

Invacare® Pronto™ M61 Series with SureStep®



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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I General

I.1 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 the operating manual.
- You can find information about ordering spare parts in the spare parts catalogue.
- Only use original Invacare® spare parts. The warranty will become invalid if other spare parts are used!
- We reserve the right to make any alterations on the grounds of technical improvements.
- 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 please contact Invacare Service.

I.2 Actions on mobility devices directly upon receipt



CAUTION!

Risk of injury and damage to mobility device

When a fault occurred, a mobility device with batteries connected could result in a hazardous situation.

- Disconnect batteries for maximum protection.

When you receive a mobility device for service and its batteries are connected, you should disconnect them immediately before leaving the mobility device unattended. Otherwise, on a mobility device with a fault condition, connected batteries combined with a secondary fault or a sequence of events could result in a hazardous situation such as a short circuit.

1. Switch off power.
2. Disconnect batteries.
Refer to the corresponding chapters about disconnecting and/or removing the batteries.

I.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.

I.4 Symbols in this manual

In this manual warnings are indicated by symbols. The warning symbols are accompanied by a heading that indicates the severity of the danger.



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.

Tools:



This symbol identifies a list of various tools, components and items which you will need in order to carry out certain work. Please do not attempt to carry out the work if you do not have the listed tools available.

I.5 Images in this manual

The detailed images in this manual are given digits to identify various components. Component numbers 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 I.1 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



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

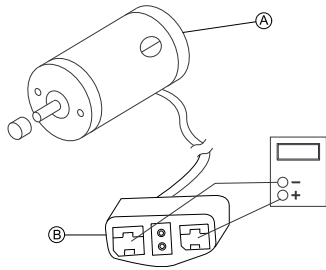
- Changes to the drive program may only be carried out by trained Invacare specialist dealers.
- Invacare supplies all mobility devices with a standard drive program ex-works. Invacare can only give a warranty for safe vehicle driving behavior - especially tipping stability - for this standard drive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

3.1 Testing the motor



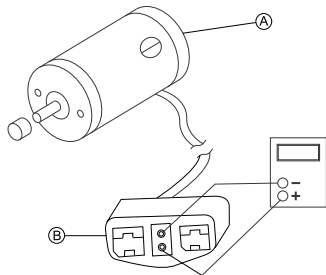
1. On the 4-pin motor connector (B), locate the two contacts in the RED and BLACK housings.
2. Set the digital multimeter to measure resistance (ohms).
3. Measure the resistance between the two motor contacts.

i A normal reading is between 0.5 and 5 ohms, depending on the motor (A).

A reading of 0 ohms or in excess of 15 ohms indicates a problem. High readings are generally caused by bad connections and/or damaged brushes. Contact Invacare.

3.2 Testing the electro-mechanical parking brake

i This procedure should only be performed on mobility devices with conventional motor/gearbox assembly.



1. Engage the motor engaging lever, refer to 4.4.1 Disengaging motors, page 13.
2. On the four-pin motor connector (B), locate the side by side connectors in the black housings.
3. Set the multimeter to measure resistance (ohms).
4. Measure the resistance between the two brake contacts.

i A normal reading is between 45–100 ohms depending on the motor (A).

A reading of 0 ohms or a very high reading (Megaohms or O. L. (out of limits)) indicates a shorted brake or an open connection respectively. If either condition exists, send the motor to Invacare Technical Service for inspection/repair.



WARNING!
A shorted electro-mechanical brake will damage the brake output section in the power module.

– Do not connect a shorted electro-mechanical brake to a good power module. A shorted brake must be replaced.

i A bad motor can damage the power module but a bad power module will not damage a motor.

3.3 Rain test

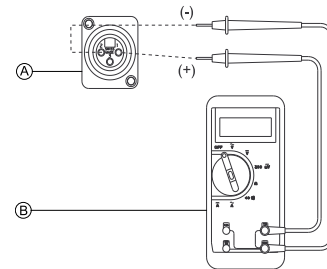
- Check to ensure that the RED and GREY battery terminal caps are secured in place, remote boot is not torn or cracked where water can enter and that all electrical connections are secure at all times.
- Do not use the mobility device if the remote boot is torn or cracked. If the remote boot becomes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

3.4 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.

i 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.

i 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.
7. 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.

i 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.

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

i 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.

3.5 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.
Don't mismatch your battery and chargers.	Use only a AGM charger for a AGM battery.

4 Service

4.1 Tightening torques



CAUTION!

Damage can be caused to the 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

Thread	Tightening torque in Nm $\pm 10\%$
M14	120 Nm
M16	180 Nm

UNC Thread	Tightening torque in Nm $\pm 10\%$
1/4"-20	11-7 Nm
5/16"-20	22-14 Nm
3/8"-16	41-25 Nm
7/16"-14	67-40 Nm
1/2"-13	100-60 Nm
9/16"-12	150-90 Nm
5/8"-11	210-130 Nm
3/4"-1	370-230 Nm
7/6"-9	600-370 Nm
1"-8	900-550 Nm

4.2 Troubleshooting



- For troubleshooting information and explanation of error codes, refer to the wheelchair base user manual and the individual Electronics Manual supplied with each wheelchair.

4.2.1 Wheels

Problem	Probable cause	Solutions	Documentation
Mobility device veers left/right	Incorrect/unequal tire pressure	If pneumatic, check tires for correct and equal pressure.	Refer to Technical specifications inside the user manual.
	Loose stem nuts/bolts	Tighten stem nuts/bolts.	Refer to 4.6.1 Removing/Installing the drive wheel, page 17.
		Check that casters contact ground at the same time.	
Sluggish turn/performance	Incorrect/unequal tire pressure	If pneumatic, check tires for correct and equal pressure.	Refer to Technical specifications inside the user manual.
	Loose stem nuts/bolts	Tighten stem nuts/bolts.	Refer to 4.6.1 Removing/Installing the drive wheel, page 17.
	Casters flutter	Incorrect/unequal tire pressure	If pneumatic, check tires for correct and equal pressure.
Loose stem nuts/bolts		Tighten stem nuts/bolts.	Refer to 4.6.1 Removing/Installing the drive wheel, page 17.
	Check that casters contact ground at the same time.		
Squeaks and rattles	Loose stem nuts/bolts	Tighten stem nuts/bolts.	Refer to 4.6.1 Removing/Installing the drive wheel, page 17.

4.2.2 Motor/Gearbox/Brake

Problem	Probable Cause	Solutions
Motor makes a clicking noise	Bad bearings	If bearings are bad, replace motor.
	Raised commutator plate inside of motor	Ohm out motor and replace motor if high reading is present. Normal reading is 0.5-5 Ohms.

Problem	Probable Cause	Solutions
Grinding noise or motor is locking up	Bad bearings, bad gears	Replace motor/gearbox.
Motors stall and start up again	Current rollback	Stop driving and let electronics cool.
Motor chatters or runs erratically, or only the motor turns	Damaged connector or worn brushes, bad motor or gear box	Ohm out motors and replace motor/gearbox if high reading is present. Normal reading is 0–5 Ohms.
	Motor engaging lever is disengaged	Engage motor engaging levers.
	Power module malfunction	Check for error codes with programmer.
Mobility device veers to the left or right when driving on level surface	Uneven tire pressure (pneumatic tires only)	Inflate tires, replace tires if worn.
	Motors out of balance	Use programmer to balance motors.
Gearbox is leaking fluid	Bad seal around drive shaft	If seal is bad, replace motor/gearbox.
	Loose hardware	Tighten hardware.
Excessive clicking coming from motor/gearbox	Bad bearing in motor or gearbox	Replace motor/gearbox.
	Loose wheel hardware	Tighten hardware (use removable Loctite™ on hardware).
Rough driving	Gearbox shaft movement or bent shaft	Replace motor/gearbox.
Motor stutters	Poor connection or worn brushes	Check DCL connectors. Check motor and replace if necessary.
Motor fails to start after initial installation	Battery voltage is too low	Check batteries and recharge if necessary.
	Bad connection	Check connector.
	Brake disengaged	Engage brake.
Motor is running then fails to restart when stopped	Heavy load on the motors forcing power module into the current rollback mode	Leave power On and allow power module to count down, and recharge the batteries overnight with power On.
	Blown fuse in battery wiring harness	Replace battery wiring harness.
	Damaged motor	Replace motor/gearbox if internal damage is determined. Ohm out motor to check for possible internal damage (worn out brushes may be possible).
	Power module power stage board or relays may be damaged	Replace power module or send to Invacare for repair.
Motor runs but loses power	Power module senses heavy load and has entered the current rollback mode	Stop driving and let electronics cool.
	Batteries are going bad	Replace batteries.
Actuator does not react	Power module defective	Replace power module.
	Cable disconnected or damaged	Safeguard cable connection, replace cable if necessary.
	Actuator defective	Check actuator.
	Remote defective	Replace remote.
Mobility device loses all power while driving	Bad connection on mobility device	Turn power OFF, wait 10 seconds and turn power back ON. Check remote connection. Check battery connection and fuses.

