



Invacare® Ultra Low Maxx by Motion Concepts

Supplement to power wheelchair service manual

en **Modular Power Positioning System
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 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.3 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:



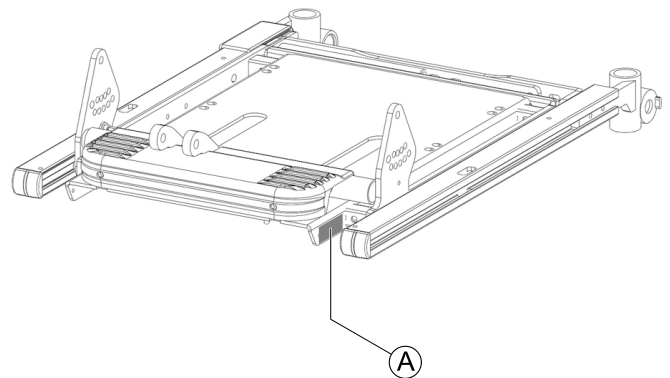
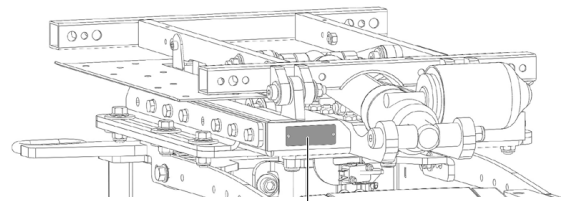
This symbol identifies a list of various tools, components and items which you will need in order to carry out certain work. Please do not attempt to carry out the work if you do not have the listed tools available.

I.4 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.

I.5 System Identification

Each Motion Concepts seating system is identified by a unique serial number, which allows us to trace the production history of the system and better equips us to address any service issues that may occur over the lifetime of the product. The location of the serial number identification plate varies depending on the type of positioning system installed. There are two possible mounting locations as indicated in the images below.



I.6 Abbreviations

Abbreviation		Meaning
CG	=	Center of Gravity
DLO	=	Drive Lockout
ESR	=	Enhanced Shear Reduction
PES	=	Power Elevating Seat
PPS	=	Power Positioning System
STF	=	Seat-To-Floor Height

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 jacking 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 Service

3.1 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 ±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

3.2 System Review Checklist



Following any installation, set-up and/or adjustment related to the seating system always test the system over its full range of positioning functions to ensure all motors, safety limits are functioning correctly. Verify that all mounting hardware and critical components are also installed/adjusted properly.

The following checklist is provided as a reference when conducting a final review/inspection of the wheelchair.

- Check all fasteners/mounting hardware to ensure that they have been properly tightened.
- Check the drive lockout limit is functioning.
- Check the reduced speed drive (if applicable)
- Check the tilt (tilt/recline) limit (if applicable).
- Check the full range of tilt and recline and elevate (as applicable). Make certain that there is no interference. Make sure that the wheelchair is stable with the client in it over the entire range.
- Check power legrest function (if applicable). Ensure there is appropriate ground clearance in the retracted position, and check for interference over the full range of travel.
- Check all wires and cables over the complete tilt/recline/elevate range for pulling, crushing or tight bends.
- Check that the charger functions properly.
- Check that the acceleration and deceleration of the wheelchair have been programmed to levels appropriate for the user.
- Check all of the wheelchair drive functions.
- Check that the rod-ends on the tilt and recline actuators have been properly pinned (if applicable).
- Check the anti-tipper latching system (if applicable).
- Check that the anti-tipper extensions are installed (if required).
- If the front or rear anti-tippers are adjustable, check that they have been set to the appropriate position for the user.
- Test drive the wheelchair and operate the seating system.
- Ensure the user manual is provided to the end user.


3.3 Inspection checklist

Item	Initially	Monthly	6 Months	Periodically
Batteries				
Load test batteries (individually)	X		X	
Ensure batteries are clean (free from corrosion/ moisture/ dirt)	X		X	
Ensure connections are tight and clean	X		X	
Electrical / Wiring Harnesses				
Check for pinches or pulls in wiring (over full range of seating system)	X	X		
Inspect for wear & tear damage to wires	X	X		
Ensure connections are secure	X	X		
Actuators (where applicable)				
Ensure actuator rod ends are properly pinned	X		X	
Ensure no interference/sticking during system operation (over full range of seating system)	X			X
Inspect for excessive noise or grinding	X			X
Hardware and Components				
Inspect mounting hardware (seating system to base)	X	X		
Inspect all adjustment hardware to ensure nuts and screws are secure (i.e. side rails, recline module, legrests/foot plates/receivers)	X			X
Inspect for loose parts/rattling sounds - ensure all nuts and screws are secure	X			X
Inspect that all pivot points are operating smoothly & freely and secured (do not overtighten)	X			X

Item	Initially	Monthly	6 Months	Periodically
Limit Switches				
Check limit switch settings	X	X		
Ensure DLO functions correctly	X	X		
Pivots, Glide Blocks & Track Maintenance				
Ensure slide channel is free from dirt/dust/grime	X			X
Lightly lubricate main pivot points, using a general purpose oil (see 3.4 Lubrication, page 7)				X

3.4 Lubrication

To maintain the smooth operation of the power positioning system (PPS), periodical lubrication of the main pivot points is recommended. Motion Concepts seating systems are pre-lubricated at the factory, however occasional lubrication using a general purpose oil will help to maintain optimal performance of your seating system.

-  Avoid the use of heavy grease or high viscosity lubricants as this can cause a build-up of dirt and contaminates which could reduce overall performance.

