

# Invacare® Mirage



en Power Wheelchair  
Service Manual



DEALER: 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.

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 service manual into account.
- It is imperative that you observe safety information.
- Information about operation or about general maintenance and care work on the mobility device should be taken from Service manual.
- 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.
- We reserve the right to make any alterations on the grounds of technical improvements.
- For more information about the product, for example product safety notices and product recalls, contact your local Invacare representative. For address and website see back page of this manual.
- The mobility device 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 mobility device 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 Invacare Service.

## 1.3 Notes on shipping

- If the mobility device 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

In this manual, hazard statements are indicated by symbols. The symbols are accompanied by a signal word that indicates the severity of the risk.



### 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.



### IMPORTANT

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



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



This product complies with Directive 93/42/EEC concerning medical devices. The launch date of this product is stated in the CE declaration of conformity.



This symbol identifies a list of various tools, components and items which you will need in order 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 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 4*).

#### Personal safety equipment

##### Safety shoes

The mobility device, 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. Mobility device 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 mobility device.

- DO NOT smoke while using this mobility device.



#### **WARNING!**

##### **Risk of Serious Injury or Damage**

Storing or using the mobility device near open flame or combustible products can result in serious injury or damage.

- Avoid storing or using the mobility device 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 vehicle starts moving unintentionally during repair work**

- Switch the power supply off (ON/OFF key).
- Engage the drive.
- Before lifting up, secure the vehicle by using chocks to block the wheels.



#### **CAUTION!**

##### **Fire and burn hazard due to electrical short-circuit**

- The mobility device 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 vehicle 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 mobility device, check all connections for tight fitting.
- After completing your work / before renewed start-up of the mobility device, check all parts for correct locking.
- Only operate the vehicle with the approved tire pressures (see technical data).
- Check all electrical components for correct function. Note that incorrect polarity can result in damage to the electronics.
- Always carry out a trial run at the end of your work.



#### **CAUTION!**

##### **Risk of injury and damage to property, if the maximum speed reduction on a 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.



**CAUTION!**

**Any changes to the drive program can affect the driving characteristics and the tipping stability of the vehicle**

- Changes to the drive program may only be carried out by trained Invacare specialist dealers.
- Invacare supplies all mobility devices with a standard drive program ex-works. Invacare can only give a warranty for safe vehicle driving behavior - especially tipping stability - for this standard drive program.



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

## 3 Hygiene

### 3.1 Handling of returned used products

When reconditioning or repairing returned mobility devices:

- 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 special" 1.5% in water ml/ml

#### Disinfection tools

- One way wipes (fleece)
- Brushes to clean difficult to access areas

#### Further information

 For more information contact your Invacare Service department.

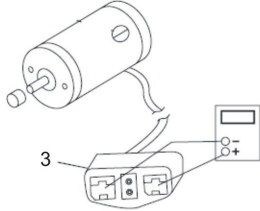
## 4 Testing

### 4.1 Testing motor




- Phillips screwdriver size 2
- Digital multimeter with resistance measurement

1. Remove rear shroud as described in *Removing rear shroud*.
- 2.



Disconnect motor plug (3) from power module.

3. Connect digital multimeter to motor plug contacts (3) and measure resistance between contacts.

 A resistance of between 0.5 and 5 ohms indicates a motor ready for operation. A resistance of between 15 ohms and infinity indicates a defective motor. High resistances are normally caused by bad connections or worn carbon brushes.

### 4.2 Testing motor brake

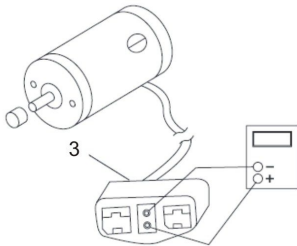


This test should only be carried out on mobility device with conventional motor/gearbox units.




- Phillips screwdriver size 2
- Digital multimeter with resistance measurement

1. Remove rear shroud as described in *Removing rear shroud*.
- 2.



Pull motor plug (3) out of power module.

3. Connect digital multimeter to central motor plug contacts (3) and measure resistance between contacts.
4. If there is a defect, replace motor and send it to Invacare Service for inspection or repair.

 A resistance of between 40 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.



#### **CAUTION!** Risk of damage to power module due to shorts in motor brake

- NEVER connect a motor brake with a short to an intact power module.
- Always replace shorted brakes immediately.



A defective motor can damage the power module, but not the other way around.

### 4.3 Rain test

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

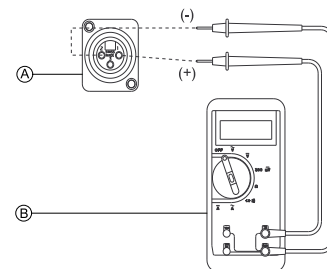
### 4.4 Field load test

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 for a pair), replace the batteries.



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

1. Switch the electronics OFF on the remote.
2. Make sure battery is fully charged. An extremely discharged battery will exhibit the same symptoms as a bad battery.
3. Remove the footboard/legrests from the mobility device.
- 4.



Connect the voltmeter leads to the charger connector **A** on the mobility device. Most digital voltmeters **B** 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 to 26 VDC with the chair in neutral.




#### **WARNING!**

– When performing the remaining steps, ensure your feet are clear from casters and wall, otherwise injury may result.


5. Run the mobility device in neutral for at least 2 minutes.
6. Sit in mobility device and place your feet against a door jam, workbench or other stationary object.



- Carefully push the remote forward, trying to drive the mobility device through the stationary object. The load should draw between 30 to 40 amps from the batteries for 0.3 seconds.

 Performing this step puts a heavy load on the batteries as they try to push through the stationary object. If the wheels spin, have two individuals (one on each arm) apply as much downward pressure as possible on the arms of the mobility device.

- Read the meter while the motors are straining to determine the voltage under load.

 If the voltage drops more than 2 volts from a pair of fully charged batteries during the 0.3 seconds, they should be replaced regardless of the unloaded voltages.

#### 4.5 Checking Battery Charge Level

The following “Dos” and “Don’ts” are provided for your convenience and safety.

DON'T	DO
Don't perform any installation or maintenance without first reading this manual.	Read and understand this manual and any service information that accompanies a battery and charger before operating the personal transporter.
Don't perform installation or maintenance of batteries in an area that could be damaged by battery spills.	Move the personal transporter to a work area before cleaning terminals, or opening battery box.
Don't make it a habit to discharge batteries to the lowest level.	Recharge as frequently as possible to maintain a high charge level and extend battery life.
Don't use chargers or batteries that are not appropriate for the chair.	Follow recommendations in this manual when selecting a battery or charger.
Don't put new batteries into service before charging.	Fully charge a new battery before using.
Don't tip or tilt batteries.	Use a carrying strap to remove, move or install a battery.
Don't tap on clamps and terminals with tools.	Push battery clamps on the terminals. Spread clamps wider if necessary.

## 5 Service

### 5.1 General warning information on installation work


**CAUTION!**
**Risk of damage to vehicle**

Collisions can be caused if the adjusting washers are removed during fitting work to the drive wheels. Adjusting washers are often fitted between the drive shaft and the wheel hub to even out tolerances. If these adjusting washers are removed and not replaced again, collisions can be caused.

- Always replace the adjusting washers exactly as they were before you started dismantling.


**CAUTION!**
**Risk of injury and damage to property, if the maximum speed reduction on a mobility device with a lifter does not function correctly**

The mobility device'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 mobility device.

### 5.2 Tightening torques


**CAUTION!**
**Risk of damage to mobility device 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	Tightening torque in Nm $\pm 10\%$
M4	3 Nm
M5	6 Nm
M6	10 Nm
M8	25 Nm
M10	49 Nm
M12	80 Nm
M14	120 Nm
M16	180 Nm

### 5.3 Tire Pressure


**CAUTION!**
**Risk of damage to rim and tire when tire pressure is exceeded**

- Observe recommended tire pressure.

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

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

### 5.4 Service plan


**CAUTION!**
**Risk of injury and damage to property, if the maximum speed reduction on a wheelchair with a lifter does not function correctly**

The mobility device'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 mobility device.