4.2.3 Battery

Problem	Probable cause	Solutions
Batteries will not charge	Blown battery fuse or damaged cables	Check cables for damage or replace battery wiring harness.
	Batteries sat discharged too long	Replace batteries.

Problem	Probable cause	Solutions
Short charge time	One or both batteries may be bad (if batteries charge up to soon)	Check each battery and replace if needed.
No power to mobility device motors	Bad connection or blown fuse	Check all connections and housings for damage. If you have blown fuse a new battery wiring harness must be purchased.
	Batteries are dead	Check battery voltage and replace if necessary.
	Loose battery connections	Check battery cable connections, may have vibrated loose when driving on rough terrain.
Corroded battery wiring connections	Possible water, salt or urine damage	Replace battery wiring harness.

4.2.4 Battery charger

Problem	Probable Cause	Solutions
No LEDs on charger	Charger not plugged into outlet or disconnected from wiring harness on mobility device	Make sure the charger is plugged into the outlet and check the wiring on the mobility device.
	No AC power at outlet	Check for AC power with digital volt meter.
	Damaged power cord	Check for damage on the power cord, replace if damaged or send to Invacare for repair.
	Charger LED's burnt out	Replace charger.
	Charger may have internal fuse that is blown	Remove charger cover and check for fuses. If fuses are present, ohm out fuses and replace if necessary.
Batteries have short driving range during a single charge. Battery gauge falls off faster than normal.	Consumer not charging batteries long enough	Instruct consumer to charge for 8–10 hours minimum.
	Batteries may be weak	Perform load test or check “Battery Quality Menu” with the programmer.
	Check programming settings	Torque settings and power level settings may be too high.
	Heavy load on motors	Chairs weight distribution may be offset (mobility device may be front loaded).
Batteries will not charge	Blown battery fuse in wiring harness or charger	Check battery wiring harness fuse on the mobility device, replace battery wiring harness if fuse is blown.
		Check fuse in the charger.
	Charger not plugged into outlet	Make sure charger is plugged into outlet.
	No AC power at the outlet	Check for AC power with a digital volt meter.
	Charger power cord may be damaged or the connector may be damaged	Check for damage and replace if necessary.
	Charger may have internal damage	Charge batteries with known good charger.
	Battery voltage too low for charger to start charging cycle	Replace batteries.

4.2.5 Maintenance plan (1x annually)



CAUTION!

Danger of injury or damage to the mobility device

If the maximum speed reduction on a mobility device with a lifter does not function correctly, injury or damage may occur.

The control unit of the mobility device 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	Done
Armrests	• Damage to armrests.	• Replace covering if damaged.	
	• Armrest fixings.	• Tighten screws.	

Component	Check	Remedy	Done
Side panels	<ul style="list-style-type: none"> • Damage to side panels. 	<ul style="list-style-type: none"> • Replace side panels if damaged. 	
	<ul style="list-style-type: none"> • Side panel fixings. 	<ul style="list-style-type: none"> • Tighten screws. 	
Seat lock	<ul style="list-style-type: none"> • Seat lock defective. 	<ul style="list-style-type: none"> • Replace seat lock. 	
Seat angle adjustment	<ul style="list-style-type: none"> • Tight seating of SL fuses. 	<ul style="list-style-type: none"> • Replace SL fuses if necessary. 	
Frames (chassis)/battery mounting	<ul style="list-style-type: none"> • Check fixings, welded seams and battery mounting. 	<ul style="list-style-type: none"> • Tighten screws • Replace components if necessary. 	
Wheel suspension and wheels	<ul style="list-style-type: none"> • Check drive wheels for tight fit and side play. 	<ul style="list-style-type: none"> • Adjust/replace wheel hubs. 	
	<ul style="list-style-type: none"> • Check casters for tight fit, float and side play. 	<ul style="list-style-type: none"> • Replace wheels, wheel fork or wheel bearings. 	
	<ul style="list-style-type: none"> • Pneumatic tires 	<ul style="list-style-type: none"> • Repair or replace if damaged. 	
Drive units, coupling mechanism	<ul style="list-style-type: none"> • Check functions in drive and push modes. 	<ul style="list-style-type: none"> • Replace motor if necessary. 	
	<ul style="list-style-type: none"> • Check coupling mechanism. 	<ul style="list-style-type: none"> • Tighten screws/nuts, adjust or replace if necessary. 	
Legrests	<ul style="list-style-type: none"> • Check welded seams, interlocking, screws, footplates. 	<ul style="list-style-type: none"> • Tighten, replace if necessary. 	
Batteries	<ul style="list-style-type: none"> • Check batteries for damage. 	<ul style="list-style-type: none"> • Replace batteries if necessary. 	
	<ul style="list-style-type: none"> • Check battery voltage. 	<ul style="list-style-type: none"> • Charge batteries. 	
	<ul style="list-style-type: none"> • Check contacts and terminals. 	<ul style="list-style-type: none"> • Clean contacts and terminals. 	
Battery case	<ul style="list-style-type: none"> • Check locking system, it must engage completely. 	<ul style="list-style-type: none"> • Replace if necessary. 	
Remote/power module	<ul style="list-style-type: none"> • Remote, status display flashing. 	<ul style="list-style-type: none"> • Evaluate error/blink code. 	
	<ul style="list-style-type: none"> • Fixings 	<ul style="list-style-type: none"> • Tighten fixings, replace if necessary. 	
	<ul style="list-style-type: none"> • Cables and connecting plugs 	<ul style="list-style-type: none"> • Tighten cables and connecting plugs, replace if necessary. 	
	<ul style="list-style-type: none"> • Joystick function. 	<ul style="list-style-type: none"> • Replace joystick if necessary. 	
		<ul style="list-style-type: none"> • Replace remote if necessary. 	
<ul style="list-style-type: none"> • Power supply 	<ul style="list-style-type: none"> • Tighten cables and connecting plugs, replace if necessary. 		
Drive program	<ul style="list-style-type: none"> • Check drive electronics program version. 	<ul style="list-style-type: none"> • Update software if newer version available. 	

4.3 Electrical system

4.3.1 Removing/Installing the batteries



WARNING!

Fire and burn hazard due to short circuit at battery poles

- DO NOT short-circuit the battery poles with a tool or metal parts of the mobility device.
- Make sure that the battery pole caps are attached at all times when you are not working on the battery poles.

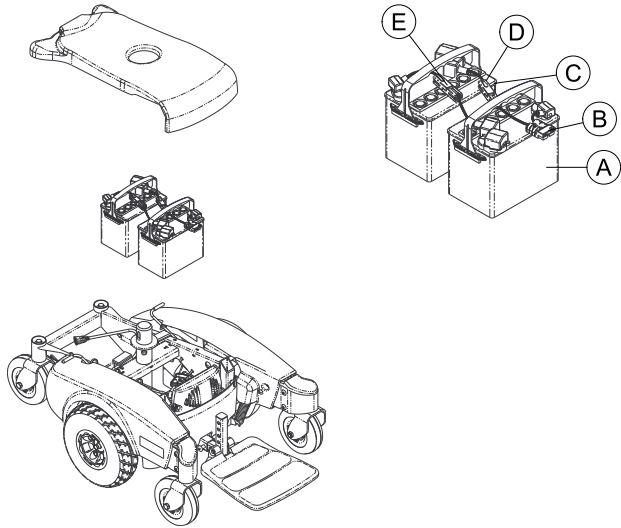


CAUTION!