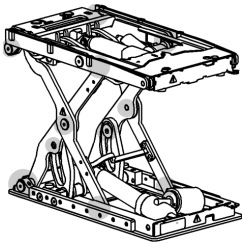


CAUTION!

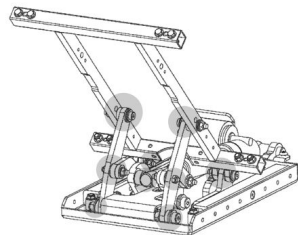
Risk of injury and damage to the wheelchair

- Turn power off to the wheelchair prior to cleaning and lubricating.

Pivot point lubrication



Lifter module



Tilt module


1. Tilt/Elevate the seating system.
2. Use a clean rag to wipe away any dirt, residue around pivots and along slide channels.
3. Lubricate main pivot points (as indicated) on the module periodically using a general purpose oil.

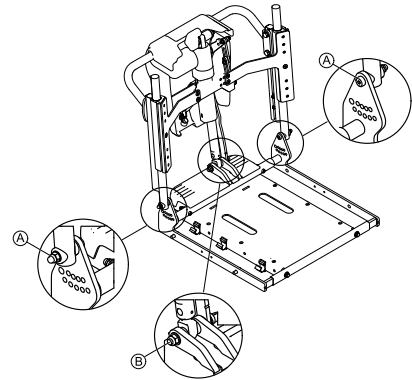
3.5 Replacing powered backrest



Tools:

- 5 mm Allen key
- 6 mm Allen key
- 10 mm open-ended spanner
- 13 mm open-ended spanner

-  When disassembling, take care of small parts such as screws and washers. Put all small parts down so that they can be reassembled in the right sequence.



Removing backrest

1. Remove the seat pan and disconnect the power cable from the base.
2. Remove screws from the backrest tube brackets (A) and the actuator bracket (B).
3. Remove the backrest.

Installing backrest

1. Align the holes of the powered backrest tubes with the upper mounting holes in the tube brackets (A) and secure with hardware as shown.
2. Align the lower ends of backrest actuator and ESR link with the actuator bracket (B) and secure with hardware as shown.

3.6 Replacing backrest actuator



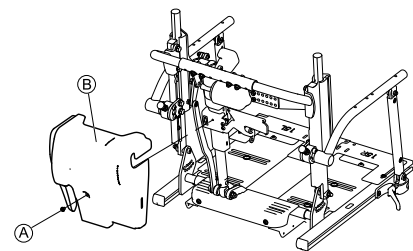
Tools:

- 3 mm Allen key
- Phillips screwdriver
- 6 mm Allen key
- 13 mm open-ended spanner



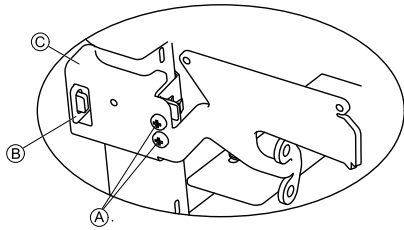
When disassembling, take care of small parts such as screws and washers. Put all small parts down so that they can be reassembled in the right sequence.

1. Remove the seat pan and disconnect the power cable from the base.
- 2.



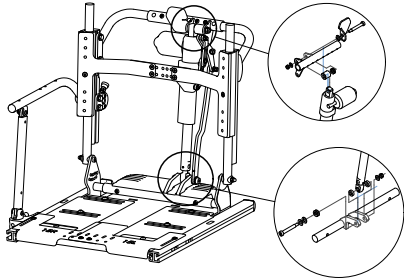
Remove screw (A) and backrest cover (B).

3.



Remove screws (A), unhook clamp strap (B), and remove clamp (C).

4.



Remove screws from the actuator brackets.

5. Remove actuator.

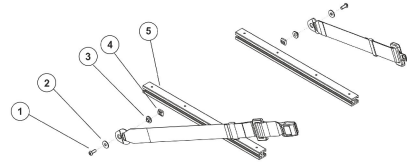
6. Align ends of new actuator with actuator brackets and secure with hardware as shown above.
7. Connect actuator to power module.
8. Install seat pan.

3.7 Replacing postural belt



Tools:

- 5 mm Allen key



1. Loosen the screw (1) with a 5 mm Allen key.
2. Remove the screw (1), the washer (2), the postural belt, the sliding bushing (3) and the sliding block (4) from the seat frame profile (5).
3. Replace the postural belt.
4. Refit the parts in the reverse order.

4 Settings and Adjustments

4.1 Removing/Installing seat



CAUTION!

Risk of strains from lifting heavy parts!

– Use proper lifting techniques.

Depending on whether you have a tilt module or lifter/tilt-module installed or not, there are two ways to remove and install the seat:

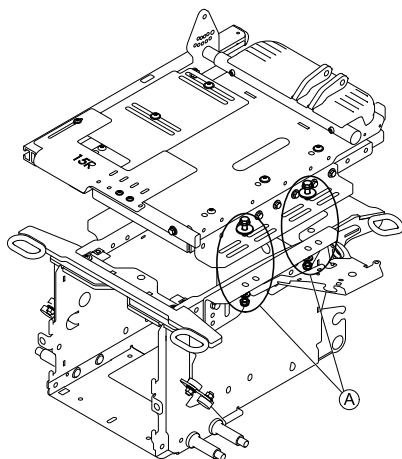
- With the seat installed directly on the seat frame.
- With the seat installed on a module or tilt wedge.

