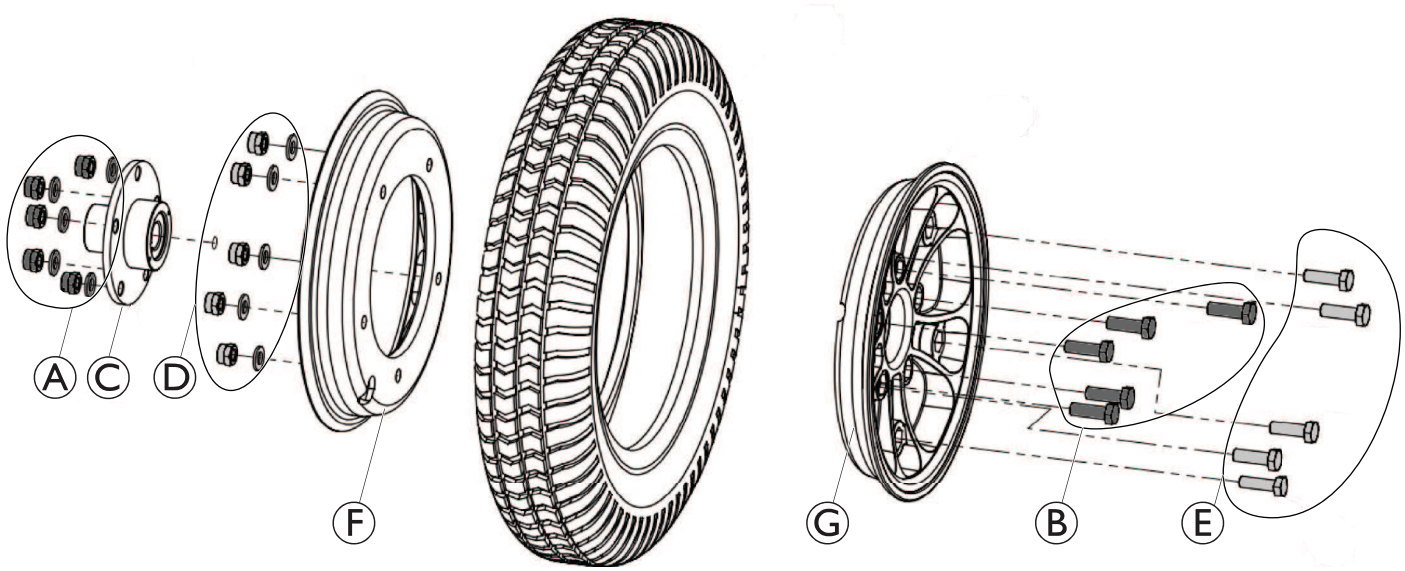
Installing

1. Install parts in reverse order.
2. Use threat locking adhesive Ⓕ when installing bolt.
3. Tighten bolt with 25 Nm
4. Test all functions.

12.5 Replacing Rim Halves

NOTICE!
Risk of damage to rim threads
Incorrectly tightened screws can cause damage to rim threads.
— Tighten rim screws with prescribed tightening torque.

- 13 mm wrench
- 3 joiner's clamps with plastic caps
- Jacking device



1. Remove drive wheel, see *12.4 Replacing Drive Wheel, page 42*.
2. Secure rim halves against unexpected discharge with three joiner's clamps. When doing so, make sure that you do not scratch rims.
3. Remove nuts and washers Ⓐ on inside of wheel to pull out screws Ⓑ.
4. Remove wheel hub Ⓒ.
5. Remove nuts and washers Ⓓ on inside of wheel to pull out screws Ⓔ.
6. Loosen joiner's clamps carefully and alternately until you can remove rim halves without risk.
7. Remove inner Ⓕ and outer Ⓖ half of rim from tyre.
8. Replace any defective or worn parts.
9. Install tyre in reverse order.
10. When fitting rim halves together, make sure that drill holes and threads for screws are placed exactly on top of each other.
11. Place joiner's clamps in position.
12. Tighten joiner's clamps alternately in small stages until rim halves are precisely aligned.
13. Install and tighten rim screws with 25 Nm.
14. Install wheel hub.
15. Remove joiner’s clamps.
16. Install drive wheel, see *12.4 Replacing Drive Wheel, page 42*.

