

Invacare® AVIVA™ RX10



en Power Wheelchair
Service Manual



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



Yes, you can.

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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 Invacare's website or contact your Invacare representative. See addresses at the end of this document.

Invacare 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 Invacare website.

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

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 Invacare 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 Invacare. 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 Invacare parts. Only use spare parts which have been approved by Invacare.

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 Invacare 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 Invacare.

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.
- Invacare 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 Invacare.
- 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 Invacare providers.
- Invacare supplies all power wheelchairs with a standard drive program ex-works. Invacare 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 |

*Invacare 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 Invacare service department.


4 Setup

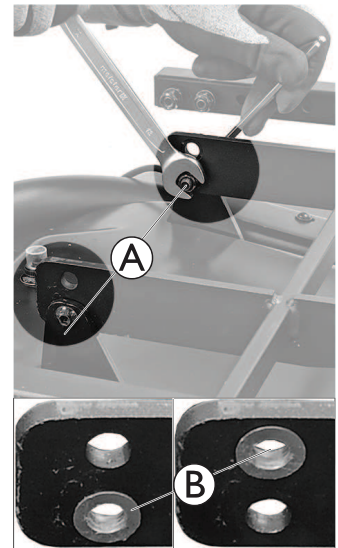
4.1 General Information on Setup

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

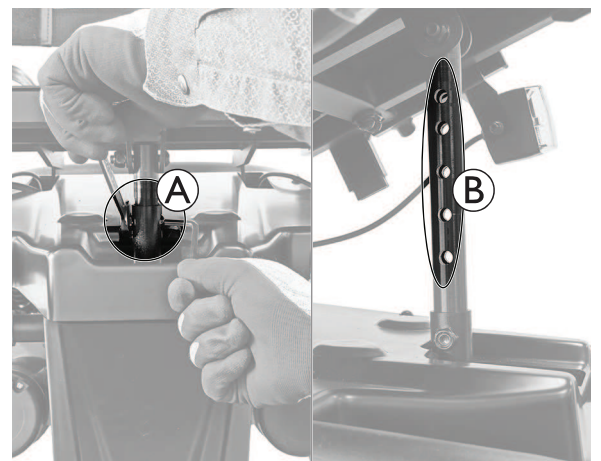
1. Remove screws, nuts and washers **(A)**.
2. Adjust seat height by installing the seat frame with one of the two available drilling holes to the base.
 -  Make sure to put the washer **(B)** in the correct height adjustment hole before installation.
3. Tighten screws.



Seat plate removed for better visibility of components.

4.3 Adjusting Manually Settable Tilt

1. Remove screw, nut and washer **(A)**.
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 **(B)** 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

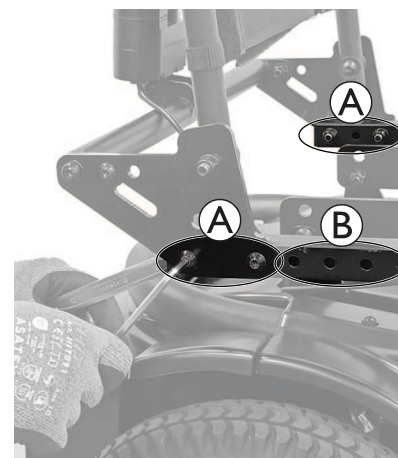
-  • 5 mm Allen key

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


1. Remove screws, washers and nuts (A) 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 (B) on both sides equally.


3. Tighten screws on both sides of the seat.

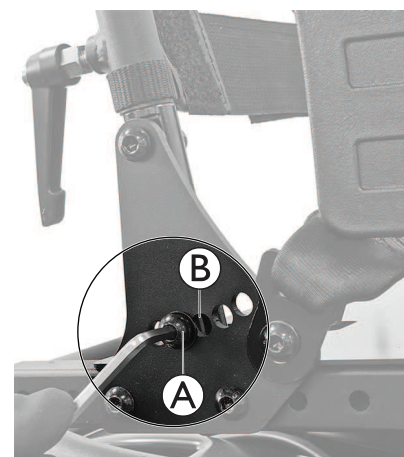


4.5 Adjusting Manual Backrest

-  • 5 mm Allen key



1. Remove screw and washers (A) on both sides of the backrest support.
2. Adjust backrest with one of the five drilling holes (B) 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.

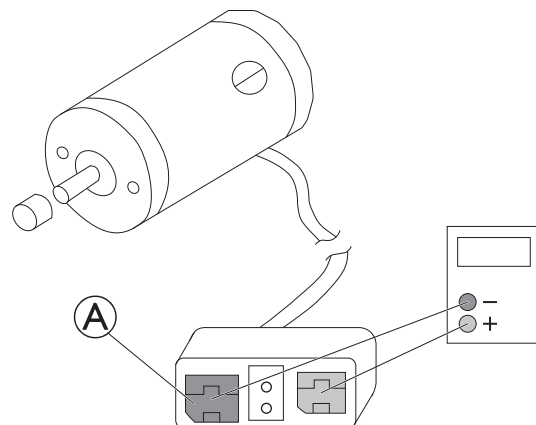



5 Testing

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 **A** 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!

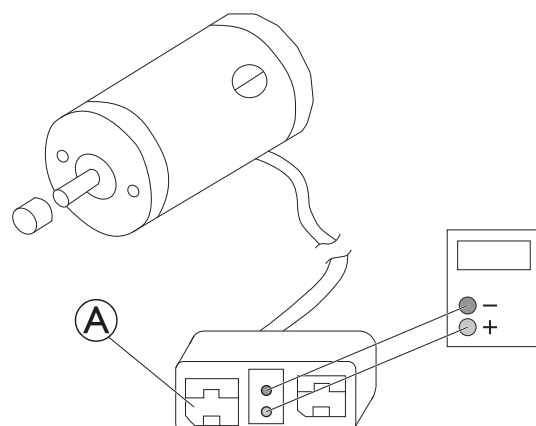
Risk of damage to power module due to shorts in motor brake


- 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 **A** and measure the resistance between the contacts.
4. If there is a defect, replace the motor and send it to Invacare 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 lose 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

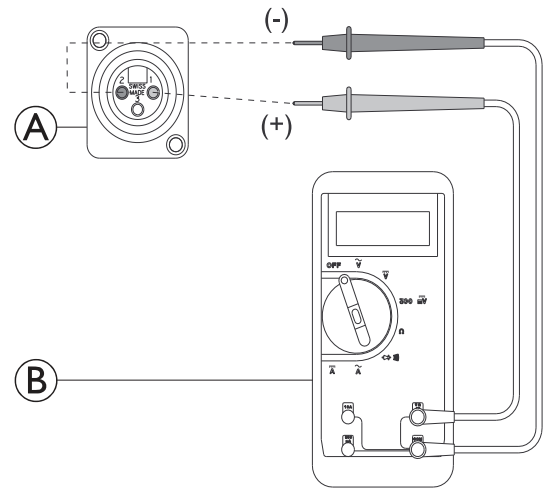


WARNING!