Component	Check	Remedy	Notes	✓
Manual Wheel Lock	Check that mechanism has no excessive looseness, is not worn or damaged	Replace if required.	See 5.8.6 Replacing Manual Wheel Lock, page 21.	
	Check correct position of manual wheel lock. Distance should be 30 ... 35 mm approximately.	Re-position manual wheel lock.		
Batteries	Check that battery box case, leads, sockets and batteries are not damaged	Replace if required.	See Replacing Batteries and Battery Boxes, page 23.	
	Check terminals for cracks or blackness	Replace batteries.		
	Check batteries.	Replace batteries.	See 4 Testing, page 8 .	
	Test capacity and runtime of batteries.			
Battery charger	Check for damage	Replace if required.	See corresponding manual of charger.	
	Check that all LED's (Charging, Charge Complete and Power On) are operational.	Replace if required.		
	Check input and output leads and plugs for damage, cuts and wear.	Replace if required.		
	Check battery voltage.	Replace if required.	See user manual.	
Armrest	Check that skirt guard is fixed and not physically damaged. If the panel is loose re-tighten fixing screws	Replace panel.	See 5.13.1 Replacing Armrest, page 26.	
	Check armpad for damage.	Replace armpad.	See 5.13.1 Replacing Armrest, page 26.	
	Check for corrosion or paint damage to bracket	Replace affected parts where necessary		
Drive Wheels	Check that label on center screw is not damaged.	Replace wheel hub or propulsion unit.	See 5.8.5 Replacing Drive Wheel Hub, page 20 or 5.7.1 Replacing Motor, page 18.	
Castor wheels	Check that wheels are not buckled or physically damaged	Replace if required.	See 5.8.2 Replacing Castor Wheels, page 19.	
	Check that wheel bearings run freely without excessive play.	Replace if required.	See 5.8.3 Installing Ball Bearings, page 19	
	Check that castor wheel and fork nuts are tight	Tighten nuts.		
	Check that castor forks are bent or damaged	Replace if required.		
	Check crown / castor for bearings for wear and correct adjustment	Replace if required.		
	Check tires for wear and correct inflation. Both wheels should show same degree of wear (see side of tyre pressure rating). For tyre fitment see drive wheel section.			

Component	Check	Remedy	Notes	✓
Chassis	Check all tubing for misalignment, damage or bending of frame or crossbar assembly	Replace if required.	See 5.6.1 <i>Removing Chassis Components</i> , page 15.	
	Check that no misalignment is present at castor mount area (Castor fork and socket)	Replace if required.		
	Check all brazed/welded joints for fractures or damage			
	Check paint finish for damage			
	Check that crossbar assembly is not damaged. Pivot bolt should not be over-tightened.			
	Check that chair folds easily and that crossbar pivots and folding mechanism operate correctly.			
Legrests / Foot plates	Check that foot plate fits securely and operates correctly		See 5.14 <i>Footrests / Legrests</i> , page 27.	
	Check operation of foot plate extension, clamping and adjustment screw.			
	Check legrest and hanger lock for damage or excessive wear.			
Seat / Backrest	Check that the upholstery (5) (6) does not excessively sag, is unevenly stretched, worn or torn. Pay particular attention to buckles and straps inside tension adjustable back upholstery.		See 5.11 <i>Seating</i> , page 25.	
	Check that all stitches are in good condition.			
	Check that all screws and washers (4) (7) are in good condition and are not burred.			
Controls	Check for damage	Replace if required.	See 5.9.2 <i>Replacing Controls</i> , page 23.	
	Check all switch operations and LED's.		See corresponding remote manual.	
	Check for faults on system.		See 5.5.1 <i>Operational faults</i> , page 12.	
Motor	Check plugs and insulation for damage, cracks and splits.	Replace if required.	See 5.7.1 <i>Replacing Motor</i> , page 18.	
	Check brake.			
	Check carbon brushes and commutator.		See 5.7.2 <i>Replacing Carbon Brushes</i> , page 18.	
	Check clutch mechanism.			

## 5.5 Troubleshooting

### 5.5.1 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 mobility device. 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®.

### 5.5.2 Drive fault diagnosis

Problem	Other symptoms	Possible cause	Solution	Documentation
<b>Mobility device will not start</b>	The remote status display illuminates normally and shows an error code.	Drive motors disengaged	Engage drive motors	See corresponding remote manual
	Remote status display does not illuminate	Batteries defective	Replace batteries	See 5.9.1 Batteries, page 22
		Completely discharge battery	Pre-charge batteries	See user manual
		Power supply to remote interrupted	Check master fuse	See Main fuse
		Remote defective	Check cables between the modules for loose connections and damage	See Cables
	Remote status display blinking	Various causes	Assess error code	See corresponding remote manual
<b>Mobility device judders in drive mode</b>	None	Batteries defective (unstable voltage)	Replace batteries	See 5.9.1 Batteries, page 22
		Drive motor(s) defective	Replace motor(s)	See 5.7 Drive components, page 18
			Replace carbon brushes	
<b>Batteries not being charged</b>	None	Batteries defective	Replace batteries	See 5.9.1 Batteries, page 22
	LEDs blinking on charging unit	Charging unit defective	Replace charging unit	See user manual
<b>Mobility device runs too slowly</b>	None	Remote defective	Replace remote	See corresponding controls manual
		Batteries defective	Replace batteries	See

### 5.5.3 Error Codes And Diagnostic Codes — Hand Held Programmer

Fault Code	Description	Sub Code	Notes
1	User Fault	00	Possible stall timeout or user error Release the joystick and try again
2	Battery fault	00	Batteries are too low to drive with or voltage is too high or low

<b>Fault Code</b>	<b>Description</b>	<b>Sub Code</b>	<b>Notes</b>
3	Left motor error (M2)	00	Motor short circuit
		01	Motor open circuit
		02	Motor connection fault (short to B-)
		03	Motor terminal connected to B+
		04	Motor voltage consistency fault (probably fault with power module electronics).
		05	Motor bridge fault (probably fault with power module electronics).
		06	Too many hardware current limit events
		07	Current measurement offset out of range
		08	Hardware current limit fault
4	Right motor fault (M1)	00	Motor short circuit
		01	Motor open circuit
		02	Motor connection fault (short to B-)
		03	Motor terminal connected to B+
		04	Motor voltage consistency fault (probably fault with power module electronics).
		05	Motor bridge fault (probably fault with power module electronics).
		06	Too many hardware current limit events
		07	Current measurement offset out of range
		08	Hardware current limit fault
5	Left park brake error	00	Left park brake-drive time test failed
		01	left park brake output enabled when chair idle
		02	left park brake output did not enable when entering drive
		03	left park brake fault during power up test
		04	left park brake feedback low during drive (park brake short circuit)
6	Right park brake error (M1)	00	Right park brake-drive time test failed
		01	Right park brake output enabled when chair idle
		02	Right park brake output did not enable when entering drive
		03	Right park brake fault during power up test
		04	Right park brake feedback low during drive (park brake short circuit)
7	Remote error	00	Local remote fault (electronics, power button fault etc)
		01	Joystick fault at remote
		02	Speed pot fault at remote

Fault Code	Description	Sub Code	Notes
8	Power module error	00	Power Module Fault
		01	RAM fault
		02	ROM fault
		03	CPU fault
		04	EEPROM fault
		05	Watchdog fault
		06	Stack fault
		07	Software fault
		08	Power up testing fault
		09	Relay fault or Pre-charge fault
		0A	Bridge fault or Disable all fault
		0B	Electronics fault
0C	Calibration settings fault		
9	Remote Communications Fault	00	Loss of communications between remote and power module
		01	Limp mode due to unreliable communications
10	Unknown error	00	Catch all fault output
11	Incompatible remote	00	Wrong remote type is connected. Ensure that the power module type code matches the remote type code.

## 5.6 Chassis

### 5.6.1 Removing Chassis Components



- 4 mm Allen key
- 5 mm Allen key
- 8 mm wrench (2x)
- 10 mm wrench (2x)
- 13 mm wrench (2x)
- 17 mm wrench (2x)
- Flat screwdriver
- Mallet

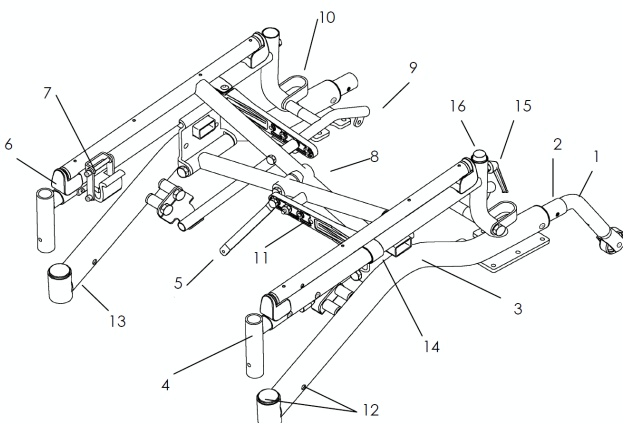




Fig. 5-1

1. Remove parts that are in the way, such as batteries, armrests, legrests, and anti-tippers. Removing wheels and motors is optional.

Batteries	See corresponding user manual.
Backrest	See 5.11.1 <i>Replacing Backrest Unit</i> , page 25.
Legrest	See 5.14 <i>Footrests / Legrests</i> , page 27.
armrest	See 5.13 <i>Armrests</i> , page 26.
Anti-Tipper	See 5.8.8 <i>Replacing Anti-Tipper</i> , page 22.
Propulsion unit	See 5.7.1 <i>Replacing Motor</i> , page 18.
Curb climber	See 5.6.6 <i>Replacing Curb Climber</i> , page 17.
Castor wheels	See 5.8.2 <i>Replacing Castor Wheels</i> , page 19.
Drive wheels	See 5.8.4 <i>Replacing drive wheel</i> , page 20.

