



GrooveTM

Directions for use

QUICKIE[®]

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Directions for use

We at Sunrise Medical want you to get the best out of your GROOVE wheelchair. This Owner's Manual will familiarise you with the chair and its features. It contains hints on everyday usage and general care in addition to information on the high quality standards which we adhere to and details about the guarantee. There are a wide range of components and adjustments available on the GROOVE. For further information about these you should contact your wheelchair prescriber/supplier.

Your wheelchair will reach you in excellent condition having been personally inspected before leaving our factory. Following the guidelines for maintenance and cleaning your wheelchair will maintain its first class condition and give you complete satisfaction.

The GROOVE has been designed for use by an individual on a daily basis. It is suitable for both indoor and outdoor use (Class B). It is only intended for use as a pavement vehicle, but may also be used when crossing between pavements.

This vehicle has been designed for a single occupant of limited mobility up to the weight of 182 kg who has the cognitive, physical and visual ability to control the vehicle safely on a maximum slope of 18% (10°). If you are in any doubt as to the suitability of the power chair, contact your local Sunrise Medical approved supplier for clarification, prior to commencing use.

It is very important to read the relevant section of the owner's manual when making any minor adjustments. Consult Technical Manual or local Sunrise dealer for more complex adjustments. If you have any queries about the use, maintenance or safety of your wheelchair please contact your local approved Sunrise Medical service agent. If you do not know of an approved dealer in your area or have any other questions please write or telephone:

Sunrise Medical LTD.
Sunrise Business Park
High Street, Wollaston
West Midlands DY8 4PS
England
Phone: +44 (0) 1384 44 66 88
Fax: +44 (0) 1384 44 66 99

Sunrise Medical is ISO 9001 certified, which ensures quality at all stages of the development and production of this wheelchair. This product is manufactured to comply with Medical Device Directive 93/42/EEC.

Dealer signature and stamp

2. How to use this manual

2.1. Introduction

Please keep a note of your local service agent's address and telephone number in the space below.

In the event of a breakdown, contact them and try to give all relevant details so they can help you quickly.

The wheelchairs shown and described in this manual may not be exactly the same in every detail as your own model. However, all instructions are still entirely relevant, irrespective of detail differences. The manufacturer reserves the right to alter without notice any weights, measurements, or other technical data shown in this manual. All figures, measurements, and capacities shown in this manual are approximate, and do not constitute specifications.

2.1.1. Guarantee

The guarantee form is included in the Sunrise Pack. Please fill in the relevant details and return to us to register your entitlement.

THIS IN NO WAY AFFECTS YOUR STATUTORY RIGHTS.

2.1.2. Warranty conditions

- 1) The repair or replacement will be carried out by an authorised Sunrise Medical dealer/service agent.
- 2) To apply the warranty conditions, should your wheelchair require attention under these arrangements, notify the designated Sunrise Medical service agent immediately giving full information about the nature of the difficulty. Should you be operating the wheelchair away from the locality of the designated Sunrise Medical service agent, work under the "Warranty Conditions" will be carried out by any other service agent designated by the manufacturer.
- 3) Should any part of the wheelchair require repair or replacement, as a result of a specific manufacturing or material defect, within twelve months from the date on which the possession of the wheelchair was transferred to the original purchaser, and subject to it remaining within that ownership, the part or parts will be repaired or replaced completely free of charge if returned to the authorised service agent.
- 4) Any repaired or replaced part will benefit from these arrangements for the balance of the warranty period applicable to the wheelchair.
- 5) Parts replaced after the original warranty has expired are covered for a further twelve months.
- 6) Items of a consumable nature will not generally be covered during the normal warranty period, unless such items have clearly suffered undue wear as a direct result of an original manufacturing defect. These items include amongst others upholstery, tyres, inner tubes, and similar parts.
- 7) The above warranty conditions apply to all wheelchair parts, for models purchased at full retail price.
- 8) Under normal circumstances, no responsibility will be accepted where the wheelchair has required repair or replacement as a direct result of:
 - a) The wheelchair or part not having been maintained in accordance with the manufacturer's recommendations, where such exist. Or failing to use only the specified original equipment parts.
 - b) The wheelchair or part having been damaged by neglect, accident or improper use.
 - c) The wheelchair or part having been altered from the manufacturer's specifications, or repairs having been attempted prior to the service agent being notified.

2.1.3. Features and Options

The GROOVE has been designed for use by an individual, on a daily basis. It is suitable for both indoor and outdoor use (Class B). It is only intended for use as a pavement vehicle, but may also be used when crossing between pavements.

This vehicle has been designed for a single occupant, of limited mobility, up to the weight of 182 kg, who has the cognitive, physical and visual ability to control the vehicle safely. If you are in any doubt as to the suitability of the powerchair, contact your local Sunrise approved dealer for clarification, prior to commencing use. Some of the options shown in this manual may not be available in your country and may also restrict the overall physical limits of the standard product (e.g. max. speed, user weight limit, etc.). Those limitations are marked on the order form, in the technical manual and in this owner's manual. For further information please consult your Sunrise supplier.

Safety is very important with any vehicle that is power driven, here are some helpful tips to safeguard your use.

3. General

- Always ensure that your wheelchair is switched off before attempting to mount or dismount.
- Always ensure that you are able to operate all controls from a comfortable position. Paying attention to your posture is essential to ensure your continued comfort and well being.
- Always make sure that you can be seen clearly, especially if you intend using your wheelchair in poor light.

3.1. Kerbs

- Never descend a kerb Forwards with a RWD chair or Backwards with a FWD and MWD chair. Please read carefully the section 4.13. on kerb climbing in this manual before attempting to mount and dismount any kerbs in your wheelchair.
- **Do not attempt to climb or descend a series of steps. It is unsafe to do so and could cause personal injury or damage the chair. The Groove has only been designed to climb a single step or kerb.**

3.2. Routine Service

Like most things in life a little care and attention makes a big difference and your chair is no exception. The recommended service interval is one year. (See service history table in section 14).

3.3. Emergency freewheel

Please remember that you have no braking facility when the freewheel levers are moved from the normal drive position to the freewheel position (Fig. 1 and Fig. 2). Always ensure an attendant is with you when bringing the chair into the freewheel mode.

The wheelchair must never be left with one or both levers in the freewheel position. For an enhanced description of this facility and its limitations to use please see later section at 5.1.



3.4. Emergency braking

There are three possibilities to stop your wheelchair.

1. Simplest and safest way to stop the wheelchair is to release the Joystick (see Hand Control section 7+8). This will bring the chair to a halt in a controlled manner.
2. Pulling back the Joystick will brake the chair abruptly with a fast stop
3. Switching the control system off whilst the chair is in motion will also bring the chair to a halt. This third method is only to be used in an emergency situation as the stopping action is very abrupt.

3.5. Sharp turns

Full speed turns should not be attempted. If you need to turn sharply you must reduce your speed with the Joystick or speed setting. This is particularly important when travelling across or down a slope. Disregarding this advice could lead to your wheelchair tipping over.

3.6. Batteries

Your wheelchair is supplied as standard from Sunrise Medical with maintenance-free batteries. These only require regular charging.

- **Do not, under any circumstances, tamper with the batteries. If in any doubt contact your local service agent.**

Before charging, please read section 9 in this manual.

Avoid contact with acid on damaged sealed type batteries or wet batteries.

Battery acid can cause burns to the skin as well as damage to floors, furniture and your wheelchair. If it comes into contact with the skin or clothing, wash immediately with soap and water. If it comes into contact with the eye, immediately flood the eye with running cold water for at least 10 minutes and seek medical attention immediately. Acid can be neutralised with baking soda and water. Take care to keep batteries upright at all times, especially when transporting your wheelchair.

Battery and charger type:

24V (2x12V) / 72 Ah/20h. Maintenance free

Dimensions: 270x160x220 mm.

24V (2x12V) / 52 Ah/20h. Maintenance free

Dimensions: 197x165x197 mm.

Connector: 3 pins "Neutrik" type (polarity scheme at page 40)

Note: Before using your vehicle for the very first time, please charge your batteries for a period of 24 hours.

For information on how to access batteries please refer to part 9 and 12.8. in the Maintenance section.

3.7. Tyres

Your wheelchair tyres can wear depending on use. Check them regularly in accordance with the service instructions in this manual, especially the pressure of the tyres.

NEVER inflate the tyres using a garage forecourt airline, always use the pump provided.

3.8. Cleaning seating

This is important should the wheelchair be used by more than one person to ensure there is no cross infection.

You can wash all parts of the covers with a gentle-wash detergent at 40°C. You can spin-dry the covers, but do not dry them in a dryer. You can remove all parts of the covers independently of each other and wash them separately.

Take out the foam inlays prior to washing and close the Velcro fasteners!

All lateral supports, headrest, armrests, side-guards, calf pads, lap belts and kneepads should be cleaned with a damp cloth.

Cleaning instructions for Rehab and Perfect Fit seating

Clean regularly to prevent build up or soiling.

Clean with a damp soapy cloth and rinse well with clean water. Dry the surface thoroughly.

Disinfectants may be used in dilution as specified by their manufacturer. Ensure surfaces are then rinsed with clean water and dried thoroughly.

Cleaning instructions for Comfort seating

Clean regularly to prevent build up or soiling.

Clean with a damp soapy cloth and rinse well with clean water. Dry the surface thoroughly.

A soft brush with soapy water may be used to remove stubborn dirt. Ensure surfaces are then rinsed and dried.

Some chemical colourings, e.g. ball point pen, food colourings or clothes dyes should be removed immediately to prevent long term staining.

Do not use solvents, bleaches, abrasives, synthetic detergents, wax polishes or aerosols.

Disinfectants may be used in dilution as specified by their manufacturer. Ensure surfaces are then rinsed with clean water and dried thoroughly.

Cleaning Instructions for Recaro

You should remove stains on your seat as soon as possible. After a long period of use, you should clean the cover of your seat with a standard commercially available dry foam cleaning agent. You should always clean the whole surface and not just individual spots in order to avoid unattractive edges. The longer you wait the more difficult it will be to remove them.

Avoid powerful rubbing with aqueous solutions. This will roughen up cover fabric.

Dirt stains (eg. beer, blood, cola, red wine etc) are best removed with the dry foam cleaning agents or with a mild-action. Please follow the respective instructions for use when treating the covers. The covers should be allowed to dry for at least 48 hours after cleaning with foam cleaning agents.

Grease stains (eg. ballpoint pen, lipstick, chewing gum etc). Use a solvent such as petroleum ether. Carefully rub the soiled location on the surface only with a clean cloth impregnated with solvent.

Important: Use only a very small quantity of solvent. The upholstery material must not be saturated, since the solvent might then attack it and destroy it.

General cleaning

All parts/ accessories such as swing away tray's should be cleaned with a damp cloth.

3.9. Cleaning controls

Should the control of your wheelchair become soiled or dirty, it can be wiped with a damp cloth with a dilute disinfectant until clean. This is important should the wheelchair be used by more than one person to ensure there is no cross infection.

Speciality controls

Ensure that wafer boards, Joysticks (all variants), head arrays and switches (all variants) are cleaned with a mild disinfectant and a cleaning cloth to avoid any cross infection possibilities. Following removal from chair regularly wash the Sip & Puff mouth piece and tube. To maintain cleanliness and function.

WARNING:

Ensure control is switched off before cleaning.

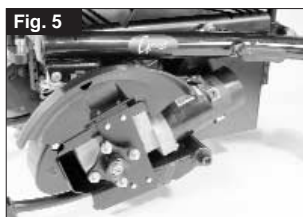
3.10. Wheelchair motors

After prolonged use, the motors will produce heat, which is radiated through the motors outer casing. Do not touch the motors outer casing for at least 30 minutes after using the wheelchair, to allow it to cool. (Fig. 4 and 5)



3.11. Wheelchair range

The range of your wheelchair can be affected by many factors such as user weight, terrain, ambient temperature, use of powered options and battery condition. The stated range in the sales literature should be seen as the theoretical maximum (ISO 7176; Part 4) and may not be attained by every user (also see section 9.11. in this manual).



We recommend that every user initially limit their journey to half the stated range, until they have confidence in the actual range their wheelchair can attain. If your battery indicator is showing a low charge then do not attempt a long journey unless you are confident in reaching your destination and also returning to your home without the risk of being left stranded.

4. Safety warning and user tips

4.1. Handling the wheelchair

Note: To dismantle the chair for transport no tools are required. List of components when dismantled (components below are related to the maximum detachable parts and dependent on the type of seating system chosen):

- 1 pair of Armrests
- 1 pair of Legrests, or single centre mount legrest with flip-up footplate
- 1 backrest (Std. Rehab/comfort seat only)
- 1 drive unit with seat frame

4.2. Prepare for transportation

First remove the legrests if swing away legrests are attached. In the case of a centre mount legrest, just flip up the Footboard. Lift off the armrests (Fig. 6, disconnect the Hand Control if necessary, for detail ref. section 4.9). Release and lift off or fold down the backrest at the frame (Fig. 7). Now you can store the chassis part. By releasing the free-wheel mechanism (Fig. 8 and 9) on the left and right side of the chassis you can move the drive unit as close as possible to the place you want to store it.