— 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 **A** on power wheelchair. Most digital voltmeters **B** are not affected by polarity. However, analog meters (meters with swinging needles) can be and should be used carefully.
5. Switch electronics ON on remote.
6. Ensure 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 $\pm 10\%$ | 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 Invacare.

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 46 |
| | | | Replace carbon brushes | See 13.3 Checking and/or Replacing Carbon Brushes, page 47 |
| 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 46 |

| 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 47 |
| | | | Measure internal resistance of motor, replace motor if defective. | See 5.1 Testing Motor, page 9 or 13.2 Replacing Motor Gearbox Unit, page 46 |
| 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 47 |
| | | Bearing defective | Replacing motor | See 13.2 Replacing Motor Gearbox Unit, page 46 |
| | | 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 46 |

| Problem | Other Symptoms | Possible Cause | Solution | Documentation |
|--|-------------------|---|--|---|
| Motors do not run | None | Bad connections | Check all cabling | See 11.4 <i>Replacing Batteries</i> , page 36 or 10.3 <i>Replacing Power Module</i> , page 33 |
| | | Circuit breaker switched off | Check cabling and switch on circuit breaker. | See 11.4 <i>Replacing Batteries</i> , page 36 or 10.3 <i>Replacing Power Module</i> , page 33 and user manual |
| | | Batteries defective | Replace batteries | See 11.4 <i>Replacing Batteries</i> , page 36 |
| | | Cabling to power module or remote defective | Check cabling | See 11.4 <i>Replacing Batteries</i> , page 36 or 10.3 <i>Replacing Power Module</i> , page 33 |
| | | Power module defective | Replace power module | See 10.3 <i>Replacing Power Module</i> , page 33 |
| | Corroded contacts | Water, salt or urine has penetrated | Check cabling, replace if necessary | See 11.4 <i>Replacing Batteries</i> , page 36 or 10.3 <i>Replacing Power Module</i> , page 33 |
| Motor makes clicking noise | None | Bearing defective | Replacing motor | See 13.2 <i>Replacing Motor Gearbox Unit</i> , page 46 |
| | | Collector defective | Measure internal resistance of motor, replace motor if defective | See 5.1 <i>Testing Motor</i> , page 9 or 13.2 <i>Replacing Motor Gearbox Unit</i> , page 46 |
| Scraping noise or motor blocked | None | Bearing defective | Replacing motor | See 13.2 <i>Replacing Motor Gearbox Unit</i> , page 46 |
| | | Gearbox defective | Replace motor gearbox unit | See 13.2 <i>Replacing Motor Gearbox Unit</i> , page 46, |

| 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 46, |
| | | 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 46 |
| | | | Check carbon brushes for oil wetting, replace motor if brushes wet | See 13.3 Checking and/or Replacing Carbon Brushes, page 47 |
| Irregular running | None | Drive shaft movable or bent | Check drive shaft, replace gearbox if defective | See 13.2 Replacing Motor Gearbox Unit, page 46 |
| 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 Invacare Service for repair. |
| | LEDs are burnt out | Send the battery charger to Invacare Service for repair. |
| | An internal fuse might be burnt out. | Send the battery charger to Invacare 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 battery charger to Invacare 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 Invacare Service for repair. |
| | Battery voltage is too low to operate power wheelchair. | Replace the batteries, see <i>11.4 Replacing Batteries, page 36</i> . |

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 12.5 Replacing Castor Wheel, page 43 | |
| | Check castor fork | Repair or replace if damaged | See 12.6 Replacing Castor Fork, page 43 | |
| | Check straight running | Replace wheels, wheel fork or wheel bearings | See Replacing Drive Wheel, page 42 or 12.5 Replacing Castor Wheel, page 43 | |
| 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 47 | |
| | Check clutch mechanism | Replace motor if necessary. | See 13.2 Replacing Motor Gearbox Unit, page 46 | |
| 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



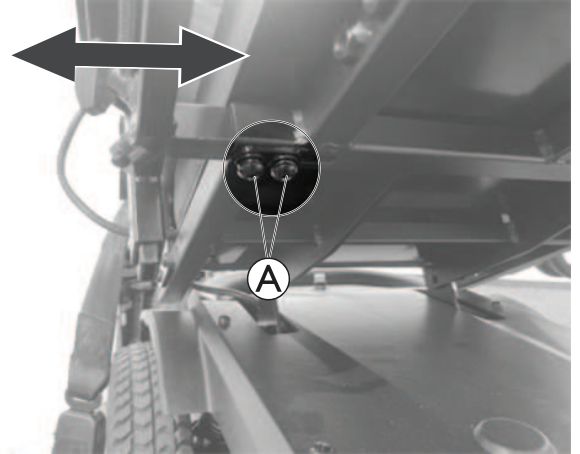
- 5 mm Allen key

Removing

1. Loosen screws Ⓐ.
2. Remove armrest.

Installing

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



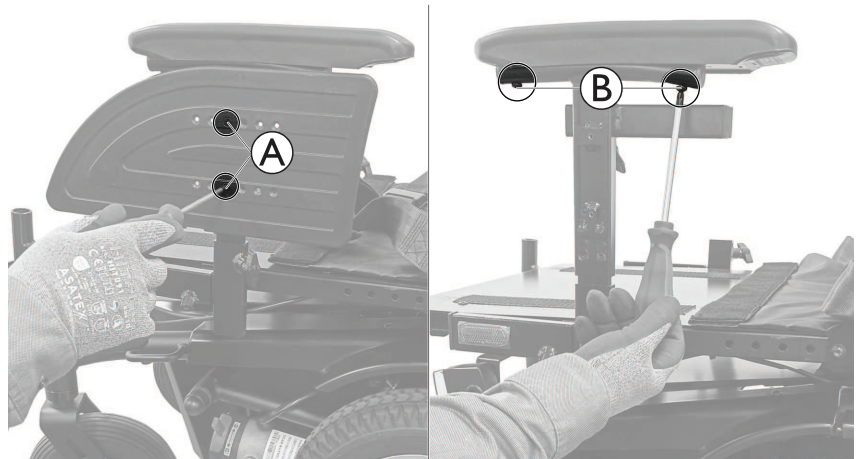
Replacing Armrest Pad

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.