12.6 Replacing Castor Wheel

- 2 x 17 mm wrench
- Plastic hammer
- Jacking device



Removing

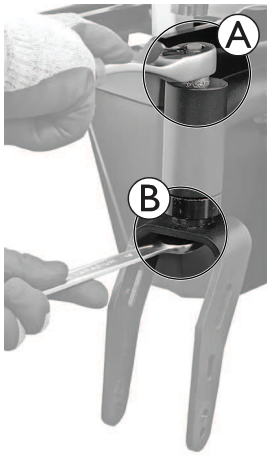
1. Jack up power wheelchair.
2. Remove plastic caps from bolt.
3. Remove bolt, washer and nut Ⓐ.
   Use plastic hammer to remove bolt.
4. Remove castor wheel from fork.

Installing

1. Install parts in reverse order.
2. Test all functions.

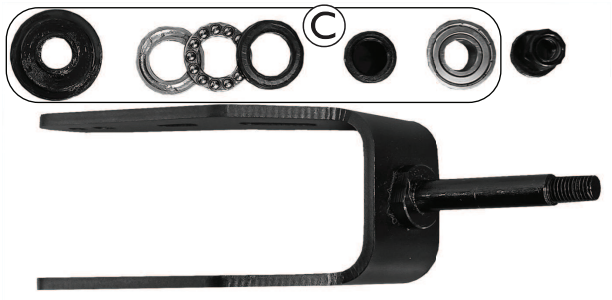
12.7 Replacing Castor Fork

- 2 x 19 mm wrench



Removing

1. Remove plastic cap from castor fork hanger.
2. Remove nut Ⓐ, counter nut Ⓑ from below.
3. Remove castor fork from castor fork hanger.



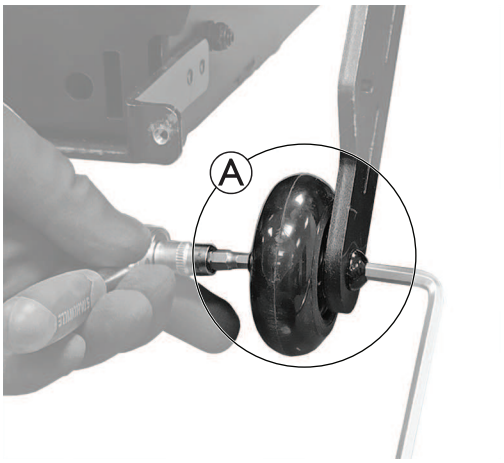
4. Remove bearing kit Ⓒ from castor fork hanger.

Installing

1. Install parts in reverse order.
2. Test all functions.

12.8 Replacing Anti Tipping Wheel

- 2 x 5 mm Allen key



Removing

1. Remove screws and washer Ⓐ.
2. Remove anti tipper wheel.

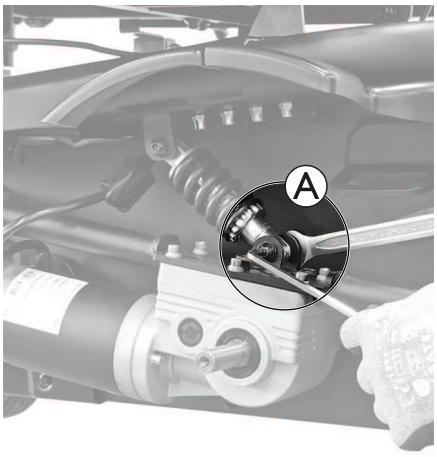
Installing

1. Install parts in reverse order.
2. Test all functions.

13 Drive Components

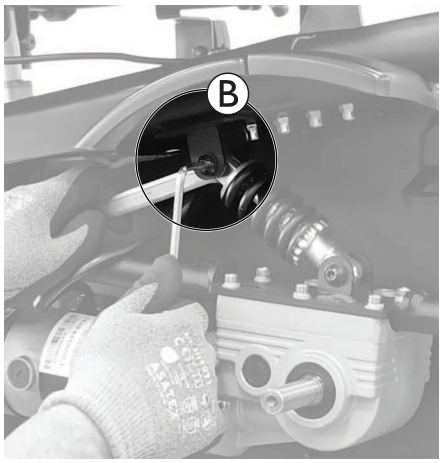
13.1 Replacing Shock Absorber

- 5 mm Allen key
- 13 mm wrench



Removing

1. Remove drive wheel, see *12.4 Replacing Drive Wheel, page 42*.
2. Remove screw, washers and nut Ⓐ from lower shock absorber fixation.