You can also drive the base with the joystick up or down a ramp into and out of a car for transportation. Make sure, when the chair is stored or left in the car or anywhere else, the controller is switched off and the freewheel mechanisms are engaged.

If there is a need to lift the drive unit on the RWD and FWD chair the big side frame tubes should be used. On the MWD use the rear castor arm and the drive wheel. Caution should be taken if the chair is in freewheel.

To remove the control pod.

Locate the cylindrical in-line connector. Carefully rotate the finger grip to unscrew the lock. Gently separate the loom. Place the control pod & arm in a safe place until required (Fig. 10 and 11).

To reconnect the Hand Control just use the process in reverse.

4.3. Re-Assembling

Flip up or replace the backrest. Put your armrests back in and connect the remote controller. Attach the hangers or flip down the footplate. Make sure your freewheel mechanisms are engaged. Now you are ready to drive the chair.

Note: Never lift the wheelchair by the armrests or the legrests, since they are detachable and harm could be done to the user or to the wheelchair.

4.4. Use on a slope

Your wheelchair has been designed and tested to allow its use on slopes or gradients of up to 10° (18%) in RWD/ MWD configuration and 6° (11%) in FWD configuration. However, you have the option of adjusting your seating position with either a lift, tilt or recline or a

combination of these options, then in certain circumstances your wheelchair could become unstable. Before attempting to climb or descend a slope or a kerb, caution should be taken when using weight shift options (e.g. powered tilt or recline) of the seat and/or your body for a counter balance weight. To improve stability lean forward when driving uphill, with the seat and back in an upright position. Alternatively sit in an upright position when travelling in a forward, downhill direction or tilt and/or recline the seat backwards. When driving downhill with a FWD chair reduce your speed below 5kph. This prevents the chair from going onto the front anti-tip wheels when decelerating. Failure to do this may cause the wheelchair to become unstable. If you are in any doubt about the capabilities of your wheelchair on a slope then do not attempt to drive up or down the slope/kerb, try to find an alternative route.

4.5. Mobile telephones and two - way radios

When operating cordless or mobile telephones, two way radios, walkie-talkies, C.B. Amateur Radio or other transmitting devices, the following must be noted: The use of a mobile phone in close proximity to the wheelchair may interfere with the normal operation of the wheelchair system. If abnormal operation is observed whilst using a mobile phone the wheelchair system should be switched off immediately.

The chair itself can disturb the performance of electromagnetic fields such as alarm systems of shops.

4.6. Hot surfaces

Not only the motors can get hot during the operation of the chair, but also the upholstery material and armrests when standing in the sun.

4.7. Wheels

WARNING

Always use the pump that is supplied with the chair. Never use a forecourt pump.

Inspect all tyres regularly for signs of wear. Do not drive over anything that could cause punctures in the tyres. Ensure that there are no objects in your path that could possibly become lodged in your chair mechanism or in the spokes of the rear wheels. This could cause the chair to come to a sudden stop. Riding over drains or grids could cause the wheelchair castors or wheels to become lodged, causing the chair to come to a sudden stop.

Pneumatic Tyres with OKO fluid. Always maintain the correct pressure for the tyre. These are listed in the maintenance section of this manual.

The OKO fluid is only meant as a temporary repair to the tyre. It must be replaced or repaired as soon as possible. The OKO fluid is classified as non hazardous but may cause irritation to the skin with prolonged contact.

First Aid measures for OKO fluid

Skin - Wash skin with plenty of water

Eyes - Immediately flood the eye with plenty of water for at least 5 minutes holding the eye open.

Ingestion - Drink lots of water - Seek medical attention immediately.

If it is necessary to remove one of the wheels (e.g. in order to repair it in case of puncture), proceed as follows:

4.7.1 Std. Castor wheel

1. Use a 5mm Allen key and a 13mm spanner to remove the fork screw.
2. Remove the damaged wheel.
3. When the wheel has been repaired, follow the reverse procedure.
4. Make sure your axle is correctly fastened.

4.7.2. Drive wheel

1. Using a screw driver, remove the cover of the hub.
2. Loosen the 4 screws with a 5 mm Allen key on the outside and a 13 mm hexagonal socket wrench on the inside.
3. Use a 6 mm Allen Key to split the rim.
4. Remove the damaged wheel. When it has been repaired, follow the reverse procedure. (Fig 12-15). Further details are described in section 12.10. and 12.11.



4.8. Lap belt

The 5 cm (2") Aircraft Buckle Lap strap. (Fig. 16).



The 5 cm (2") Aircraft Padded Lap strap. (Fig. 17)



The lap strap fitted for a right-handed user. (Fig. 18)



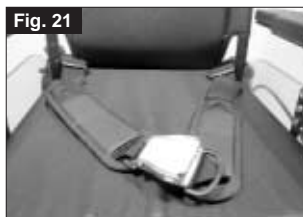
The lap strap fitted for a left-handed user. (Fig. 19)



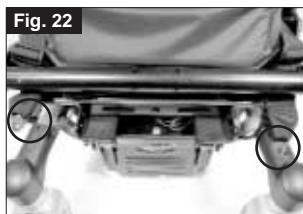
Place the strap loosely across the seat with the opening end of the buckle facing to the right for a left-handed person and to the left for a right-handed person. (Fig. 20)



Pass the other ends of the strap through the gap between the backrest posts and the backrest upholstery as shown above. (Fig. 21)



Feed the bracket ends of the straps under the backrest brace bar as shown. Ensure that the adjuster buckles can be accessed & the strap is not twisted. (Fig. 23)



Pass the bolt through the plain washer & strap bracket. (Fig. 23)



Place a saddle washer on the bolt (Fig. 24).



Pass the bolt through the seat frame. Mount as shown above for the 36-46cm, (14"-18"), seat depth. Mount the bolt the other way round, with the head on the inside, for seat depths greater than 51cm, (20"), to avoid a clash with the back post bracket (Fig. 25).



Place the other saddle washer on the end of the bolt and against the frame. Fit the plain washer & nut. Tighten using a 4.0mm Allen key & 10.0mm spanner (Fig. 26).



Adjust the lap strap to suit, leaving no more than a hand's width gap for comfort & safety. When servicing, check for correct operation of the release buckle & for any signs of wear on the material or plastic brackets (Fig. 27).



Notes

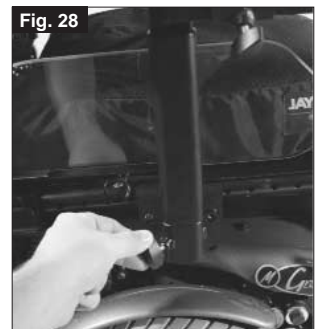
1. Standard Sling - Lap belt movement is restricted by upholstery
2. Contoured back - Use universal bottom bracket as per recline back method

Maintenance

Check lap belt, and securing components, at regular intervals for any sign of frays, or damage. Replace if necessary

4.9. Armrests-removing

The armrests on both sides of the wheelchair can be moved to allow side transfer. (For Hand Control removal see section 4.2.) Please refer to your appropriate armrest type.



Single Post Armrest (Comfort, Rehab and Recaro Seat):

Release the handle screw on the side of the armrest receiver and remove armrest (Fig. 28).

Flip-back armrest (Perfect Fit seat):

For side transfer simply flip the armrest all the way up until it goes into its mechanical stop. This frees your space for side transfer.



Reclining armrest (Perfect Fit Seat):

Unlock the quick release mechanism at the bottom front pivot of the armrest. Lift the armrest off the receiver. You can now turn it to the outside, flip it backwards or release also the rear part of the armrest to take it fully off (Fig. 29).

4.10. Armrests-replacement

Please refer to your appropriate armrest type.

Single Post Armrest (Comfort, Rehab and Recaro Seat):

Place the armrest tube in the armrest receiver. Fix and tighten it with the handle screw on the side of the armrest receiver (Fig. 28).

Flip-back armrest (Perfect Fit seat):

Simply flip the armrest all the way down until it sits on its mechanical stop. Guide it in its downward movement and do not let it fall on its own.

Reclining armrest (Perfect Fit Seat):

If you have taken it fully out, fit the rear stem into the round receiver at the back rest. Then lower the armrest and guide the front tube until it locks into the retaining tube. Lock it with the quick release mechanism (Fig. 29).

4.11. Fitting legrest

Offer the legrest assembly at right angles to the frame (Fig. 30 + 31), locate the stem into the legrest and swing the assembly forward as in Fig. 31 to lock in position. To swing away the footrest, simply depress the retaining catch and turn the footrest out. This can now be lifted out if required.



4.12. Control box

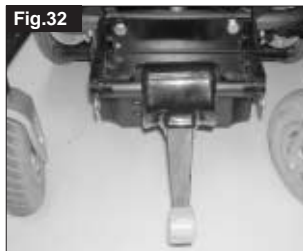
Depending on your control system chosen, there are two principles of control systems: Quickie Consumer (QC) and Quickie REHAB (QR) controls (for details please see the controls section 7+8). The remote is mounted on a sliding mechanism which enables the control to be moved forwards and backwards. When the most comfortable position has been selected, secure the slider by tightening the locking screw. Ensure the locking screw is fully tightened prior to use and especially when transporting your wheelchair.



4.13. Mounting a kerb or step (FWD, MWD and RWD)

Always approach a kerb at 90°

1. Approach the kerb (step) head on driving forwards slowly and steadily and always at a 90° angle.
2. RWD-Chair: As the Kerb Climber or castor makes contact with the kerb (step), the wheelchair should be moving slowly. Small kerbs can be climbed from a standstill. FWD-Chair: Start accelerating the chair after a stop approx. 20cm in front of the kerb to create enough speed/torque to get the chair up. MWD-Chair: Stop the chair as soon as the castor wheels touch the kerb.
3. RWD- and MWD-Chair: Apply sufficient power to the motors to lift the front of the chair up onto the kerb (step) and then apply slightly more power and speed so that the drive wheels climb the kerb (step) smoothly and without hesitation. As far as possible, keep the joystick in the straight forward position. FWD-Chair: slow down the acceleration as soon as the drive wheels are on the kerb until the rear castor are up.
4. In accordance to the ground clearance, the maximum Obstacle height possible to climb is 5 cm for a RWD-Chair (10 cm with kerb climber on a rear wheel drive base, Fig. 32). And 10 cm for a FWD- and MWD chair, when conducted as described above.



Note: The approach speed and process can vary depending on their drive and castor wheel choice.

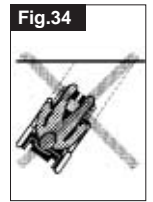
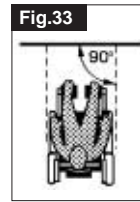
4.13.1. Dismounting the kerb with a rear wheel drive chair

1. Reverse the chair slowly and carefully until both rear wheels are on the edge of the kerb again in a 90° position to the kerb.
2. Reverse as slowly as possible off the kerb with the rear wheels. You will feel more secure if you can lean forward, but if you can't, don't worry, the wheelchair is extremely stable. As long as you stay within its limitation, you will be quite safe.
3. The front of the chair will naturally follow down the kerb as you continue to drive slowly backwards.

4.13.2. Dismounting the kerb with a front (FWD) or mid wheel drive (MWD) chair

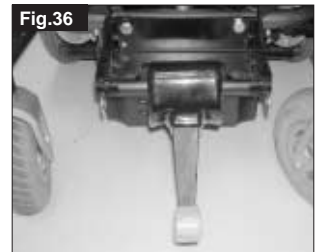
1. Move the chair slowly and carefully in forward direction until both front wheels are on the edge of the kerb again in a 90° position to the kerb.

2. Drive as slowly as possible off the kerb with the drive wheels. You will feel more secure if you can lean backwards, but if you can't, don't worry, the wheelchair is extremely stable. As long as you stay within its limitation, you will be quite safe.
3. The rear of the chair will naturally follow down the kerb as you continue to drive slowly forwards.
4. We recommended that during this operation all powered options are in their home position.



4.13.3. Kerb Climber Fitting and removal procedure (RWD base only)

1. Locate the kerb climber bar into the left hand location bracket and push it into the right hand receiver bracket (Fig. 35/36).
2. Hold the kerb climber with your right hand in the receiver bracket.
3. Align the holes of the receiver bracket and the kerb climber tube and plug in the locking pin from the top.
4. Reverse the procedure to remove the kerb climber.