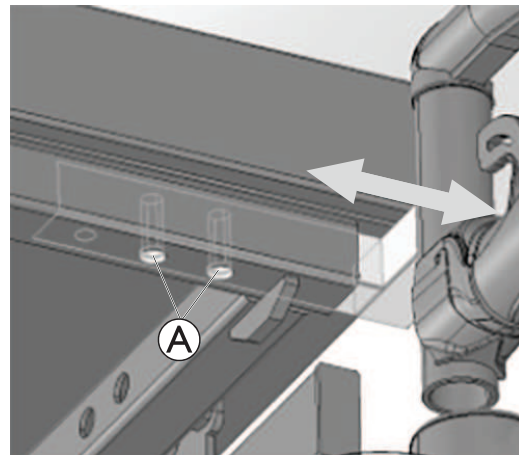
7.2 Replacing Standard 80° Legrest

Removing

1. Remove screws (A).
2. Remove legrest.

Installing

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



7.3 Replacing Headrest

Removing



1. Loosen hand screw (A).
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 (A), 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



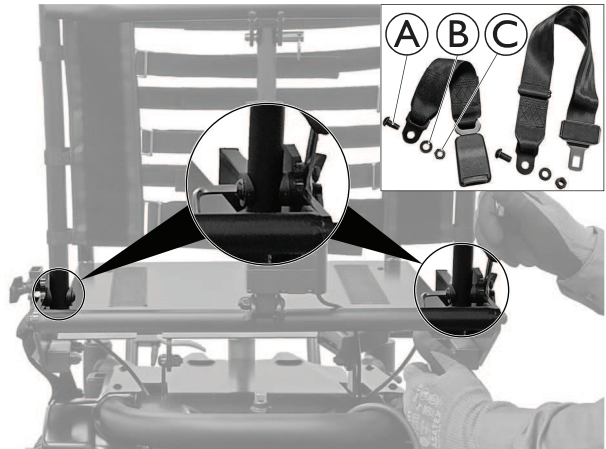
- 6 mm Allen key
- 17 mm wrench

Removing

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

Installing

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



7.5 Replacing Seat Plate



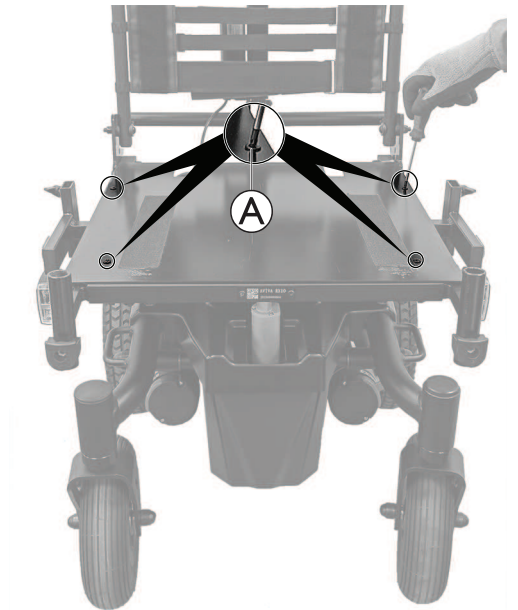
- Phillips screwdriver

Removing

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

Installing

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




7.6 Replacing Seat Frame



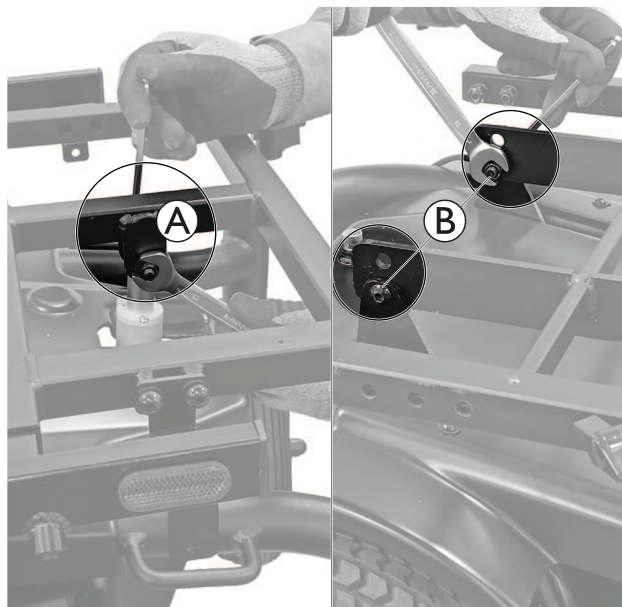
- 5 mm Allen key
- 13 mm wrench
- Oblique pliers
- Cable ties

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 **A**.
4. Remove screws, washers and nuts from rear seat frame brackets **B**.
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.

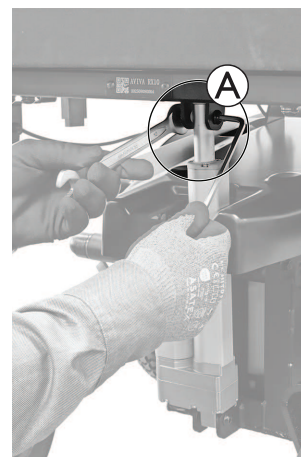
7.7 Replacing Tilt Actuator




- 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 **A**.



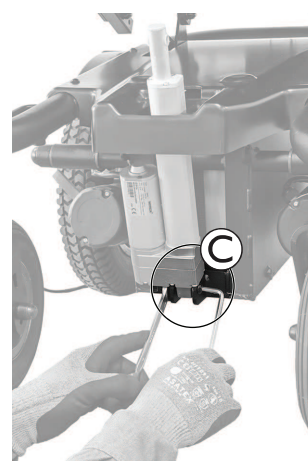
4.  For better accessibility of the recline actuator, you can fold the seat upwards after the upper fixation of the recline actuator is removed.
 - a. Unplug light cable, if present, from power module, see *10.3 Replacing Power Module, page 33*.
 - b. Fold the seat upwards and fix it with a cable tie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