Risk of crushing

The batteries are very heavy. There is a risk of hand injury.


- Be aware that the batteries are very heavy.
- Handle the batteries with care.



Removing the batteries


1. Disconnect the front battery (A) from the controller (BLACK connector (B)).
2. Disconnect the rear battery (C) from the front battery (RED (D) and BLACK (E) connectors).
3. Lift rear and front battery out of the battery tray using the battery handles.

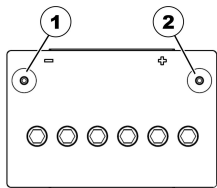
Installing the batteries

 Ensure that both batteries are properly seated and resting on the battery tray.

1. Position the front battery (A) in the battery tray.
2. Position the rear battery (C) in the battery tray.
3. Connect the rear battery to the front battery (RED (D) and BLACK (E) connectors).
4. Connect the front battery to the controller (BLACK connector (B)).

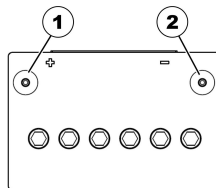
4.3.2 Use the correct batteries

 **CAUTION!**
Risk of injury and risk of damage to the batteries if incorrect batteries are used
 – Only use batteries that have a terminal configuration like that described below.



Correct battery

- (1) NEGATIVE terminal (-)
 (2) PLUS terminal (+)



Wrong battery

- (1) PLUS terminal (+)
 (2) NEGATIVE terminal (-)

 Use only batteries of the same type.

4.3.3 Connecting/Disconnecting battery cables



WARNING!

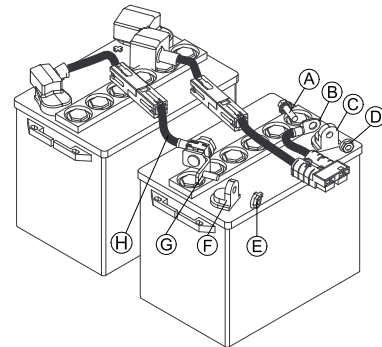
Risk of injury or damage due to electrical shorts.

- Never allow any of your tools and/or battery cables to contact both battery terminals at the same time.
- Connect same color connectors to each other (red to red, black to black).
- Do not remove fuse or mounting hardware from positive (+) battery cable screw. To replace the fuse, obtain and replace battery harness with fuse.
- The positive (+) battery cable must connect to the positive (+) battery terminal.
- The use of rubber gloves is recommended when working with batteries.



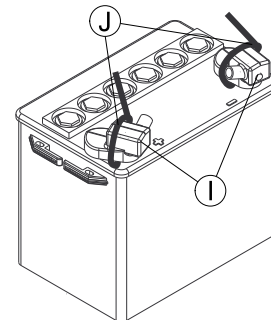
Tools:

- 7/16" socket wrench
- 3/8" socket wrench
- diagonal pliers
- 1 1/2-inch (292 mm) long tie-wraps



Connecting battery cable

1. Secure negative (-) battery cable (B) to negative (-) battery terminal (C) using the screw (A) and the locknut (D).
2. Secure positive (+) battery cable (H) to positive (+) battery terminal (F) using the L-bracket with screw (G) and the locknut (E).
3. Verify all battery cables are correctly installed and securely tightened.
- 4.



Slide terminal caps (I) down battery cables and onto battery terminals.

5. Secure each terminal cap in place with a tie-wrap (J).
6. Position the batteries into the mobility device and connect them. Refer to 4.3.1 Removing/Installing the batteries, page 11 and the battery wiring label under the top cover.
7. If necessary charge the batteries. Refer to the User Manual.

Disconnecting battery cables

1. Remove the seat. Refer to 4.11 Removing/Installing the seat, page 21.
2. Disconnect and remove the batteries. Refer to 4.3.1 Removing/Installing the batteries, page 11.
3. Cut the tie-wraps (J) that secure the battery terminal caps (I) in place.

4. Slide terminal caps up onto the battery cables.
5. Disconnect positive (+) battery cable **H** from the positive (+) battery terminal **F**.
6. Disconnect negative (-) battery cable **B** from negative (-) battery terminal **C**.

4.3.4 Cable routing

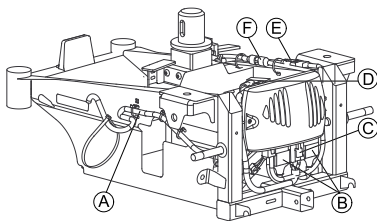


WARNING!

Risk of injury or damage

If cables come loose it could result in injury to the user, attendants and/or bystanders and/or damage to the mobility device.

- Cables must be secured to the frame and/or base with tie-wraps after servicing is completed.
- Cables must be secured so there are no loops of excess cable extending away from the mobility device. Bundle all excess cable together and secure with a tie-wrap. It may also be necessary to secure these bundles to the frame and/or base.
- Always test all functions of the mobility device after securing the cables to be sure cables do not get pinched or crushed during operation of the mobility device.



(A)	Motor lead
(B)	Motor lead connectors
(C)	Battery cable
(D)	Battery connector
(E)	Actuator cable connectors
(F)	Proximity switch connectors

4.3.5 Checking the cables

1. Switch the electronics Off on the remote.
2. Remove the seat. Refer to 4.11 Removing/Installing the seat, page 21.
3. Remove the top and front cover. Refer to 4.7.1 Removing/Installing the top cover, page 19 and 4.7.3 Removing/Installing the front cover, page 19.
4. Check all cables for visible damage, crushing points and abrasion points.
5. Replace damaged cables.
6. Pull on each plug carefully. The plug must not come out of its socket when pulled on lightly.
7. If a plug is loose, apply slight pressure to push the plug into the socket. The plug must snap in place securely.
8. Check that the plug is firmly attached to its socket.
9. Remove the batteries. Refer to 4.3.1 Removing/Installing the batteries, page 11.
10. Check the battery cables for visible damage, crushing points or abrasion points.
11. Replace damaged cables. Refer to 4.3.3 Connecting/Disconnecting battery cables, page 12.

12. Assemble all parts again in reverse order.
13. Test all functions of the mobility device.

4.4 Drive components

4.4.1 Disengaging motors



CAUTION!

Risk of the mobility device running away

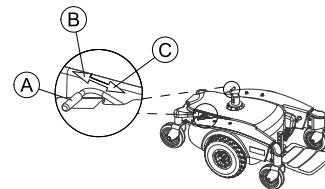
- When the motors are disengaged (for push operation whilst freewheeling), the electromagnetic motor brakes are deactivated. When the mobility device is parked, the levers for engaging and disengaging the motors must without fail be locked firmly into the "DRIVE" position (electromagnetic motor brakes activated).



The motors may only be disengaged by an attendant, not by the user.

This ensures that the motors are only disengaged if an attendant is available to secure the mobility device and prevent unintended rolling.

The levers for disengaging the motors are located on each motor.



Disengaging the motor

1. Switch off remote.
2. Pull the engaging lever **A** towards the rear of the mobility device **B**.

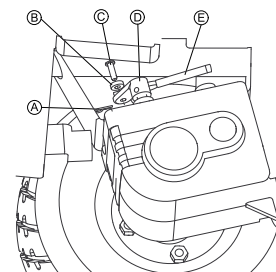
The motor is disengaged.

Engaging the motor

1. Push the engaging lever **A** towards the front of the mobility device **C**.
- The motor is engaged.

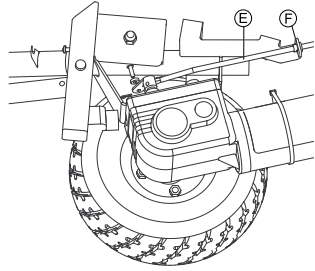
4.4.2 Removing/Installing the motor engaging lever

1. Remove the side cover. Refer to 4.7.2 Removing/Installing the side cover, page 19.
2. Remove the cap (not shown) from the motor engaging lever.
- 3.




Remove the cotter pin **A**, washer **B** and mounting pin **C** securing the motor lock **D** to the motor engaging lever **E**. Set cotter pin and mounting pin aside.