2. If seat clamp (7) is locked, unlock both right and left hand side and fold wheelchair frame.
3. Remove legrest holder. See 5.14.1 *Replacing Legrest Holder*, page 27.
4. Remove plastic frame fittings (12) carefully.
5. Remove X-Brace and seat stays. See 5.6.3 *Replacing X-Brace*, page 16.
6. Remove battery rails. See 5.6.5 *Replacing Battery Rails*, page 16.
7. Remove rear seat saddles (6). See 5.6.2 *Replacing Seat Saddles*, page 16.

### 5.6.2 Replacing Seat Saddles

-  • 4 mm Allen key
-  • 10 mm wrench

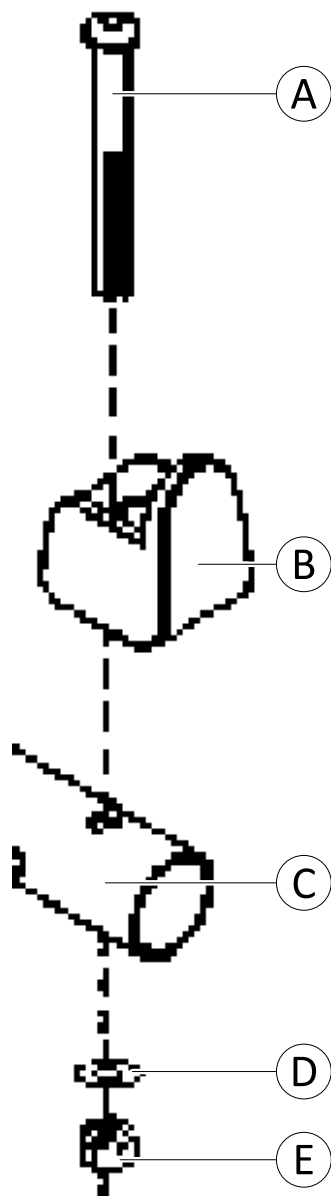







Fig. 5-2

1. Loosen and remove bolt (A), nut (E) and washer (D) of seat saddle (B).
2. Replace seat saddle.
3. Install parts in reverse order.
4. Test all functions.

### 5.6.3 Replacing X-Brace

-  • 4 mm Allen key
-  • 5 mm Allen key
-  • 10 mm wrench (2x)
-  • 13 mm wrench (2x)
-  • 17 mm wrench (2x)

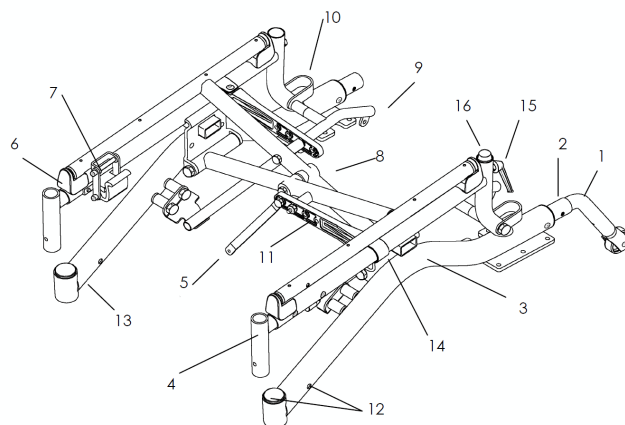




Fig. 5-3

1. Remove bolts which clamp U brackets (14), seat stay (11) and side frames (13 and 3).
2. Remove U bracket (14).
3. Locate large bolts at bottom of each side of X Brace (8). Remove bolts
4. Remove X Brace (8) from side frames (3 and 13).
5. Replace further parts of X Brace (8) if required:
  - a. Push bearings out from short bottom tubes of X Brace.
  - b. Remove bolt and spacer which supports seat stays (11) to remove seat stays
  - c. Remove bolt and spacers to replace X Brace centre pivot.
  - d. Remove seat clamp (7).

### 5.6.4 Replacing Anti-Tipper Socket

-  • 4 mm Allen key
-  • 10 mm wrench

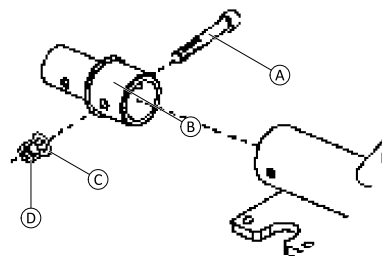



Fig. 5-4

1. Remove bolt (A), nut (D) and washer (C).
2. Pull anti-tipper socket (B) out of side frames.
3. Install parts in reverse order.
4. Test all functions.

### 5.6.5 Replacing Battery Rails

-  • 13 mm wrench (2x)



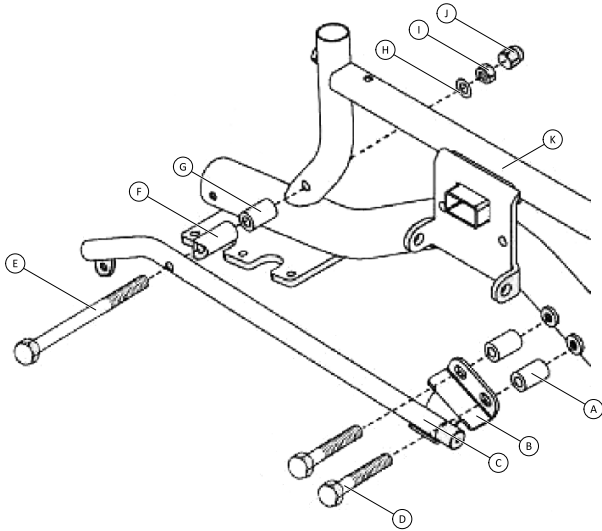


Fig. 5-5

1. Loosen and remove bolts ④, front tie-down clamp ⑥ (if installed) and spacer ① at front position.
2. Loosen and remove bolt ⑤, spacers ⑦ + ⑧, rear tie-down clamp (not shown), washer ⑨, nut ⑩ and end cap ⑪ at rear position. When removing take care on battery rail ③. Completely withdraw bolt ⑤ to remove rear tie down clamp and spacers.
3. Install new parts in reverse order.
4. Test all functions.

### 5.6.6 Replacing Curb Climber



**CAUTION!**

**Risk of crushing**

Injury hazard to hands. The gas spring is under pressure.

- Be careful with your hands.
- Use suitable tools.



- 4 mm Allen key
- 10 mm Allen key
- 10 mm wrench
- 13 mm wrench (2x)
- 19 mm wrench



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.

### Removing Curb Climber

1. Secure mobility device against rolling away.
2. If necessary, remove parts that are in the way like legrests.

3.

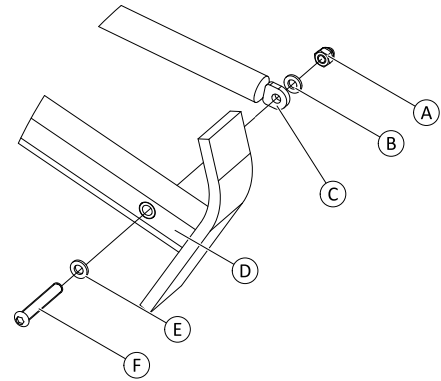


Fig. 5-6

Loosen and remove nut ① and washer ②.

4. Secure gas spring ③! Pull bolt ④ and washer ⑤ out of holder ⑥.
- 5.

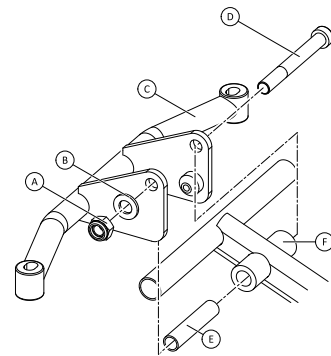


Fig. 5-7

Loosen and remove nut ① including washer ②.

6. Pull bolt ④ out of holder.
7. Remove curb climber ⑥ including bushing ⑤ from mounting bracket ③.
- 8.

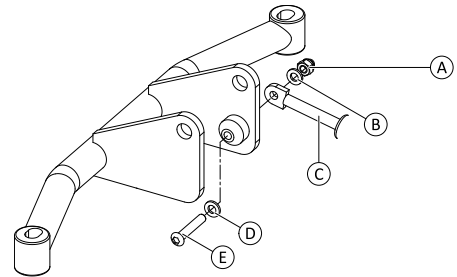


Fig. 5-8

Hold in place bolt ⑤. Loosen and remove nut ① including washer ②.

9. Replace gas spring ③.

10.