Removing seat from seat frame



Tools:

- 2 x 13 mm open-ended spanner



1. Remove screws and washers (A) on both sides.
2. Remove seat.



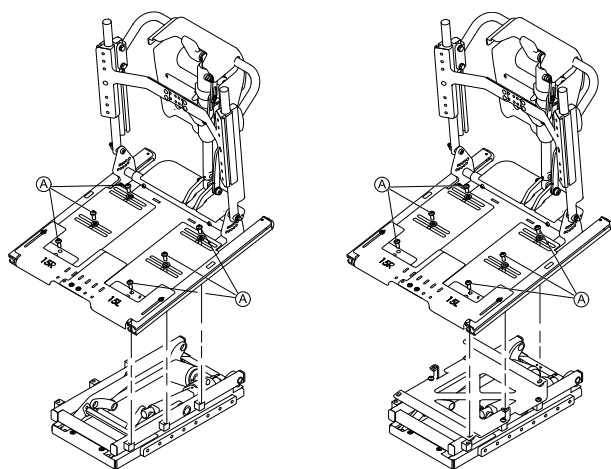
Installing seat takes place in reverse order. We recommend to use new Nyloc nuts to ensure safe locking.

Removing seat from module or tilt wedge



Tools:

- 6 mm Allen key



Example of tilt module

Example of anterior tilt wedge

1. Remove screws and washers (A) on both sides.
2. Remove seat.



Installing seat takes place in reverse order.

4.2 Removing/Installing tilt module / lifter/tilt module

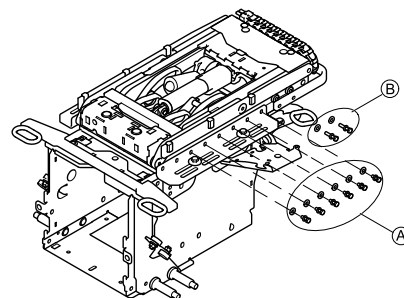


Tools:

- 10 mm open-ended spanner

Removing module

1. Remove seat. Refer to 4.1 Removing/Installing seat, page 9.
2. If a tilt wedge is installed, remove it. Refer to 4.6 Setting pre-tilt, page 11.
- 3.



Remove screws and washers (A).

4. Remove module.
5. If a rear wiring bumper is installed, remove its screws and washers (B).
6. Remove bumper from module.

Installing module

1. Align module to correct depth.
2. Insert screws and washers and tighten.
3. If needed, align rear wiring bumper.
4. Insert screws and washers and tighten.
5. If needed, align tilt wedge with holes on module and in the desired orientation and install.
6. Align seat with holes on tilt wedge or module and install.

4.3 Seat depth adjustment



The seat depth has a major influence on the selection of the center of gravity of the seat. This impacts its dynamic stability. If you make a major change to the seat depth, the center of gravity of the seat must also be adjusted. Refer to 4.14 Center of Gravity (CG) Adjustments (forward and aft), page 15.



Seat depth adjustments will often require further adjustments to the legrest(s) and/or legrest receivers to compensate for the change in seat depth.

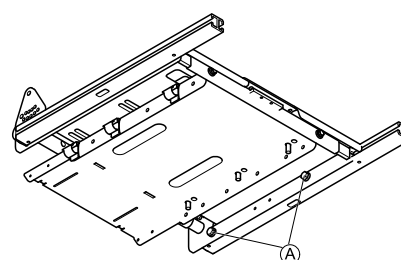


Seat depths of 530 mm and larger will require a seat depth extension kit.



Tools:

- 13 mm wrench



1. Tilt or lift seat for easier access.
2. Loosen screws of side rails (A) — two on each side.
3. Adjust side rails to desired depth.
4. Tighten screws.

4.4 Adjusting seat width and backrest width

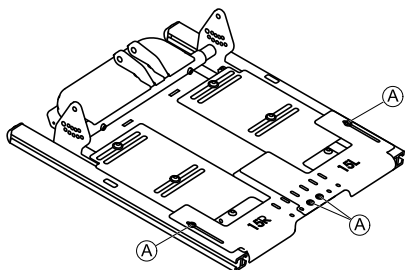
i Seat width adjustments are more complex than depth adjustments and require additional adjustments/changes to the seat frame and backrest assembly.

The Ultra Low Maxx seat frames are available in two width ranges to accommodate a wide range of seat sizes from 405 mm up to 610 mm.

The Ultra Low seat side frames are used to adjust the width of the seating system. Side frames are adjustable at 12.5 mm intervals per side (left/right), which allow for 25 mm incremental width adjustments up to a maximum range of 75 mm.

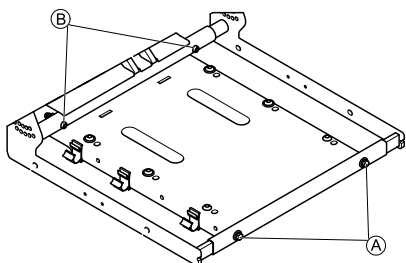
- i** Tools:
- 3 mm Allen key
 - 5 mm Allen key
 - 6 mm Allen key
 - 10 mm wrench

1.



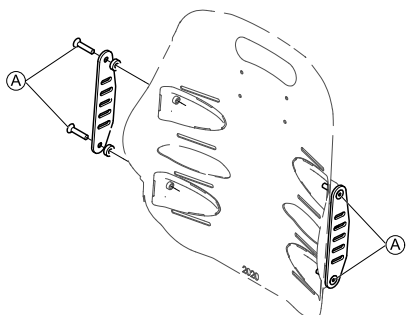
Loosen and remove screws of front seat pans (A).

2. Remove front seat pans.
- 3.



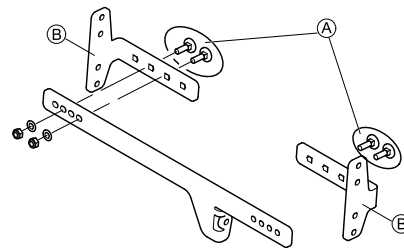
On each side, loosen and remove screws of side frame parts fore (A) and aft (B).