4. Grasp the motor engaging lever by the end that attaches to the motor lock.
- 5.



Pull the motor engaging lever (E) through the lever support (F) on the inside of the walking beam.

 To install the motor engaging lever, reverse steps 1–5.

4.4.3 Removing/Installing the motor



WARNING!
Risk of injury or damage

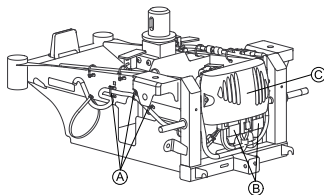
When repairing or servicing the mobility device under power, injury or damage may occur.

- Always turn off the mobility device before repairing or servicing the mobility device.
- After any adjustments, repair or service and before use, make sure that all attaching hardware is tightened securely.



- Tools:
- 5 mm Allen key
 - diagonal pliers
 - tie-wraps

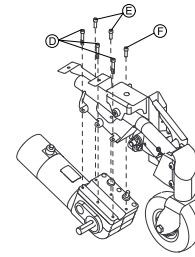
1. Remove the seat. Refer to 4.1.1 Removing/Installing the seat, page 21.
2. Remove the front battery. Refer to 4.3.1 Removing/Installing the batteries, page 11.
3. Remove the drive wheel. Refer to 4.6.1 Removing/Installing the drive wheel, page 17.
4. Remove the side cover. Refer to 4.7.2 Removing/Installing the side cover, page 19.
5. Remove the front cover. Refer to 4.7.3 Removing/Installing the front cover, page 19.
- 6.



Cut all tie-wraps (A) securing the motor lead to the frame.

7. Disconnect the motor lead connector (B) from the controller (C).
8. Remove the cotter pin to disconnect the motor engaging lever. Refer to 4.4.2 Removing/Installing the motor engaging lever, page 13.

9.



Remove the three long screws (D) and three short screws (E) and (F) securing the motor to the walking beam.



Long screws are used on the same side of the motor as the drive shaft.

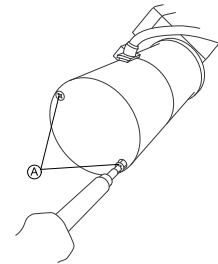
10. Remove the motor from the walking beam.
11. Position the new motor against the walking beam.
12. Loosely install all screws except of the front inside short screw (F).
13. Install the front inside short screw.
14. Tighten the three long and the three short screws.
15. If necessary, repeat steps 3–14 for motor on the other side.
16. Reverse steps 1–8 to reassemble the base.

4.4.4 Replacing motor brushes



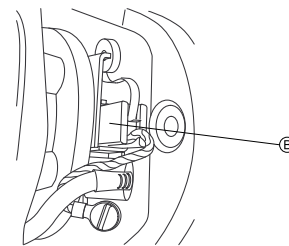
- Tools:
- Phillips screwdriver
 - small flat screwdriver

1. Turn power off.
2. Disengage motors. Refer to 4.4.1 Disengaging motors, page 13.
- 3.



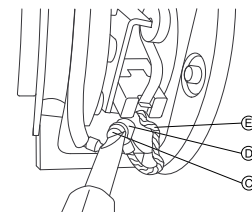
Remove the two end cap screws (A) on the end cap.

4.



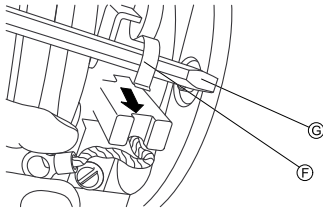
Remove the end cap and locate the brush assembly (B) on each side of the motor.

5.



Remove the screw (C) and washer (D) that mounts the shunt wire (E) to the motor assembly. Do not discard the screw and washer.

6.



Release the tension on the brush spring retainer (F) with a small screwdriver (G) and position the screwdriver in place to hold the spring retainer.


7. Remove the motor brush and perform the following:

- a. Inspect the commutator (not shown) for damage.
- b. Inspect the motor brush thoroughly for excessive wear or chips in the brush and any discoloration in the shunt wire and perform one of the following:
 - If motor brush is in good condition (i.e. the end of the brushes are smooth and shiny and shunt wire is not discolored), reinstall existing brush back into brush holder.
 - If motor brush is in bad condition, brush is worn or damaged, discard immediately and install new brush into brush holder.


8. Remove the screwdriver to release spring retainer so as to hold brush in place.

9. Attach the shunt wire to the motor housing using the screw and washer (removed in step 5). Tighten securely.


10. Replace the motor end cap and secure using the two end cap screws.

 Repeat steps 1–10 for opposite motor.

11. If new motor brush was installed, perform the following process:

 This process, also called Brush Burn-in or Finger Printing Process, is necessary to seat the brush to the commutator plates inside the motor for optimum performance of the motor.

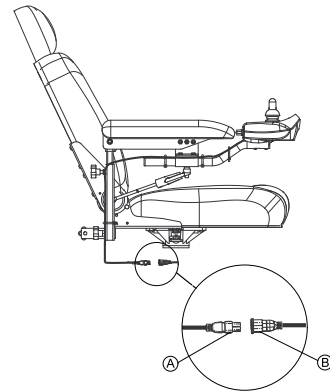
a. Put the mobility device on blocks so that the drive wheels do not contact the ground.

 For steps b and d use a rubber band to hold the joystick in the direction needed or program the chair for latched driving. Refer to the electronics manual for latched programming instructions.

- b. Run the motors forward for one hour.
- c. Turn motors off and allow 30 minutes for motors to cool off.
- d. Run the motors in reverse for one hour.
- e. When process is complete, remove mobility device from blocks and test drive the mobility device.

4.5 Electronics


4.5.1 Disconnecting/Connecting the remote



Disconnecting the remote

1. Switch the remote OFF.
2. Pull the plug (A) of the remote cable to disconnect the remote from the controller connector (B).

Connecting the remote

 **The remote connector and controller connector fit together in one way only.**
– Do not force them together.

1. Lightly push to engage the plug (A) of the remote cable and the controller connector (B).

4.5.2 Removing/Installing the remote



WARNING! **Risk of injury or damage**

When performing any maintenance, adjustments or service while the remote is on, damage or personal injury may result.
– Verify that the remote is switched off.

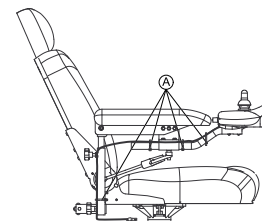


Tools:

- Phillips screwdriver
- diagonal pliers
- tie-wraps

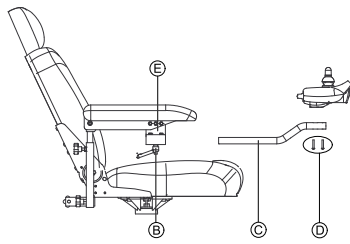
Removing the remote

1. Disconnect the remote. Refer to 4.5.1 Disconnecting/Connecting the remote, page 15.
- 2.



Cut the tie-wraps (A) that secure the remote cable to the arm.

3.




Loosen the clamping lever **B** to release the remote mounting tube **C** from the mounting bracket **E**.


4. Remove the remote and the remote mounting tube from the mounting bracket.
5. Remove the screws **D** securing the remote to the mounting tube.

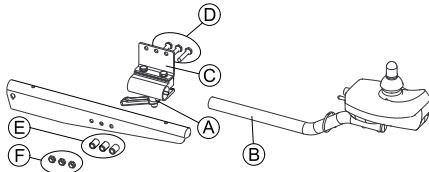
Installing the remote

1. Install the screws **D** to secure the remote onto the remote mounting tube **C**.
2. Slide remote mounting tube through the mounting bracket **E** to the desired position.
3. Tighten the clamping lever **B** to secure the remote mounting tube to the mounting bracket on the arm.
4. Tie-wrap **A** the remote cable to the arm.
5. Connect the remote. Refer to 4.5.1 Disconnecting/Connecting the remote, page 15.
6. Ensure the arm can swing fully up, without pulling on the remote cable.


4.5.3 Repositioning the remote mounting bracket

 Take note of position and orientation of mounting hardware for reinstalling the remote assembly.