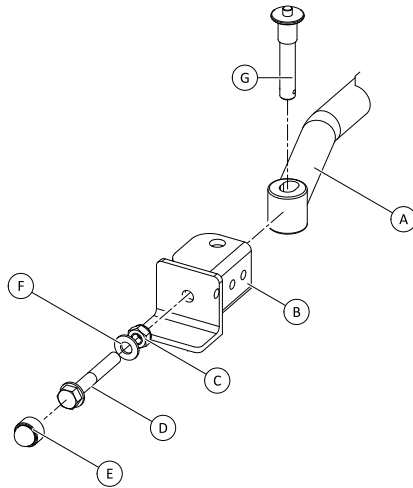



Fig. 5-9

If required, remove mounting bracket. Remove locking pin ⑥ and pull mounting bracket ① out of bracket ②.

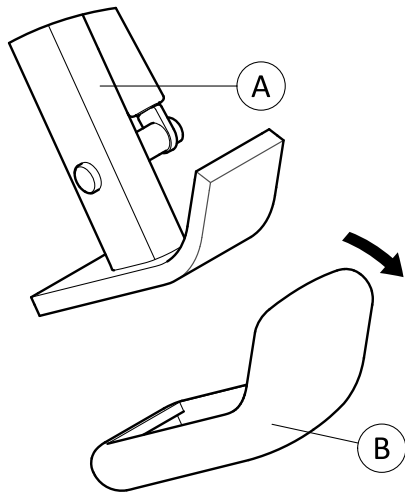
11. Remove end cap ⑤.
12. Loosen and remove nut ③, washer ④, bolt ⑥ and bracket ②.

### Installing Curb Climber

 When applying the correct tightening torque to nut ⑥, ensure that curb climber can move freely.

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

### 5.6.7 Replacing Rubber Foot



1. Pull front part of old rubber foot ② off kerb climber ① in forward direction.
2. Place rear part of new rubber foot over kerb climber.
3. Push front part of new rubber foot over kerb climber.

## 5.7 Drive components

### 5.7.1 Replacing Motor

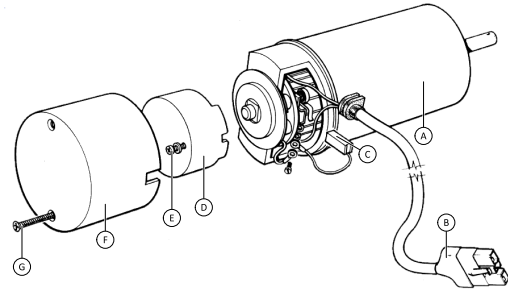




Fig. 5-10


-  • Phillips screwdriver, size 1
-  • 3 mm Allen key


1. Turn off mobility device.
2. Remove plug ② from power module.
3. If necessary, remove drive wheels. See 5.8.4 Replacing drive wheel, page 20.
4. Remove screws ⑦ and motor end ⑥.
5. Remove two / three electro magnetic brake fixing screws ⑤ and brake ④.
6. Replace motor ①.

### Installing Motor

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

### 5.7.2 Replacing Carbon Brushes

 Always replace all carbon brushes on both motors.

 If carbon brushes were 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. If necessary, make markings on motor and carbon brushes to guarantee correct installation.

-  • Flat screwdriver

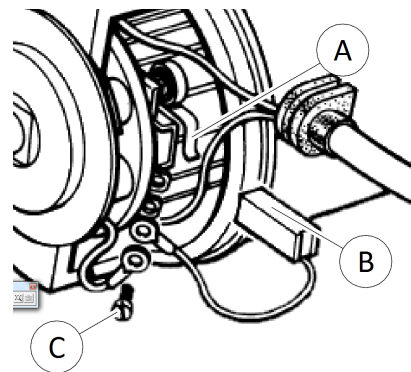


Fig. 5-11

1. Remove motor end cap and motor brake. See 5.7.1 Replacing Motor, page 18.
2. Remove feeder wire termination screws ③.
3. Release bush springs ① and replace carbon brushes ②.

## 5.8 Wheels

### 5.8.1 General Warning Information on Wheel Replacement



#### WARNING!

##### Risk of injury

If a tire with one or more damaged rim threads is inflated, rim could burst and cause serious injury.

- Do not inflate tire if one or more rim threads are damaged.
- Immediately replace rim with damaged threads.



#### CAUTION!

##### Risk of injury from wheels coming loose

If wheels are insufficiently secured during mounting, they can come loose when driving.

- When mounting wheels tighten bolts with prescribed torque.
- Secure all bolts using a suitable blocker.
- Never use normal nuts instead of self-locking nuts.
- Always use new nuts and bolts with an undamaged coating.



#### CAUTION!

##### Risk of injury due to uncontrolled movement of mobility device

- Turn power off.
- Engage motors.
- Secure mobility device against rolling away by placing wedges under wheels.



##### Risk of damage to rim threads

Incorrectly tightened screws can cause damage to rim threads.

- Tighten rim screws with recommended tightening torque.

### 5.8.2 Replacing Castor Wheels

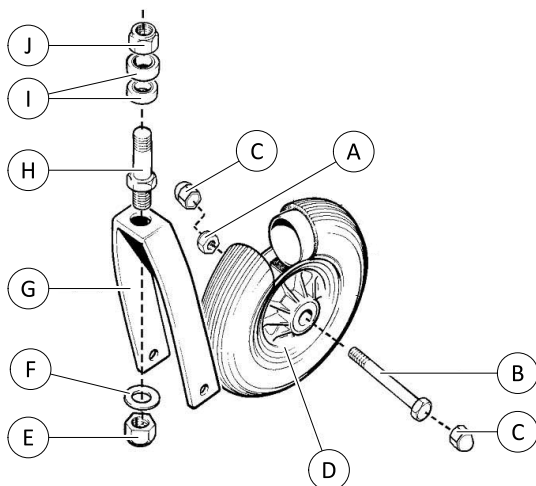


Fig. 5-12



- 13 mm wrench (2x)
- 19 mm wrench (2x)
- Torque wrench
- Flat screwdriver (large)
- Wooden block (approx. 12 cm x 12 cm x 30 cm for propping up mobility device)

1. Remove castor plastic cap with flat screwdriver. Counter lower nut (E) and remove upper nut (I).
2. Pull out castor fork assembly. out of steering head tube. Make sure not to damage threads of steering head shaft (H).
3. Counter steering head shaft (H). Remove nut (E) and washer (F).
4. If necessary, replace ball bearings (I), see 5.8.3 *Installing Ball Bearings*, page 19. Make sure not to damage steering head tube.
5. Remove end caps (C).
6. Counter axle bolt (B). Remove axle nut (A).
7. Remove axle bolt (B) and wheel (D).
8. If necessary, repair flat tire. See 5.8.7 *Repairing tire puncture (drive wheel)*, page 21.

### Installing Castor Wheels



#### CAUTION!

##### Incorrect reassembly can damage the bearings and cause the castors to fall out

The single-row angular ball bearing rings are not identical on both sides. There is only one correct way to insert them.

- The bearings must always be assembled so that the narrow borders of the ball bearings are facing each other (inside).
- The steering head bolts and nuts must always be pressing against the wide (outside) border of the ball bearings! Otherwise, the bearings will be pressed apart and damaged by the bolts.



After installation, castor wheels should rotate freely but bearings should have no play.

1. Install parts in reverse order.
2. Test all functions.
3. First tighten nuts to 20 Nm ± 2 Nm.
4. Then loosen them slightly.
5. Then retighten to 15 Nm ± 1.5 Nm.

### 5.8.3 Installing Ball Bearings



#### CAUTION!

##### Incorrect installation can damage bearings and cause steering wheels to fall out

The single-row angular ball bearing rings are not identical on both sides. There is only one correct way to insert them.

- The bearings must always be assembled so that narrow borders of the ball bearings are facing each other (inside).
- The steering head bolts and nuts must always be pressing against wide (outside) border of ball bearings! Otherwise, the bearings will be pressed apart and damaged by the bolts.

The illustrations show the wide border of the ball bearing on outside of ball race (A) and the narrow ball bearing edge on the inside (B).



After installation wheels should rotate freely but bearings should have no play.

### 5.8.4 Replacing drive wheel



**CAUTION!**  
**Risk of crushing to hands and feet by weight of mobility device**

- Pay attention to hand and feet.
- Use proper lifting techniques.

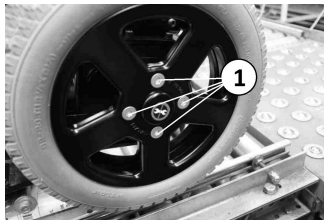


- Torx wrench with  
 – TX40 Bit
- Mounting kit
- Wooden block (approx. 12 x 12 x 30 cm) for propping up mobility device



Take care of small parts and observe sequence in which component parts are installed. Set them out in an orderly fashion so that they can be installed again easily in correct sequence.

1. Prop up mobility device using wooden block.
- 2.



Loosen 4 screws (1).