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

Installing

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



7.8 Replacing Manually Settable Tilt Bracket

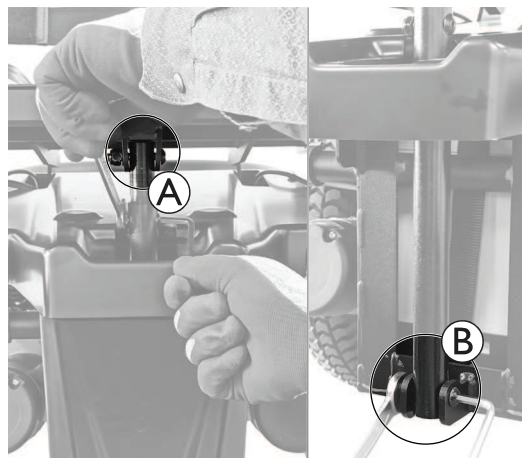
- 5 mm Allen key
- 13 mm wrench

Removing



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

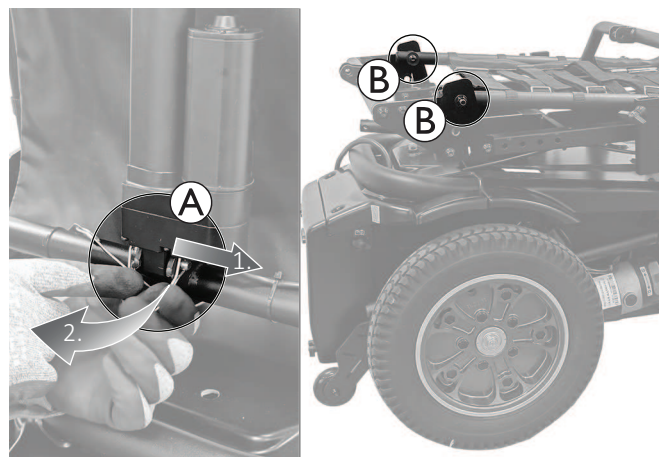
— Pay attention to your fingers, when removing or installing safety pin of backrest actuator.

Removing



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

Installing

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



Replacing Backrest Actuator

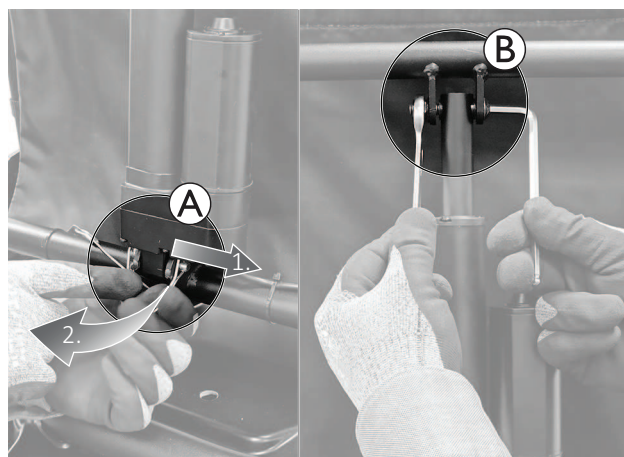
-  • 5 mm Allen key
-  • 13 mm wrench

Removing



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

Installing

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

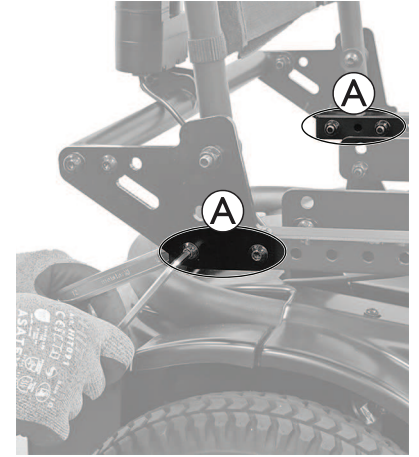


Replacing Powered Backrest Support

-  • 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 **A** on both sides of seat frame.
3. Remove backrest support.



Installing

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

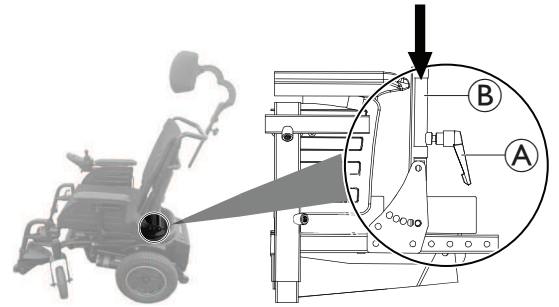
7.10 Replacing Manual Backrest

Removing



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

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 **A** 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



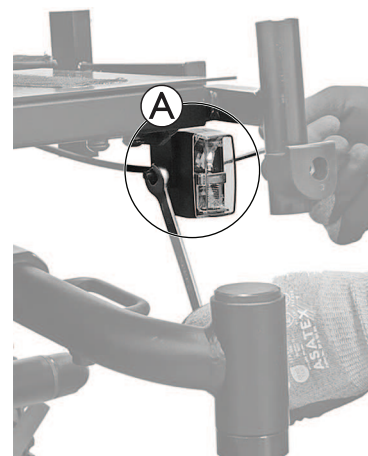
- 4 mm Allen key
- 10 mm wrench
- Oblique pliers
- Cable ties

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 (A) 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



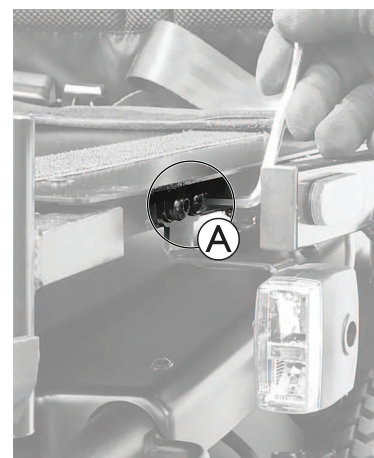
- 5 mm Allen key

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 (A).
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.



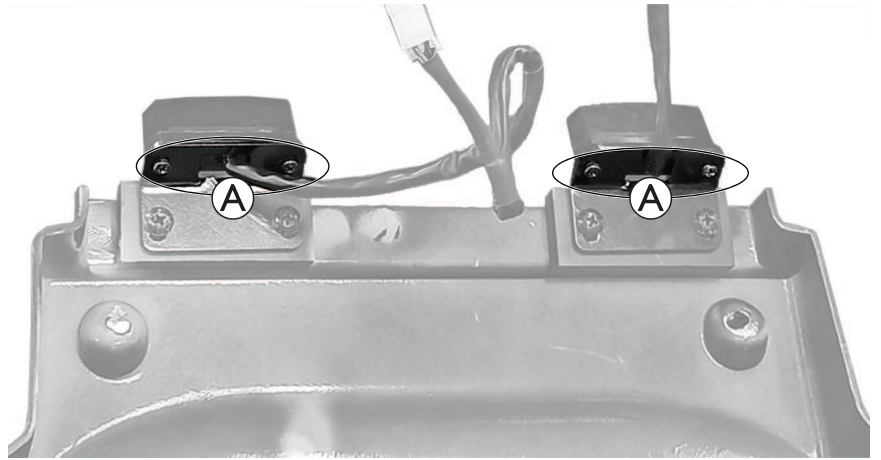
8.2 Replacing Rear Light



- 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 **A**.
4. Remove rear light from bracket.