 Tools:
• 2 x 1/4" socket wrench



1. Turn the clamping lever **A** to release the remote mounting tube **B** from the mounting bracket **C**.
2. Remove the remote.
3. Remove the three screws **D**, spacers **E** and locknuts **F** that secure the mounting bracket to the three mounting holes on the arm frame.

 The mounting bracket is mounted to the inside of the arm frame.

4. Reposition the mounting bracket on the opposite arm frame.
5. Using the three screws, spacers and locknuts to secure the mounting bracket to the three mounting holes of the arm frame.
6. Slide remote mounting tube through the mounting bracket to the desired position and secure with the clamping lever.

4.5.4 Replacing the Shark power module



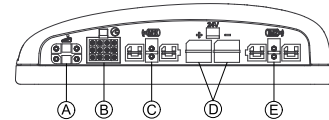
WARNING! **Risk of injury and/or damage**

Do not attempt to perform this procedure with any power supplied to the mobility device.
– The remote and batteries must be disconnected prior to beginning to remove the power module.



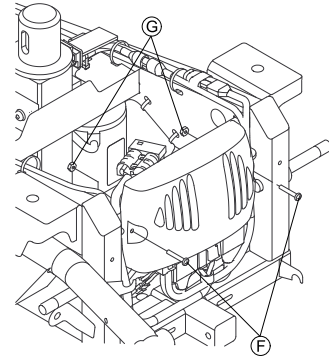
Tools:
• Phillips screwdriver
• 11/32" socket wrench

1. Remove the seat. Refer to 4.1.1 Removing/Installing the seat, page 21.
2. Remove the top cover. Refer to 4.7.1 Removing/Installing the top cover, page 19.
3. Remove the front battery. Refer to 4.3.1 Removing/Installing the batteries, page 11.
4. Remove the front cover. Refer to 4.7.3 Removing/Installing the front cover, page 19.
5. Remove the footboard. Refer to 4.9.1 Removing/Installing the footboard assembly, page 21.
- 6.



Disconnect the remote cable **A** from the power module.

7. Disconnect the actuator cable **B** from the power module.
8. Disconnect the battery cable **D** from the power module.
9. Disconnect the right **C** and left **E** motor leads from the power module.
- 10.



Remove the two screws **F** and locknuts **G**, that secure the existing power module to the frame.

11. Remove the power module from the frame.
12. Reverse steps to install a new power module.



Pull the remote cable through the center hole in the top cover, when installing a new power module. Refer to 4.7.1 Removing/Installing the top cover, page 19.

4.5.5 Updating software



WARNING!

Any changes to the drive program can affect the driving characteristics and the tipping stability of the mobility device.


- Changes to the drive program may only be carried out by trained Invacare specialist dealers.
- Invacare can only give a warranty for safe mobility device driving behavior — especially the tipping stability — for unaltered standard drive programs.



Tools:
• Dynamic® Wizard software
• User manual of Wizard software
• Further requirements, such as a minimum system configuration for the PC used for programming, required programming cables etc., can be taken from the Wizard software user manual.


The drive programs for mobility devices are continually being further developed and improved by Invacare. For this reason, you should always check whether the drive program version number is up-to-date when carrying out any repairs or regular maintenance.

If a newer version is available, the drive program should be updated. The procedure for updating the drive program is described in the Wizard software operating manual.

-  The electronic system is supplied with a standard drive program. If the drive program has been customized, you have to perform this customization again, after installing the new drive program.

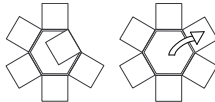
4.6 Wheels

4.6.1 Removing/Installing the drive wheel

-  Tools:
- 13 mm socket wrench
 - flat screwdriver

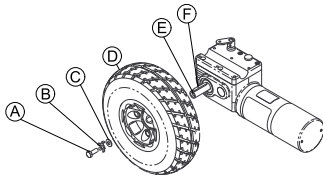
Removing the drive wheel

1. Block up the mobility device (place wooden blocks under frame).
- 2.



Fold down tab of existing locking tab washer **B** with a flat screwdriver.

3.



Remove screw **A**, locking tab washer and washer **C**. Discard existing locking tab washer.

4. Remove wheel **D** from drive shaft **E**. If necessary, use wheel puller to remove drive wheel from drive shaft.

Installing the drive wheel



WARNING! Risk of injury or property damage

Failure to properly install locking tab washer can result in wheel separation and potential user injury or property damage.

- When replacing wheels always use a new locking tab washer. Do not reuse locking tab washer.




Leaking of lubricant

Applying more than one-inch (25,4 mm) (in length) can cause the lubricant to leak resulting in damage to flooring (carpet, tile, etc.).

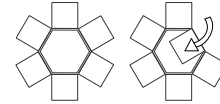
- Do not apply more than one-inch (25,4 mm) (in length) thin film of lubricant to the drive shaft.

1. Apply lubricant to drive shaft **E** and keystick **F**.
2. Align the keystick in the drive shaft with the cutout in the wheel hub and position the wheel **D** on to the drive shaft.
- 3.

-  The locking tab washer must be inserted into the cutout in the rim and hub.


Using the screw **A**, washer **C** and new locking tab washer **B**, secure wheel to drive shaft.


4.




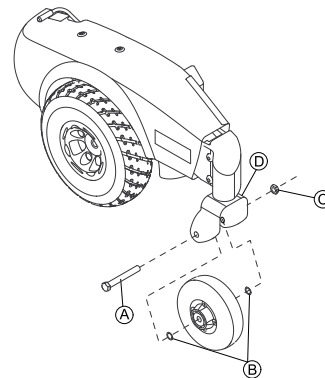
Fold one tab of locking tab washer up so that the tab rests against one side of the mounting bolt.

4.6.2 Replacing the front/rear casters

-  Front and rear casters are replaced in the same manner.


-  When replacing the front/rear casters, it is necessary to brace the caster to prevent spinning.


-  Tools:
- 2 x 5/8" socket wrench

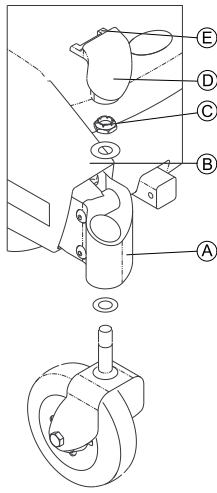


1. Remove the screw **A**, two washers **B** and locknut **C** that secures the caster to the fork **D**.
2. Remove caster and discard.
3. Secure new caster to fork **D** with existing screw **A**, two washers **B** and locknut **C**. Tighten securely.

4.6.3 Adjusting caster assembly

-  Front casters shown. Rear casters adjusted the same way.


-  Tools:
- 15/16" socket wrench
 - Flat screwdriver

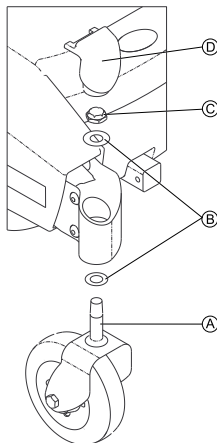


1. Remove the dust cover (D) with a flat screwdriver from steering head (A).
2. To properly tighten caster assembly and guard against flutter, perform the following check:
 - i Two people are recommended to perform this step — one to tip the mobility device back and one to inspect/adjust the caster assembly.
 - a. Tip back the mobility device.
 - b. Pivot both caster assemblies to top of their arc simultaneously.
 - c. Let casters drop to bottom of arc (casters should swing once one-side, then immediately rest in a straight downward position).
 - d. Adjust locknuts (C) according to freedom of caster swing.
3. Test mobility device for maneuverability.
4. Re-adjust locknuts if necessary and repeat Steps 1–3 until correct.
5. Snap dust cover into the caster steering head ensuring that the tabs (E) are under the plastic side cover (B).

4.6.4 Removing/Installing the front/rear caster assembly

i Front and rear caster assemblies are replaced in the same manner.

-  Tools:
- 15/16" socket wrench
 - Flat screwdriver



Removing the caster assembly


1. Remove the dust cover (D) with a flat screwdriver.
2. Remove locknut (C) and washers (B) securing caster assembly to the steering head.
3. Remove caster assembly.