3. Remove wheel from hub.



**CAUTION!**  
**Risk of injury if wheels come off**

If drive wheels are insufficiently attached during assembly, they can come off during driving.

- Tighten TX40 countersunk screws to 30 Nm when mounting drive wheels.
- Always use new screws with undamaged coating.



Make sure wheel is re-fitted on same side and in same running direction as removed.

4. Install parts in reverse order.

### 5.8.5 Replacing Drive Wheel Hub

New versions of the drive wheel hub for this mobility device are not serviceable. Make sure to follow the instructions below if you have an old version of drive wheel without label. Contact your provider or Invacare directly if you are not sure which version of wheel hub you have.



- Torque wrench (30 Nm) with TX40 Torx bit
- Wooden blocks (approx. 12 x 12 x 30 cm)
- Cleaner (Loctite® 7063™ or similar)
- Thread locking adhesive, high-strength (Loctite 270 or similar)

#### Removing Drive Wheel Hub

1. Raise mobility device and place wooden blocks under it to support it.
2. Remove drive wheel. See 5.8.4 *Replacing drive wheel*, page 20.

3. Loosen and remove countersunk center screw and washer.
4. Pull hub off motor shaft

#### Degreasing Mounting Holes and Motor Shaft

The following describes the degreasing of the threaded mounting holes and surface of the motor shaft.

To ensure a secure connection between the shaft and the hub and guarantee the function of the retaining compound and thread locking adhesive according to DIN 267-28, the threaded mounting holes and surface of the motor shaft must be cleaned of all grease. This process refers to all wheelchairs, on which the axial direction of movement of the rear wheels is secured by the "wheel hub cover" (Z122014-0002 and Z122014-9005) using a hub screw with a thread locking adhesive. To do this, a spritz of Loctite® 7063 (or a cleaner with identical features) is sprayed into the shaft's threaded mounting hole ( ) and on its surface. The cleaner must be allowed to evaporate completely before connecting the parts to one another.

This cleaning instruction is also valid for other screw joints where screws with a retaining compound or thread locking coating are used. It is also important to ensure that the threaded surfaces are free of grease when securing a screwed joint with screw adhesive, e.g. Loctite®.



Fig. 5-13

#### Installing Drive Wheel Hub



**CAUTION!**  
**Risk of injury from wheels coming loose**

If the drive wheels are insufficiently secured during mounting, they can come loose when driving.

- When mounting the drive wheels and hub tighten the TX40 countersunk screws with 30 Nm.
- Always use new screws with an undamaged coating.



**Risk of damage to the rim painting**

Retaining compound dissolves the rim painting.  
 – Avoid contact of retaining compound with rim painting.

1.



Apply retaining compound circular on leading edge of shaft and thread locking adhesive into threaded mounting hole of shaft.

2.



Apply retaining compound circular on inner surface of hub.

3. Shift hub on shaft twice to thoroughly spread retaining compound.
4. Remove excessive retaining compound with a cloth. Avoid contact of compound with rim painting.
5. Install the wheel again.
6. Apply thread locking adhesive on center screw.
7. Insert countersunk center screw including washer and tighten with 30 Nm.
8. Affix label on center screw.
9. Allow adhesives to cure for approximately 30 minutes. Do not drive under load during this time.

### 5.8.6 Replacing Manual Wheel Lock

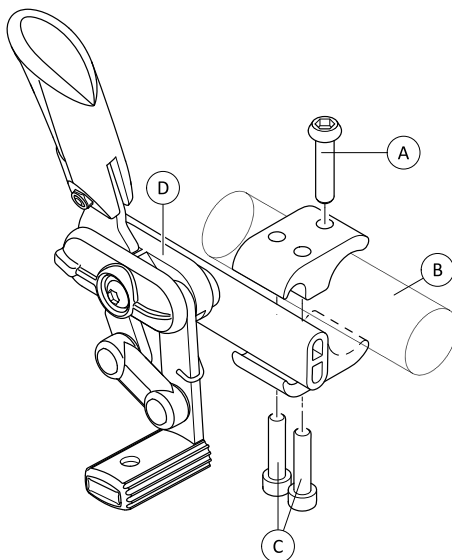


Fig. 5-14

- 4 mm Allen key
- 5 mm Allen key

1. Disengage wheel lock (D).
2. Loosen Anti-rotation screw (A).
3. Loosen clamp screws (C) and remove wheel lock (D) and clamp from side frame (B).

### 5.8.7 Repairing tire puncture (drive wheel)



#### CAUTION!

**Risk of injury if mobility device starts moving unintentionally during repair work**

Switch power supply off (ON/OFF key).

- Engage drive.
- Before raising mobility device, secure wheels by blocking them with wedges.



#### CAUTION!

**Risk of crushing to hands and feet by weight of mobility device**

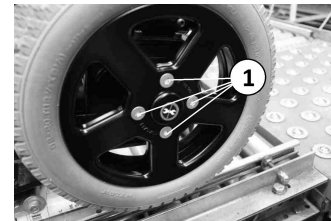
- Pay attention to hand and feet.
- Use proper lifting techniques.



- Torque wrench with
  - Torx-Bit TX40
- 5 mm Allen key
- Mounting kit
- Wooden block (approx. 12 x 12x 30 cm for propping up mobility device)
- Repair kit for tire repair or a new inner tube
- Talcum powder

### Removing wheel

1. Lift mobility device up and place wooden block underneath it to keep it in raised position.
- 2.



Remove four countersunk head screws TX40 (1) using Torx bit.

3. Pull wheel from hub.

### Repairing flat tire



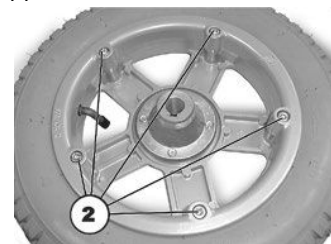
#### WARNING!

**Risk of explosion**

There is considerable pressure in tire. Risk of injury if you do not deflate tire before removing wheel rim.

- Press in tappet and deflate tire.


1. Remove valve cap.
2. Pressing in tappet and deflate tire.
- 3.




Remove 5 screws (2) on reverse side of wheel.

4. Remove rim halves from tire.
5. Remove inner tube from tire.

6. Repair inner tube and replace, or insert new.

 If old inner tube is to be repaired and re-used and has become wet during repair, you can make replacement easier by lightly dusting inner tube with talcum powder.

 Make sure that the wheel is refitted on the same side and in the same running direction as removed.

7. Re-insert rim halves into tire.
8. Pump a little air into tire.
9. Insert socket head screws into rim and tighten screws to 10 Nm. Make sure the inner tube is not crushed between the two rim halves.
10. Make sure that tire is situated directly on rim.
11. Inflate tire to recommended pressure.
12. Check that tire is still situated directly and correctly on rim.
13. Screw valve cap back on.

**Installing wheel**



**CAUTION!**

**Risk of injury if wheels come off**

If drive wheels are insufficiently attached during assembly, they can come off during driving.

- Tighten the TX40 countersunk screws to 30 Nm when mounting drive wheels.
- Always use new screws with undamaged coating.

1. Install wheel.
2. Insert four new countersunk screws and tighten them with torque of 30 Nm.

**5.8.8 Replacing Anti-Tipper**



- 8 mm wrench (2x)
- Flat screwdriver (2x)
- Starlock® installation tool

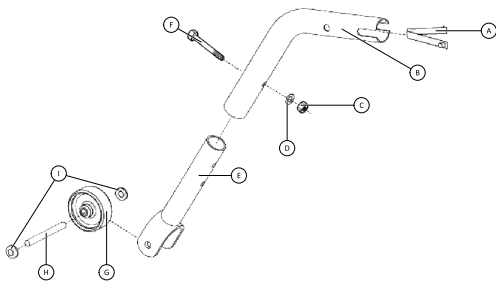


Fig. 5-15

**Removing Anti-Tipper**

1. Push buttons on side of anti tipper socket and remove top section (B).

**Replacing Anti-Tipper Bottom Section**

1. Loosen and remove bolt (F), nut (C) and washer (D).
2. Pull bottom section (E) out of top section (B).
3. Install parts in reverse order.

**Replacing Anti-Tipper Wheel**

1. Remove one of starlock washers (I).
2. Remove pin (H) and remaining starlock washer.
3. Pull wheel (C) out of bottom section (E).
4. Install parts in reverse order.

**Installing Anti-Tipper**

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

**5.9 Electrical components**

**5.9.1 Batteries**



**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 mobility device 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.
- Pay attention to hands.
- Use proper lifting techniques.



**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!



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.

**General instructions on handling the 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 mobility device technician or a person with adequate knowledge. They have the necessary training and tools to do the job safely and correctly.

### How to handle damaged batteries correctly



#### **CAUTION!** Corrosion and burns from acid leakage if batteries are damaged

- Remove clothes that have been soiled by acid immediately.

#### **After contact with skin:**

- Immediately wash affected area with lots of water.