4.



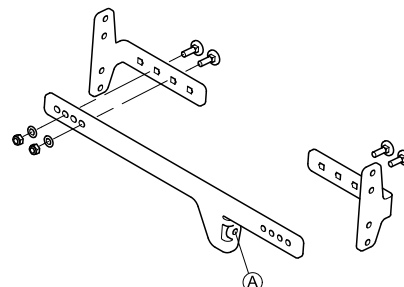
Remove screws (A). Remove backrest pan.

5.



Remove screws (A). Adjust brackets (B) to desired width.

6.



If necessary, remove screw (A) and replace cross plate.

- i** The cross plate is available in two widths:
- 405–505 mm
 - 505–610 mm

7. Reassemble brackets.
8. Install backrest pan in new width.
9. Adjust side frames to desired width.

i Make sure that both sides are set to the same width.

10. Insert screws and tighten.
11. Reinstall front seat pans and adjust to new seat width.
12. Insert screws and tighten.

4.5 Adjusting seat height

- i** Tools:
- 13 mm open-ended spanner

	Seat height 420 mm (only in combination with 8.5° anterior tilt)	
Low interface bracket	Seat height 440 mm	
	Seat height 460 mm	
High interface bracket	Seat height 480 mm	

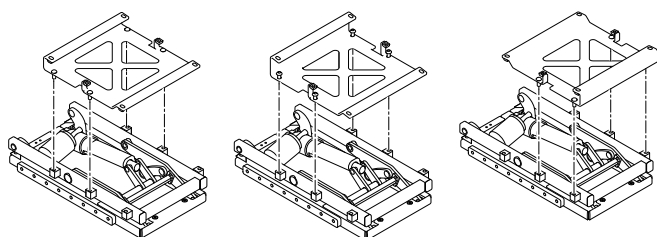
1. Remove seat. Refer to 4.1 Removing/Installing seat, page 9 .
2. Remove tilt module or lifter/tilt module. Refer to 4.2 Removing/Installing tilt module / lifter/tilt module, page 9 .
3. Loosen and remove screws (A).
4. Adjust bracket to desired height. See graphics above. Switch to other bracket size if needed.
5. Insert and tighten screws.
6. Install tilt module or lifter/tilt module and seat.

4.6 Setting pre-tilt

The seating system can be set to a predefined anterior or posterior tilt:

- 5° anterior tilt which reduces the maximum possible tilt by 5°
- 10° anterior tilt which reduces the maximum possible tilt by 10°
- 5° posterior tilt which increases the maximum possible tilt by 5°

Orientation of tilt wedge



5° anterior tilt

10° anterior tilt

5° posterior tilt

Setting the tilt



CAUTION!
Risk of strains from lifting heavy parts!
 – Use proper lifting techniques.



Tools:
 • 6 mm Allen key

1. Remove seat. Refer to 4.1 Removing/Installing seat, page 9 .
2. Align tilt wedge with holes on module and in the desired orientation. See graphics above.
3. Insert screws and tighten.
4. Align seat with holes on tilt wedge and install.

4.7 Adjusting backrest height

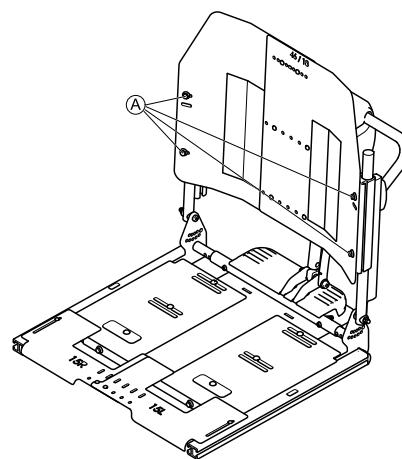
The backrest pans are available in different heights. In addition, the overall height can be adjusted by adjusting the gap between backrest pan and seat.

High Back



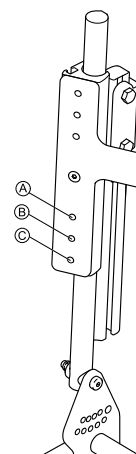
Tools:
 • 10 mm wrench

1.



Remove screws and washers (A).

2.



Align bottom hole of backrest pan to hole of desired height on backrest tube:

- (A) = 200 mm gap
- (B) = 175 mm gap
- (C) = 150 mm gap

3. Insert screws and washers and tighten.

Matrx

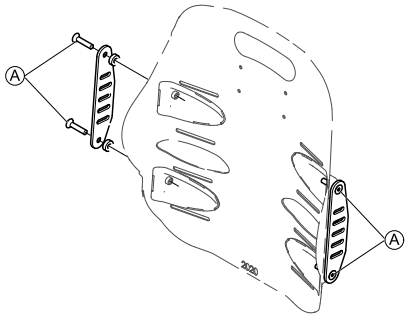


The Matrx Elite TR Back shown in this section serves as an example. Matrx Elite Deep Back and Matrx Posture Back are adjusted the same way.



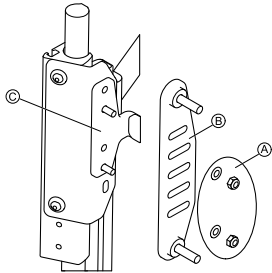
Tools:
 • 5 mm Allen key
 • 6 mm Allen key
 • 10 mm wrench

1.



Remove screws **A**. Remove backrest pan.

2.