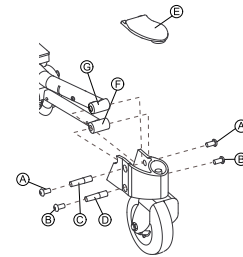
Installing the caster assembly

1. Insert threaded post (A) of caster assembly into steering head.
2. Using washers (B) and locknut (C), secure caster assembly to steering head.
3. Snap dust cover (D) into the steering head ensuring that the tabs are under the plastic cover.

4.6.5 Removing/Installing the steering head assembly

i Take note of position and orientation of steering head and mounting hardware installation.

-  Tools:
- 2 x 7/32" Allen key
 - Flat screwdriver



Remove steering head assembly

1. Remove dust cover (E) with a flat screwdriver.
2. Remove the two top screws (A) and bushing (C) that secure the steering head to the walking beam (G).
3. Remove the two bottom screws (B) and bushing (D) that secure the steering head to the pivot tube (F).
4. Remove the steering head from the walking beam and pivot tube.

Install the steering head assembly

1. Secure the steering head to the pivot tube (F) using the two bottom screws (B) and bushing (D).
2. Secure the steering head to the walking beam (G) using the two top screws (A) and bushing (C).
3. Snap dust cover (E) into the steering head.

4.6.6 Repairing flat tires




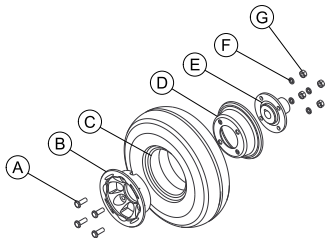
CAUTION!

Risk of explosion

The wheel explodes if the air pressure has not been released from the wheel before the wheel rim is removed.

– Always let all the air out of the tire before removing the rim.

-  Tools:
- 1/2" socket wrench
 - repair kit for tire repair **or** new inner tube
 - talcum powder



1. Remove the drive wheel. Refer to 4.6.1 Removing/Installing the drive wheel, page 17.
2. Let the air escape completely out of the tire by pressing the pin in the center of the valve firmly in.
3. Remove the four screws (A), locknuts (G) and washers (F).
4. Remove the wheel rim halves (B) and (D) from the wheel (C).
5. Remove the inner tube from the wheel.
6. Repair the inner tube and re-fit it, or replace it with a new one.

i If the old inner tube has been repaired and is to be used again, and became wet during repair, it is easier to replace it if it is lightly dusted with talcum powder beforehand.

i Installation takes place in reverse order. Always ensure that the wheel is replaced on the same side and in the same direction as it was removed.

7. Apply the wheel rim halves to the wheel again.

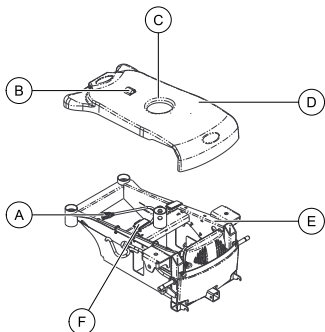
i When installing the outer rim into a pneumatic tire ensure the valve stem of the inner tube protrudes through the stem opening in the outer rim.

8. Insert the hub (E) into the inner rim (D) and align the four mounting holes of the hub and the wheel rim halves. Ensure that the inner tube is not clamped between the wheel rim halves.
9. Ensure that the tire is contacting the wheel rim directly.
10. Secure the outer rim to the inner rim and hub with the screws, washers and locknuts. Tighten the locknuts with 20 Nm ($\pm 10\%$).
11. Inflate the tire to the recommended pressure. Refer to the Technical specifications in the User Manual.
12. Ensure that the tire is still closely contacting the wheel rim.
13. Install the drive wheel. Refer to 4.6.1 Removing/Installing the drive wheel, page 17.

4.7 Covers

4.7.1 Removing/Installing the top cover

i The top cover cannot be completely removed from the mobility device without disconnecting the remote cable.



Removing the top cover

1. Remove the remote cable (A) from the clip (B) of the top cover (D).
2. Remove the top cover by pulling it off the frame (E).

Installing the top cover

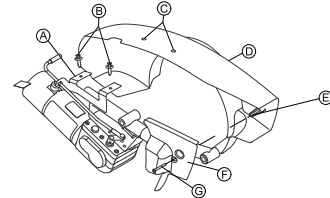
1. Pull the remote cable (A) through the center hole (C) in the top cover.
2. Position the top cover (D) onto the frame (E) and push downward to engage the hook and loop straps (F).
3. Secure the remote cable using the clip (B) on the top cover.

4.7.2 Removing/Installing the side cover



Tools:

- Phillips screwdriver



Removing the side cover

1. Remove the two screws (B) securing the side cover (D) to the frame (A).
2. Remove the screw (G) securing the inner cover (F) to the side cover.
3. Remove the side cover from the frame.

Installing the side cover

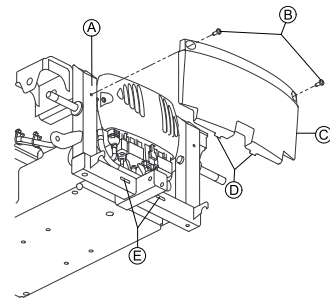
1. Position the side cover (D) onto the frame (A).
2. Align the cover mounting holes (C) with the mounting holes in the frame.
3. Secure the side cover to the frame using the two screws (B). Do not overtighten.
4. Align the mounting hole in the inner cover (F) with the mounting hole (E) in the side cover.
5. Secure inner cover and side cover with the screw (G).

4.7.3 Removing/Installing the front cover



Tools:

- Phillips screwdriver




Removing the front cover

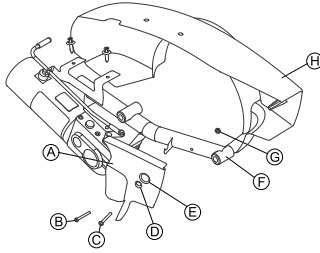
1. Remove the two screws (B) securing the top of the front cover (C) to the frame (A).
2. Remove the front cover from the frame.

Installing the front cover

1. Insert the tabs at the bottom (D) of the front cover (C) into the slots (E) in the bottom of the frame (A).
2. Secure the top of the front cover to the frame using the two screws (B). Do not overtighten.

4.7.4 Removing/Installing the inner cover

-  Tools:
- Phillips screwdriver
 - 3/8" socket wrench



Removing the inner cover


1. Remove the walking beam **F**. Refer to 4.8.3 Removing/Installing the walking beam, page 20.
2. Remove the large screw **C** and locknut **G** securing the inner cover **A** to the walking beam.
3. Remove the small screw **B** securing the inner cover to the side cover **H** (if present).
4. Remove the inner cover.

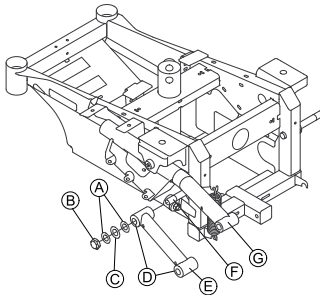
Installing the inner cover

1. Position the inner cover **A** on the walking beam **F**.
2. Use the small screw **B** and the small mounting hole **D** to secure the inner cover to the side cover **H**. Do not overtighten.
3. Insert the large screw **C** through the large mounting hole **E** in the inner cover and the walking beam.
4. Use the locknut **G** to secure the inner cover to the walking beam. Do not overtighten.
5. Install the walking beam. Refer to 4.8.3 Removing/Installing the walking beam, page 20.

4.8 Frames


4.8.1 Removing/Installing the pivot tube

-  Tools:
- 3/4" socket wrench




Removing the pivot tube

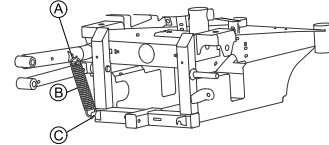
1. Remove the front steering head assembly. Refer to 4.6.5 Removing/Installing the steering head assembly, page 18.
2. Remove the side cover. Refer to 4.7.2 Removing/Installing the side cover, page 19.
3. Remove the locknut **B**, two small washers **A** and the large washer **C** securing the rear of the pivot tube **E** to the pivot post **F**.
4. Remove the pivot tube from the frame.

 The front and rear bushings may fall out of the pivot tube when it is removed. Retain these for installation.