#### **After contact with eyes:**

- Immediately rinse eyes under running water for several minutes; consult a physician.

- Always wear safety goggles and appropriate safety clothing when handling damaged batteries.
- 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.

### Disposing of dead or damaged batteries correctly

Dead or damaged batteries can be given back to your provider or directly to Invacare.

### Replacing Batteries and Battery Boxes

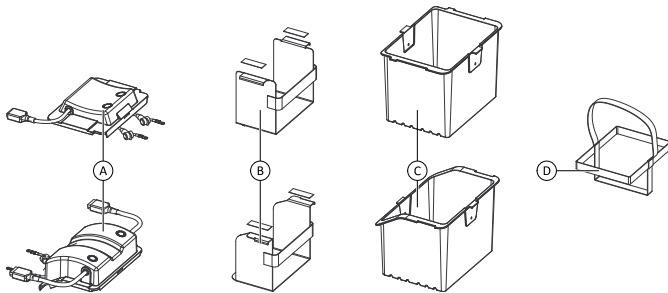


Fig. 5-16

1. Remove battery from chassis. See corresponding user manual.
2. Remove battery box strap **D**.
3. Loosen and remove battery box lid **A**.
4. Pull battery out of battery box **C**.
5. Remove battery box insert **B**.
6. Replace batteries and/or other parts.
7. Install parts in reverse order.
8. Test all functions.

### 5.9.2 Replacing Controls

#### Removing Remote



- 5 mm Allen key
- 8 mm wrench

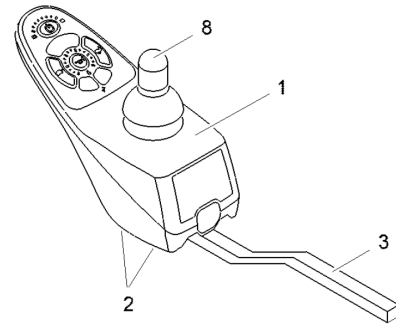


Fig. 5-17

1. Unplug remote (1) from power module (4).
2. Remove remote.
3. Depending on type of remote holder installed to mobility device, remove screws (2) using either a 5 mm Allen key or 8 mm wrench.
4. If required, remove joystick knob (8) by firmly pulling upwards.

#### Removing Power Module



- 3 mm Allen key
- 5 mm Allen key
- 7 mm wrench
- 10 mm wrench

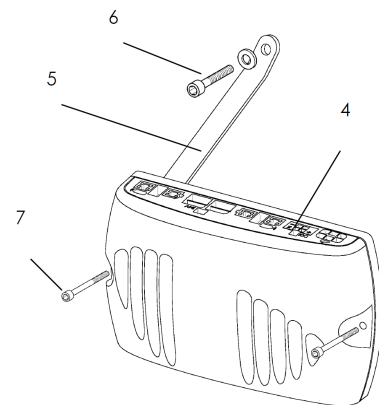


Fig. 5-18

1. Unplug remaining connectors from power Module.
2. Loosen and remove both screws (7), washer and nuts (not shown). Remove power module.
3. If necessary, remove screw (6) washers and nut (not shown) to replace power module bracket (5).

#### Installing Controls



When installing joystick remote screws be sure not to use a torque in excess of 2 Nm.

1. Install parts in reverse order. Take care not to overtighten screws.
2. Test all functions.

5.9.3 Wiring Diagrams

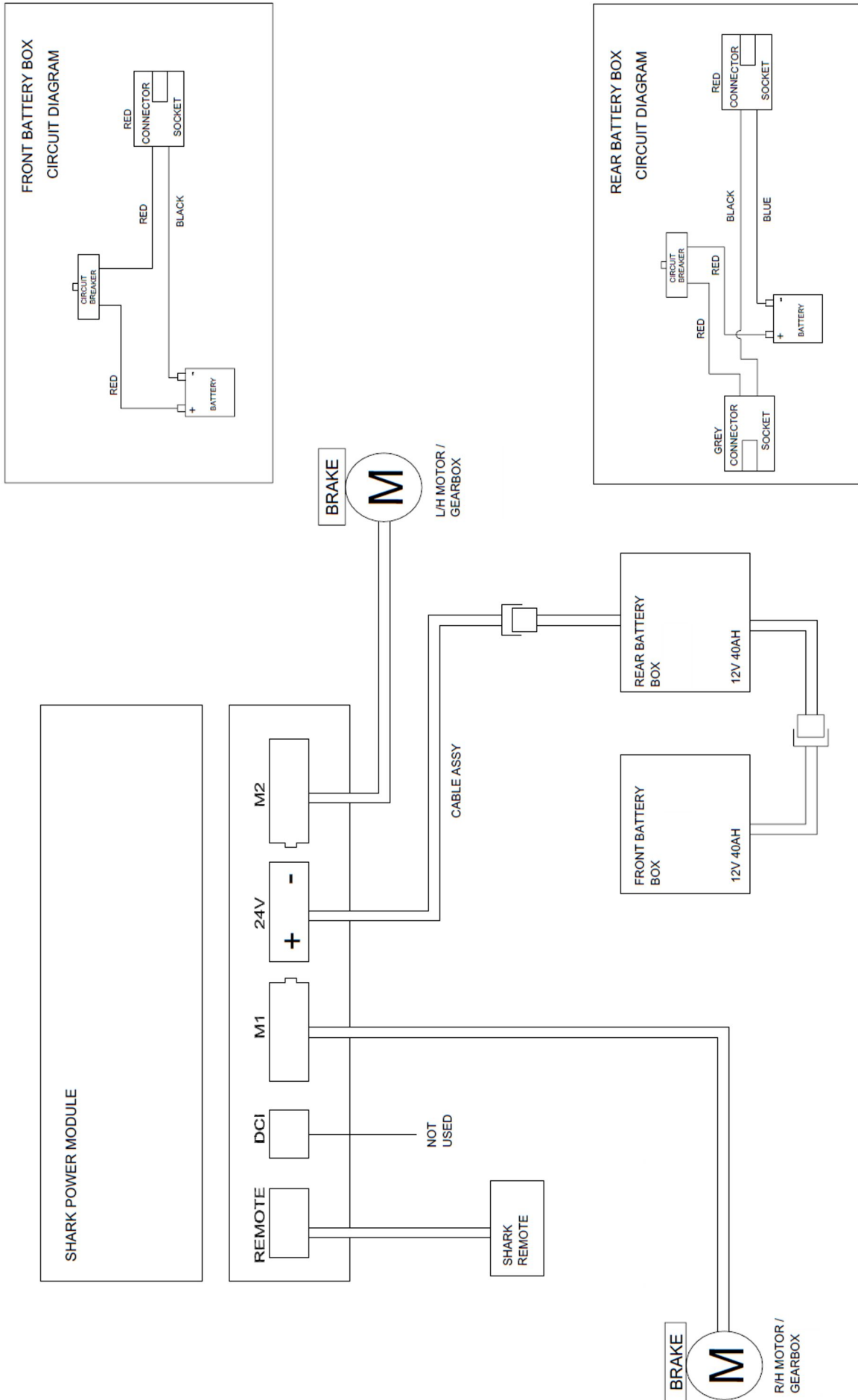


Fig. 5-19



**5.9.4 Resetting Circuit Breaker**

If the mobility device cannot be turned on, check whether the safety cutout has triggered. The safety cutout is reset by pressing the knob inwards.

See user manual.

**5.10 Lighting unit**

**5.10.1 Replacing Headlight**

**Replacing Headlight**

See corresponding light manual.

**Removing Headlight Holder**

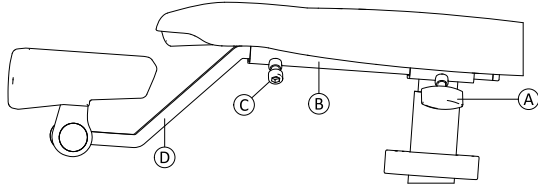


Fig. 5-20

1. Loosen screw C.
2. Pull holder D out off remote bracket B.
3. If necessary, loosen hand screw A and remove remote bracket B.

**Installing Headlight Holder**

1. Install parts in reverse order.
2. Test correct installation.

**5.10.2 Replacing Rear Light**

See corresponding light manual.

**5.11 Seating**

This manual refers to configurations with standard seat system.

For other seat systems (for example Modulite), refer to the corresponding manual.