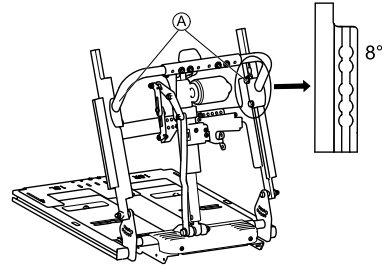
Remove nuts and washers **A** and adjust hanger plate **B** to desired gap height. If necessary, also adjust side plate **C**. See graphics below for details on how to combine hanger plate and side plate for which gap height.

Gap Height	Screw Position Side Plate	Screw Position Hanger Plate
150 mm		
175 mm		
200 mm		

4.8 Adjusting backrest precline angle

Adjusting backrest angle to 8° precline

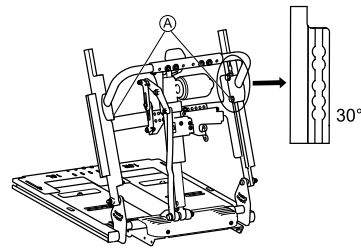
- Tools:
- 13 mm wrench



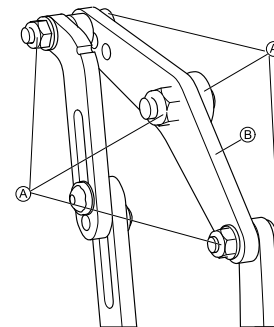
1. Remove top screws and washers **A**.
2. Adjust thick 6.35 mm (0.25") washer inside backrest tube to top hole. Align with top hole of pushbar. See detail in graphic.
3. Insert screws and washers and tighten.

Adjusting backrest angle to 30° precline

- Tools:
- 5 mm Allen key
 - 6 mm Allen key
 - 10 mm wrench
 - 13 mm wrench



1. Remove screws and washers **A**.
2. Adjust thick 6.35 mm (0.25") washer inside backrest tube to bottom hole. Align with bottom hole of pushbar. See detail in graphic.
3. Insert screws and washers and tighten.
- 4.

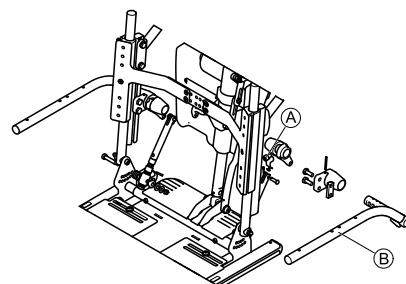


- Remove screws, washers and nuts **A**.
5. Replace ESR crankarm **B** with precline ESR crankarm.
 6. Insert screws, washers and nuts and tighten.

4.9 Adjusting cantilever flip-back armrest


Adjust armrest width

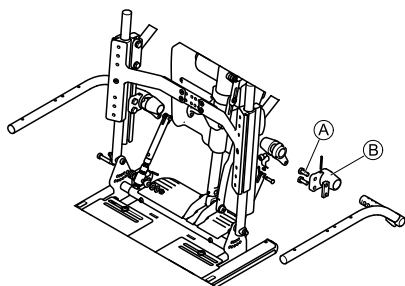
- Tools:
- 6 mm Allen key



1. Remove screw **A**.
2. Adjust armrest **B** to desired width.
3. Insert and tighten screw.


Adjust armrest height

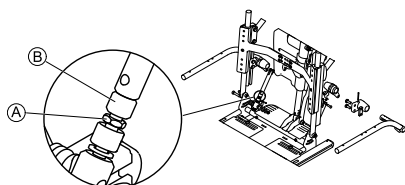
-  Tools:
- 13 mm open-ended spanner



1. Loosen screws **A**.
2. Adjust armrest **B** to desired height.
3. Tighten screws.

Adjust armrest angle


-  Tools:
- 13 mm open-ended spanner

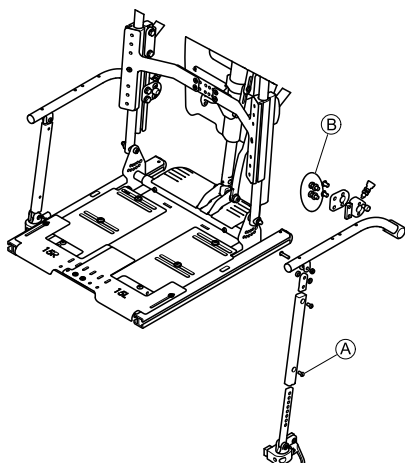


1. Loosen lock nut **A**.
2. Adjust armrest angle by adjusting thread rod with thumb nut **B**:
 - To lift armrest, screw in thread rod.
 - To lower armrest, screw out thread rod.
3. Tighten lock nut.

4.10 Adjusting recline armrest

The standard recline armrest has an adjustable pivot arm to allow height adjustments in 13 mm increments.

-  Tools:
- 5 mm Allen key
 - 13 mm open-ended spanner



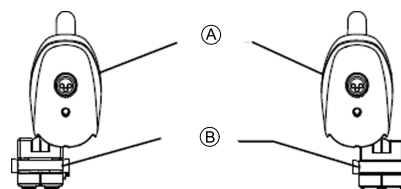
1. Remove screw **A** and slide the inner pivot arm up/down to the desired height.
2. Reinstall screw.

3. To adjust the armrest receiver assembly to match the height adjustment of the pivot arm assembly, loosen the two screws **B** on the inside of the armrest receiver and slide the armrest receiver up/down the recline tube to the desired height.
4. Retighten screws.