Caution:

1. Please show the utmost consideration for the other traffic on the road. Remember that the last thing a car or lorry driver expects to see is a wheelchair backing off the kerb into the road. If in any doubt, do not risk crossing the road until you are certain that it is safe.
2. Always cross the road as quickly as possible, there may be other traffic.
3. Do not attempt to go up or down more than a 10 cm (4") high kerb (GROOVE R only with kerb climber fitted).
4. Do not attempt to use the kerb climber on a series of steps.
5. Do not attempt kerbs if on steep slopes or cambers.
6. Do not attempt any kerbs in the vicinity of drain covers, uneven or gritty road surfaces.
7. Do not attempt to dismount a kerb any higher than 5 cm (2") in the forwards direction in a RWD-chair.
8. Do not mount or dismount kerbs at an angle other than straight on (90 degrees) to the edge of the kerb.
9. Prior to climbing ensure your legrests will clear the kerb.
10. Take care of the anti tips which might interfere with the kerb or the ground when mounting or dismounting a kerb.

Note: This wheelchair is designed to be repaired and assembled by the dealer and not the end user. The end user has to disassemble and assemble the chair only for transportation (see section 4.2. Preparing for transportation).

4.14. WARNING

Ensure that the lights and indicators are functioning correctly and lens are clean before going outdoors at night.

4.15. WARNING

To avoid injury to people around you please be aware that the mirror protrudes outside the space envelope of the chair and could cause injury to someone when driving past.

The mirror must be used on the 10KPH model on UK roads. Always make sure that when using the mirror that it is clean and unbroken so that it does not impair your visibility.

4.16. WARNING

Make sure that the crutch is securely fastened to the crutch holder.

Make sure that the crutch is not interfering with the mechanisms of the chair.

Make sure that the crutch does not protrude from the chair. Do not attempt to remove the crutch whilst the chair is in motion. Always come to a complete stop and turn off the power to the controls before attempting to remove the crutch. This will avoid accidentally operating the chair.

5. Preparing your wheelchair for use

5.1. Emergency freewheel

GROOVE F/R

By pressing and turning the release levers on both sides of the base into the down position (Fig. 37) the drives become disconnected from the motors.



GROOVE M

By releasing the locking lever and pulling the freewheel lever backwards on both sides of the base (Fig. 38) the drives become disconnected from the motors.



This may only be used in an emergency, or if you need to manually push your wheelchair.

It is not intended for permanent use or to push the wheelchair up/down a slope with the user sitting in it.

Note: The chairs automatic braking system will not work unless the brake release levers are in the "drive" position.

CAUTION: Motor surfaces can be hot after use. Be careful not to touch the motor casing when disengaging the freewheel.

5.2. Drive wheel suspension GROOVE F/R

The GROOVE F/R has an effective and adjustable drive wheel suspension system as a standard feature. To match your requirements on drive comfort, the tension of the springs at the damper can be adjusted.

Turning the aluminium ring on the bottom of the spring downwards will soften your ride, adjusting the aluminium ring in a higher position will harden it. This option is to be used to match the different user weights to the suspension system. (Fig. 39). We recommend the suspension adjustments are done equally on the left and right side of the chair.



5.3. Armrests

5.3.1. Adjusting the armrest width (Recaro, Rehab and Comfort Seat only)

To adjust the width loosen the two screws (10mm spanner) as shown in (Fig. 40) move the armrest receiver brackets to the desired position, and tighten the screws firmly prior to use. The steel part must always be located in both aluminium clamp halves.



5.3.2. Adjusting armrest height

Please refer to your appropriate armrest type.

Single Post Armrest (Comfort, Rehab and Recaro Seat):

The height adjustment of the armrests is made via the threaded screws at the upper edge of the insertion tube of the side guard. To adjust the height (Fig. 41) loosen the adjusting screw (6 mm Allen Key), move the armrest to the desired position and tighten the screw.



Flip-back armrest (Perfect Fit seat):

Take the back cover off the Perfect Fit backrest. Loosen the two bolts of the armrest receiver and adjust the height along the slot. Tighten the screws carefully when the appropriate height is achieved. The adjustment range is increased also by turning the receiver part upside down.

Reclining armrest (Perfect Fit Seat):

Loosen the two screws at the rear armrest receiver and slide the armrest up and down along the slot in the backrest wing. Fix it with the screws at the appropriate height. Take the two screws out at the front tube of the reclining armrest to adjust the front height. Hold the outer tube at the appropriate height, replace the screws and re-tighten.

5.3.3. Parallel Swing Away Arm

Before adjusting the swing-away arm, switch off the controller to avoid accidental displacement of the joystick, which would cause unwanted movement of your wheelchair.

Gently apply pressure to the side of the controller nearest the user and as close as possible to the front of the controller.

The controller will move outwards and then backward before reaching its fully back position.

Keep your fingers and clothing, etc. Clear while operating the swing-away mechanism.

If required, your wheelchair can be operated with the swing-away mechanism in its fully back position, but only for slow manoeuvring such as positioning the wheelchair closer to table tops, etc. To revert to the normal driving position, switch off the power and pull the arm outwards and then forwards before returning the arm to its 'home' position.

Make sure the controller is fully engaged in its home position before switching on and operating the wheelchair in the normal manner.

Caution:

Please ensure that after placing the parallel swing away into its in-line position that the cable of the Hand Control is correctly stowed away under the arm-rest. Do not hang any items on or over the parallel swing-away remote assembly as this could damage the swing-away mechanism. When transferring to and from the wheelchair do not use the remote as a means of support.

Warning:

Keep fingers, clothing, etc. Clear of the swing-away mechanism at all times. Ensure the power is switched off while adjusting the parallel swing-away arm. Only operate the wheelchair at low manoeuvring speed when the parallel swing-away is in use.

5.4. Legrests

5.4.1. Adjusting the footrest length

To adjust the footrest length remove the screw assembly on the footrest stem as shown in (Fig. 42+43), adjust the length to suit. Ensure the bolt is firmly located and tightened prior to use.



Note: The internal footrest stem may require cutting down in length to allow the footplate position to be raised.

5.4.2. Footplates

The footplates may be flipped up to aid entry and exit from the chair. Do not use the footplates to stand on as the full weight of your body may cause the chair to tip forwards. This could result in injury and could damage the footrests.

5.4.3. Manual elevating legrest (ELR)

To elevate:

Pull the legrest upwards and stop at the desired height. The legrest will automatically lock in the chosen position.

To lower:

Push the release lever slowly forward. The legrest will lower the angle. As soon as you release the lever, the legrest will be locked in the current position.

CAUTION: Always ensure that the legrests do not come into contact with the castors before driving the chair.

CAUTION: Keep hands clear of the adjustment mechanism between the frame and the movable parts of the legrest while elevating or lowering the legrest.

CAUTION: Legrests are not to be used for lifting or carrying the wheelchair with an occupant.

5.4.4. Powered elevating Legrest

To operate:

Delphi QC Control:

To operate the Legrests simply push the Mode Button to select Actuator mode and then operate the Joystick left or right to select the Actuator required (Actuator 1 or Actuator 2). Selection is indicated via the lighting of the Green LED adjacent to the desired

Actuator number. Then operate the Joystick in the forward or rearward direction to move the Legrest up or down. Release the Joystick when the desired angle is reached. Once the legrest is fully lifted or in its lowest position do not hold the Joystick in its operating position as this could damage the actuator. To return to Drive Mode, simply press the Mode Button again.

Note: Both legrests can also be operated simultaneously.

Delphi QR Control:

To operate the legrest simply push the Mode Button twice to select Actuator Mode. Selection is indicated via the lighting of the Green LED adjacent to the Mode Button. The wheelchair icon LEDs in the centre of the Remote, will light up with the currently selected Actuator Option. Move the Joystick in the left or the right direction to scroll through the possible options until the legrest Option is selected. Operate the Joystick in the forward or rearward direction to move the legrest up or down. Release the Joystick when the desired angle is reached. Once the Legrest is fully lifted or in the lowest position do not hold the Joystick in its operating position as this could damage the actuator. To return to Drive Mode, simply press the Mode Button.

Note: Both legrests can also be operated simultaneously

5.5. Manual setting of the seat angle on the GROOVE

To set the seat angle, release the bolt fixing the “Banana” bracket between the Seat Interface Module and the Seat Packer Module. Set the seat angle at 0°, 3° or 6° and 9°. Then replace and re-tighten the bolt between the Seat Interface Module and the Seat Packer Module. (Fig. 44).

5.6. Powered Seat tilt

The seat can tilt up to 30° by operating it through your control system.

Delphi QC Control:

To operate the Powered Tilt simply push the Mode Button to select Actuator mode and then operate the Joystick left or right to select the Actuator required (Actuator 1 or Actuator 2). Selection is indicated via the lighting of the Green LED adjacent to the desired Actuator number. Then operate the Joystick in the forward or rearward direction to move the Tilt forward or backward. Release the Joystick when the desired angle is reached. Once the seat is fully tilted or in its lowest position do not hold the Joystick in its operating position as this could damage the actuator. To return to Drive Mode, simply press the Mode Button again.

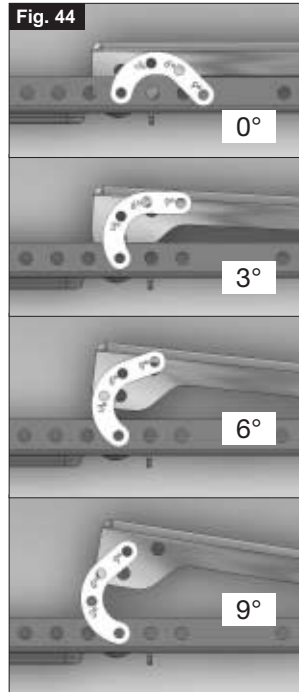
Delphi QR Control:

To operate the Powered Tilt simply push the Mode Button twice to select Actuator Mode. Selection is indicated via the lighting of the Green LED adjacent to the Mode Button. The wheelchair icon LEDs in the Centre of the Remote will light up with the currently selected Actuator Option. Move the joystick in the left or the right direction to scroll through the possible options until the Tilt Option is selected (Both Seat and Backrest lights lit). Then operate the Joystick in the forward or rearward direction to move the Tilt forward or backward. Release the Joystick when the desired angle is reached. Once the Seat is fully tilted or in the lowest position do not hold the Joystick in its operating position as this could damage the actuator. To return to Drive Mode, simply press the Mode Button.

5.7 Preparing your seat position for driving on the road

Please ensure your backrest recline angle relative to floor level, which is a combination of the back recline itself and the tilt angle, does not exceed 12° to drive the chair safely. If your backrest to level floor angle exceeds this limit the chair will automatically convert into “creep mode” which will allow you a maximum of 10% of the speed programmed in the profile.

Operating the powered lift higher than 5cm from its lowest position will bring the chair into “creep mode“, moving it below will allow full speed.



6. Seating

6.1. Firm seat board

The Firm Seat Board is designed to allow pressure relief cushions such as Jay to be used. If Retrofitting the firm seat board you must ensure the two retaining screws and collars are fitted and that the seat hooks are located behind them prior to use (Fig. 45). Failure to do this may result in the seat tipping up and possibly causing injury.

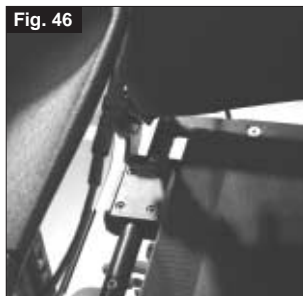


6.2. Seat cushions

Seat cushions supplied by Sunrise Medical will have Velcro® strips that correspond to patches on the seat. You must ensure these are aligned prior to using the wheelchair. Other cushions used should also have Velcro® strips in a similar position to ensure the cushion does not slip off the seat. The seat cushions, supplied by Sunrise Medical all have removable covers.

6.3. Changing seat depth on the Standard Rehab Seat

To change the seat depth loosen the two clamps on each side of the seat rails. The backrest can now be moved to the desired position along the seat rail. Tighten the four bolts at the clamps on each side of the backrest. Make sure you have at least 1cm of the rear of the seat rail tube left when adjusting the maximum seat depth (Fig. 46 and 47).



6.4. Changing seat height

To change the seat height loosen the four nuts of the receivers of the seat module Interface (Fig. 48 and 49) on the bottom frame with two 13 mm spanners. Take the bolts off the frame. Make sure the top frame does not trap your fingers. Hold the top frame securely in the up position. Adjust the seat height by choosing your required hole position of the Module Interface and replace the bolts and the nuts. Tighten them securely.



6.5. Removable seat covers

The seat covers are all fully removable using zips or Velcro® once-brackets are removed seat covers can be removed. The zip for the backrest is located on the underside of the cushion.