Installing the pivot tube

1. If necessary, insert the bushings **D** into each end of the pivot tube.
2. Position the pivot tube **E** onto the pivot post **F**.
 -  Ensure the opposite end of the pivot tube is parallel to the end of the walking beam. If necessary, reposition the pivot tube.
3. Secure the end of the pivot tube to the pivot post using the two small washers **A**, the large washer **C** and the locknut **B**. Torque with 10 Nm.
4. Install the front steering head assembly. Refer to 4.6.5 Removing/Installing the steering head assembly, page 18.

4.8.2 Removing/Installing the SureStep spring




Removing the SureStep spring

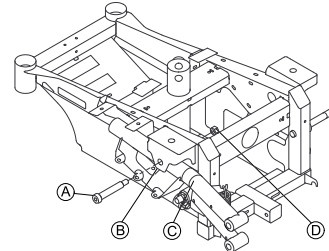
1. Unhook the SureStep spring **B** from the hooks on the walking beam **A** and frame **C**.

Installing the SureStep spring

1. Position the SureStep spring **B** on the hook of the frame **C**.
2. Position the top of the SureStep spring onto the hook on the walking beam **A**.

4.8.3 Removing/Installing the walking beam

-  Tools:
- 1/4" Allen key
 - 9/16" socket wrench



Removing the walking beam

1. Remove the front steering head assembly. Refer to 4.6.5 Removing/Installing the steering head assembly, page 18.
2. Remove the SureStep spring. Refer to 4.8.2 Removing/Installing the SureStep spring, page 20.
3. Remove the screw **A** and locknut **D** securing the walking beam **C** to the frame bracket **B**.
4. Remove the walking beam from the frame.

Installing the walking beam

1. Position the walking beam **C** into the frame bracket **B**.
2. Secure the walking beam to the frame using the screw **A** and the locknut **D**. Torque with 31 Nm.
3. Install the SureStep spring. Refer to 4.8.2 Removing/Installing the SureStep spring, page 20.
4. Install the front steering head assembly. Refer to 4.6.5 Removing/Installing the steering head assembly, page 18.

4.9 Center-mounted footboard



WARNING!

After any adjustments, repair or service and before use, make sure that all attaching hardware is tightened securely - otherwise injury or damage may result.

- Before performing any maintenance, adjustment or service verify that on/off switch on the joystick is in the off position.
- DO NOT stand on the flip-up footboard. When getting in or out of the wheelchair, make sure that the flip-up footboard is in the upward position.



WARNING!

Limited clearance between footboard and caster

- The user's feet MUST remain centered on the footboard, away from the footboard sides, while operating the wheelchair. If the user's feet are allowed to rest off the side of the footboard they may come in contact with the caster possibly resulting in injury.

4.9.1 Removing/Installing the footboard assembly



WARNING!

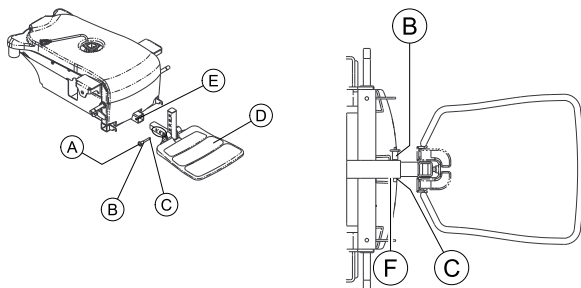
Pinch point may occur when adjusting the footboard



WARNING!

Make sure the detent balls of the quick-release pin are fully released beyond the outer edge of the tube before operating the mobility device. Otherwise, injury and/or damage may result.

- Keep detent balls clean.



Detail "A"

Removing

1. Remove the quick release pin (B) that secures the footboard assembly (D) to the frame by depressing the button (A) while sliding the pin out.
2. Remove the footboard assembly from the frame (E).

Installing

1. Position the footboard assembly onto the frame so that the mounting hole (E) in the frame aligns with the desired mounting hole in the footboard assembly.
2. Install the quick release pin (B) by depressing the button (A) while sliding the pin in. Ensure that the detent balls (C) are engaged with the outer edge of the tube (F) (Detail "A").

4.10 Vari-A legrests

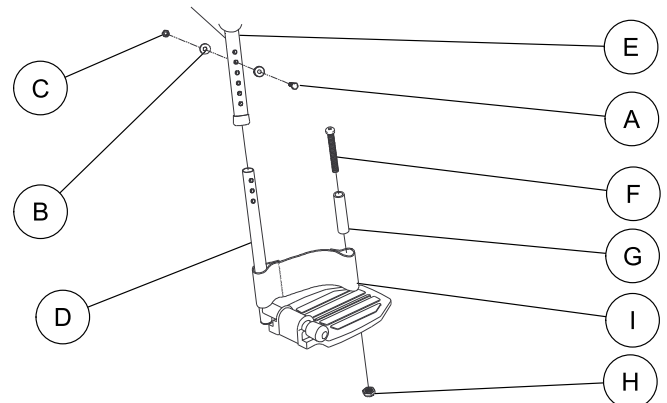
4.10.1 Swivelling the footrest/legrest outward and/or removing

The small unlocking button is located on the upper section of the footrest/legrest. When the footrest/legrest is unlocked, it can be swivelled inward or outward when getting into the wheelchair as well as being removed completely.



1. Press the unlocking button (1) and swivel the footrest/legrest outward.
2. Remove the footrest/legrest in an upward direction.

4.10.2 Replacing Heel Loops



1. Note the position of hex bolt (A), coved washers (B) and locknut (C) for reinstallation.
2. Remove the hex bolt, coved washers and locknut that secure the lower footrest (D) to the footrest support (E).
3. Remove the lower footrest.
4. Remove the Phillips bolt (F), spacer (G) and locknut (H) that secure the existing heel loop (I) to the lower footrest.
5. Slide the existing heel loop off the lower footrest.
6. Replace heel loop.
7. Reverse STEPS 1-6 to reassemble.



When securing heel loop to lower footrest, tighten the Phillips screw and locknut until the spacer is secure.

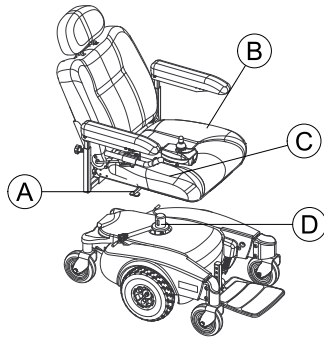
4.11 Removing/Installing the seat



CAUTION!

Risk of strains from lifting heavy parts!

- Use proper lifting techniques.



Removing the seat

1. Pull the detent lever (A) up and turn the seat to one side. Prevent the seat from engaging with the seat post again.
2. Release the detent lever.
3. Hold the seat assembly (B) firmly by the backrest and front edge of the seat.
4. Lift the seat assembly up and away from the seat post (D).

Installing the seat

1. Align the seat pivot (C, hidden from view) with the seat post (D).
2. Pull the detent lever (A) up and lower the seat assembly (B) on the seat post. If necessary, slightly twist seat assembly back and forth to lock it in place.
3. Release the detent lever.
4. Pull the seat assembly up to ensure that it is locked in place.

4.12 Removing/Installing the lifter actuator

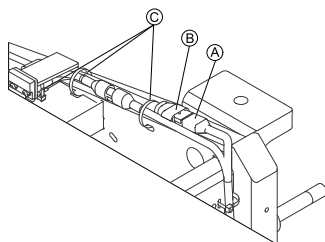


Tools:

- diagonal pliers
- 7/16" socket wrench
- 3/16" Allen key
- Phillips screwdriver

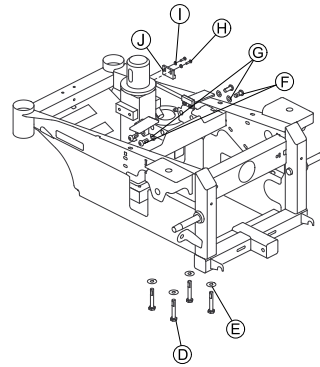
Removing the lifter actuator

1. Remove the seat. Refer to 4.11 Removing/Installing the seat, page 21.
2. Remove the batteries. Refer to 4.3.1 Removing/Installing the batteries, page 11.
3. Disconnect the actuator connector (B) from the controller connector (A).
- 4.