4.11 Adjusting QuadLink

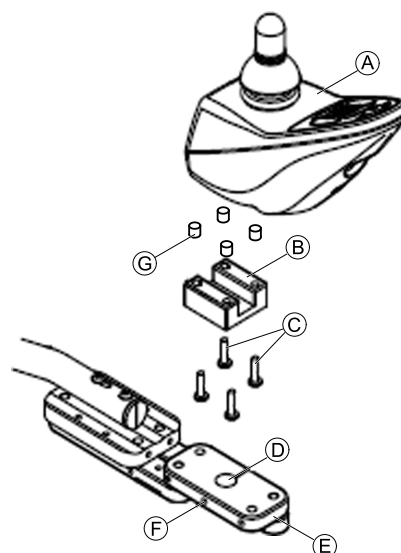
4.11.1 Installing remote onto Quad Link

By default, the remote is mounted centered regardless of which side of the wheelchair the remote is mounted on. The position of the remote **A** on the adjustable remote tray **B** can nevertheless be adapted as shown below:



Right Mount Front View (For Right Hand Use)


Left Mount Front View (For Left Hand Use)



1. If necessary, remove the adjustable remote tray from the Quad Link by performing the following steps:
 - a. Loosen the two cap screws **F** securing the adjustable remote tray **B** to the Quad Link **E**.
 - b. Remove the adjustable remote tray from the Quad Link.
2. Secure the remote to the adjustable remote tray using the four screws **C** and four spacers **G**. Torque the screws to 3.6 Nm.
3. Insert the adjustable remote tray into large hole **D** in the Quad Link.
4. Adjust the adjustable remote tray to the desired position. Refer to Adjusting the remote position in the user manual.
5. Secure the remote cable. Refer to 4.11.3 Securing the remote cable, page 14.

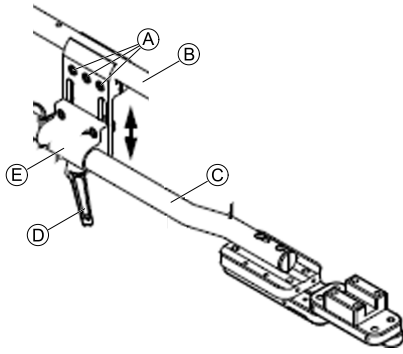
4.11.2 Reversing the mounting position

Perform this procedure to reverse the Quad Link from the right side to the left or vice-versa.

-  Take note of position and orientation of mounting hardware for reinstalling the remote assembly (remote mount, Quad Link and remote).

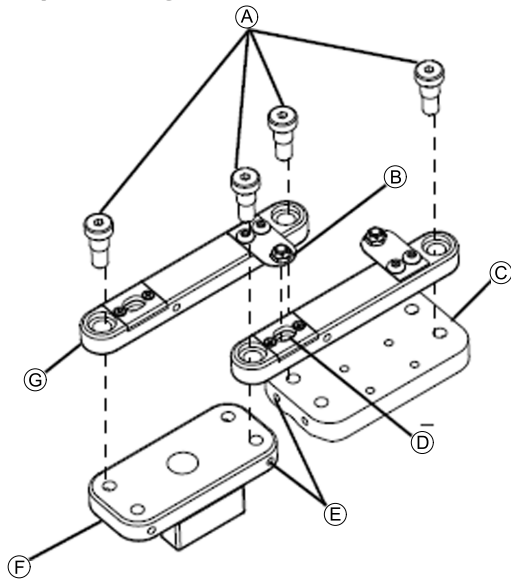
Repositioning the remote mount

This procedure applies to both fixed and adjustable height remote mounts.



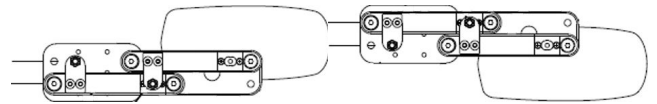
1. Turn the adjustment lock lever **D** to remove the remote mounting tube **C** from the remote mount **E**.
2. Loosen the three upper set screws **A** securing the remote mount to the arm tube **B**.
3. Remove the remote mount.
4. Install the remote mount onto the opposite arm tube.
5. Tighten the three upper set screws to secure the remote mount to the arm tube.
6. Install the remote mounting tube into the remote mount.
7. Turn the adjustment lock lever to secure the remote mounting tube at the desired position.

Repositioning the Quad Link



1. Remove the four set screws **E** securing the four shoulder screws **A** to the Quad Link.
 - i** Each corner mounting hole in the front **F** or rear **C** portion of the Quad Link has a corresponding set screw mounting hole. The set screw mounting hole will be along the edge of the Quad Link near the corners.
2. Remove the four shoulder screws securing the linkage bars **G** to the front and rear portions of the Quad Link.
 - i** The linkage bars will disconnect from each other and the Quad Link.

3.



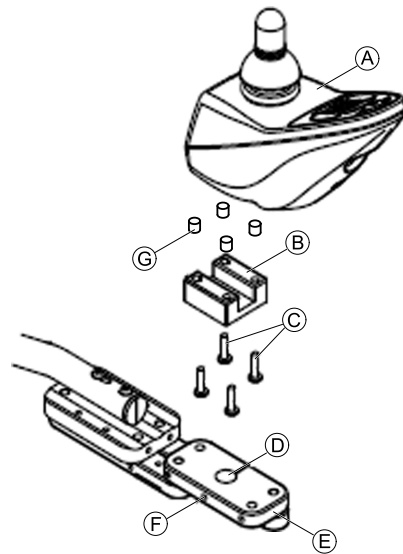
Left Mount

Right Mount

Rearrange the linkage bars to the desired position shown above.