6.6. Backrest removal and refitting (Rehab and Comfort Seat only)

Although there are a variety of back upholsteries which can be used on the GROOVE backrest structure, they all attach and release in the same way. To remove the standard backrest (Fig. 50 and 51) loosen the screws on the base of the backrest and pull up the back. To attach the backrest repeat the process in reverse. You must ensure the two screws are securely locked in position and the backrest is correctly and firmly attached prior to using your chair.



6.7. OPTIMA backrest upholstery

GROOVE can be supplied with optima backrest upholstery, which can be adjusted in tension to the individual's requirements. (Fig. 52).



6.8. Changing the shape or tension on the OPTIMA back

To change the shape and/or tension of the 'Optima' backrest remove the padded cover from the rear of the backrest and expose the tension straps. Loosen or tighten the straps to suit. (The most comfortable and supportive position is achieved with the wheelchair user seated in the chair). Ensure the straps are securely fastened and replace the padded cover prior to use.

6.9. Manual adjustable backrest (manual recline)

For depth adjustment see section 6.3. above. To recline the backrest angle simply pull the lever at the top of the backrest which operates the gas strut. Hold the lever and adjust the back angle required. If you release the lever, the angle will stay in the adjusted position. If you want to adjust the backrest into the upright position you might need to support the upward motion (Fig. 53).



6.9.1. Manual angle adjustment of the fixed back

To adjust the back angle, release the two outer screws of the back adapter plate on both sides of the frame. After removing the screws you can set the back angle between -3 degrees and 12 degrees in 3 degree steps. Then retighten the outer screws in the adapter plate. (Fig. 54)



6.9.2. Powered adjustable backrest

For depth adjustment see 'Changing the seat depth' above in section 6.3.

Delphi QC Control:

To recline the backrest angle simply push the Mode Button to select Actuator mode (Fig. 55) and then operate the Joystick left or right to select the Actuator required (Actuator 1 or Actuator 2). Selection is indicated via the lighting of the Green LED adjacent to the desired Actuator number. Operate the Joystick in the forward or rearward direction to move the backrest up or down. Release the Joystick when the desired angle is reached. Once the back is fully reclined or raised do not hold the Joystick in its operating position as this could damage the actuator. To return to Drive Mode, simply press the Mode Button again.



Delphi QR Control:

To recline the backrest angle simply push the Mode Button twice to select Actuator Mode (Fig. 56 and 57). (If only 1 drive profile is enabled, then the mode button needs to be pressed only once). Selection is indicated via the lighting of the Green LED adjacent to the Mode Button. The wheelchair icon LEDs in the Centre of the Remote will light up with the currently selected Actuator Option. Move the Joystick in the left or the right direction to scroll through the possible options until the Backrest Option is selected. Operate the Joystick in the forward or rearward direction to move the backrest up or down. Release the Joystick when the desired angle is reached. Once the back is fully reclined or raised do not hold the Joystick in its operating position as this could damage the actuator. To return to Drive Mode, simply press the Mode Button.



Lowering the backrest by an angle of greater than 15° from vertical alters the balance of your wheelchair.

Never exceed 15° of recline when on any gradient or when driving your wheelchair.

6.10. JAY backrests

The standard backrest assembly will allow the fitting of a JAY backrest, which is available as an optional extra.

6.11. Headrest

To fit the headrest, fit the location bracket to the backrest brace, using the screws and nuts supplied, ensuring that they are fully tightened.

The headrest height is changed by loosening the adjustment lever, and sliding the inner vertical tube to the desired position and tightening the lever mechanism. The headrest to seat depth is adjusted by loosening the 6mm Allen screws, and moving the hinge to the desired position, and then tightening the screws securely. To adjust the headrest angle, loosen the screws at the headrest upholstery, position the headrest as required and tighten the screws securely.

6.12. Powered Lift

The seat can lift up to 30 cm by operating it through your control system.

Delphi QC Control:

To operate the powered lift simply push the Mode Button to select Actuator mode (Fig. 57) and then operate the Joystick left or right to select the Actuator required (Actuator 1 or Actuator 2). Selection is indicated via the lighting of the Green LED adjacent to the desired Actuator number. Operate the Joystick in the forward or rearward direction to move the lift up or down. Release the Joystick when the desired angle is reached. Once the lift is fully raised or in its lowest position do not hold the Joystick in its operating position as this could damage the actuator. To return to Drive Mode, simply press the Mode Button again.

Delphi QR Control:

To operate the powered lift simply push the Mode Button twice to select Actuator Mode (Fig. 56 and 57). (If only 1 drive profile is enabled, then the mode button needs to be pressed only once). Selection is indicated via the lighting of the Green LED adjacent to the Mode Button. The wheelchair icon LEDs in the centre of the Remote will light up with the currently selected Actuator Option. Move the Joystick in the left or the right direction to scroll through the possible options until the Lift Option is selected. Operate the Joystick in the forward or rearward direction to move the lift up or down. Release the Joystick when the desired angle is reached. Once the lift is fully raised or in its lowest position do not hold the Joystick in its operating position as this could damage the actuator. To return to Drive Mode, simply press the Mode Button. Operating the powered lift higher than 5cm from its lowest position will bring the chair into "creep mode", moving it below will allow full speed.

7. The Delphi QR Hand Control

- On/off button: This connects or disconnects the entire electronic system, which supplies energy to the motors. Do not use this button to stop the chair except in case of an emergency. This stopping method is only to be used in an emergency situation as the stopping action is very abrupt.
- Battery Gauge: This indicates, when lit, that the wheelchair is powered. It also indicates any electrical fault that there may be on the system. The sequence of flashing lights indicates the fault type (See "Battery Gauge" in this manual). If it remains lit, this means that the System is working normally. It flashes to indicate any fault that may have arisen. Slow flashing of the Red LED indicates that the Batteries should be recharged as soon as it is feasibly possible.
- Profile indicator: This indicates the 4 independent programmable profile sets for the wheelchair. There are four profiles predefined. The first is the slowest, the last is the fastest.
- Horn switch: Initiates the Horn when pressed.
- To operate the lights, indicators or hazard lights, press the relevant button for the on and off operation. (Fig. 58 and 59).



7.1. Adjustable Drive Profiles

Your controller has four separate Drive Profiles (Fig. 58 and 59) that are predefined as factory defaults. Profile 1 is the slowest and 4 is the fastest. The character of these profiles can be programmed to suit your individual needs. For more information please contact your local SUNRISE MEDICAL supplier.

To adjust:

- Press the mode button once. The Mode LED adjacent to the Mode Button will light up Red. This indicates Drive Profile Selection Mode. One of the Pie Chart Icon LEDs in the centre of the Remote will be lit up with the currently selected Drive profile.
- Move the Joystick in the Direction of the desired drive profile and the LED for that Drive Profile will light up e.g. Forward Press on the Joystick to select Profile 1.
- Release the Joystick and the Control System will now be in the desired Drive Profile and ready to drive.

Note: If drive profile has been changed but driving has not been initiated, the hand control will beep and revert to the previously used drive profile after 15 sec.

7.2. Battery level indicator

This has seven colour coded lights, 1 red, 2 amber, and 4 green, and denotes the state of charge of the batteries (Fig. 60). Green indicates high charge, Amber indicates low charge, and Red indicates that the batteries are almost depleted. A flashing red light indicates that the Wheelchair should be charged as soon as feasibly possible. The most accurate reading is attained when the chair is driving on a good level surface. The lights also help indicate the position of a fault (should the need arise). When in fault mode the lights will flash quickly. Noting the number of lights flashing may help your service agent in simple fault finding.



Approximate battery state of charge	LED-Display	Display state
Battery charge \geq 80%	██████████	steady
80% \geq Battery charge \geq 70%	██████████	steady
70% \geq Battery charge \geq 60%	██████████	steady
60% \geq Battery charge \geq 50%	██████████	steady
50% \geq Battery charge \geq 40%	██████████	steady
40% \geq Battery charge \geq 30%	██████████	steady
30% \geq Battery charge \geq 20%	██████████	steady
Battery charge \leq 20%	██████████	flash 1,5 Hz

7.3. Power and Communication Connection

Ensure the power and communication (Bus) lead is connected correctly into the transition connector in the cable between the Remote and the Control Box.

7.4. The Keyless Lock

When this is activated the chair will not function. This may be useful if you wish to leave your wheelchair unattended.

7.4.1. To activate the Keyless Lock

- Ensure that the Controller is switched off.
- Push the Joystick fully forward and hold the Joystick in this position. Whilst doing this, press and hold the On / Off Button for more than 5 seconds.
- The Remote will beep once, indicating that the system is now Locked, and all LEDs will be extinguished.

7.4.2. To identify a locked system

- To identify a locked system, turn on the Remote at the On / Off Button. If the system is locked, all of the Battery Gauge LEDs will flash twice and then extinguish

7.4.3. To de-activate the Keyless Lock

- Ensure that the Controller is switched off.
- Push the Joystick fully into Reverse and hold the joystick in this position. Whilst doing this, press and hold the On / Off Button for more than 5 seconds.
- The Remote will Beep 3 times, indicating that the system is now unlocked.
- Your chair should now be ready to use.

7.5. Lights and indicators

GROOVE can be equipped with lights and indicators. Where lights are not factory fitted, they may be fitted as an optional extra by an approved Sunrise Medical service dealer.

WARNING

Ensure that the lights and indicators are functioning correctly and lens are clean before going outdoors at night.

7.5.1. Lighting bulb exchange procedure

If bulbs of your lights and indicator system show a defect, indicated through a double speed flash of the indicating LED on the hand control, please proceed in the following way:

Front lights and indicators (TUV and LED light type):

Use a cross screw driver to release the screw of the light or indicator glass. Take the glass off. This gives you access to the bulbs.

- For the TUV lights 12V/3W bulbs with an E12 thread are required
- For the TUV indicators 12V/5W bulbs with a 90° bayonet socket are required
- For the LED lights and Indicators specific 12V bulbs with an E12 thread are required. Please contact Sunrise Medical for spares.

Rear lights and indicators:

TUV-lights: Lift the red or orange glass of the light carefully off the socket. If a bulb needs to be replaced 12V/5W cylindrical, capless is required.

- For the LED lights and Indicators specific 12V bulbs with an E12 thread are required. Please contact Sunrise Medical for spares.

Note: We recommend the use of Sunrise Medical authorised spare parts only.

Be advised, that all lighting circuits are electronically protected. In the event of a short circuit it current limits. Once the fault is removed the system resets automatically.

7.6. Indicators

The right hand button operates the right side, front and rear indicators, the left button operates the left side, front and rear indicators. To cancel press the button again (Fig. 59).

7.7. The horn button

Hand Control: When pressing the horn buzzer will sound. It stops when you release the button (Fig. 58 and 59).

Compact Hand Control: When pressing and holding the mode button the buzzer will sound. It stops when you release the button.

7.8. Hazard lights

Depressing the button will operate the front and rear hazard lights. This is effective either when the chair is switched On or Off. The indicators will flash intermittently until cancelled by pressing the button again (Fig. 58 and 59). This function is also indicated through the Hand Control LED's.

7.9. Main lights

Depressing this button will operate the lights (Fig. 59) only when the chair is switched on. Pressing it again will switch the lights off.

7.10. Actuator mode function

This will be included on your remote Joystick module if you have one or more electric options fitted to your chair (Fig. 58 and 59). Refer to sections 5.4.4., 5.6., 6.9.2. and 6.12. on powered option operation.

7.11. Menu select

To choose an electric option press the mode button twice until the green lights are visible on the wheelchair icon in the centre of the joystick. Move the joystick to the left or right to indicate which function can be used. When the desired function has been chosen you can activate the electric actuator system. If you attempt to operate the electric functions when driving, the chair will automatically come to a safe stop. We recommend you only use the electric options whilst stationary.

Up/Down movement

Once the relevant electric option has been chosen the required movement is achieved by moving the joystick forwards or backwards.

Accessing Environmental Control Modes (via ECM where fitted)
Where an Environmental Control Module (ECM) is fitted to the wheelchair, access to the Modes is achieved as follows:

1. Press the Mode Button until the Mode LED adjacent to the Mode Button lights up Amber (This may be two presses, or three presses depending upon whether Actuators are present on the chair).
2. Select the desired Environmental Control Channel by moving the Joystick in the direction that matches the channel option on the Pie Chart.
3. To operate channel outputs, move the Joystick into the direction required.
4. To return to Drive Mode, press the Mode Button once more.

7.12. Operating the control joystick

When engaging the main On/Off switch, allow a few seconds prior to moving the joystick (Fig. 60). This allows the system to self check. If you move the joystick too soon, the battery level indicator display will not illuminate until the joystick is released.

If it is off null for more than 5 seconds a system error will occur. Whilst this is not harmful to your wheelchair, you will need to switch off and then back on to clear the system.

Note: This is a safety feature to prevent unintended movement.