Cut the three tie-wraps (C) securing the actuator cable to the frame.

5.



Remove the four screws (D) and washers (E) securing the lifter actuator to the bottom of the frame.

6. Remove the four screws (F) and washers (G) securing the lifter actuator to the top of the frame.
7. Remove the two screws (H) and small washers (I) securing the actuator switch sensor (J) to the lifter actuator.
8. Remove the lifter actuator.

Installing the lifter actuator

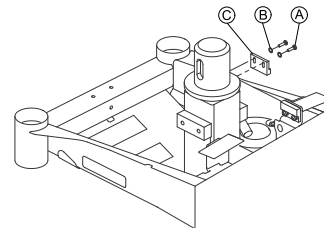
1. Secure the actuator switch sensor (J) to the lifter actuator using the two screws (H) and the small washers (I). Tighten securely.
2. Secure the lifter actuator to the top of the frame using the four screws (F) and washers (G). Torque to 8.5 Nm.
3. Secure the lifter actuator to the bottom of the frame using the four screws (D) and washers (E). Torque to 8.5 Nm.
4. Connect the actuator connector (B) to the controller connector (A).
5. Secure the cables to the frame using three tie-wraps in the locations (C).
6. Install the batteries. Refer to 4.3.1 Removing/Installing the batteries, page 11.
7. Install the seat. Refer to 4.11 Removing/Installing the seat, page 21.

4.12.1 Removing/Installing the actuator switch sensor



Tools:

- Phillips screwdriver



Removing the actuator switch sensor


1. Elevate the seat.
2. Remove the seat. Refer to 4.11 Removing/Installing the seat, page 21.
3. Remove the batteries. Refer to 4.3.1 Removing/Installing the batteries, page 11.
4. Remove the two screws (A) and small washers (B) securing the actuator switch sensor (C) to the elevating actuator.

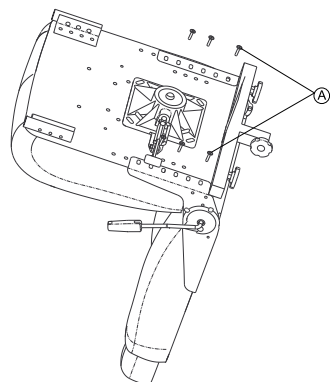
Installing the actuator switch sensor

1. Secure the actuator switch sensor (C) to the elevating actuator using the two screws (A) and the small washers (B). Tighten securely.
2. Install the batteries. Refer to 4.3.1 Removing/Installing the batteries, page 11.
3. Install the seat. Refer to 4.11 Removing/Installing the seat, page 21.

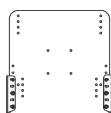
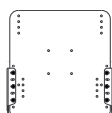
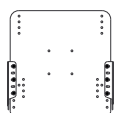
5 Settings and Adjustments

5.1 Adjusting the seat depth

-  Tools:
- 5/32" Allen key



Min. seat depth: 16 inch (550 mm)	Middle seat depth: 17 inch (562,5 mm)	Max. seat depth: 18 inch (575 mm)
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Detail "A"


1. Remove the seat. Refer to 4.11 Removing/Installing the seat, page 21.
2. Remove the six screws (A) located under the seat that secure the seat back assembly in place.
3. Adjust seat back assembly to desired position (Detail "A") and reinstall the six screws. Tighten securely.
4. Reinstall the seat base onto the seat assembly. Refer to 5.3 Adjusting seat position on seat base, page 23.
5. Reinstall the seat. Refer to 4.11 Removing/Installing the seat, page 21

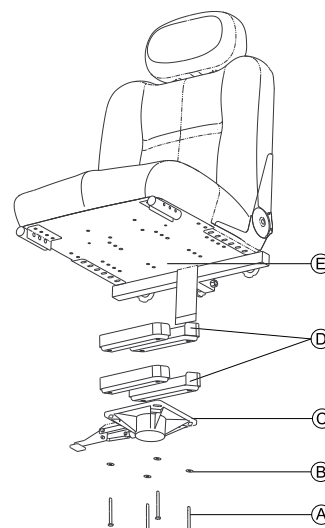
5.2 Adjusting the seat height




CAUTION!

– Spacers should be placed in orientation shown, otherwise they will interfere with the seat lever.

-  Tools:
- 7/16" socket wrench




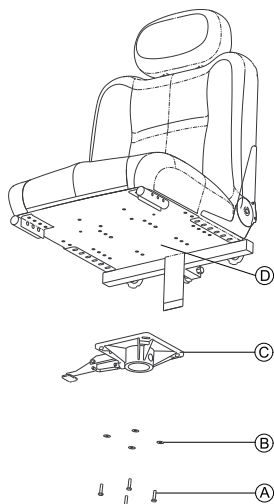
1. Remove the seat. Refer to 4.11 Removing/Installing the seat, page 21.
2. Remove the four screws (A) and washers (B) securing the seat pivot (C) and four 1-inch adjustment spacers (D) to the seat base (E).
3. To reduce seat height by one inch: Remove one set of 1-inch adjustment spacers to achieve desired height.
4. To reduce seat height by two inches: Remove both sets of 1-inch adjustment spacers to achieve desired height.
5.
 -  The seat comes installed with four 1-inch spacers secured by 3 1/2-inch screws. 1-inch and 2 1/2-inch screws are supplied with the seat.

For seat height reduced by one inch:

- a. Align the mounting holes on the seat pivot with the mounting holes on one pair of the adjustment spacers and the seat base.
 - b. Install the seat adapter to seat base using the 2 1/2-inch screws and existing washers. Tighten securely.
6. For seat height reduced by two inches:
 - a. Align the mounting holes on the seat pivot with the mounting holes on the seat base.
 - b. Install the seat adapter to the seat base using the 1-inch screws and existing washers. Tighten securely.
 7. Reinstall the seat. Refer to 4.11 Removing/Installing the seat, page 21.

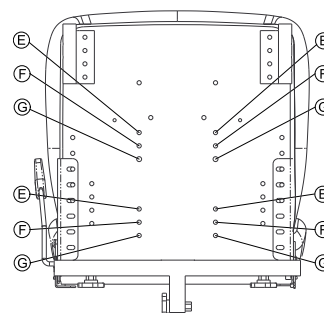
5.3 Adjusting seat position on seat base

-  Tools:
- 7/16" socket wrench



1. Remove the seat. Refer to 4.11 Removing/Installing the seat, page 21.
2. Remove the four screws (A) and washers (B) securing the seat pivot (C) to the seat base (D).
3. Separate the seat pivot from the seat base.

4.



Align the mounting holes on the seat pivot with the mounting holes on the seat base, that achieve the desired seat position.

- 1-Inch back seat position (E)
- Standard seat position (F)
- 1-Inch forward seat position (G)



WARNING!

Risk of injury or damage

If the seat position is not adjusted to the users weight, the mobility device may tip over.

- For users from 68 kg to 100 kg do not use the 1-Inch forward seat position (G).
- For users over 100 kg do not use the 1-Inch forward seat position (G) or the standard seat position (F).

5. Using the four screws and washers to secure the seat pivot to the seat base. Tighten securely.
6. Reinstall the seat. Refer to 4.11 Removing/Installing the seat, page 21.

6 Accessories

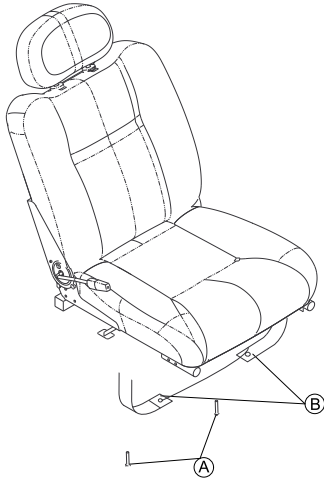
6.1 Replacing the postural belt



Tools:

- 5/32" Allen key
-

1. Remove the two screws **A** securing the postural belt **B** to the seat frame.
2. Remove the two halves of the postural belt from the rear seat frame.
3. Reposition the two new postural belt halves underneath seat rails.
4. Reinstall the two screws that secure the postural belt to the seat frame. Tighten securely.



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