- i** The linkage bars will align to a different set of mounting holes than the ones previously used.
- Ensure the tab is aligned with a tab mounting hole (see upper graphic).
4. Secure the linkage bars to the front and rear portions of the Quad Link using the four shoulder screws.
 5. Secure the four shoulder screws to the Quad Link using the four set screws.
 - i** Each corner mounting hole in the front or rear portion of the Quad Link has a corresponding set screw mounting hole. The set screw mounting hole will be along the edge of the Quad Link near the corners.

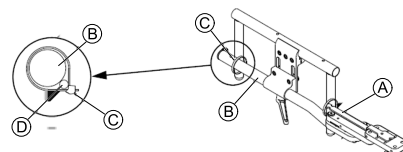
Repositioning the remote



1. Loosen the two cap screws **F** securing the adjustable remote tray **B** to the Quad Link **E**.
2. Remove the remote **A** with the adjustable remote tray attached.
3. Remove the two screws **C** securing remote to the adjustable remote tray.
4. Install the remote on the opposite side of the adjustable remote tray. Refer to 4.1.1.1 Installing remote onto Quad Link, page 13.

4.1.1.3 Securing the remote cable

To ensure proper use and operation of the quad link, the remote cable must be properly secured.




1. If present, secure the remote cable **D** to the cable bracket **A**.
2. Position the remote cable along the remote mounting tube **B**.
3. Using a tie-wrap **C**, secure the remote cable to the rear of the remote mounting tube so that the remote cable is positioned along the inside of the tube, facing the inside of the wheelchair.

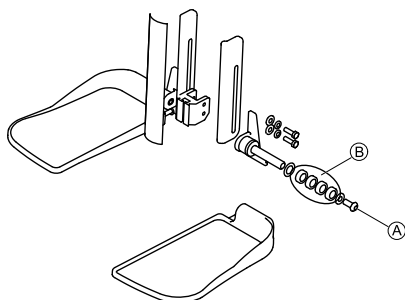
4.12 Adjusting footplate width

The footplate width is adjusted via spacers:

- Add spacers to increase width.
- Remove spacers to decrease width.

 Tools:

- 6 mm Allen key




1. Remove screw (A).
2. Remove or add spacers (B).
3. Retighten screw.


4.13 Setting drive lockout and limit switches

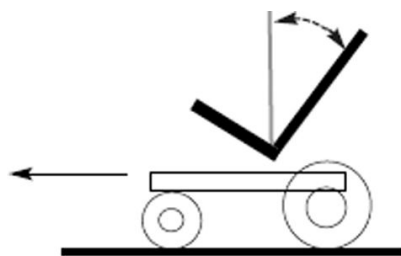
Setting the drive lockout for tilt/recline systems

All modular systems with tilt and/or recline functions are supplied with a drive lockout (DLO) switch. This prevents the drive motors from operating if the backrest is positioned beyond a pre-determined angle. The maximum drive lockout angle is 60° from the vertical (see diagram below). After the angle has been set, ensure the drive lockout is tested. Further adjustments may be required.

For a tilt/recline seating system the DLO switch is typically mounted to the side of the actuator module on the backrest pan.

 If the drive is locked out when the switch angle is adjusted, the tilt or recline will have to be activated again before re-testing the drive lockout. The drive lockout will remain engaged until the tilt or recline has been activated, regardless of the switch angle.

 The drive lockout limit should always be set to the angle that best meets the individual needs of the user and overall stability of the wheelchair. However, the DLO angle should not exceed the maximum 60° backrest angle.



 – Ensure base is on a level surface when adjusting limits.

Setting the power elevating seat (PES) lockout limit switch for tilt-elevating systems

All modular systems with tilt and recline functions in combination with a power elevating seat (PES) are fitted with a PES lockout limit switch. This limit switch prevents the PES actuator from elevating when the DLO is activated. The limit switch used to set the elevating actuator lockout is identified by a WHITE colored end. After the

switch value has been set, ensure that the elevating actuator lockout is tested. Further adjustments may be required.

Speed reduction microswitch for power elevating seats


All modular systems with power elevating seats (PES) are fitted with a microswitch for the speed reduction. This microswitch reduces the speed by 30% when the seat actuator is elevated beyond a recommended 100 mm (4") limit, measured from the home (lowest) position. The microswitch/speed reduction functions as a 'normally closed' circuit. This provides fail safe operation. As soon as the seat is elevated over the 100 mm (4") limit, the switch is opened and the speed reduction is engaged. The microswitch is typically mounted to the underside of the seating system and is attached to an actuator mounting plate in either a vertical or horizontal position (depending on the seating system). Ensure the speed reduction microswitch is tested after installation. Further adjustments may be required.


Setting the max. back angle limit switch

All modular systems with tilt and recline functions are available with a max. back angle limit function. This function prevents the back angle from extending beyond a pre-set angle. The correct max. back angle limit differs for each installation. The limit switch should be set so that with any combination of tilt and recline, there is no chance of interference between the backrest of the modular system and the wheelchair base or any accessories located at the back. The recline angle should never extend beyond 5° from the horizontal (see graphic below). After the back angle has been set, ensure the max. back angle limit is tested. Further adjustments may be required.

For a tilt/recline seating system, the switch is typically mounted to the side of the actuator module mounting bracket on the back of the system.



 The max. back limit switch will need to be set to best meet the needs of the user. However, the recline angle should not be permitted to extend beyond the recommended 5°.

 – Ensure base is on a level surface when adjusting limits.