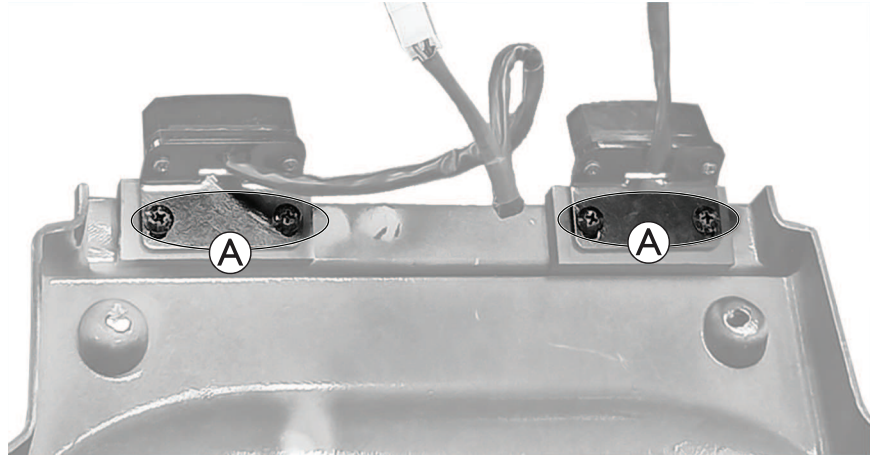
Installing

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 **A**.
4. Remove rear light bracket.



Installing

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

9 Shrouds

9.1 Replacing Front Shroud

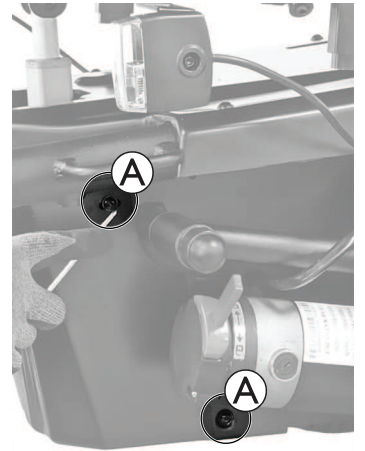
-  • 3 mm Allen key

Removing

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

Installing

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



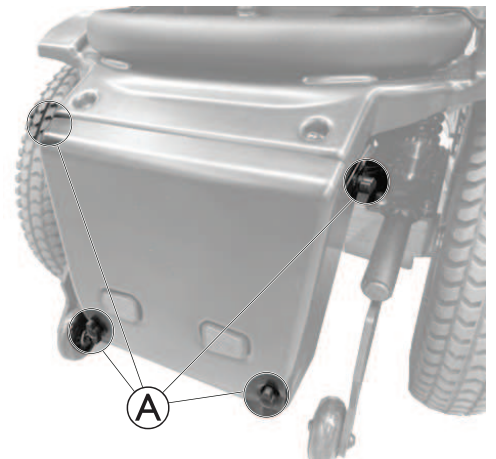
9.2 Replacing Power Module Shroud

Removing


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

Installing

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



9.3 Replacing Rear Shroud

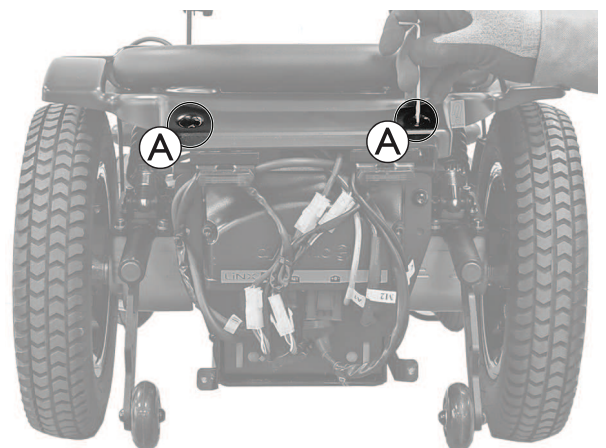
-  • 3 mm Allen key

Removing

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

Installing

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



10 Controls

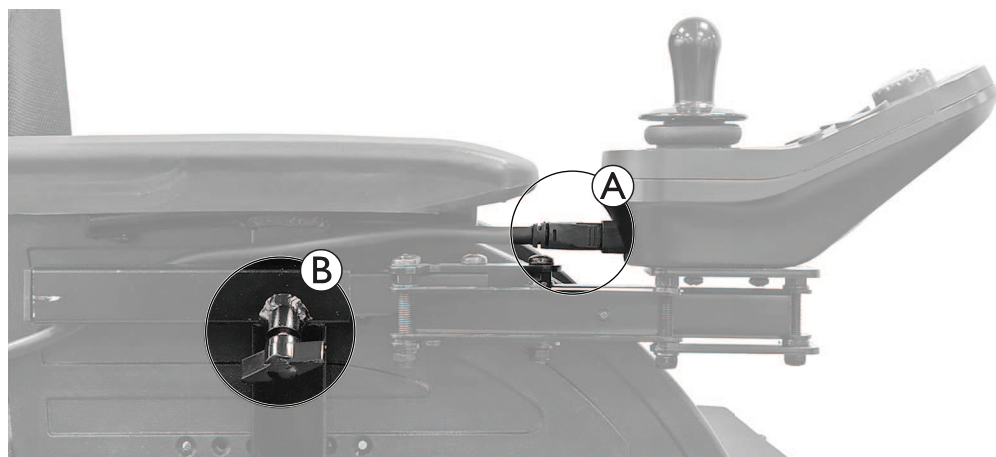
10.1 Replacing Remote Holder

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



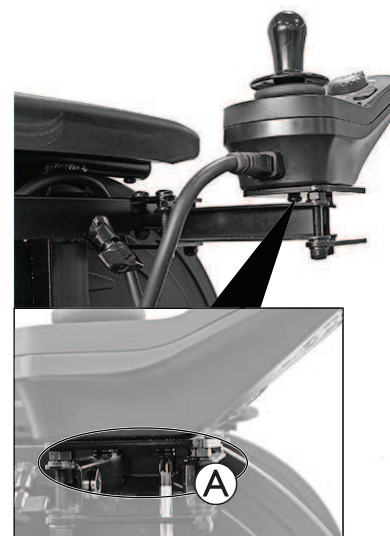
- Phillips screwdriver

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.