To steer, simply move the joystick in the direction you wish to go. Proceed slowly at first, i.e., do not push the joystick too far forward. Brakes will engage as soon as the joystick is released and the chair has come to a halt.

Once the brakes have been applied, switching off will make no difference to the brakes, although it is always safer when remaining stationary for a period of time to switch off.

7.13. Proportional control Summary

1. To steer, simply move the joystick in the direction you wish to go (Fig. 58 and 59).
2. The further you move the joystick, the faster you will go.
3. New users should use slower speeds until they feel confident when driving the powerchair. Adjust the Drive Profile as explained in section 7.1.
4. The brakes will automatically stop the wheelchair from any speed when the joystick is released.
5. Switching off the chair immediately applies abrupt braking and is not recommended for normal use.

6. It is important that the chair is stationary when changing direction from reverse to forward.

7. Always switch to off before getting into or out of the chair.

7.14. Programming port

Hand Control: The programming port is placed in the bottom front of the pod.

No hand control: The programming port can be any unused bus socket on any of the modules. If no free bus socket is available bus splitters are available through SUNRISE MEDICAL.

This will enable an approved service agent to re-programme your chair and also gain useful information when tracing any faults.

When the chair leaves the factory, the parameters of the controller are set to default.

To programme the controller you need a special programming device (Handheld or PC software), which is available through your Sunrise Medical Dealer.

Note: SUNRISE MEDICAL does not accept responsibility for damages which result from unexpected stopping of the wheelchair or inappropriate programming or unauthorised use of the wheelchair.

Note: Programming the controller of the wheelchair is only allowed through authorised personnel trained by Sunrise Medical. Incorrect controller settings could cause driving outside the safe limits and could result in damage or injury.

7.15. Charging socket

See section 9.0. about charging.

7.16. WARNING

Ensure that you set the speed of the attendant control to a speed that you can comfortably follow.

Ensure that you always have comfortable access to the controls whilst the chair is moving and make sure that the controller is fixed securely to the chair.

It is important that the joystick boot is replaced if it is torn or brittle, failing to do so could cause substance damage to the controller and unexpected movement of the chair.

Always turn off the power to the controller when leaving the user in the chair.

Do not replace the joystick knob with any unauthorised item. It may cause hazardous operation and loss of control of the chair.

Ensure that you always have comfortable access to the controls whilst the chair is moving. Make sure that the controller is fixed securely to the centre bar. See Fig. 45.

It is important that the joystick boot is replaced if it is torn or brittle, failing to do so could cause substance damage to the controller and unexpected movement of the chair.

Always turn off the power to the controller before moving the controller out of the way.

The maximum weight allowed for the tray is 2.5kg.

Do not to overload the tray, this could cause the tray to break or could cause the chair to become unstable.

Ensure that you always have comfortable access to the controls whilst the chair is moving and make sure that there is nothing on the tray that could interfere with your control of the chair.

It is important that the joystick boot is replaced if it is torn or brittle, failing to do so could cause substance damage to the controller and unexpected movement of the chair.

Always turn off the power to the controller before moving the tray out of the way.

Do not leave lit cigarettes or other heat sources on the tray as this could cause the tray to deform and mark.

Ensure that all extremities and clothing are free when positioning the tray for use.

Do not replace the joystick knob with any unauthorised item. It may cause hazardous operation and loss of control of the chair.

Ensure that you always have comfortable access to the controls whilst the chair is moving.

Do not replace the joystick knob with any unauthorised item. It may cause hazardous operation and loss of control of the chair.

The maximum weight allowed for the tray is 2.5kg.

Do not to overload the tray, this could cause the tray to break or could cause the chair to become unstable.

Do not leave lit cigarettes or other heat sources on the tray as this could cause the tray to deform and mark.

Ensure that all extremities and clothing are free when positioning the tray for use.

WARNING

Before adjusting the swing-away arm, switch off the controller to avoid accidental displacement of the joystick which would cause unwanted movement of your wheelchair.

Keep your fingers and clothing, etc. clear while operating the swing-away mechanism.

Be aware that the width of you chair has increased if the swing-away arm is out and you may not get between certain obstacles.

Do not hang any items on or over the parallel swing-away remote assembly as this could damage the swing-away mechanism.

When transferring to and from the wheelchair do not use the remote as a means of support.

Keep fingers, clothing, etc. clear of the swing-away mechanism at all times.

Ensure the power is switched off while adjusting the parallel swing-away arm.

Only operate the wheelchair at low manoeuvring speed when the parallel swing-away is in use.

8.1.1. Drive System Failures (QC and QR controller)

Drive System failures are indicated by the Mode LED flashing Red. In conjunction with this flashing red LED, the Battery Gauge will flash steadily in one of the following combinations:

LED-Display	Error description
■ ■ ■ ■ ■ ■ ■ ■	Motor Controller Internal Module Error
■ ■ ■ ■ ■ ■ □ □	Module Communication Error
■ ■ ■ ■ ■ □ □ □	Input Device Out of Neutral at Power On
■ ■ ■ ■ □ □ □ □	Park Brake Open Circuit Error
■ ■ ■ □ □ □ □ □	Right Motor Open Circuit OR Right Motor Encoder Error
■ ■ □ □ □ □ □ □	Left Motor Open Circuit OR Left Motor Encoder Error
■ □ □ □ □ □ □ □	Battery Under Voltage OR Battery Over Voltage Error
□ □ □ □ □ □ ■ ■	Motor Controller High Temperature Warning
□ □ □ □ □ ■ ■ ■	Invalid System Configuration Error
□ □ □ □ ■ ■ ■ ■	Drive Lockout External Source

8.1.2. Seating System Failures (QMAC failures on QR System Only)

Seating System failures are indicated by the Mode LED flashing Green. In conjunction with this flashing Green LED, the Battery Gauge will flash steadily in one of the following combinations:

LED-Display	Error description
■ ■ ■ ■ ■ ■ ■ ■	QR-MAC Internal Module Error
■ ■ ■ ■ ■ ■ □ □	Module Communication Error
■ ■ ■ ■ ■ □ □ □	QR-MAX Hex Switch Not Neutral at Power On
■ ■ ■ ■ □ □ □ □	QR-MAX Home Switch Not Neutral at Power On
■ ■ □ □ □ □ □ □	Actuator Encoder Error
■ ■ □ □ □ □ □ □	Actuator Over Current Error
■ □ □ □ □ □ □ □	Battery Under Voltage OR Battery Over Voltage Error
□ □ □ □ □ □ ■ ■	QR-MAC High Temperature Warning
□ □ □ □ □ ■ ■ ■	Invalid System Configuration Error
□ □ □ □ ■ ■ ■ ■	Drive Lockout External Source

8.1.3. Environmental Control System Failures (QR System Only)

Environmental Control System failures are indicated by the Mode LED flashing Amber. In conjunction with this flashing Amber LED, the Battery Gauge will flash steadily in one of the following combinations:

LED-Display	Error description
■ ■ ■ ■ ■ ■ ■ ■	QR-ECM Internal Module Error
■ ■ ■ ■ ■ ■ □ □	Module Communication Error
■ □ □ □ □ □ □ □	Battery Under Voltage OR Battery Over Voltage Error
□ □ □ □ □ ■ ■ ■	Invalid System Configuration Error
□ □ □ □ ■ ■ ■ ■	Drive Lockout External Source

8.1.4. Lighting System Failures

Failures in the Lighting system are indicated by double speed flashing of the LED next to the relevant Lighting Button on the Remote Control

8. The Delphi QC Hand Control

- On/off button: This connects or disconnects the entire electronic system, which supplies energy to the motors. Do not use this button to stop the chair except in case of an emergency. Doing so may damage the wheelchair.
- Battery Gauge: This indicates that the wheelchair is under power. It also indicates any fault there may be in functioning. The number of lights flashing indicates the fault type. (See "Battery Gauge" in this manual.)
- Speed indicator: This indicates the maximum speed set for the wheelchair. There are four speeds predefined. The first is the lowest, the last is the highest.
- Speed down button: Decrease the maximum speed setting.
- Speed up button: Increase the maximum speed setting.
- Horn switch: Initiates the Horn when pressed.
- Battery Gauge: If it remains lit, this means that the System is working normally. It flashes to indicate any fault that may have arisen.



Approximate battery state of charge	LED-Display	Display state
Battery charge ≥ 80%	■ ■ ■ ■ ■ ■ ■ ■	steady
80% ≥ Battery charge ≥ 70%	■ ■ ■ ■ ■ ■ □ □	steady
70% ≥ Battery charge ≥ 60%	■ ■ ■ ■ ■ □ □ □	steady
60% ≥ Battery charge ≥ 50%	■ ■ ■ ■ □ □ □ □	steady
50% ≥ Battery charge ≥ 40%	■ ■ ■ □ □ □ □ □	steady
40% ≥ Battery charge ≥ 30%	■ ■ □ □ □ □ □ □	steady
30% ≥ Battery charge ≥ 20%	■ □ □ □ □ □ □ □	steady
Battery charge ≤ 20%	■ □ □ □ □ □ □ □	flash 1,5 Hz

Slow flashing of the Red LED indicates that the Batteries should be recharged as soon as it is feasibly possible.

- To operate the **lights and indicators** press the relevant button for the on and off operation.
- To operate the **actuators** press the Mode button in the centre of the Joystick. A left or right movement of the joystick selects the desired seat function. A green LED will indicate the option selected.

Moving the joystick forwards and backwards changes the angle of the seat option chosen.

By pressing the actuator button again you return into the drive mode.

8.1. Controller Diagnostics

The following list shows Diagnostic information that applies to both the Delphi Consumer (QR) and Rehab Control Systems:

8.15. WARNING

Ensure that you set the speed of the attendant control to a speed that you can comfortably follow.

Ensure that you always have comfortable access to the controls whilst the chair is moving and make sure that the controller is fixed securely to the chair.

It is important that the joystick boot is replaced if it is torn or brittle, failing to do so could cause substance damage to the controller and unexpected movement of the chair.

Always turn off the power to the controller when leaving the user in the chair.

Do not replace the joystick knob with any unauthorised item. It may cause hazardous operation and loss of control of the chair.

Ensure that you always have comfortable access to the controls whilst the chair is moving. Make sure that the controller is fixed securely to the centre bar. See Fig. 45.

It is important that the joystick boot is replaced if it is torn or brittle, failing to do so could cause substance damage to the controller and unexpected movement of the chair.

Always turn off the power to the controller before moving the controller out of the way.

The maximum weight allowed for the tray is 2.5kg.

Do not to overload the tray, this could cause the tray to break or could cause the chair to become unstable.

Ensure that you always have comfortable access to the controls whilst the chair is moving and make sure that there is nothing on the tray that could interfere with your control of the chair.

It is important that the joystick boot is replaced if it is torn or brittle, failing to do so could cause substance damage to the controller and unexpected movement of the chair.

Always turn off the power to the controller before moving the tray out of the way.

Do not leave lit cigarettes or other heat sources on the tray as this could cause the tray to deform and mark.

Ensure that all extremities and clothing are free when positioning the tray for use.

Do not replace the joystick knob with any unauthorised item. It may cause hazardous operation and loss of control of the chair.

Ensure that you always have comfortable access to the controls whilst the chair is moving.

Do not replace the joystick knob with any unauthorised item. It may cause hazardous operation and loss of control of the chair.

The maximum weight allowed for the tray is 2.5kg.

Do not to overload the tray, this could cause the tray to break or could cause the chair to become unstable.

Do not leave lit cigarettes or other heat sources on the tray as this could cause the tray to deform and mark.

Ensure that all extremities and clothing are free when positioning the tray for use.

Before adjusting the swing-away arm, switch off the controller to avoid accidental displacement of the joystick which would cause unwanted movement of your wheelchair.

Keep your fingers and clothing, etc. clear while operating the swing-away mechanism.

Be aware that the width of your chair has increased if the swing-away arm is out and you may not get between certain obstacles.

Do not hang any items on or over the parallel swing-away remote assembly as this could damage the swing-away mechanism.

When transferring to and from the wheelchair do not use the remote as a means of support.

Keep fingers, clothing, etc. clear of the swing-away mechanism at all times.

Ensure the power is switched off while adjusting the parallel swing-away arm.

Only operate the wheelchair at low manoeuvring speed when the parallel swing-away is in use.

9. Batteries and charging

9.1. Batteries

The batteries are contained within the drive unit located under the battery shroud. To remove the batteries, should they require changing or maintenance, first release the two handle screws under the front of the seat frame (Fig. 65), which connect the seat frame with the seat module interface. Release and hold the safety locking pin. Flip the seat frame backwards (Fig. 63 and 66) and secure it with the safety bar like the bonnet of a car (Fig. 62). Lift off the battery lid. Disconnect the 2 pin Andersen connectors from each battery (Fig. 63, 64 and 67). There are straps available on each battery where they can be lifted out. To fit the batteries please proceed in the opposite way.