4.14 Center of Gravity (CG) Adjustments (forward and aft)

The Ultra Low Maxx power positioning system may be adjusted in the forward and aft direction when being mounted onto a power base. Several factors must be considered when determining the correct position for the user, including the clients weight distribution and body type. It is very important to ensure adequate stability is maintained during driving, and in the various power seating positions. When determining a suitable system for a client, it is equally important to ensure that the user's weight does not exceed (the lesser of) the calculated wheelchair weight capacity or the designated power positioning system (PPS) weight capacity. A weight capacity calculator has been provided for reference, to calculate the total user weight and the wheelchair weight capacity (see below).

Important information (for dealers and users)

The Ultra Low Maxx power positioning system is designed to accommodate a wide range of user needs. Only the dealer and the healthcare professional can ensure that the system meets the user's individual requirements. It is the dealer's responsibility to ensure that the wheelchair and the power positioning system are set up properly and safely for the end user's specific needs.

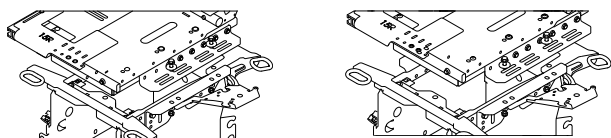
Stability

By changing the seating position (tilting, reclining, or elevating), the user is changing the stability characteristics of the wheelchair. It is very important that the system is set up so that it is stable in all seating positions. When evaluating stability, remember the following:

- The Ultra Low Maxx system can be mounted onto the power base in various fore and aft positions. Make certain that the position selected provides the user with maximum stability over the full range of seating positions.
- Consider all personal gear and accessories (backpacks, vent systems, extra batteries, etc.) that will be carried on the wheelchair. For example, a loaded backpack, attached to the back of the seating system, can significantly reduce the rearward stability of the wheelchair. Consider the backrest being used. For example, a recessed backrest can shift the user's center of gravity back and significantly reduce the rearward stability of the wheelchair. Conversely, a thick back cushion will shift the user forward and reduce the wheelchairs forward stability.
- If using a backrest other than Invacare, check with manufacturer to ensure it is suitable for power positioning systems.
- Consider the seat cushion being used. A thick seat cushion will raise the user's center of gravity and reduce the wheelchairs stability in all directions.
- The Ultra Low Maxx system is equipped with drive lockouts. Make sure this is set so as not to compromise the user's stability while driving.
- All power bases have programmable controllers which allow adjustment of the maximum acceleration and deceleration of the wheelchair. Make sure that these are set to an appropriate level for the system and for the user.
- Ensure all medical conditions are considered when setting up the wheelchair. Involuntary muscle movement such as spasming may affect the stability of the wheelchair, especially when the seating system is in a tilted or reclined position.
- When a system is fully tilted or reclined, the front wheels of the power base should never come off the ground. If this occurs, you must adapt the system's center of gravity.

Typical system depth settings

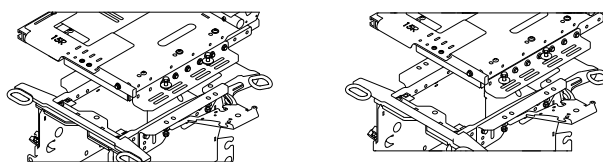
380 mm – 480 mm deep seat frame



Typical 380 mm setting

Typical 480 mm setting

480 mm – 580 mm deep seat frame



Typical 480 mm setting

Typical 580 mm setting

Adjusting the center of gravity

To achieve the best overall base stability, the system depth should be adjusted as far back as possible when the seat depth is deepened. This will be determined by the type of legrests used.



Tools:

- 2 x 13 mm open-ended spanner

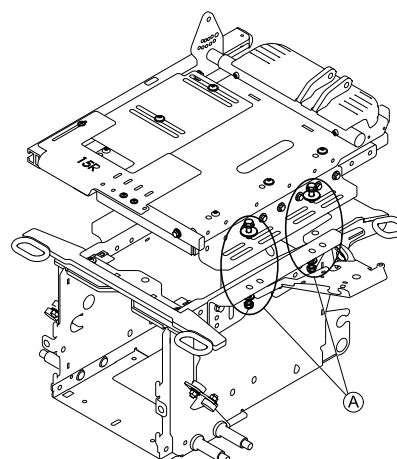


CAUTION!

Risk of strains from lifting heavy parts!

– Use proper lifting techniques.

1.



Loosen screws and nuts and remove together with washers (A).

2. Adjust system to desired position.
3. Insert screws, nuts and washers and tighten.

Invacare Sales Companies

Australia:

Invacare Australia PTY. Ltd.
1 Lenton Place, North Rocks NSW
2151
Australia
Phone: 1800 460 460
Fax: 1800 814 367
orders@invacare.com.au
www.invacare.com.au

United Kingdom:

Invacare Limited
Pencoed Technology Park, Pencoed
Bridgend CF35 5AQ
Tel: (44) (0) 1656 776 222
Fax: (44) (0) 1656 776 220
uk@invacare.com
www.invacare.co.uk

Canada:

Invacare Canada LP
570 Matheson Blvd E. Unit 8
Mississauga Ontario
L4Z 4G4, Canada
Phone: (905) 890 8300
Fax: (905) 501 4336

Eastern Europe & Middle East:

Invacare GmbH, EDO
Kleiststraße 49
D-32457 Porta Westfalica
Tel: (49) (0)57 31 754 540
Fax: (49) (0)57 31 754 541
edo@invacare.com
www.invacare.eu.com

Ireland:

Invacare Ireland Ltd,
Unit 5 Seatown Business Campus
Seatown Road, Swords, County Dublin
Tel : (353) 1 810 7084
Fax: (353) 1 810 7085
ireland@invacare.com
www.invacare.ie

New Zealand:

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



Manufacturer:

Invacare Deutschland GmbH
Kleiststraße 49
32457 Porta Westfalica