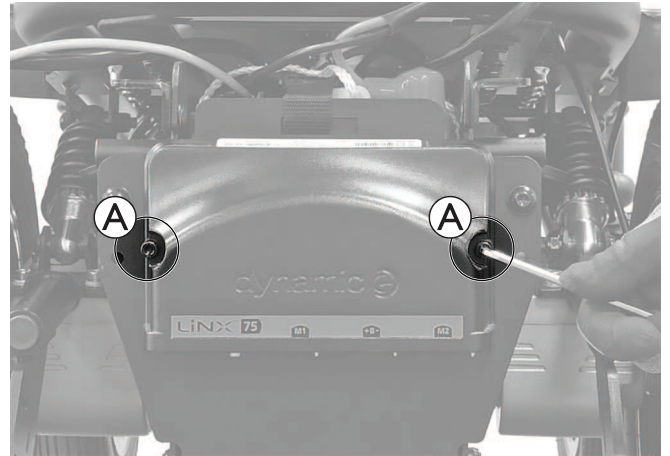
10.3 Replacing Power Module



- 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 all cable ties.
4. Unplug cables from power module.
5. Remove screws (A).
6. Remove power module.

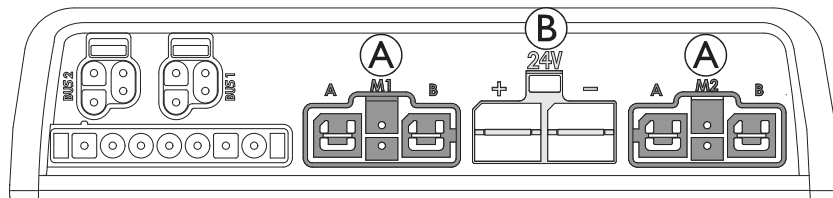


Installing

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

Overview Power Module Ports

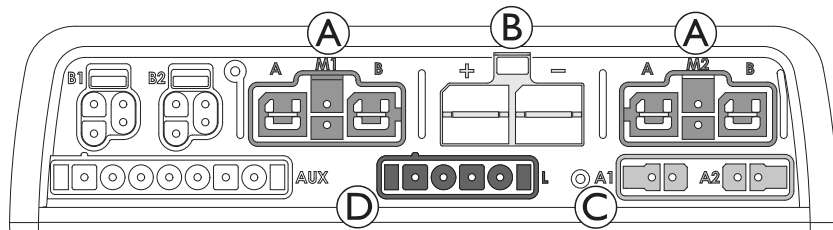
(A) Motor



Power Module DLX-PM75

(B) Battery

(C) Actuators



Power Module DLX-PM75 AL


(D) Light

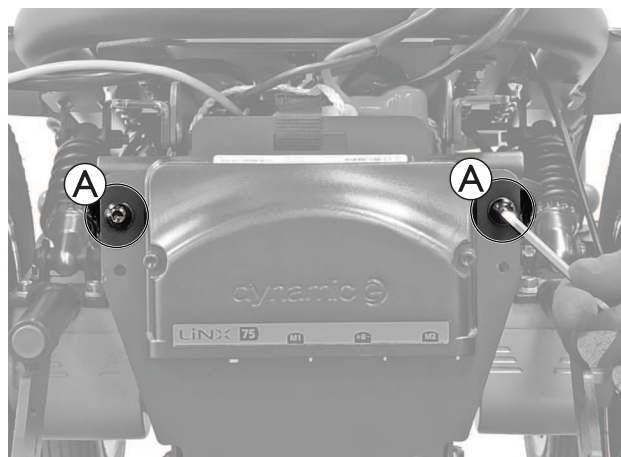
10.4 Replacing Power Module Bracket



- 5 mm Allen key
- Oblique pliers
- Cable ties

Removing

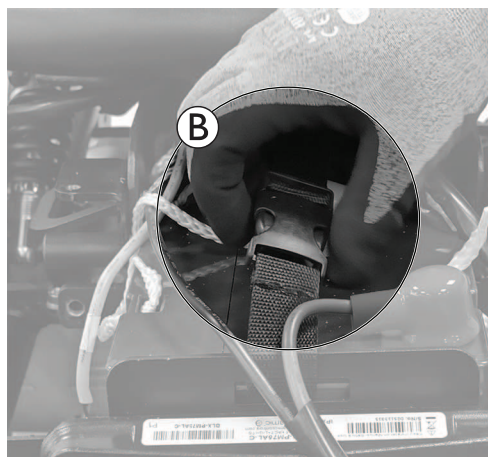
1. Remove power module shroud, see 9.2 *Replacing Power Module Shroud*, page 31.
2. Remove rear shroud, see 9.3 *Replacing Rear Shroud*, page 31.
3. Remove all cable ties.
4. Unplug cables from power module.
 -  The power module must not be taken off to remove the bracket.
5. Remove screws **A**.



6. Carefully pull out battery tray until plastic buckle is visible. Open plastic buckle **B**.
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

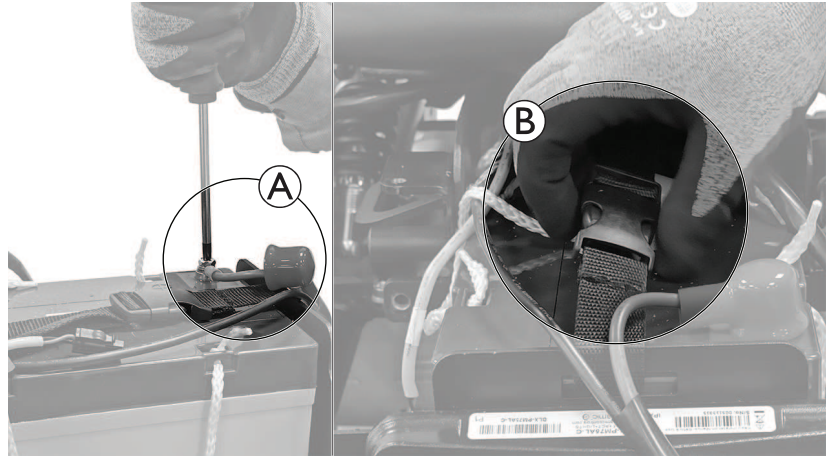
1. Remove power module shroud, see 9.2 *Replacing Power Module Shroud, page 31*.
2. Remove rear shroud, see 9.3 *Replacing Rear Shroud, page 31*.
3. Remove screws of power module bracket, see 10.4 *Replacing Power Module Bracket, page 34*.
4. Carefully pull out battery tray until first battery is visible.