9.2. Safety cut-outs

In the event of a short circuit there are several safety systems built into your wheelchair to safeguard your electrical circuits.

1. Fusible 100A links are connected in to the battery harnesses to prevent short battery circuits
2. 15A auxiliary power circuit fuses for the Q-MAC module and the Recaro power supply
3. A 70A re-settable fuse in the main controller power harness. This is on the front shroud of the MWD and on the shroud between the castor wheels on RWD/FWD chair.

To replace them contact your local Sunrise Medical supplier, who will also diagnose the fault.

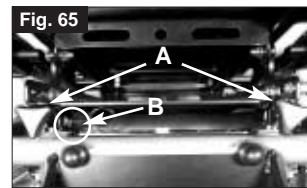
9.3. General Battery information

Batteries are the power source for almost all of the modern mobility products available today. The design of batteries used in mobility products is significantly different to the batteries used to start a car for example. Car batteries are designed to release a large amount of power over a short period of time, whilst mobility batteries (commonly called deep cycle batteries) release their power evenly, over a long period of time. Therefore, due to the lower production volumes and increased technological requirements, mobility batteries are typically more expensive.

Commonly two 12 volt batteries are used together in a mobility product, giving a total voltage of 24 volts. The size of the battery, (e.g. its available power) is expressed in amps per hour e.g. 70amp/hr. The higher the number, the bigger the battery size, weight and, potentially, the greater the distance you can travel. Sunrise Medical only fit as standard maintenance free batteries into these types of wheelchairs.

9.4. Maintenance free batteries

This type of battery uses a method of carrying the electrolyte commonly referred to as 'gel', that is held within the battery case. As the name implies, no maintenance is required other than regular charging. You can safely transport this type of battery without fear



of acid spilling. Furthermore, they are approved for transportation on aircraft.

9.5. Battery care

Below is set out a battery care plan for maintenance free batteries. This has been agreed between Sunrise Medical and the battery manufacturers, to enable you to get the best out of your batteries. If a different care plan is followed, this may result in lower than expected performance from your mobility vehicle.

9.6. Maintenance free battery care plan

1. Only use an approved Sunrise Medical charger compatible with the vehicle to be charged.
2. Charge your batteries every night, regardless of the amount of use your mobility device has had during the day.
3. Do not interrupt the charging cycle.
4. If your mobility device is not required for use, it should remain connected to the charger until required. This will not damage your batteries, as long as the mains socket/plug is left switched on. Turning the mains socket/plug off, but leaving the mains cable plugged in will eventually deplete your battery charge.
5. If you leave your vehicle for an extended period (more than 5 days) disconnect the main battery lead.
6. Failure to allow for recharge will damage the batteries and can lead to shortened distances and premature failure.
7. Do not top up the charge of your batteries during the day. Wait until the evening for a full overnight charge.
8. As a general rule, maintenance free batteries take longer to fully charge than lead acid batteries.
9. The battery terminals need to be checked regularly for signs of corrosion. If any corrosion is apparent, then clean the terminals completely (a wire brush is ideal) and re-grease the terminal using Vaseline petroleum jelly, not ordinary grease. Ensure that the terminal nut and bolt, cable clip and exposed cable are completely covered with jelly.
10. Following all the points above should result in a healthier battery, greater range for the vehicle user and a longer life for your batteries.
11. Return the batteries back to Sunrise Medical or directly to the battery manufacturer for recycling, when they no longer hold charge.

Do not expose any part of the battery to direct heat (i.e. naked flame, gas fire).

When charging always place your charger on a hard surface in a room with good ventilation.

You should not charge your batteries in outdoor conditions.

9.7. General Charger Information

The external charger has been designed to charge two 12V Gel type batteries connected in series (= 24 V).

9.8. Charger Safety features

The chargers have features which prevent hazards or accidents occurring as a result of connecting batteries the wrong way round, overheating caused by fault conditions, or attempting to charge wrong voltage batteries.

The majority of charger sizes are electrically double insulated and no earth connection is required. Some larger sizes may be electrically earthed and this will be clearly stated on the label.

The 3 pin UK mains input plug contains a replaceable fuse. The rating of this fuse is shown on the charger label. Always replace with the same type and size of fuse as specified. Fitting of different fuses can result in damage to the charger or failure of the charger to operate properly.

If your charger has been specified for use in Continental Europe it will contain a European two pin plug which does not have a fuse. In this case the fuse is located in the fascia panel of the charger.

Note: Please read the owners manual with the charger supplied carefully. The general procedures and effects for the interference with the chair and the batteries remain still valid.

9.9. Procedure for connecting the charger and charging

1. The wheelchair can be charged via the External charging socket (Fig. 68 and 69).
2. Connect the charger to the mains supply by means of the mains plug and switch on.
3. Do not leave the charger connected to the battery with the mains disconnected or switch-



Fig. 68

ed off. This could result in damage to your battery being caused by deep discharge over a period of time.

4. Always switch off at the mains before disconnecting the batteries.

9.10. Charger Safety and caution notes

1. The charger is designed for indoor use. Do not use outdoors or expose to rain, snow, spray or moisture.
2. Use only with SUNRISE MEDICAL specified batteries.
3. The charger may be used with other brands of Gel type batteries, subject to written confirmation from the Technical Department of Sunrise Medical.

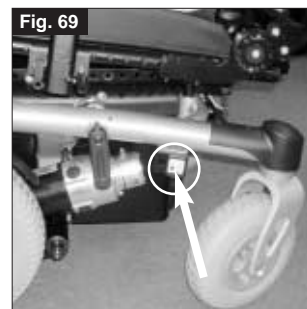


Fig. 69

9.11. The range of your vehicle

Most manufacturers of mobility products state the range of their vehicles either in the sales literature or within the Owners Manual. The range stated sometimes differs from manufacturer to manufacturer even though the battery size is the same. Sunrise Medical measure the range of their vehicles in a consistent and uniform manner, but variances still occur due to motor efficiencies and overall product load weight.

The range figures are calculated to **I.S.O. Standard 7176. Part 4: Wheelchair Energy Consumption Theoretical Range**

This test is carried out in controlled conditions with new, fully charged batteries, on a level test surface and a user weight of 100 kg. The range figures stated should be seen as a theoretical maximum and could be reduced if any single, or combination, of the following circumstances occur:

1. User weight heavier than 100 kg.
2. Batteries whose age and condition are less than perfect.
3. The terrain is difficult e.g. very hilly, sloping, muddy ground, gravel, grass, snow and ice.
4. The vehicle climbs kerbs regularly.
5. The ambient temperature is very hot or very cold.
6. Incorrect tyre pressures in one or more tyres.
7. Lots of start/stop driving.
8. Also thick pile carpets within the home can affect range.
9. Use of additional power consumption options (e.g. light, actuators, etc.)

All this technical information may seem complicated and a little daunting, but please remember that the battery sizes available on each Sunrise Medical product should give sufficient range to cope with the majority of customer's lifestyles.

9.12. Common Battery statements

Over the years, battery technology has moved forward but, unfortunately, some of the advice given on battery care has not. This has resulted in a number of confused and at times contradictory instructions on the 'best' way to care for your batteries. This section will help to dispel some of these myths and legends.

To reduce the risk of damage to electric plug and cord, pull by the plug rather than the cord when disconnecting the charger. Make sure the cord is located so that it will not be stepped on, tripped over, or otherwise subjected to damage or stress. An extension cord should not be used unless absolutely necessary. Use of an improper extension cord could result in a risk of fire and electric shock. If any extension cord must be used, make sure the pins on the plug of the extension cord are the same number, size and shape as those of the plug on the charger; and that the extension cord is properly wired and in good electrical condition.

Important !

- Do not rest a battery on top of the charger.
- Do not stand the charger on a carpet or other soft surface. Always place it on a hard surface.
- Do not operate the charger if it has received a sharp blow, been dropped or otherwise damaged in any way. Take it to a qualified technician.
- Do not disassemble charger; only have it repaired by the manufacturers. Incorrect re-assembly may result in a risk of electric shock or fire. To reduce the risk of an electric shock, unplug the charger from the outlet before attempting any maintenance or cleaning. Turning off the controls will not reduce the risk.
- Never place the charger directly above the battery being charged; gases from the battery will corrode and damage the charger.
- Never smoke or allow a spark or flame in the vicinity of battery

or charger. Be extra cautious to reduce the risk of dropping a metal tool on to the battery. It could spark or short circuit the battery or other electrical parts that may cause an explosion. Also take off all personal metal effects and dangling objects when working on the battery.

- Never charge a frozen battery. A fully charged battery will rarely freeze but the electrolyte of a discharged battery can freeze at -9° Centigrade, any battery that is suspected of being frozen should be thawed completely before charging.

Note: When buying replacement batteries always consult your Sunrise Medical service agent.

9.13. Battery warranty

Battery warranties are subject to periods set by the manufacturers, however, most of these warranties are subject to a wear and tear clause, and if you genuinely wear out your batteries in 6 months, it will not be possible to obtain a replacement under warranty.

10. User tips

10.1. Caution

Please show the utmost consideration for the other traffic on the road. Remember that the last thing a car or lorry driver expects to see is a wheelchair backing off the kerb into the road. If in any doubt, do not risk crossing the road until you are certain that it is safe. Always cross the road as quickly as possible; there may be other traffic.

10.2. Adverse conditions

Please be aware that when driving your wheelchair in adverse conditions, e.g. on wet grass, mud, ice, snow, or other slippery surfaces you may experience a reduction in the grip and traction of your wheelchair. We recommend you take extra precautions in these conditions, particularly on hills and slopes, your wheelchair could become unstable or skid causing possible injury. Extreme variances in temperature may trigger the self protect mechanism in the control system. If this occurs the control system will temporarily shut down to prevent damage to the electronics or the chair.

10.3. Ramps

When using a ramp, please ensure that it is capable of taking the combined weight of the power chair and yourself. If a ramp is being used to load a chair into a vehicle, please ensure the ramp is properly secured to the vehicle. Always approach the ramp head-on and exercise caution.

Note: Please ensure your ramp is suitable for the product you are transporting.

10.4. Transfer to and from the chair

Sunrise Medical recommend that you consult your healthcare professional for assistance in developing your personal front or side transfer technique to best suit your needs, and avoid any personal injury.

Note: Ensure controller is switched off during transfers to avoid unintentional movement.

10.5. Gradients: ascents

When going uphill, keep the chair moving. Steer by moving the joystick from side to side. If you have stopped on a hill, you should start slowly. On a RWD chair, if necessary lean forward to prevent the tendency for the front wheels to lift.

10.6. Gradients: descents

On descents, it is important not to let the wheelchair accelerate beyond its normal level of ground speed. In fact, it is safer to proceed slowly down steep descents (below the speed of 5kph) and stop, if any anxiety arises regarding directional control. If the chair picks up speed, centre the control to slow it or to stop all forward movement, then restart slowly and do not allow the speed to increase. The solid state controller has the benefit of a logic system that will help compensate when driving along a camber or up a hill. This is an added safety feature on your wheelchair. In addition of course, you may control the wheelchair speed by using the speed control.

11. Transportation

11.1. Clamp points

Should you choose to transport the GROOVE, please clamp the product using a 4 Point Webbing Restraint as per the diagram shown (Fig. 70 and 71). Make sure chair is not in Freewheel mode!

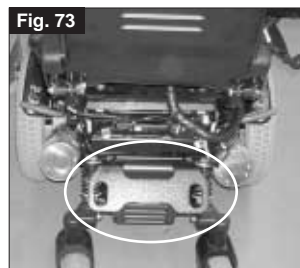
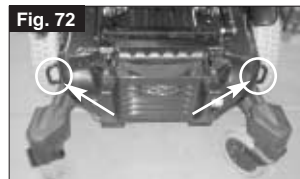


11.2. Transportation in vehicles

This wheelchair has been crash tested in its standard configuration. However, due to safety risks Sunrise Medical do not recommend the transportation of people in their wheelchairs.

Should a person need to be transported in wheelchair on transport systems, the following should be adhered to:

1. The wheelchair must be positioned forward facing.
2. For tie down points on the wheelchair, please look for the tie-down symbols on the wheelchair. Use D rings part number DR.
3. A head restraint suitable for transportation (see label of headrest) must be fitted and suitably positioned at all times during the transportation.
4. If possible, remove seat cushion to create a lower centre of gravity.
5. The wheelchair must be secured by a 4-part Tie Down Restraint system, conforming to ISO 10542 part 2.
6. The occupant must be restrained independently of the wheelchair by a lap and diagonal safety belt, conforming to ISO 10542 part 3. Sunrise Medical postural lap belts are for postural support only, and not suitable as restraints during transportation.
7. Any detachable accessories or components of the wheelchair must be removed and stored securely in the vehicle luggage compartment during transportation.
8. The Tie down restraints should be fitted to the main frame of the wheelchair as indicated by the karabiner stickers, and in the User Manual, and not to any other part of the chair.
9. The Tie Down restraints should be attached as close as possible at an angle of 45°, and tightened securely in accordance with the restraint manufacturers' instructions.
10. The wheelchair parking brakes must be firmly applied.