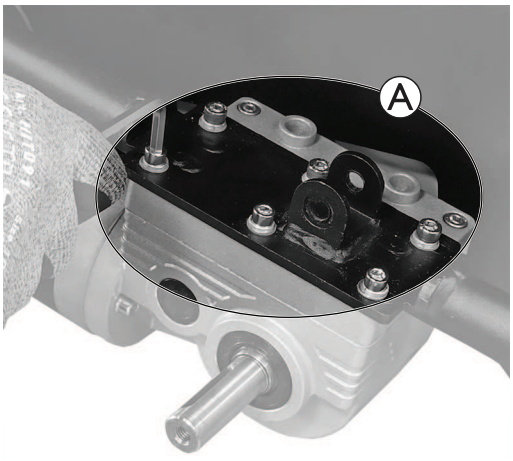
3. Remove screw, washers and nut Ⓑ from upper shock absorber fixation.
4. Remove shock absorber.

Installing

1. Install parts in reverse order.
2. Test all functions.

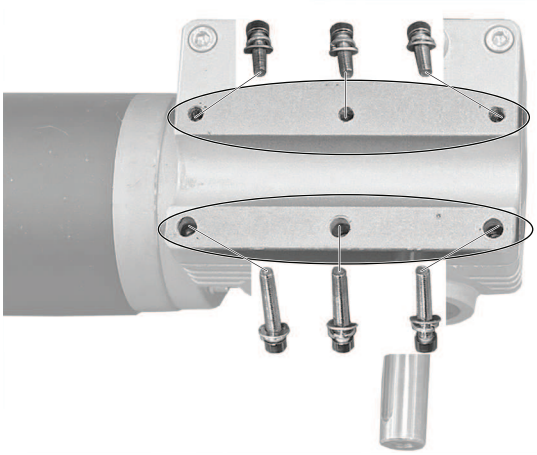
13.2 Replacing Motor Gearbox Unit

- 5 mm Allen key



Removing

1. Remove drive wheel, see *12.4 Replacing Drive Wheel, page 42*.
2. Disconnect motor cable from power module, see *10.3 Replacing Power Module, page 33*.
3. Remove shock absorber from lower shock absorber fixation for better availability of motor screws, see *13.1 Replacing Shock Absorber, page 46*.
4. Remove screws Ⓐ.
5. Remove motor gearbox unit from chassis.



Installing

1. Install parts in reverse order.
   When installing the motor gearbox unit, use short screws for rear fixation and long screws for front fixation.
2. Test all functions.

13.3 Checking and/ or Replacing Carbon Brushes

If carbon brushes are checked but not replaced, you must know their exact fitting position. Used carbon brushes need to be refitted exactly in the same position from which they were taken to guarantee optimum contact to collector.

In case of replacing carbon brushes, always replace all carbon brushes on both motors.

- Screwdriver

Removing

1. Remove motor gearbox unit, see *13.2 Replacing Motor Gearbox Unit, page 47*.
2. Remove plastic caps Ⓐ.
3. Pull carbon brushes a little bit out of brush holder. Make a marking on motor and carbon brushes to guarantee correct installation.

   If carbon brushes are checked but not replaced, you must know their exact fitting position.



4. Remove carbon brushes Ⓑ completely from mounting.
5. Test carbon brushes and springs of wear, broken components or discoloration.



Installing

1. Depending on condition of brushes and springs:
   - either re-insert brushes in exactly same position from which they were taken or
   - fit new brushes.

     Always replace all carbon brushes on both motors.
2. Replace plastic caps and tighten them.
3. Install drive wheels as described in .

   To guarantee maximum performance after replacement treat carbon brushes according to following procedure.

CAUTION!
Risk of accidents
Risk of injury to workers or damage of surroundings or power wheelchair.
— Do not leave power wheelchair unattended during following procedure.
— Make sure both drive wheels are off ground before calibrating.
— Secure area.

4. Jack up power wheelchair so both drive wheels can move freely.
5. Allow motors to run in forward direction for an hour.
6. Allow motors to cool down for 30 minutes.
7. Allow motors to run in reverse direction for an hour.
8. Put power wheelchair back on the ground.
9. Test all functions.



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