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



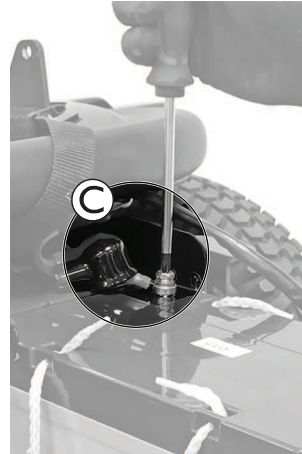
5. Remove red battery connector (A) of first battery.
6. Open plastic buckle (B).
7. Remove power module bracket.



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.

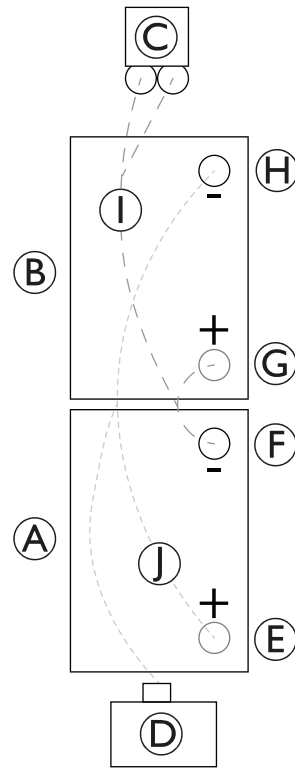
Installing

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

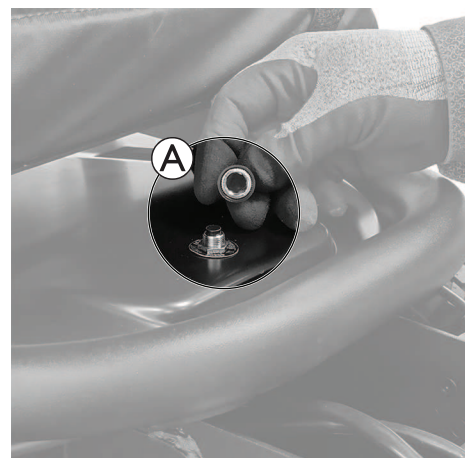


11.5 Replacing Circuit Breaker

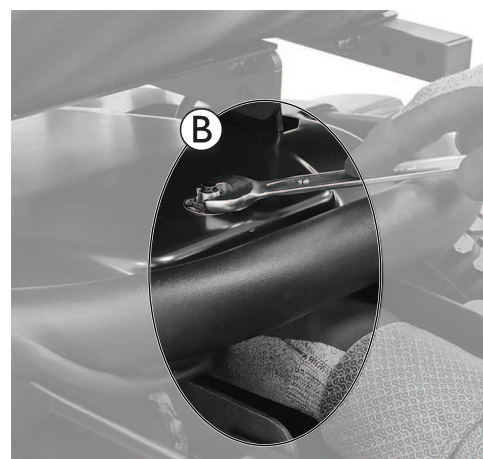
-  • 14 mm wrench
-  • Phillips screwdriver

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 **A**.



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



7. Remove screws **D**.
8. Remove cable **E** 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. If 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 Invacare. 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 |

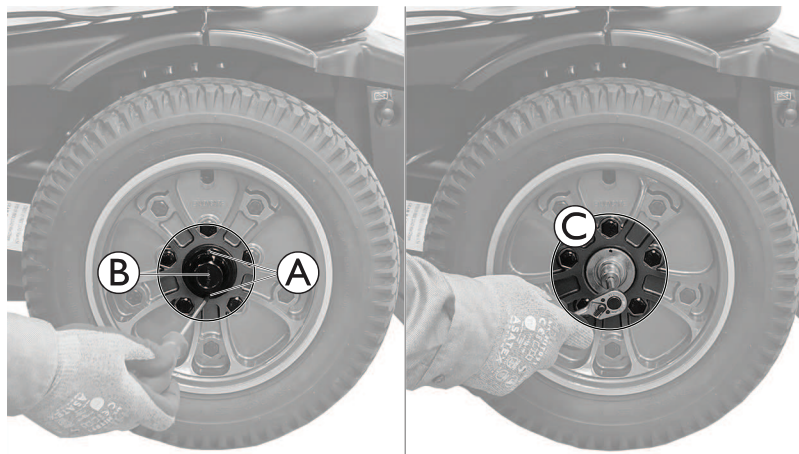
12.4 Replacing Drive Wheel



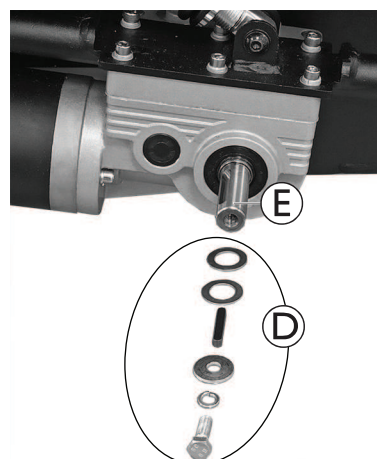
- Phillips screwdriver
- 13 mm wrench
- Torque wrench
- Jacking device
- Medium-strength thread locking adhesive (Loctite 242 or similar)

Removing

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

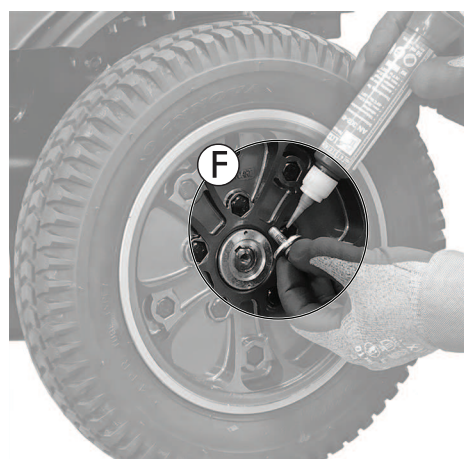


5. Remove wheel and drive wheel fixation kit (D) from axle (E).



Installing

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



12.5 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 (A).