12. Maintenance and Cleaning

The wheelchair should be wiped over once per week with a slightly damp, not wet, cloth and any fluff or dust that has accumulated around the motors should be blown or dusted away.

12.1. Tyre pressures

If pneumatic tyres are fitted to your wheelchair it is important to regularly check the air pressure and for signs of wear. The correct pressures are between the minimum of 137 kiloPascals (20 psi, 1.37 bar) and the maximum 241 kiloPascals (35 psi, 2.41 bar) for rear and front wheels (see side of tyre). The pressure will need to vary, depending on the weight of the user.

IT IS IMPORTANT that front wheels are inflated to the same pressure as a pair, and likewise the rear. The inflator pump provides the safest method of inflating your wheelchair tyres and the pressure can be checked with a standard motor vehicle pressure gauge.

Do not inflate beyond the maximum allowed tyre pressure.

12.2. Tyre wear

When inspecting the tyres for signs of wear, look for significant scuff marks, cuts and a diminished tyre tread. Tyres will need to be changed when the tread cannot be seen over the complete surface of the tyre.

12.3. Electrical connections

When inspecting electrical connections, pay attention to the battery connections, the connection of batteries to power loom and plug in sockets for the joystick, control box and lights and indicators.

12.4. Upholstery/seating

Tears, dents, wearing or slackening of upholstery particularly near to metal could result in poor posture or lower levels of comfort and pressure relief.

12.5. Authorised Sunrise Medical service agents

The annual full service must be performed by an approved Sunrise Medical Service Agent. For a list of approved service agents in your area please contact Sunrise Medical Service Centre on this telephone number: 01384 44 66 66

12.6. Storage

When storing your powerchair for long periods of time (in excess of one week), first fully charge, and then disconnect the batteries, to minimise battery discharge. Never store your wheelchair in direct sunlight or in a damp/outdoor environment. It might bleach plastic parts and components.

12.7. GROOVE maintenance and routine

Complete inspection, safety check and service should be made by an authorised Sunrise Medical supplier or it may void warranty!

12.8. Battery installation for the GROOVE wheelchair

12.8.1. How to connect the cables to the batteries

To access batteries refer to part 9.1 in this manual.

The red cable always goes to the positive terminal (+) of one battery. The black cable always goes to the negative terminal (-) of the other battery. One of the yellow cables goes to the negative pole of one battery (see label on cable) and the other yellow cable goes to the positive pole of the other battery (see label on cable), linking both batteries serially with the red connectors to give a supply of 24 volts.

It is better to direct the cable terminals towards the interior of the box to avoid risk of contact with the outer box.

If you are in any doubt, please contact your Sunrise Medical supplier. For further information please refer to the technical manual.

Parts in the battery box:

- Supporting plate for wheelchair controller and electric modules.
- Conical-shaped terminals for batteries with cylindrical terminals.
- Two installation cables. The black plate has holes and is designed to support special controls. It should be placed in the space between the two batteries and fixed with two bolts on each top side.

Connect the batteries with the terminals opposing the centre of the plate to avoid possible contact with it.

CAUTION:

Before connecting the battery terminals it is very important to connect together the two connectors that join the cables. This way, if one cable is connected wrongly, it will produce a small spark indicating that something is wrong.

CAUTION:

The cables are connected first and then the connectors together, if there is a problem, the installation will ignite, causing major damage to the batteries.

The red cable always goes to the positive terminal (+) of one battery. The black cable always goes to the negative terminal (-) of the other battery. One of the yellow cables goes to the negative pole of one battery (see label on cable) and the other yellow cable goes to the positive pole of the other battery (see label on cable), linking both batteries serially with the red connectors (Fig. 74) to give a supply of 24 volts.

It is better to direct the cable terminals towards the interior of the box to avoid risk of contact with the outer box.

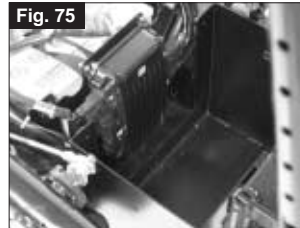
If you are in any doubt, please contact Sunrise Medical Tel (+44) 1384 44 66 66.

12.9. Controller access

For the GROOVE F/R please follow the "battery access instruction" in section 9. This gives also access to the Motor Control Module (Fig. 75) on GROOVE F/R.

To access the controller on the GROOVE M take the rear shroud on the base between the rear castor wheels of (Fig. 76).

For further information please refer to the technical manual.



12.10. Drive Wheel Tyre Repair

Remove the plastic hub cap by levering it off (Fig. 77). To remove the wheel, use a 5.0mm hex key on the 4-button head studs. The button head studs protrude through to the back of the wheel. Undo the corresponding nylok nuts using a 13mm spanner (Fig. 78). Remove the wheel. Note that when replacing the wheel use new nylok nuts.

There are 5 rim studs that must be loosened/tightened in the number order shown. Use a 6mm Allen key to release the studs. Lift the inner rim off the tyre wall (Fig. 79 and 80).

Lift the tyre and tube off the outer rim. Gently get a hold of the inner tube just behind the valve.

Carefully feed the tube out of the tyre.

When refitting, place the tube inside the tyre & rest it on the outer rim with the valve stem aligned with the cut out in the rim. Face the valve stem outward. Place the inner rim over the tyre, tube & outer rim. Align the cut out to fit over the valve stem & match it up to the cut out in the outer rim. Make sure the stud mounts are in line on both rims. Tighten the studs in the sequence shown earlier taking care not to pinch the tube. Slowly inflate to the pressure marked on the tyre. Refit the wheel back onto the motor shaft and fix it safely with the 4-button head studs.

In case a solid tyre is used the wheel needs to be replaced as a complete assembly.



12.11. Removing the Castor Wheel

Note which one of the two holes is used to mount the castor wheel. Ensure that both castors use the same mount position. Depending on the castor wheel type use two 6.0mm hex keys or two 13mm spanners to undo the axle bolt.

Remove the nyloc nut in case of the Hex bolt type. Always use a new nyloc nut when refitting.

There is an enclosed spacer between the wheel bearings. When refitting do not try to force the bolt through. Gently move the wheel back and forth until the bolt slips through.

Withdraw the axle bolt. Remove the castor wheel.

The Groove R/F tyre can be removed and repaired/exchanged by following the rim split procedure for the drive wheel in section 12.10.

12.12. Recommended maintenance routines

Daily Checks:

With the control system switched off, check that the joystick is not bent or damaged and that it returns to the centre when you push and release it. If there is a problem do not continue with the safety checks and contact your service agent.

Weekly checks:

Parking brake:

This test should be carried out on a level floor with at least one meter clearance around the chair.

Switch on the control system.

Check that the battery gauge remains on, or flashes slowly, after one second.

Push the joystick slowly forwards until you hear the parking brakes operate. The chair may start to move.

Immediately release the joystick. You must be able to hear each parking brake operate within a few seconds.

Repeat the test a further 3 times, pushing the joystick slowly backwards, left and right.

Connectors:

Make sure that all connectors are securely mated.

Cables:

Check the condition of all cables and connectors for damage.

Joystick gaiter:

Check the thin rubber gaiter or boot around the base of the joystick shaft for damage or splitting. Check visually only, do not handle the gaiter.

Mounting:

Make sure that all components of the control system are securely mounted. Do not over-tighten any securing screws.

12.13. WARNING

Please refer to Service manual for any information about Torques.

13. Specification sheets according to EN 12184 and ISO 7176-15

Manufacturer (Europe):

Sunrise Medical Ltd UK
Sunrise Business Park High Street
DY8 4PS Wollaston
West Midlands
United Kingdom

ENGLISH

Model: Quickie Groove R



Maximum occupant mass (test dummy mass): 182 kg

The wheelchair Quickie Groove R conforms to the following standards:

- requirements and test methods for static, impact and fatigue strengths (ISO 7176-8)
- power and control systems for electric wheelchairs – requirements and test methods (ISO 7176-14)
- climatic test in accordance with ISO 7176-9
- requirements for resistance to ignition in accordance with ISO 7176-16

ISO 7176-15	Min.	Max.	Comments
Overall length (with legrest)	1185 mm	1215 mm	With 50mm leg extensions fitted
Overall width	620 mm	825 mm	W/o lights & with lights
Folded length	N/A	N/A	Not a folding chair
Folded height	N/A	N/A	Not a folding chair
Total mass (w/batteries)	–	152 kg	Heaviest chair config.
Mass of the heaviest part		23,5 kg	Heaviest removable part
Static stability downhill	24° +	–	0°tilt/0°recline & max. seat height
Static stability uphill	10,7°	–	9°tilt/12°recline & max. seat height
Static stability sideways	19,2°	–	0°tilt/0°recline & max. seat height
Energy consumption (Max. range)	–	40 km	depending on terrain, speed and user weight
Dynamic stability uphill		10°	
Obstacle climbing (w/kerb climber)	–	100 mm	137 kg (75 mm @ 182 kg)
Maximum speed forward	6 km/h	13 km/h	
Minimum braking distance from max. speed	–		Dep. Programming
Seat plane angle	0°	9°	
Effective seat depth	305 mm	558 mm	
Effective seat width	305 mm	609 mm	
Seat surface height at front edge	438 mm	490 mm	
Backrest angle	-3°	12°	mechanical
Backrest height	350 mm	700 mm	
Footrest to seat distance	340 mm	540 mm	
Leg to seat surface angle	90°	70°	
Armrest to seat distance	203 mm	316 mm	
Front location of armrest structure	49 mm	249 mm	
Handrim diameter	N/A	N/A	Not a manual chair
Horizontal location of axle	N/A	N/A	Not a manual chair
Minimum turning radius	1000 mm		depending on legrest option
Mass of the test dummy	–	182 kg	
EN 12184	Min.	Max.	Comments
Maximum kerb height	50 mm	75 mm	<50mm with kerb climber only
Maximum height of obstacle	–	100 mm	<50mm with kerb climber only
Turning space	–	1400 mm	
Speed control operation force	–	1,8 N	
Direction control operation force	–	1,5 N	
Pressure switch range	-6.9 kPa	+6.9 kPa	Relative to atmospheric (-1.0 to +1.0 PSI)
Pressure switches operation force (puff)	n.a.	n.a.	Programmable
Pressure switches operation force (sip)	n.a.	n.a.	Programmable
Pressure resolution	0.1		
Pressure Barb size (O.D.)	0.15 inches		

Model: Quickie Groove M



Maximum occupant mass (test dummy mass): 182 kg

The wheelchair Quickie Groove M conforms to the following standards:

- a) requirements and test methods for static, impact and fatigue strengths (ISO 7176-8)
- b) power and control systems for electric wheelchairs – requirements and test methods (ISO 7176-14)
- c) climatic test in accordance with ISO 7176-9
- d) requirements for resistance to ignition in accordance with ISO 7176-16

ISO 7176-15	Min.	Max.	Comments
Overall length (with legrest)	1070 mm	1100 mm	
Overall width	622 mm	838 mm	
Folded length	N/A	N/A	Not foldable
Folded height	N/A	N/A	Not foldable
Total mass (w/batteries)	130 kg	197 kg	
Mass of the heaviest part	17,2 kg	23,6 kg	(batteries)
Static stability downhill	10°	> 25°	
Static stability uphill	6,5°	> 25°	
Static stability sideways	19°	21°	
Energy consumption (Max. range)	-	40 km	depending on terrain, speed and user weight
Dynamic stability uphill	6°	10°	
Obstacle climbing (w/kerb climber)	-	100 mm	137 kg (75 mm @ 182 kg)
Maximum speed forward	6 km/h	13 km/h	
Minimum braking distance from max. speed	-	950 mm	Dep. programming
Seat plane angle	0°	9°	
Effective seat depth	305 mm	558 mm	
Effective seat width	305 mm	609 mm	
Seat surface height at front edge	420 mm	480 mm	
Backrest angle	-3°	12°	mechanical
Backrest height	350 mm	700 mm	
Footrest to seat distance	340 mm	540 mm	
Leg to seat surface angle	90°	70°	
Armrest to seat distance	203 mm	316 mm	
Front location of armrest structure	49 mm	249 mm	
Handrim diameter	N/A	N/A	Not a manual chair
Horizontal location of axle	N/A	N/A	Not a manual chair
Minimum turning radius	495 mm	635 mm	
Mass of the test dummy	-	182 kg	
EN 12184	Min.	Max.	Comments
Maximum kerb height	-	60 mm	
Maximum height of obstacle	-	100 mm	
Turning space	-	1100 mm	depending on legrest option
Speed control operation force	-	1,5 N	
Direction control operation force	-	1,5 N	
Pressure switch range	-6.9 kPa	+6.9 kPa	Relative to atmospheric (-1.0 to +1.0 PSI)
Pressure switches operation force (puff)	n.a.	n.a.	Programmable
Pressure switches operation force (sip)	n.a.	n.a.	Programmable
Pressure resolution	0.1		
Pressure Barb size (O.D.)	0.15 inches		