**5.11.1 Replacing Backrest Unit**

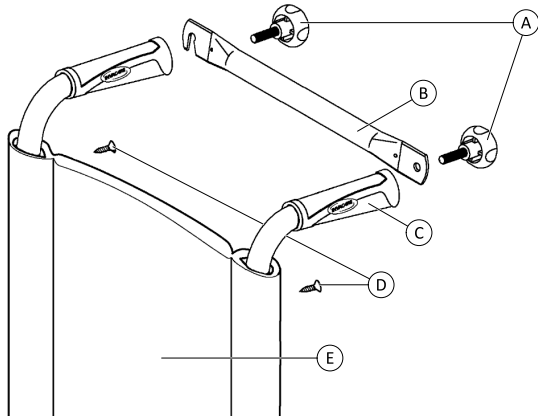


Fig. 5-21

**Replacing Backbrace**

1. Remove both hand screws A on backrest unit.
2. Remove back brace B.
3. Install parts in reverse order.

**Replacing Handle**

1. Remove backbrace.
2. Remove defective handle C.
3. Install parts in reverse order.

**Replacing Backrest Upholstery**

This mobility device is delivered with different upholsteries. If a recliner backrest is installed, it may be necessary to remove the gasspring and lower section of the backrest tubes to completely remove the upholstery.



- Phillips screwdriver, size 2

1. Remove backbrace and handle.
2. Remove screws D including rosette.
3. Remove both backrest tubes from chassis.
4. Replace Backrest Upholstery E.

**Replacing Backrest tubes**

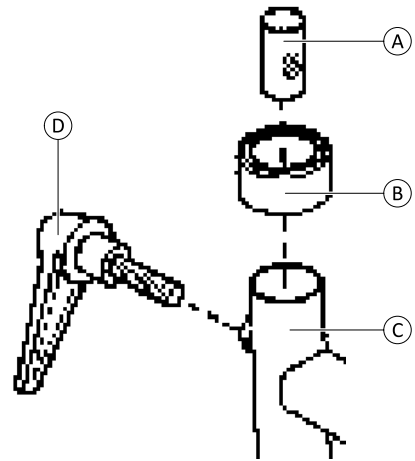


Fig. 5-22

1. Remove backbrace, handle and upholstery.
2. Loosen lever D on chassis C.

**Replacing Fabric Seat (Padded)**

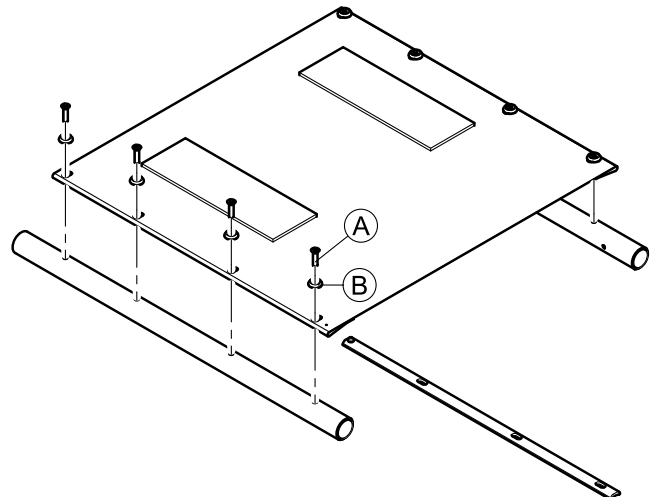


Fig. 5-23 Schematic representation of a padded fabric seat



- Phillips screwdriver, size 2

1. Remove any parts that are in the way, such as armrests and seat cushion.
2. Loosen and remove eight screws including rosette.
3. Replace seat.
4. Install parts in reverse order.

### Replacing Seat Board



**CAUTION!**

**Risk of injury and damage**

An incorrectly installed safety clip can come off and the seat board can unexpectedly fall down, which can lead to injuries.  
 – Make sure that you install safety clip correctly and it engages.

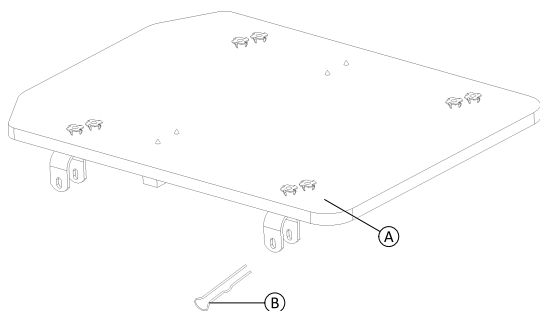


Fig. 5-24

1. Remove any parts that are in the way, such as armrests and seat cushion.
2. Remove four safety clips (B).
3. Lift off seat board (A).

## 5.12 Headrest / Neckrest

### 5.12.1 Replacing Headrest

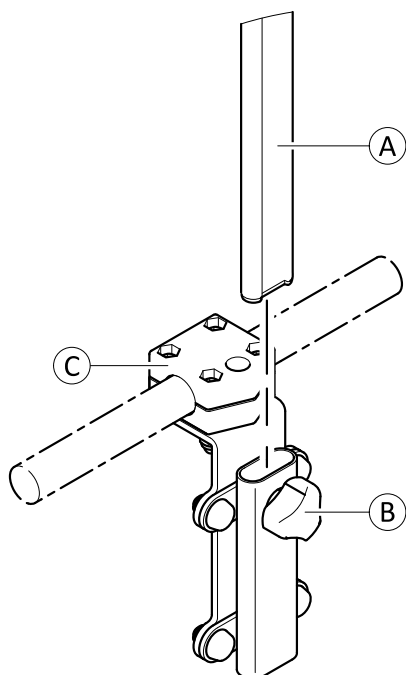


Fig. 5-25

#### Removing headrest

1. Loosen hand screw (B).
2. Pull headrest (A) out of bracket (C).

### Installing headrest

1. Install parts in reverse order.
2. Tighten hand screw (B) hand-tight.
3. Test all functions.

### 5.12.2 Replacing Headrest Mounting Bracket



- 4 mm Allen key

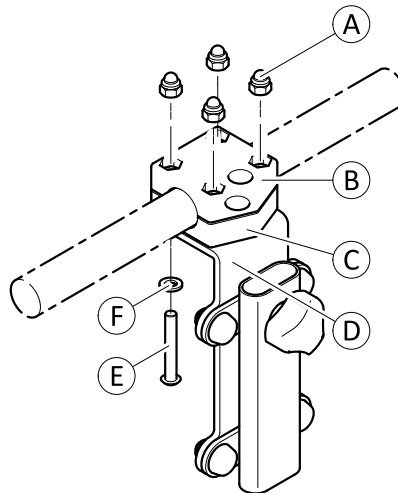


Fig. 5-26

#### Removing bracket



Not all bolts and washers are shown in illustration.

1. Loosen and remove bolts (E) including washers (F), mounting plate (D) and bottom side of bracket (C).
2. Remove top side of bracket (B) including nuts (A).

#### Installing bracket

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

## 5.13 Armrests

### 5.13.1 Replacing Armrest

#### Replacing Armpad

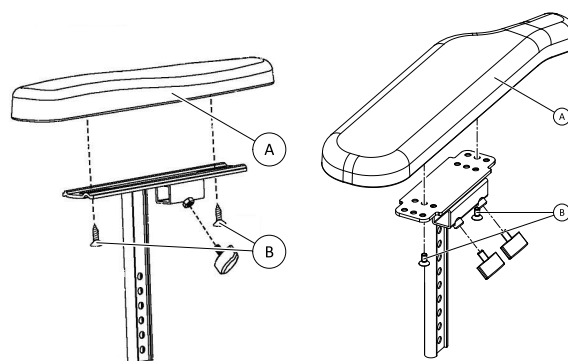


Fig. 5-28

Fig. 5-27



- Phillips screwdriver, size 2 (Standard armpad)
- 3 mm Allen key (Long armpad)

1. Loosen hand screw on siderest holder.
2. Remove screws (B) and armpad (A).
3. Install parts in reverse order.

## Replacing Siderest



- Phillips screwdriver, size 2

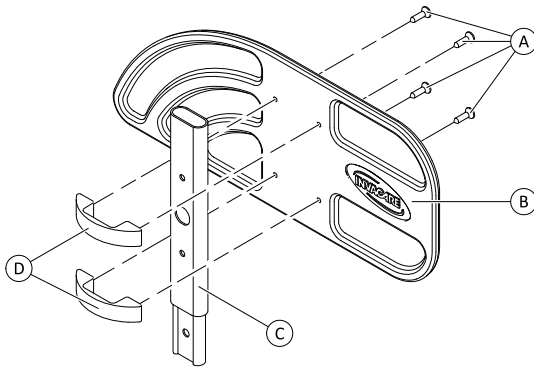


Fig. 5-29

1. Remove screws (A) and take away clothing guard (B) and clamps (D).

## Replacing Hand Screw Assembly



Hand screw assembly is used to fix upper and lower armrest tubes. Illustration shows how to replace lower assembly.

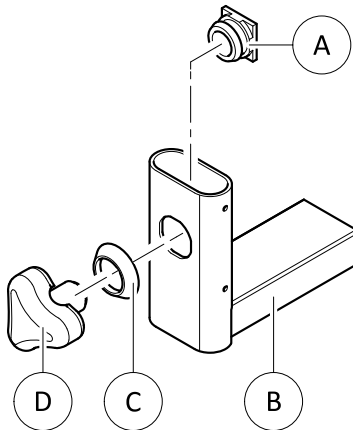


Fig. 5-30 Hand screw assembly on armrest lower tube

1. Remove hand screw (D).
2. Push fixing nut (A) into tube to release plastic ring (C).
3. Remove fixing nut and plastic ring from tube (B).
4. Install parts in reverse order.