Use plastic hammer to remove bolt.

4. Remove castor wheel from fork.



Installing

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

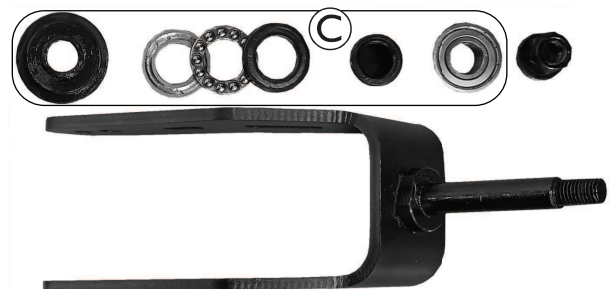
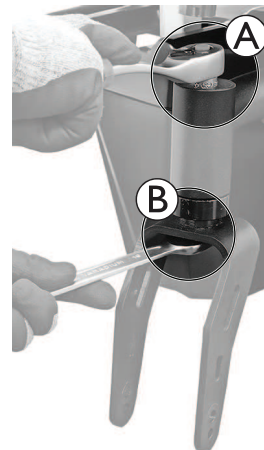
12.6 Replacing Castor Fork



- 2 x 19 mm wrench

Removing

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



4. Remove bearing kit (C) from castor fork hanger.

Installing

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

12.7 Replacing Anti Tipping Wheel



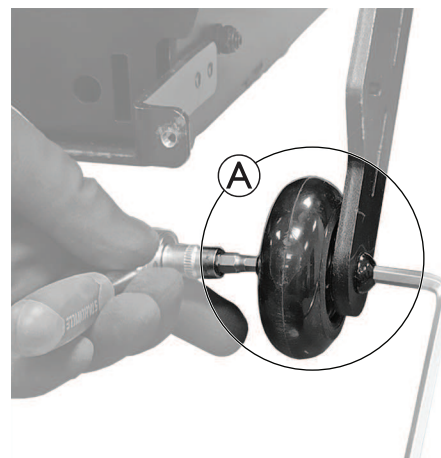
- 2 x 5 mm Allen key

Removing

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



Installing

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



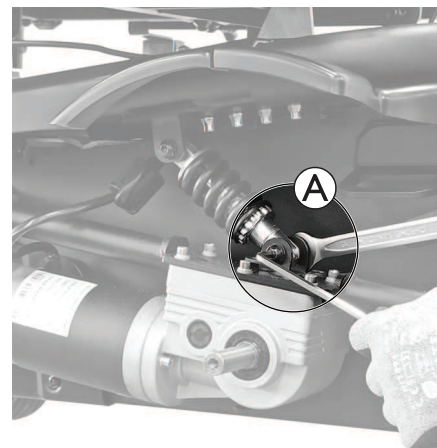
13 Drive Components

13.1 Replacing Shock Absorber

-  • 5 mm Allen key
-  • 13 mm wrench

Removing

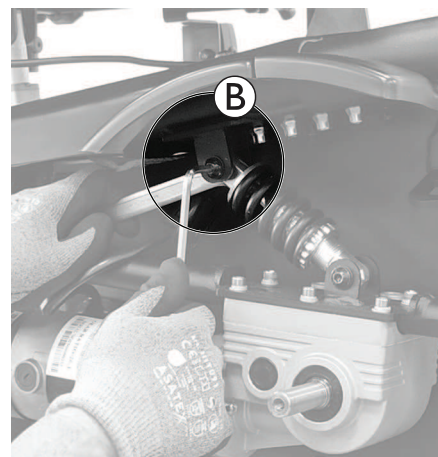
1. Remove drive wheel, see *12.4 Replacing Drive Wheel, page 42*.
2. Remove screw, washers and nut **A** from lower shock absorber fixation.



3. Remove screw, washers and nut **B** 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




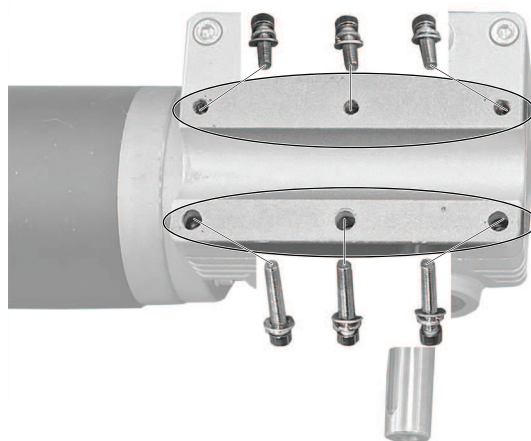
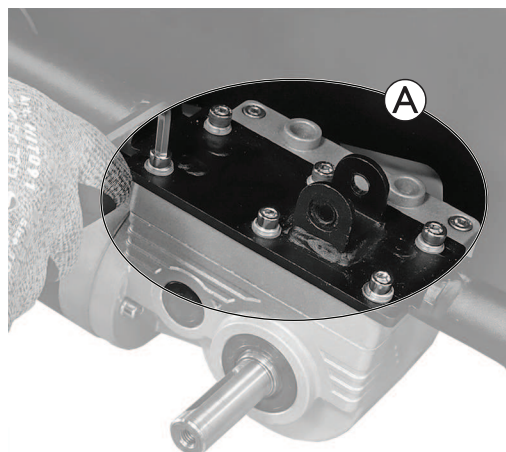
- 5 mm Allen key

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 45*.
4. Remove screws **A**.
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 46.
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.

**Australia:**

Invacare Australia Pty. Ltd.
Building 5, Unit F, 161 Manchester Road,
Auburn, Sydney, NSW 2144
Australia
Phone: 1800 460 460
Fax: 1800 814 367
orders@invacare.com.au
www.invacare.com.au

Canada:

Invacare Canada LP
c/o Motion Concepts Canada
84 Citation Drive Unit 11
Concord, Ontario L4K 3C1

New Zealand:

Invacare New Zealand Ltd
4 Westfield Place, Mt Wellington 1060
New Zealand
Phone: 0800 468 222
Fax: 0800 807 788
sales@invacare.co.nz
www.invacare.co.nz

United Kingdom & Ireland:

Invacare Limited
Pencoed Technology Park, Pencoed
Bridgend CF35 5AQ
Phone: (44) (0) 1656 776 200
uk@invacare.com
www.invacare.co.uk

EU Export:

Invacare Poirier SAS
Route de St Roch
F-37230 Fondettes
Phone: (33) (0) 2 47 62 69 80
serviceclient_export@invacare.com
www.invacare.eu.com