Modell: Quickie Groove F

Fig.F



Maximum occupant mass (test dummy mass): 182 kg

The wheelchair Quickie Groove F conforms to the following standards:

- a) requirements and test methods for static, impact and fatigue strengths (ISO 7176-8)
- b) power and control systems for electric wheelchairs – requirements and test methods (ISO 7176-14)
- c) climatic test in accordance with ISO 7176-9
- d) requirements for resistance to ignition in accordance with ISO 7176-16

ISO 7176-15	Min.	Max.	Comments
Overall length (with legrest)	1185 mm	1215 mm	With 50mm leg extensions fitted
Overall width	620 mm	825 mm	W/o lights & with lights
Folded length	N/A	N/A	Not a folding chair
Folded height	N/A	N/A	Not a folding chair
Total mass (w/batteries)	-	155,5 kg	
Mass of the heaviest part	-	23,5 kg	Heaviest removable part
Static stability downhill	15°	-	3°tilt/3°recline & max. seat height
Static stability uphill	22,7°	-	9°tilt/12°recline & max. seat height
Static stability sideways	16,4°	-	9°tilt/12°recline & max. seat height
Energy consumption (Max. range)	-	40 km	depending on terrain, speed and user weight
Dynamic stability uphill	-	6°	
Obstacle climbing (w/kerb climber)	-	100 mm	137 kg (75 mm @ 182 kg)
Maximum speed forward	6 km/h	10 km/h	
Minimum braking distance from max. speed			Dep. programming
Seat plane angle	0°	9°	
Effective seat depth	305 mm	558 mm	
Effective seat width	305 mm	609 mm	
Seat surface height at front edge	438 mm	490 mm	At 0° seat angle
Backrest angle	-3°	12°	mechanical
Backrest height	350 mm	700 mm	
Footrest to seat distance	340 mm	540 mm	
Leg to seat surface angle	90°	70°	
Armrest to seat distance	203 mm	316 mm	
Front location of armrest structure	49 mm	249 mm	
Handrim diameter	N/A	N/A	Not a manual chair
Horizontal location of axle	N/A	N/A	Not a manual chair
Minimum turning radius	700 mm	-	
Mass of the test dummy	-	182 kg	
EN 12184	Min.	Max.	Comments
Maximum kerb height	-	75 mm	
Maximum height of obstacle	-	100 mm	
Turning space	-	1400 mm	depending on legrest option
Speed control operation force	-	1,8 N	
Direction control operation force	-	1,5 N	
Pressure switch range	-6.9 kPa	+6.9 kPa	Relative to atmospheric (-1.0 to +1.0 PSI)
Pressure switches operation force (puff)	n.a.	n.a.	Programmable
Pressure switches operation force (sip)	n.a.	n.a.	Programmable
Pressure resolution	0.1		
Pressure Barb size (O.D.)	0.15 inches		

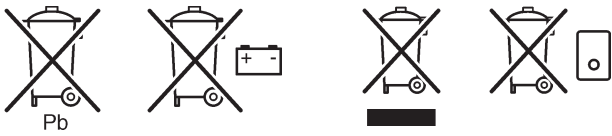
14. Service History

This section is designed to assist you in keeping a record of any service and repairs to your Wheelchair. Should you decide to sell or exchange your vehicle in the future, this will prove most helpful to you. Your Service Agent will also benefit from a documented record and this manual should accompany the Wheelchair when service or repair work is carried out. The Service Agent will complete this section and return the manual to you. Your new wheelchair is manufactured in the West Midlands by Sunrise Medical. With over 30 years experience, we are one of the longest established mobility equipment manufacturers in the UK. All our Scooters, Wheelchairs and Power Chairs undergo rigorous tests to ensure that they meet our requirements of comfort, safety and durability. Our success is based on the strong traditions of quality, value for money and genuinely caring for our customers. We pride ourselves not only on designing and building the most innovative products but also on our commitment to offer an excellent standard of customer service both during and after sale.

Model					Serial No.				
Year	1	2	3	4	Year	1	2	3	4
Date					Date				
Controller					Chassis				
On/Off switch					Condition				
Output plug					Steering				
Joystick					Upholstery				
Brakes					Seat				
Programmable configuration					Backrest				
Batteries					Armrests				
Level					Electrics				
Connections					Condition of loom				
Discharge test					Connections				
Wheels					Test run				
Wear					Forwards				
Pressure					Reverse				
Bearings					Emergency stop				
Wheel nuts					Left turn				
Motors					right turn				
Wiring					Up/down slope				
Connections					Over obstacles				
Noise					Parking brake				
Brakes					NOTE: Only use Sunrise Medical parts for service and repairs				
Brushes									

Dealer signature and stamp:

14.1 Disposal



14.1 The above symbol means that in accordance with local laws and regulations your product should be disposed of separately from household waste. When this product reaches the end of its life, take it to the local collection point designated by local authorities. The separate collection and recycling of your product at the time of disposal will help conserve natural resources and ensure that it is recycled in a manner that protects the environment.

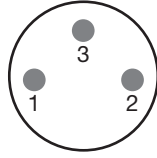
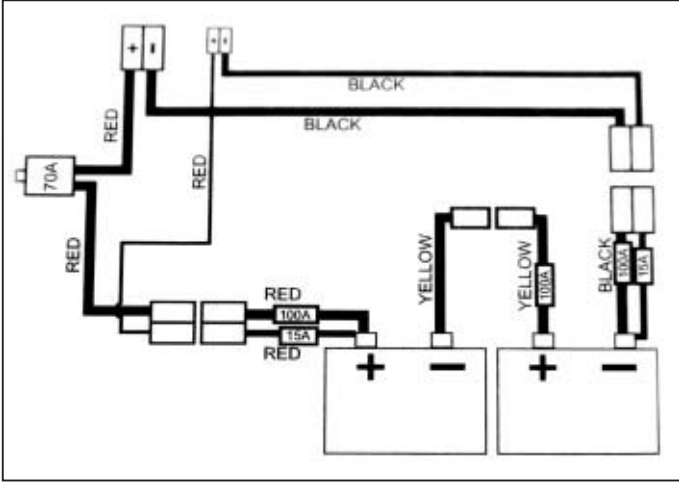
Ensure you are the legal owner of the product prior to arranging for the product disposal in accordance with the above recommendations.

Dealer signature and stamp:

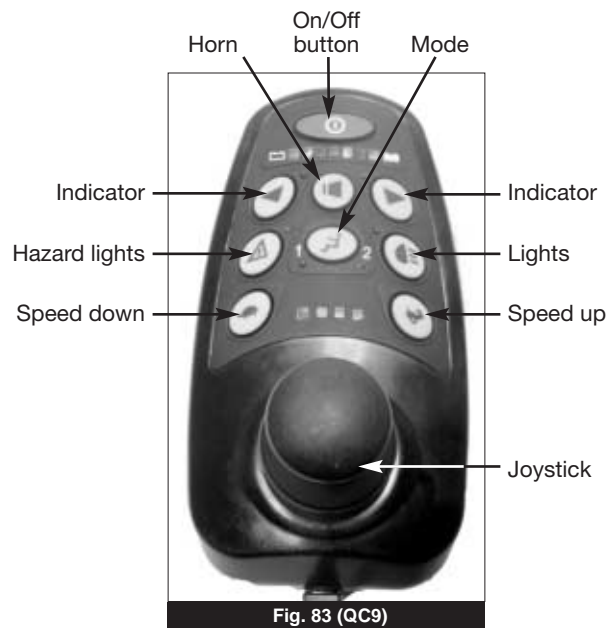
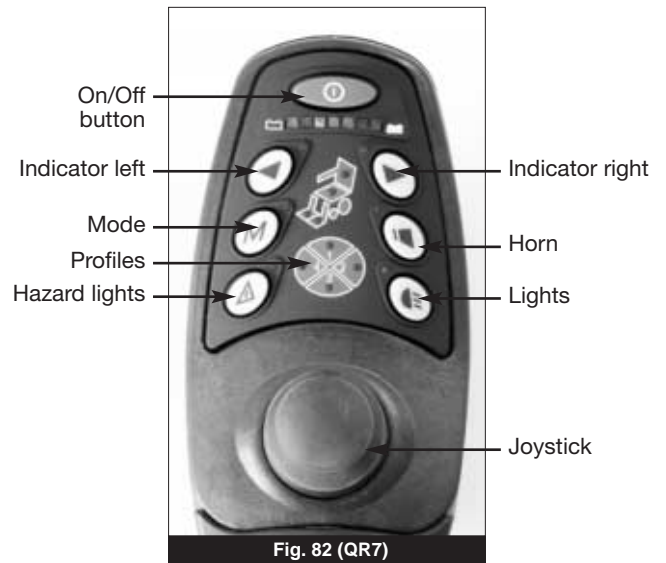
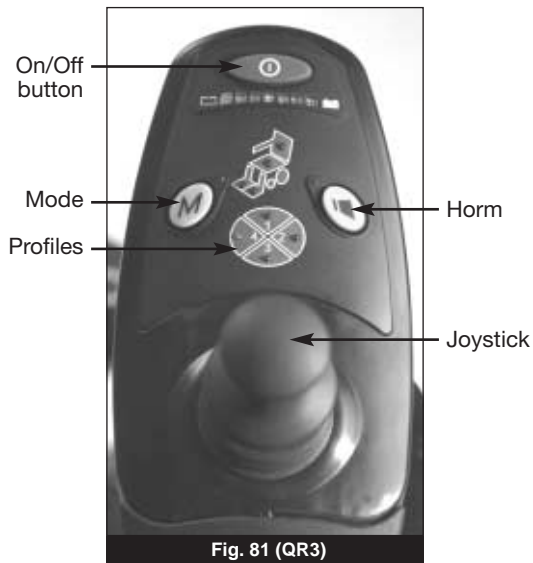
Dealer signature and stamp:

Dealer signature and stamp:

GROOVE Battery Wiring Diagram



Charger Socket:
Pin 1: Battery Positive
Pin 2: Battery Negative
Pin 3: Inhibit



Sunrise Medical GmbH + Co.KG
Kahlbachring 2-4
69254 Malsch/Heidelberg
Deutschland
Tel.: +49 (0) 72 53/980-0
Fax: +49 (0) 72 53/980-111
www.sunrisemedical.com

Sunrise Medical Limited
High Street Wollaston
West Midlands DY8 4PS
England
Phone: +44 (0) 13 84 44 66 88
www.sunrisemedical.com

Sunrise Medical S.L.
Polígono Bakiola, 41
48498 Arrankudiaga - Vizcaya
España
Tel.: +34 (0) 9 02 14 24 34
Fax: +34 (0) 9 46 48 15 75
www.sunrisemedical.com

Sunrise Medical S.A.
13, Rue de la Painguetterie
37390 Chanceaux sur Choisille
France
Tel.: +33 (0) 2 47 55 44 00
Fax: +33 (0) 2 47 55 44 03
www.sunrisemedical.com

Sunrise Medical Srl
Via Riva 20, Montale
29100 Piacenza (PC)
Italy
Tel.: +39 05 23-57 31 11
Fax: +39 05 23-5 70 60
www.sunrisemedical.com

Sunrise Medical A.G.
Lückhalde 14
3074 Muri bei Bern
Schweiz
Tel.: +41 (0) 31-958-38 38
Fax: +41 (0) 31-958-38 48
www.sunrisemedical.com

Sunrise Medical AS
Rehabsenteret
1450 Nesoddtangen
Norway
Tel.: +47 (0) 66 96 38 00
Faks: +47 (0) 66 96 38 38
www.sunrisemedical.com

Sunrise Medical AB
Britta Sahlgrens gata 8A
421 31 Västra Frölunda
Sweden
Tel: +46 (0) 31-748 37 00
Fax: +46 (0) 31-748 37 37
www.sunrisemedical.com

Sunrise Medical B.V.
Groningenhaven 18-20
3433 PE Nieuwegein
Nederlands
Tel.: +31 (0) 30 60-8 21 00
Fax: +31 (0) 30 60-5 58 80
www.sunrisemedical.com

G2 A/S
Graham Bells Vej 21-23 A
8200 Arhus N
Denmark
Tel.: +45 (0) 86 28 60 88
Fax: +45 (0) 86 28 65 88
www.G2.dk