## Replacing Armrest Holder



- 5 mm Allen key

1. Loosen set screw on chassis.
2. Pull out holder (B).
3. Install parts in reverse order.

## 5.14 Footrests / Legrests



Replacing of footrests and legrests is dependent on their type. For more information about this, see *Adjusting footrests and legrests*.

## 5.14.1 Replacing Legrest Holder

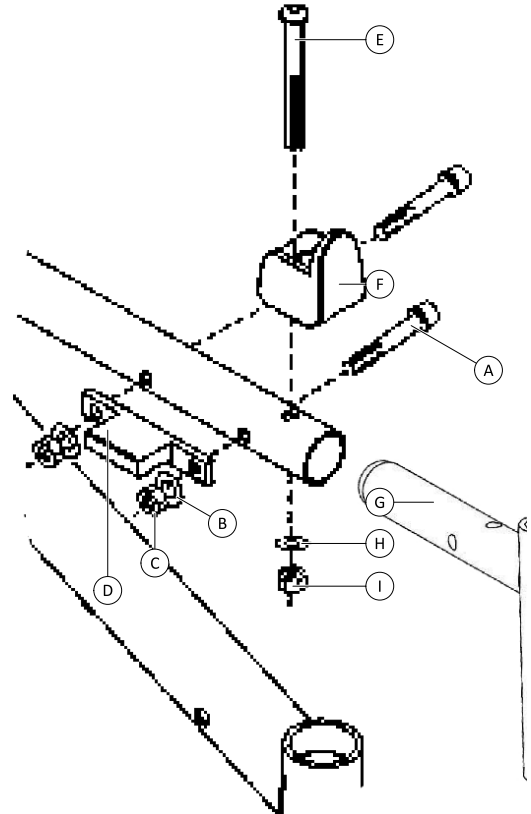


Fig. 5-31



- 4 mm Allen key
- 5 mm Allen key
- 10 mm wrench

1. Loosen and remove nut (I), washer (H) and bolt (E) of seat saddle (F).
2. Loosen and remove nuts (C), washers (B), bolts (A) and seat clamp receiver (D).
3. Pull legrest holder (G) out of side frame.

## 5.14.2 Replacing Legrest Hanger Parts

### Replacing Hanger Pivot



- Phillips screwdriver, size 2 (up to June 2015)
- 5 mm Allen key (since July 2015)

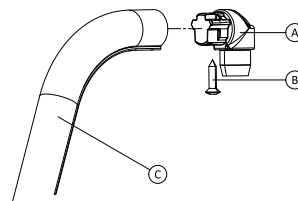


Fig. 5-32

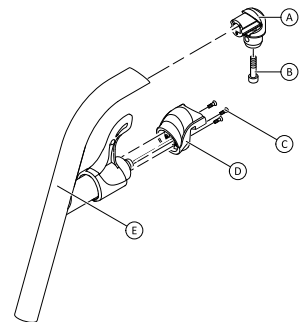



Fig. 5-33

1. Remove screw (B) on bottom side of pivot.
2. Pull pivot (A) out off hanger.

## Replacing Nose Locking

-  • TX10 Torx key

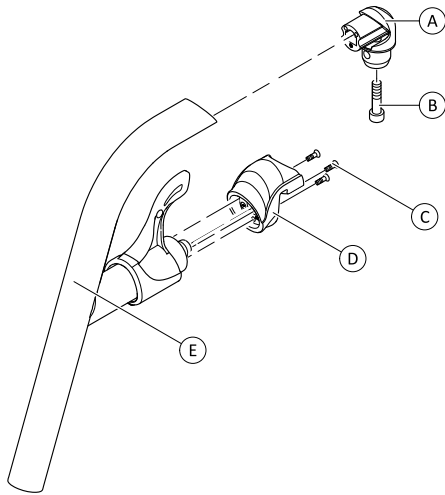



Fig. 5-34

1. Remove three screws (C).
2. Pull nose (D) out off hanger (E).

## Replacing Hanger Lock (up to June 2015)

-  • 10 mm wrench (2x)

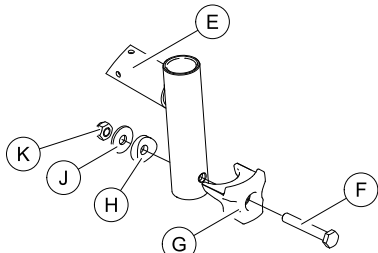



Fig. 5-35


1. Counter nut (K).
2. Loosen and remove bolt (F) including nut (K), washer(s) (H) and locking part (G).

## Replacing Hanger Lock (since July 2015)

-  • 4 mm Allen key

1. Loosen and remove screw including saddle washer and locking part.

## 5.14.3 Replacing Angle- And Depth-Adjustable Foot Plate

-  • 5 mm Allen key

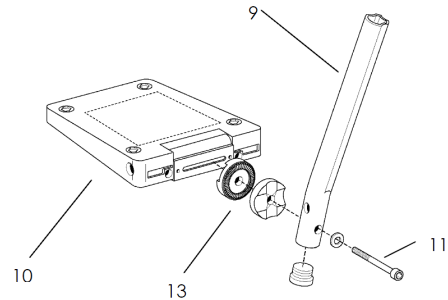




Fig. 5-36

1. Remove screw (11) on foot plate (10).
2. Remove foot plate (10) from lower legrest tube. Take care not to damage adjustment fixings (13).
3. Install parts in reverse order.
4. Test all functions.

## 5.14.4 Replacing Foot Plate / Heel Strap of Legrest

-  • 6 mm Allen key
-  • Phillips screwdriver, size 2

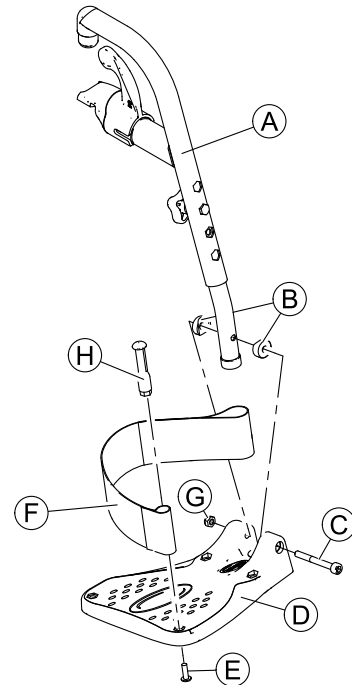



Fig. 5-37

## Removing Foot Plate / Heel Strap

1. Loosen and remove screw (C), saddle washers (B) and nut (G).
2. Pull legrest (A) out of foot plate (D).
3. Loosen and remove screw (E) including plastic bolt (H).
4. Remove heel strap (F).

## Installing Foot Plate / Heel Strap

1. Install parts in reverse order.
  -  Ensure that saddle washers (B) are in correct position.
2. Test all functions.

## 5.15 Posture Belt

### 5.15.1 Replacing Posture Belt

#### Removing Posture Belt

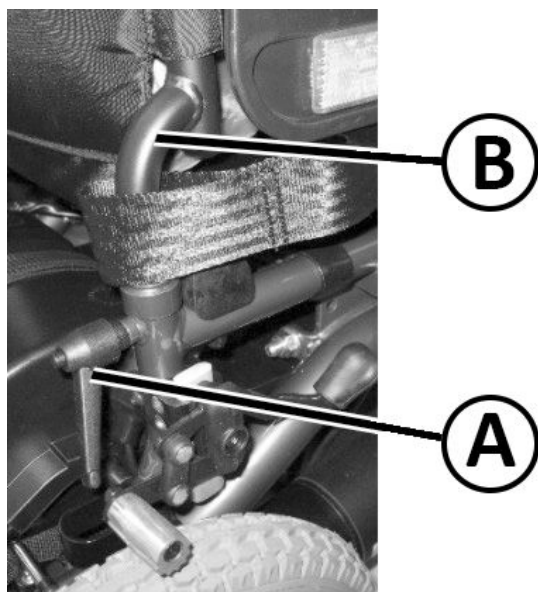


Fig. 5-38

1. Loosen clamp lever (A).
2. Pull out backpost (B).
3. Remove posture belt.

#### Installing Posture Belt

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


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## 6 Accessories

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### 6.1 Accessories

- Swing-away tray, left-hand mounted
- Swing-away tray, right-hand mounted
- Taxi Clamp
- Tie-Down Clamp (Rear and Front)
- Battery transportation strap
- Mirror
- Caneholder

 The installation instructions for accessories are available at your provider or directly from Invacare.



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